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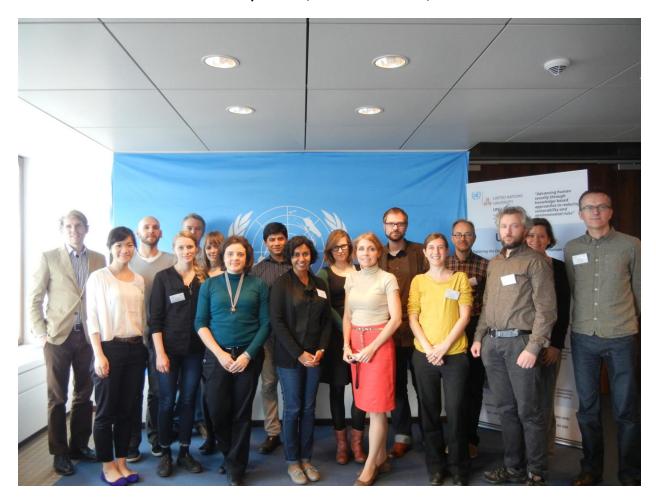EUROPEAN COOPERATION
IN SCIENCE AND TECHNOLOGY

COST Workshop:

"Managing SCALE and contextualized knowledge in inter/transdisciplinary research on environmentally induced migration"

UN Campus Bonn, 9-10 October 2013, Room 2116

Rapporteur's Notes

By Alice Yiu and Christina Rademacher-Schulz (UNU-EHS)

Dr. Koko Warner and Dr. Christina Rademacher-Schulz (UNU-EHS, Bonn)

Title: Lessons learnt from the Rainfalls project

Abstract: As a point of departure, the Rainfalls project will be briefly described as an example of interdisciplinary social science research using a case study-based approach in 8 countries worldwide. Fieldwork was conducted at a district level in up to four communities. The presentation will center on limitations and challenges that the team was facing and their lessons learnt, using a small-scale approach.

1. Background Information
   - 8 case studies in Guatemala, Peru, Ghana, Tanzania, India, Thailand, Vietnam, and Bangladesh
   - Duration: 2011-2013
   - Fieldwork done between Autumn 2011 and Spring 2012
   - Partners are CARE International, Center for International Earth Science Information Network (CIESIN) at Columbia University, New York, Universities of Bonn & Amsterdam
2. Research Objectives
   1) Conceptualize the **relationship between changing weather patterns**, **food security, social inequalities** and different forms of **human mobility**
      ➔ *Focus of field work*
      Question: Under what circumstances do households use migration as a risk management strategy in response to rainfall variability and food insecurity?
   2) Assess the potential for changing weather patterns to become a major driver of human migration and displacement in coming decades.
      ➔ Develop an agent based model on migration decisions
   3) Enable a range of stakeholders, including southern civil society organizations, to contribute to policy plans and practical interventions at national, regional and local levels. The findings will further contribute to global policy discussions about climate change adaptation, resilience and food security.
      ➔ Research findings will help inform climate change adaptation programmes run by CARE International in four countries
3. Rainfalls approach and procedure
   Procedure
      ➔ Site selection criteria:
         high incidence of poverty
         incidence of migration
         majority of people relying on rainfed agriculture
         measured variability in rainfall (incidence of droughts, floods etc.)
         Field research in one district, between 4-6 communities

Research with a national research team

Method	Interest	Subjects
Participatory Research Approach (PRA)	Depth of understanding, local perceptions	Groups of people, mixed- or same- sex groups
Household Survey	Comparability & breadth	Household head (m/f) or delegate
Expert Interviews	Expert knowledge	• Government representatives (i.e. extension & meteorology department officers) • Civil society actors • Scientists/academics • Local experts (i.e. chiefs, teachers)

4. Approach & methods triangulation
   Rainfalls approach:
   • Case specific, problem oriented approach
   • Actor as well as household oriented approach (migration as an adaptive strategy)
   • Rainfall variability (independent variable); food security and migration (dep. variables)
   • Historical perspective (last 20-30 years), current situation & assessment of potential future developments via ABM
   Methods assessment/triangulation:
   • Mix of qualitative & quantitative methods
   • Data triangulation of socio-demographic, economic and environmental/meteorological data
   • Comparison: Perceptions of local people & bio-physical data
5. Limitations & Lessons learned
   Limitations:
   • Small geographical scope (normally one agro-ecological zone)
   • Research in area of migrant's origin only
   • Hardly any socio-economic profiling to do stratified sampling
   • Limited availability of statistical data at commune, district and provincial levels
   • Limited availability of rainfall data on daily basis

   Lessons learned 1
   Site selection:
   It was felt that many pragmatic issues overwhelmed the scientific criteria, leading to suboptimal site selection in some cases. In the future, better communication may help to prevent this.
   Data collection:
   • There needs to be greater supervision

- The timing of research needs to be considered
    - in terms of the agricultural calendar (workload of research participants)
    - in terms of some key questions (i.e. on food security, lean season better than harvest time)

Lessons learned 2

Household survey:
- Shorten the questionnaire & add country specific questions
- Plan more time for pre-testing the survey

Data entry & cross check:
- More time and resources need to be allotted

PRA sessions:
- To ensure a smooth session, it's best to have a moderator, 2 facilitators and a note taker

Expert interviews:
- The semi-structured interview guideline was helpful
- More time needs to be allocated for interviews, esp. problem-centered interviews
- Biographical interviews would be good to complement our other methods

General:
- Research with a national research team is valuable (team composition is crucial)
- Allocate more time and resources for research

6. Feedback from policy makers

High interest from national and international policy makers...
- provide a more nuanced understanding of migration as adaptation in the context of environmental change
- improved methods design
- some interesting new findings, such as rainy season migration in Ghana
- results were taken to national climate change adaptation planning fora, NAPs etc.

... however, concerns about operational and policy implications:
- how to come to general conclusions at the regional level?
- what about general conclusions at the country level?
- how to best manage migration?
- which policy measures should be taken to improve the livelihood security of rural smallholders affected by climate change?

Q: In the next generation of projects, how to best come up with relevant information at the relevant scale?

Q&A section: (O= Opinion)

O: (Helen) The problem I am facing at the moment is about questionnaires. The major problem is that we will have to take a huge leap when we generalize the implication. How do you get social data up to the scale? How do you pick them?

Q: (Emilie) *Well, large-scale* in geographical analysis is equivalent to *small-scale* in social science, and vice versa. Also, are the terms migration and mobility the same? How are they different?

> **A:** Human movement can be seasonal and we do not want to exclude people who work on this field. Displacement /re-settlements have different patterns and different policy implications. The US state department has different bureaus dealing with migrants and refugees. Sometimes the terms cannot be mixed for policy and political purposes. Rainfall projects look at migration— voluntary moving.

Q: (Clemens) How do you avoid suggestive questioning and bias in questionnaire? Is meteorological data relevant when understanding migration? Or people's perception is more important?

> **A:** it is very important to consider both. Perception is how people see the future of their lives. Meteorological data often coincide with perceptions. The concept of climate change (perception) and the projective implication also change migration pattern.

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Prof. Dr. Etienne Piguet (University of Neuchatel)

Title: Assessing the link between the environment and migration at different scales and in different contexts: a methodological overview

Abstract: This presentation will introduce a typology of research methods used for empirically assessing the links between the environment and migration. The presentation will be based on the CLIMIG database, a compilation of more than 1000 bibliographic references worldwide. We'll critically discuss the different methods and make a case for methodological pluralism and complementarity.

1. Guiding questions
   Which approaches, are currently used in different fields of research? How to best combine methods and scales for the purpose of understanding migration processes under climatic change?
2. Literature on environmentally-induced migration
   Environment, Forced Migration & Social Vulnerability International Conference 9-11 October 2008 !
   - ➢ EACH-FOR (2009) http://www.each-for.eu/
   - ➢ Foresight/Migration and GEC (2011) http://www.bis.gov.uk/foresight/
   - ➢ Rainfalls (2013) http://wheretherainfalls.org/
   - ➢ IPCC/WG2 chapter 12 + … https://ipcc-wg2.gov/
   - ➢ MICLE (2013) http://www.micle-project.net/

➢ Synthesis books / Readers (Hugo [2013] in the The International Library of Studies on Migration)

3. Theoretical reembedding
   i. Economic disparities (economic theories of migration)
   ii. Unequal relations of power through space (political economy)
   iii. Connections between spaces (network theory, globalization theory)
   iv. Multiscalar processes (local – global)
   v. Environmental degradations / ecosystem services
   ➔ Methods…

4. **Current research questions**
   - Contribution of environmental changes to human mobility (*weight/interactions*)
   - Hotspots and scenarios (*migration, displacement, immobility*)
   - Regional specificities (*LECZ, drylands, mountain environments,…*)
   - The perception/construction of the migration/environment nexus (*agenda setting*)
   - Immigration *toward* environmentally vulnerable areas (*megacities*)
   - Mobility as coping strategy toward environmental change
   - Mitigation policies & mobility (*NCCAF, Proactive relocation, insurance schemes*)
   - Conceptual and legal issues related to migration and environmental changes

5. Revised typology of methods
   1) Type 1: Multiple regression models based on area characteristics
   2) Type 2: Multilevel analysis on area and individual data
   3) Type 3:Individual models based on large sample surveys
   4) Type 4 : Historical analogues
   5) Type 5 : Hotspots identification
   6) Type 6: Ethnographic case studies

6. Multiple regression based on area characteristics (type 1 – 11%/344)
   - The environmental characteristics of a geographic area should be correlated with the migratory characteristics of that same area (Afifi & Warner 2008).
   - Most studies confirm the impact of environmental variables on migration but the intensity varies greatly.
   - Environmental variables always appear as only one driving force of migration among others.
   - The issue of scale is central > Multilevel (type 2) : "information at the smallest level" (Henry 2004).

7. Individual sample surveys (type 3 - 15%/344)
   - The migratory behavior of an individual should be linked to individual characteristics and context .
   - Data about current and past migrations / environmental pressure / socio-economic context are collected through large HH or individual surveys (>100).
   - Panel data where HH are contacted several times (Massey et al. 2007).
   - Multivariate methods (logistic regression) or model building using ABM, etc…
   - Most studies emphasize the complexity and indirect linkages between migration and environmental variables.

8. Historical analogues and Hotspots
   - Historical analogues (type 4 – 10%)
   - The compilation of past links between environmental change and migration gives insights regarding current and future events (Arenstam Gibbons 2006).
   - Hotspot identification (type 5 – 11%)
   - Geographical hotspots can be identified on the basis of indicators of vulnerability based on socio-economic and environmental data (GIS, etc.) (Warner et al. 2009)
9. Qualitative / ethnographic studies (type 6 – 45%)
   - These studies use either interviews or small sample questionnaires among inhabitants of threatened areas & experts as well as participatory research, etc.
   - Although not suited to quantify the weight of different variables, these studies strongly support multicausality.
   - They offer invaluable insights into people's attitudes and representations of environmental change and about the interlinkages between the drivers of migration.
10. Next steps
    - Discuss the list of research questions
    - Discuss the typology of methods
    - Focus on scale
    - Stimulate methodological discussion and improve data collection
      a. Text book on methods
      b. Meta data platform (questionnaires)
      c. Monitoring of the literature

11. CliMig: BiblioBase Project
    - Literature watch based on a selection of topics (research questions)
    - Rigourous selection of literature (scientific papers, reports, etc…)
    - Implementation of specific keywords
      a. 7 Methodological keywords
      b. 9 Regional keywords (Asia / mountain) + country
      c. 7 Focus keywords (gender, …)
      d. 5 Type of hazard keywords (SLR, …)
    http://enviref.omeka.net/items/tags

Q&A Section:

Q: Where do you put discourse in the methods typology?

> **A:** Most probably on type 6 if the issue is conceptualized in policy making. It is not included in methodologies because these typology are about case studies

Q: How to you separate overlapping features of these methods in the typology?

> **A:** We simply give two keywords to the same studies. If many studies have the same keywords, it means the typology is not useful.

Q: Where is the line between large sample and small sample?

> **A:** The technical answer is 100 but it can vary given the population size. The non-technical answer is that it is difficult to make more than qualitative interviews with more than 100 samples. The real question is not the size of the sample, but the meaning of things captured in the sampling.

Q: Given that type 6 is the majority (45%), is this just because it is the more "popular" methods in policy analysis?

> **A:** we know that research based on quantitative analysis by nature has more advantage because they are perceived as more "scientific," but there are also important insights. Qualitative analysis, though not as so-called "scientific," gives a more personal analysis that suits the needs of policy makers.

Q: what do you think are the dangers and potentials of some of these types of methods?

> A: Very high potential of improvement regarding quantitative methods: there are often sophisticated methods used on not very good data; visual effects may make people think that these data are solid. ABM: I am more skeptical about it but I find it interesting.

Q: Are there any conceptual limitations in methodology?

> **A:** Qualitative is extremely important, but if someone takes it as a representation on a quantitative spectrum, it is not representative anymore (taking qualitative data for the use of quantitative use).

Q: have you come across any literature that uses individual information at scale? One of our research subgroup tries to analyze mobility pattern with cell phone.

> **A:** No.

Q: Is there any studies done on global north, since most participants here focus their research on global south. You cannot ignore the other part of the globe.

> **A:** There are two reasons: 1) geography of field work (heavily focus on the south 2) geography of the authors

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Dr. Jonathan Seaquist (Lund University)

Title: Teleconnections and Scale

Abstract: The concept of scale is framed in the context of network science which can be used to model flows of material, energy, ideas, and people across the Earth's surface. The short presentation will briefly highlight theory, practice, and challenges.

1. Teleconnections: When climate anomalies are related over very large distances, ex. El Nino

2. Land Trade teleconnections: There is a rush for buying land in the international communities. The map shows land transactions. Ex. UK has purchased land in Australia. Global north is generally importer and global south is generally exporter of land. Africa is quite popular for land purchase. Land trade can lead to potential land use change. The map shows the volumes and links of land trade. This map shows the relationship between countries and the way the trade lands. Analyzing the patterns embedded in the teleconnections.

3. Topology of teleconnections:
   Undirected, directed, undirected/weighted, directed/weighted.

4. Quantification of teleconnection:

   Node degree—the measure of power and centrality/ the number of links connected to the node. (sum of in-degree and out-degree)

5. What if you have hundreds of thousands nodes (ex. Neuroactivity/ internet)

   → Complex network: network with non-trivial topological features (structural properties). They have features and are not connected randomly.

   Nodes with high connection: hubs

   Nodes with very few links end up being the majority and the hubs are usually rare (hierarchy). Low frequency and high magnitude. The structure means that it is not randomly selected.

6. Some structural metrics:
   - Nearest neighbor correlations: assortative connection and dissortative connection
   - Betweenness centrality (and information broker←node that holds source of information)
   - Clustering coefficient (cliquishness): nodes that cluster together

7. Network Science:

It is called discovery-based science. It is a very large data set and you smash the data set into small piece and hopefully you can see the pattern that you hope to see. It is top-down, inductive. Theory grows from big data, and then hypotheses. Structure, functioning of systems, is →is the whole greater than the sum of its parts→emergent properties.

8. Spatial scale: minimum mapping unites, resolution, hierarchy→ all of these are fixed geographically. But from a network perspective, the "relational space" is more important→role of social forces in manipulating scale. Scales disappear in the network on connectivity. Social preferences are more influential. These networks are dynamic. These nodes may even have material impact on the landscapes too.

9. Apprehending scale:

Objective←--→ subjective

Logical positivism, realistic scales, complex scale invariance←→network scaling, complex constructionist scales, relativism

10. Reflection
What is the scale framework that best helps me organize and or provide answer to my research questions?

Q&A Section

Q: When you said that space disappeared in the beginning, do you mean geographical distance (physical space)?

A: Yes, referring to globalization.

Q: Even though if we do small-scale research, the primary audience of the UNU (country delegates) are interested. They want to know about relationships between variables. They do not care too much about the big numbers. What is your reflection on relations and social science?

A: Network theories can have around social science for years already. There are research focusing to show how groups interact.

Also, weak relational ties are seductive to social changes.

→Manson (2008) apprehending scale

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Vasna Ramasar (PhD student in sustainability science, Lund University)

Title: Scalar research for the management of environmentally-induced migration

Abstract: An introduction to the different approaches to scale in social and natural science research. This is followed by an overview of the ways scale is relevant to the governance and management of environmentally-induced migration. Particular attention will be paid to the implications of different scalar approaches.

1. Introduction on scale
   - The spatial, temporal, quantitative or analytical dimensions used to measure and study any phenomenon
   - 3 facets: size, level and relation
   - Tension between how scale is used as a means of framing and analyzing sustainability challenges: is it predefined or produced?
   - Governance and management require an interrogation of scalar assumptions
2. Politics of scaling
   - Scale as a social construction
   - Reflecting power relations and creating a particular explanation for the use of space
   - Environmental resources links various scales, actors and activities
   - With limitations on available resources, people exert power to achieve their own ends
   - Actors context scales and levels by shifting issues to those at which they are most influential or powerful
   - Multi-level governance confounded by politics of scaling
   - Contests can be relatively direct, as in debate or argument, or through use of technologies, controlling resource access and other ways of shaping the arenas of interaction (knowledge production through research)
   - Policy makers use scale differently than scientists
3. Globalization and localization
   - In response to illegally parked diplomatic vehicles in New York, Mayor Guilliani suggested that NYC needs its own foreign policy
   - George Soros provide a US ½ billion dollar loan to the struggling Yeltsin government
   - Disney company in releasing a movie on Tibet sent Henry Kissinger as its ambassador to China
   - Kensington Welfare Rights Union took their protest against the Philadelphia City Council to the United Nations
4. Governance and management of environmentally-induced migration
   - Norms, power, knowledge and scale
   - Challenges increasing, perception of migration increasing? Scale increasing?
   - Science more critical to governance and government but what science?
   - Which actors act on what information?
   - Multilevel governance or multi-centered governance (nodal or polycentric)?
5. Key questions for governance

- What potential governance strategies at different scales should be adopted to deal with environmental migration and protect the most vulnerable?
- How do solutions on different scales of governance interact?
- What socioeconomic and political factors and developments could either positively or negatively affect the governance or environmental migration through the politics of scaling?
- Which institutional arrangements could be implemented to address the issue across scales?

6. Governance and management across scales
   a) Architecture
      How is environmentally-induced migration framed in terms of scale and level and what implications this has for the scale and level at which architectures are developed?
   b) Adaptation
      How deos adaptive change at one level destabilize at another, with cross-level interactions providing both constraints and sources of innovation?
   c) Accountability
      What happens to accountability if the sites of governance shift and, to whom are they then accountable?
   d) Access and allocation
      By defining problems and solutions at specific scales and levels, how do researchers shape access and allocation?

7. Relating to management and governance
   - Scale is socially produced: whose environment is inducing migration, where is migration a problem, where are the solutions to be found, etc.
   - Governance of environmentally-induced migration is political and scale is a tool in political constructions
   - Our scale choices in research influence politics and policies of adaptation and management

Q&A Section

Q: To what extent is the scales considered in policy making?

   A: In many instances. One example is when people make discourses on territorial accountability. Ex. Building a dam→economic benefits on the national scale is more important that livelihood in on local scale

O: (Vasna)One problem with policy makers is that when they ask you a question that you know you cannot be brief (too complex on smaller scales), you tend to upscale the findings for them. And it is a dilemma because policy makers will use the findings the ways they wanted to.

O: (Lennart) In the IPCC Fifth assessment, there are issues with the agreement on evidence and the quality of evidence. You can have low evidence but high agreement; or lots of evidence but low agreement.

Q: How do you approach the hypothesis that scale is socially constructed?

A: I think researchers need to be more explicit in their positions. There is hardly any neutrality in our hypothesis.

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Lina Eklund (PhD student at Centre of Middle Eastern Studies, Lund University) and Clemens Romankiewicz (PhD student at Institute of Geography, University of Bayreuth)

Title: Issues of data and methods in linking environment and migration - a critical focus on scale

Abstract: The validity of research results on the environment-migration nexus implies scale issues of environmental, demographic, and socio-economic data. Questions of scale in empirical investigations are directly related to the methods of analysis as well as to the nature and quality of available data. We will provide a theoretical overview of temporal and spatial scale issues such as the Modifiable Area Unit Problem or Ecological fallacy and discuss implications of scale in results of selected empirical studies according to their methodical approach.

1. Introduction
   Scale issues in EIM research are essentially related to
   a. Methodical approach of data collection and analysis
   b. Nature and quality of the data available and how to make them comparable and utilizable
   c. Identifying processes and mechanisms of changes in both environment and migration and their nexus
2. Concepts of scale
   - Definition
   - Grain and extent
   - Identify and explain patterns
   - Issues
     a. Scale mismatch
     b. Upscaling and downscaling
     c. Maup
3. Review of case studies
   - 24 papers
   - Extent: village to global
   - Grain: individual to national
   - Ecological inference based on area characteristics
   - Individual sample survey
   - Ethnography
   - Multilevel Analysis
4. Socio-Economic and migration data
   - National censuses, large-N sample surveys
   - Ethnographic local case studies
     ➔ Individual / household level;

→ Social, economic, (environmental),...characteristics and context

→ Spatial, temporal patterns and volume of migration

5. Census data

   Most comprehensive demographic information

   Issues:

   - Migration information relates to birth place or last residence 5 years ago
   - Census surveys every 10 years
   - Reports give information on aggregated administrative levels
   - Aggregated net population redistribution is not real migration flows/ population movements
   - Long-term data comparability, census quality and restructuring of administrative boundaries

6. Sample surveys

   - Individual/ household information available

     Issues:

   - Varying definitions of migration
   - Atomistic fallacy
   - Retrospective migration information & long-term studies for longitudinal analysis
   - Generalization & comparability of results

7. Scale issues in environmental data

   - Usually in ecological inference methods
   - Rainfall data CRU (0.5°)
   - Normalized Different Vegetation Index (NDVI) (250m to 8km)
   - Spatial heterogeneity within units
   - Temporal scale—when does the rain come?

8. Concluding remarks and further questions

   Know your data and your study area!

   - At what scales can we identify reasonable mechanisms that link environmental and migration processes?
   - Are multi-method and multi-level approaches the future?
   - How to harmonize data and scales so that they are comparable?
   - Is it possible at all and reasonable to know the contribution of slow onset environmental change in global (or local) migration patterns?

Q&A

Points to consider:

1. At what scales are environmental changes affecting people?
2. Are multi-method and multi-level approaches the future?
3. How to harmonize data so they are comparable.

Q: Is the concept of grain the same as level of analysis?

   A: Yes.

O: (Lennart) The timing of data is so important. For example, the TRMM project is not as accurate when it comes to rainfall collection, but it is accurate in timing (on a daily basis) → much more related to trigger events

October, 10th 2013

Dr. Benjamin Schraven (German Development Institute, Bonn, Germany)

Title: Survey research on environmental change and migration: challenges and perspectives

Abstract: The advancement of survey research on the relationship between environmental change and migration is of an essential meaning for both academia and the policy arena. This presentation wants to highlight some central challenges in survey research in this context. Furthermore, it wants to outline some perspectives for addressing these challenges.

1. Introduction
   - We have quite a young history of survey research on the nexus between environmental change and migration
   - In the following, I would like to briefly present some challenges related to recent survey research in that area
   - There are at least three bigger challenges
2. Challenge 1—the multiplicity of factors and actors influencing migration decision
   - Only in rare cases, ecological factors solely impact on migration decisions
   - Usually complex interplay of economic, social, political, cultural, demographic and environmental factors that have an impact on migration
   - Furthermore, migration is hardly a purely individual decision. It is also influenced by group characteristics and the accessibility of related networks and resources
   - A better and more universal triangulation with other data sources/ multi-method approaches
   - Thoughtful application of vulnerability/ resilience indicators
   - Use of household rosters with detailed individual (migration related) information instead of aggregated information
3. Challenge 2—the (missing) time dimension
   - A time series would be needed to fully analyze the role of migration for household resilience or to observe the impact of a certain environmental event on human mobility.
   - Most studies so far are based on singular surveys
   - Migration history could be a solution
   - Retrospective collection of "who went where, for how long, etc."
   - This has its shortcomings (as it only applicable for shorter periods of time) but it is at least a way of getting a proxy for this special human-environment-relationship over time

4. Challenge 3—population and sampling
   - Studies on the environment-migration-nexus so far are mainly based on non-probabilistic case study designs
   - There is a demand for representative studies
   - Randomization as well as knowledge about population size and other population characteristic need to be given in order to get a representative sample
   - The problem is that the relevant information about the target population is missing
   - If the necessary information about the population is available but the share of the specific group in the population is too small, complicated oversampling techniques need to be applied
   - If this is not given, we still need to rely on case studies. The task is to justify why a certain case study side was chosen.

Q&A Section:

Q: How do you consider the role of pre-test in surveying in enhancing the quality of questionnaire?

A: (Koko) The Rainfalls questionnaire are more systematic in terms of its questionnaire. The questions started with demographic information and we consulted a number of experts from Columbia University. We also tried to ask a bunch of experts of survey work in order to enhance the quality of it. I agree with Lennart's comment earlier that sadly, the degree of sophistication in questionnaires sometimes is not proportional to the quality of the data.

Moreover, we admit that we were not strong enough for hypothesis building. If we did better in hypothesis, the survey will be much shorter and precise. HYPOTHESIS BUILDING is important.

O: (Kees) Yes, questionnaire should be short and well structured. You have to be certain (concise) about your central issue.

O: (Viktoria) For my project, we looked at several questionnaire about migration in different times. Some questionnaires are very general. Surveys on Africa in the 1990s are very sophisticated and time-considerate. A good questionnaire will need several times of practices and refinement.

Q: (Clemens) on the bias inherited in survey—how you present the survey may induce bias on the answers. For example, you should not ask whether environmental factors cause interviewees to migrate. We should not ask about what you are looking for in the field.

A: (Kees) In the Rainfalls project, the questions are clear about what we are looking for. Though on the first page of the instruction you would introduce ourselves and made explicit about what research is about. We mentioned that the research is about livelihood, migration etc.

A: (Koko) We wanted to see if rainfall variability and migration. In each question, we try to ask about different environmental stressors (floods etc.) but we are critiqued that those are leading question. But it is impossible to obtain the necessary information without asking those questions

O: (Lennart) There is a health and demographic surveys (on monthly basis) →successful →remote sensing and time series.

Q: (Viktoria): I think it is also important to do a field phase before you start in order to clarify concepts and align interests with local partners.

A: (Koko) One of the big lesson learned from Rainfalls is to increase our comparability. But with the questions, we are too strict. We did change some measures of units but we were insisting hard on uniformity. This may create tension with local partners who have different terminologies or conceptual definitions. Another tension is that with our donors, we really cannot send a team to stay there for a long time. The practical issue is money and funding.

A: (Helen) For me, we just keep pushing for 3 trips in order to fully understand the field in order to capture the seasonality. We want to see how people use different ecosystem services in different years.

O: (Koko) There is a journal called Fieldwork. Some of us can do an article on the issues on questionnaire.

Q: (Viktoria) Would it be more helpful if we formulate questionnaire that can be comparable to future studies?

A: (Piguet) Collecting a simple list of sources of quality data can be useful for other studies.

A: (Koko) If we at least have a core set of questions that are similar as a community (demographic questions), that would make the data much more comparable.

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Helen Adam (Geography, College of Life and Environmental Sciences, University of Exeter)

Title: Understanding the subjective elements of well-being and place

Abstract: Wellbeing, sense of place and place utility are important aspects of the decision to migrate. Understanding how these processes operate remains a key methodological issue, yet is fundamental to understanding how migration decisions will play out under environmental change.

1. Why worry about subjective factors?

- When is migration the adaptation of choice and the adaptation of last resort? (McLemen and Smit, 2006)
- Planning for migration – who should we help adapt in situ? Who should we help to resettle or migrate (Foresight, 2011)?
- Immobility under environmental change (Black et al, 2013)
- Environment as a pull factor (Adams and Adger, 2011)
2. Global Satisfaction with Life Scale

   Below are five statements that you may agree or disagree with

   Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item.

   > Please be open and honest in your response
   > __ In most ways my life is close to my ideal.
   > __The conditions of my life are excellent.
   > __I am satisfied with my life.
   > __So far I have got the important things I want in life.
   > __If I could live my life over, I would change almost nothing.
   > Scale: 7 Strongly agree; 6 Agree; 5 Slightly agree; 4 Neither agree nor disagree; 3 Slightly disagree; 2 Disagree; 1 strongly disagree

3. Subjective wellbeing and migration
   - Migration is preceded by a period when individuals experience a significant decline in happiness
   - Migration itself causes a boost in happiness, and brings people back to their initial levels
   - Long-distance migrants are at least as happy as short-distance migrants despite the higher social and psychological costs involved
   - **The findings of this paper add to the pressure to retheorize migration within a conceptual framework that accounts for social well-being from a life-course perspective**
4. The sense of place as a factor to stay
5. The environment as a reason to stay

   Includes environment and climate, safe/ uneventful, services and amentities of the town, emotional attachment, friends family and social events, work related, and peace and tranquility
6. To what is the population forming attachment?

   Climate, farming lifestyle, lack of pollution, aesthetic/ experimental value
7. Summary and conclusions
   - Subjective wellbeing helps to explain migration
   - Migration and wellbeing are known to interact
   - The environment itself can contribute to wellbeing (and therefore influence migration) in ways beyond income and livelihoods
   - Subjective wellbeing, measured quantitatively can be integrated with environmental factors at higher scalesEnvironment, migration and wellbeing can be integrated at various scales
8. Why worry about subjective factors?
   - When is migration the adaptation of choice and the adaptation of last resort? (McLemen and Smit, 2006)

- Planning for migration – who should we help adapt in situ? Who should we help to resettle or migrate (Foresight, 2011)?
- Immobility under environmental change (Black et al, 2013)
- Environment as a pull factor (Adams and Adger, 2011)

9. Global Satisfaction with Life Scale

Below are five statements that you may agree or disagree with

Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item.

Please be open and honest in your response

__ In most ways my life is close to my ideal.

__The conditions of my life are excellent.

__I am satisfied with my life.

__So far I have got the important things I want in life.

__If I could live my life over, I would change almost nothing.

7 Strongly agree; 6 Agree; 5 Slightly agree; 4 Neither agree nor disagree; 3 Slightly disagree; 2 Disagree; 1 strongly disagree

10. Subjective wellbeing and migration
- Migration is preceded by a period when individuals experience a significant decline in happiness
- Migration itself causes a boost in happiness, and brings people back to their initial levels
- Long-distance migrants are at least as happy as short-distance migrants despite the higher social and psychological costs involved
- **The findings of this paper add to the pressure to retheorize migration within a conceptual framework that accounts for social well-being from a life-course perspective**

11. The sense of place as a factor to stay

12. The environment as a reason to stay

Includes environment and climate, safe/ uneventful, services and amentities of the town, emotional attachment, friends family and social events, work related, and peace and tranquility

13. To what is the population forming attachment?

Climate, farming lifestyle, lack of pollution, aesthetic/ experimental value

14. Summary and conclusions
- Subjective wellbeing helps to explain migration
- Migration and wellbeing are known to interact
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- Environment, migration and wellbeing can be integrated at various scales

Q&A Section

O: (Koko) There is a common perception that there is a progressive rational choice scale about human needs (from survival, human needs, primary desires to aesthetic value). Instead of a ladder-like scale, some argue that some people would sacrifice primary needs for ideas and dreams. Scaling is not just about aggregating results to a larger implication, but it is also about relationship (aesthetic value).

Q: What is your definition for happiness and wellbeing?

A: (Helen) I consider them as the opposite of poverty. The World Bank asked thousands of question to the impoverished people about their perceptions on poverty—my concept of wellbeing is defined as not having these problems.

Q: You said in the beginning that people are not rational. But maybe it is just that people are rational, and that their rationality varies. These people are making very rational choices but they are just not using the rational choice theory.

A: Yes, I would agree with your explanation. I should have said that people are rational. I was not referring to the rational choice theory.

Q: Wellbeing relates a lot to individual matters. Was there any gender difference in your finding? How do you decide that migration is an individual choice instead of a household choice?

A: There is no difference for gender in my findings. As for the individual and household choice, we are in the process of formulating questionnaire on the household instead of individuals.

Q: Have you ever considered migration is a part of lifestyle for some people (ex. Africa). Isn't there also any emotional preferences on moving and being in different places?

A: There are people who are intrinsically more interested in the outside world. It is still difficult to decide who is an intrinsic migrant and who is not. There might be a lifestyle decision.

It is true that you have some people choose to stay in rural areas even though the cities can provide more economic opportunities. People use excuses (lack of money) to not migrate to places with better opportunities→they are fighting within themselves →trading off the opportunity to move to cities to live with families in rural area.

Q: How would you draw questions on appropriate scales?

A: (Helen) Scaling up to collecting information quantitatively and make it quantitative with the model.

Q: How do you differentiate your definition of wellbeing from economics and universal psychology? Some societies may have different definition of wellbeing.

> A: (Tamar) Wellbeing is a very subjective term. It is happiness. To be well.

> O: (Vasna): I am afraid that sometimes researchers impose a sterotype to define wellbeing and happiness. Maybe not everyone wants to be well.

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Dr. Kees van der Geest (UNU-EHS)

Title: Methods for studying environmental drivers of migration at different levels of scale: an example from Ghana.

Abstract: Kees van der Geest will discuss his experience of combining different research tools and data sources to study environmental drivers of migration from Northern Ghana to Southern Ghana. For his PhD research and the EACH-FOR project, he used local case study data, generated through a questionnaire survey, as well as regional data from population censuses (migration) and remote sensing (environment). He will argue that none of these sources alone can adequately address the complex reality of migration-environmental linkages.

1. Introduction: PhD thesis (human geography): "The Dagara farmer at home and away: Migration, environment and development in Ghana" (2011)
    -   Dagara people: Ethnic group with home area in NW-Ghana / SW Burkina Faso
    -   Migrant source area: Upper West
    -   Destination area: mostly Brong Ahafo
    -   Increasing migration
    -   What role for the environment?
2. Context:
    Three principal inter-regional migration flows in Ghana:
    -   North to South = mostly farmer migration
    -   To national capital Accra = mostly urban-urban migration
    -   Cocoa frontier settlement = mostly farmer migration
        ➔ Rural-urban migration is mostly intra-regional
3. Methods
-   Local case studies in source and destination areas
    -   Questionnaires
    -   Focus group discussion
    -   Life histories
    -   Perceptions
-   Regional analyses of migration and natural resources
4. Causal relationship is not just environment ➔ migration; it is environment ➔development, livelihoods, and poverty ➔migration

5. North-South migration: What role for the environment?
   Two research strategies:
   1. Ask migrants - in <u>destination</u> area are (n=203): why did you migrate? (open questions, later coded)
   2. Secondary data: relation between migration and natural resources scarcity
      – Cross-district analysis
      – Longitudinal analysis
   3. Other option: relating migration moment to climate event (also problematic)
6. Findings from interviews
   Common reasons to migrate:
   a. Scarcity of fertile land at home / availability of land in Brong Ahafo
   b. Poverty / to make money
   c. Hunger / to improve food security
   Not often mentioned:
   d. Unreliable rainfall / climate change
   e. Environmental degradation
   f. Lack of employment opportunities
   Not mentioned:
   g. Sudden onset environmental stresses (natural disasters)
   h. Conflict over natural resources

7. Conclusions from interviews
   - Environment = important driver of North-South migration in Ghana
   - Scarcity rather than degradation / disaster
   - Environmental *pull* just as important as environmental *push*.
   - Migration mostly *voluntary:* livelihood strategy to deal with poor and variable conditions
   - But limited portion of migrant population *forced* to migrate because of hunger (survival strategy).
8. Cross-district analysis: Environmental push in Northern Ghana
   Findings:
   Out-migration propensities are higher in areas that experience more environmental scarcity.
   Strongest correlation with rainfall (R = -0.67).
   Together, rainfall, vegetation, crop yields and rural population density explain 44.2% of variation in out-migration propensities.
9. Conclusions on Environmental pull
   Migrants from Northern Ghana predominantly settle in areas with combination of:
   a. Adequate rainfall
   b. Suitable soils
   c. **Low population density!**
   In line with interviews: Migrants relocated in search of better conditions for farming
   Note: BAR's proximity to UWR makes it attractive (cf. Ravenstein 1898)
10. Longitudinal analysis: Does out-migration increase in times of increased environmental stress?

Focus here: rainfall. **Above average** rainfall from the 1930s to the early 1970s, **deterioration** in the mid 1970s and early 1980s (Sahelian droughts), partial **recovery** in the 1990s (source: 24 weather stations)

- Unexpected finding:

  Migration <u>reduced</u> in period of worst environmental stress

- What happened?
  - 1970s and early 1980s: time of droughts and famine in N-Ghana.
  - But also: time of political turmoil, economic crisis, unemployment and high food prices in the South.
  - Southern Ghana temporarily unattractive for migrants. Many were 'forced' to return.
  - Apparently, political and economic factors weighed heavier than the environmental ones

11. Conclusion on environmental causes of migration from Northern Ghana
    - Environment matters
    - Multi-causality: Interplay of environmental and other factors
    - Structural scarcity rather than degradation or disaster
    - Mixed findings on role of climate
    - Migration not a 'last resort', rather adaptation and part of larger strategy to reduce pressure on resources and benefit from better opportunities in the South
    - Northern Ghana is not a 'hotspot', but represents many areas where livelihood are under pressure and where migration is one of the responses

12. Reflection on methods
    - How reliable is asking migrants why they migrate?
    - How reliable are census and other secondary data (e.g. crop yields)?
    - Time-intensive
    - Research skills
    - Multiple data sources make reporting in journal articles more complicated

Q&A Section

Q: How is the issue of property rights with these migrants in your project?

A: obtaining property rights vary—sometimes it is with a beer, sometimes with money etc.

Q: Are property rights considered as an environmental factor?

A: Yes.

Q: Are you happy with the 44.2% variance of out-migration propensities (rainfall, vegetation, crop yields and rural pop)? Do you consider it representative?

A: Yes. I think these three IVs explain a lot of the research.

O: (Lennart) To what extent are these driving variables independent? Since vegetation and rainfall are very interrelated. You are assuming these variables are independent form each other. Multiple regression has a assumption that variables are independent form each other.

O: (Clemens) You asked how reliable it is to interview the migrants about their reasons to move. I think sometimes migrants would not tell us the true reasons why they move. So an intense field research is required.

O: (Lennart) In the past, there were studies to see how hard people would work to move for economic reasons (entrepreneur reasons). In these studies, migrants is being pulled, not pushed. Now most research focuses on seeing how environmental factors *pushes* people. The perspective has changed from s**eeing migration as an opportunity to a social problem.**

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Dr. David Wrathall (UNU-EHS)
Title: What we can learn about human mobility in the context of environmental stress from very large sets of small-scale data: Mobile phone data and the case of Cyclone Mahasen, Bangladesh

Abstract: Anonymised call data records (CDR) from generated from mobile phone calls offer a large scale view of three crucial variables for the study of human migration: physical location, wealth, and social networks. With millions of data points, it is possible to study human behavioural responses to environmental stress, like tropical cyclones, in vast numbers, in vastly linked social networks, and across vast geographical scales. In order to make sense of such interactions, it is critical to embed computational analysis in the context of quasi-experimental research design that considers qualitative differences between local social-ecological contexts.

1. Aims
- Origin of the project
- Reflections on scale
- It is difficult to find out the time they migrate and the destination they choose. You have to depend on census data, people's memory, and field work in these remote areas. Research is time-consumptive.
2. You can follow people with mobile phone data→Call data records (CDRs)
   The example of the Haiti Earthquake in 2010: a large population flew from Port-au-Prince
   Anonymized CDRR at the cell (tower level)
- NDA with Digicel Haiti
- 1.9 million SIM cards
- 50% user penetration in PaP
- Anonymous daily CDR data: anonymization in operator's system
- Data points: once per day
- Resolution: cell tower
3. In Bangladesh, the Cyclone Mahasen on the 16 may, 2013, affected 1.3 million people

What we have:
- CDR of all Grammenphone users in Barisal division and Chittagong district
- 87 gigs of data (> 1 billion data points)
- N = ? (about 1 million)
  Additional layers:
- Wind speed
- Rainfall
- Standing water
- Timing/ delivery of early warning
- JNA impact assessments
- Demographic and health HH data
- OTHER MOBILE DATA: top-ups and social networks

Matching social and environmental data at critical temporal and spatial scales: what does a SIM card represent?

4. Hypotheses
- Evacuation:
  A. Many cyclone shelters are in the same area as the receiving towers, so not much mobility in the hours before mahasen is expected to appear in the data.
  B. However if shelters are in a different area from towers then the data will show a delayed response to early warning because men stayed behind longer than women and are more likely to have phones
- Mobility and livelihood shocks:
  Relatively few people were displaced even in heavily affected areas. Rather significant impacts were related to standing flood waters that lasted between 10 and 15 days. Thus we expect to see mobility staggered at an interval of between 10 and 20 days (with important caveats: mobility may have been pre-programmed for that time period).
- Destination:
  There are historical migrant networks between Barisal and Chittagong, and so we expect to see some population flows across those areas after Mahasen.
- Gender:
  Distinguishing between male SIMs (appearing in lots of diverse places, top-ups) and femalre SIMS (staying in specific places, no calls during the day).
5. MDEEP phase 2 (2014-)
- Long-term displacement and uninhabitability
- "Culmulative causation"
- Social "disassembly"

Q&A Section

Q: In order to distinguish migration and environmental degradation that we must not only rely on the phone data but also communicate with the people. Did you get permission from the people directly?

A: the permission was obtained from the phone company, not individual data.

O: (Tamer) The assumption of male and female usage of phone—you should also consider that children have phones as well.

A: There is a social world behind these SIM cards that we may be able to identify some aspects of the context for the phone data. Generally, female keeps small credits on the phone to receive calls anytime and they also stay close to homes.

Q: How do you deal with reception disconnections?

> **A:** In Bangladesh they use 10 different towers for phone reception. Also phone reception is disturbed only at a max for two hours usually.

Q: Does this go against the ethics of social research? How easy was it to obtain the data? What sort of security measures are in place so that the people are not misusing the data?

> A: I fully understand this. The partner company establish a track record and we approached them with great difficulty. We had to make a very strong case and with very strict protocols, establishing a very trustful relationship with the company.

O: (Johnathan) Now we get this big data, it's the data analysis which is driving the theory of network science forward. SO this may shed new light to previous studies. Also, this may be a good study to apply network science into it. Seeing the connectivity between phones and the volumes of calls (duration).

O: (David) There are already studies now based on phone data to predict the spread of disease. And that is why I call this "very large sets of small-scale data" because this gigantic data can be break down into very smalls-scale analysis.

Q: What is the density of this tower?

> A: I have the data now but I cannot answer your question until two weeks later. There is not perfect coverage in southern Bangladesh. There are limitations too. The maps are not in high resolution. We will know more in about two weeks.

Q: Given the massive size of your data, there is a huge opportunity to touch a lot of elements. Will you develop more concepts later?

A: In the next stage of project, some ideas can be evolved are such as 1)long-term displacement and uninhability, cumulative causation, and social disassembly.

Q: Could you please say more on the telephone survey?

A: We have not started it and have not implemented it yet. It is quite cheap (US$3 per survey). This would be a very good opportunity to find out the demographic information. One of the issue though, is whether we can actually use the mobility data by calling individuals.

Q: have you considered the fact that some people use multiple SIM cards because different companies offer different regions?

A: Yes. But some people who have dual SIM built them into the same phone. In the second and third phase, we are planning to involve the regulators and other companies.

O: (Lennart)I suppose many issues can be solved technically, but there is still concerns for ethics of the research.

O: (Etienne) I just wanted to point out a potential issue—you should not forget that the question should come before the data—it should not be inductive. Even thought the data is huge and can generate a lot of research questions, it is very important to find out the central question and how this specific method/data can answer questions that cannot be answered by other data/methods.

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Discussion and wrap-up session (Moderation by: Koko and Lennart)

1. **Workshop continuity**
   (Lennart) There is a problem with organizing workshops. There are very few people who participate in all series of workshops. It is important to maintain the coherence of the story of the workshop. If you organize a series of workshop on a specific topic, it is challenging because you need to have a core group and it requires stronger commitment.

2. **Spatial vs. relational scales**
   (Koko) Jonathon's lecture on teleconnection gives me a much different perspective on scales. There is a big audience in the media and the potlicians on where people are migrating and the relationships .

   (Jonathan) Once you make this shift form spatial to relational and it about to show it, it opens up a lot of potential possibilities. →need literature to highlight the need for such methods

   How can we match network science with social science methodologies? Ex. extended case methodology. Ethnographic and structural are important.

(Lennart) We should put together a mini-cannon of scale research: what is your best source of inspiration (experts and articles) or papers to problemizing scales. If we sent ideas together and combine it together, it will be great.

3. **Issues in scales**

   Scale jumping—scales jumping are often cross-level interactions or cross-sclae interactions. People do that often but they are not explicit about it .

   - Need a typology to define and categorize scales
   - Conceptual framings improvements are necessary in hypothesis building. Typology can help us do better in grouping methods.
        Ex. Proverbs: a general phenomenon is expressed in a elegant, direct way that can be seen in a million observations across time and space →hypothesis is a little bit like proverbs

4. **Understanding social change:**

   Path dependency theory: if we want to understand what is happening now, we go back to history to find the contingent moments.

   - There is a spectrum of people that human behavior can be narrowed into a theory (rational choice theory) and there are another people who think human behavior can never be universalized

5. **Big issues: what is the next generation of methods?**
   - **Time to work with local corporations.** Working with local corporation can help us at least understand the local perception better. Staying longer, your methods will change. The field will tell you more.
   - Integration between the qualitative (social science) and quantitative (natural science).
   - Focusing both on the exterior (environment) and interior (psychological) reasons.

6. **Biases in research questions: is migration an opportunity or a problem?**
   - If you frame your question with one of these assumptions, you would be biased.
   - Instead of looking what methods fail to answer questions, we should consider this: **What types of questions that we cannot answer with the existing methodologies now?**

   O: (Lennart) I would investigate more about using qualitative, ethnographic research methods reasons—is it the entrepreneurial mind or the a forceful decision. I am not a fan of quantitative interviews because household surveys have so many pitfalls.

7. **Possible topics for future workshops**
   - Statistics that can be used in human environment dynamics studies

- Spatial statistics in migration studies
- Involuntary migration→both ends of the spectrum has been widely researched now, but the ones the middle have not been researched on.
- Knowledge about what can be scaled up (generalized) and what cannot be generalized.
- Geographically weighted logistic regression