Climate Change in a Growing, Urbanizing World: Understanding the Demography of Adaptation
**Environmental Change and Security Program
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The use of census and survey to plan for adaptation to climate change

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Main sources

* <u>Understanding Vulnerability and Adaptation Using Census Data</u>

    Guzman, Schensul and Zhang , Chapter 4

* <u>Using Households Surveys in Climate Vulnerability And Adaptation Analysis</u>

    Sanchez Pena and Fuchs, Chapter 6

Putting Population on the Adaptation to Climate Change Maps

Population related data from census, surveys and other administrative data can be used, and linked to environmental data in a practical and effective way.

This will make possible to introduce to climate change discussion one of the most important dimensions of adaptation: **The adaptation of individuals and households to the effects of climate change.**

In spite of the importance of '***putting people on the adaptation maps*** ', the use of population dynamics issues for climate change adaptation is still rather limited.

A framework for using population data and access to high resolution data
in Planning for Adaptation to Climate Change

<u>Census and household surveys data</u> are excellent sources of good and adequate data for climate change adaptation. Exploiting their potential requires to:

* define a **framework** that better link population to adaptation (Schensul: previous presentation) and that allows for the selection of key indicators, their specific relevance for adaptation programs and their level of disaggregation of them.

* have **access** to the data in a way that makes possible to link population data to environmental information

* create/re-process/re-arrange existing individual and household data to map vulnerabilities and adaptive capacities to climate change impacts
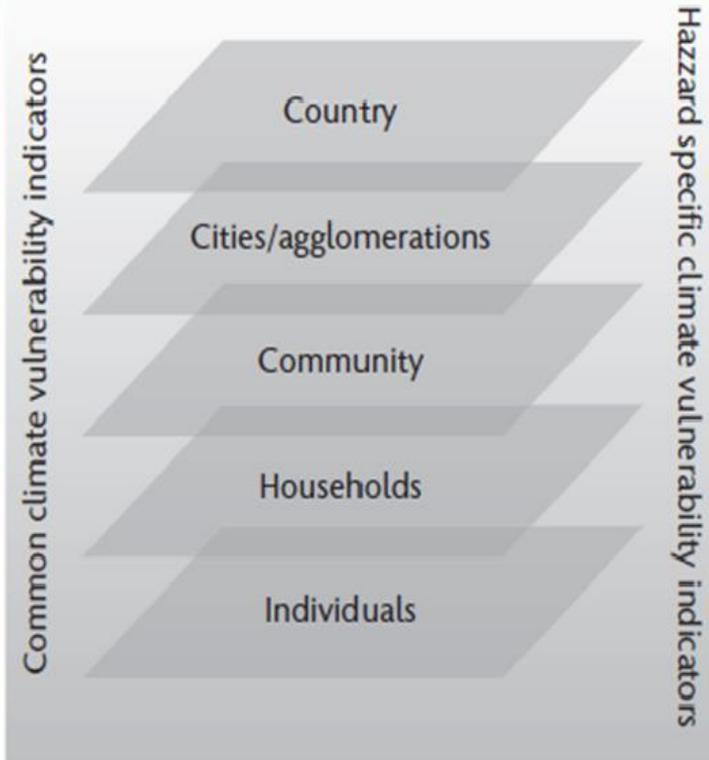
A Framework

Understanding the effects of climate change and responding to them

There exists different levels or layers of vulnerability and adaptive capacities :

In defining the issues to be solved, the indicators to be defined and the data to be collected/used we need to consider these layers or levels going from the individual to the household, to the communities, the cities, the countries, etc.

Figure 4.1: Layers of Vulnerabilities/ Adaptive Capacity

Common climate vulnerability indicators

Hazzard specific climate vulnerability indicators

Country

Cities/agglomerations

Community

Households

Individuals

A Framework

Understanding the effects of climate change and responding to them

Type of indicators:

Bottom levels: Indicators based on individual and household data

Upper levels: They are aggregated to higher levels … but at these higher levels we also need other type of information at each of these higher levels.
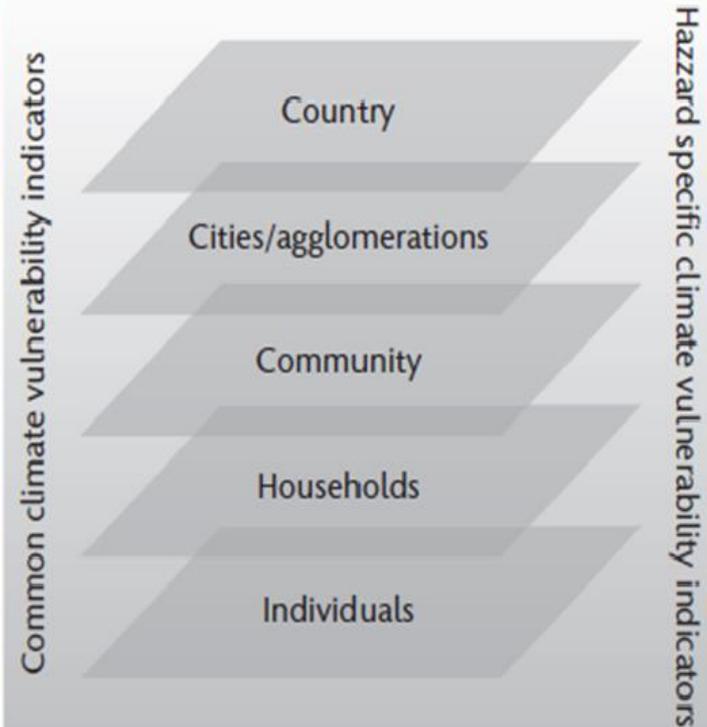
Contents and focus

From bottom to Upper levels: From individual and households decision-making process to a more political and institutional decision making process

Analysis:

Both bottom-up and top-bottom are complement each other

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The measures of exposure, sensitivity as well as adaptive capacities must differentiate between the:

* **Non hazard specific** characteristics /indicators shared across all climate change hazards: common climate vulnerability indicators (CCVIs).

* **Hazard specific** characteristics/ indicators associated with different climate change hazards: hazard-specific vulnerability indicators (HSVIs).

* Both share the same set of layers defined in Figure 4.1.

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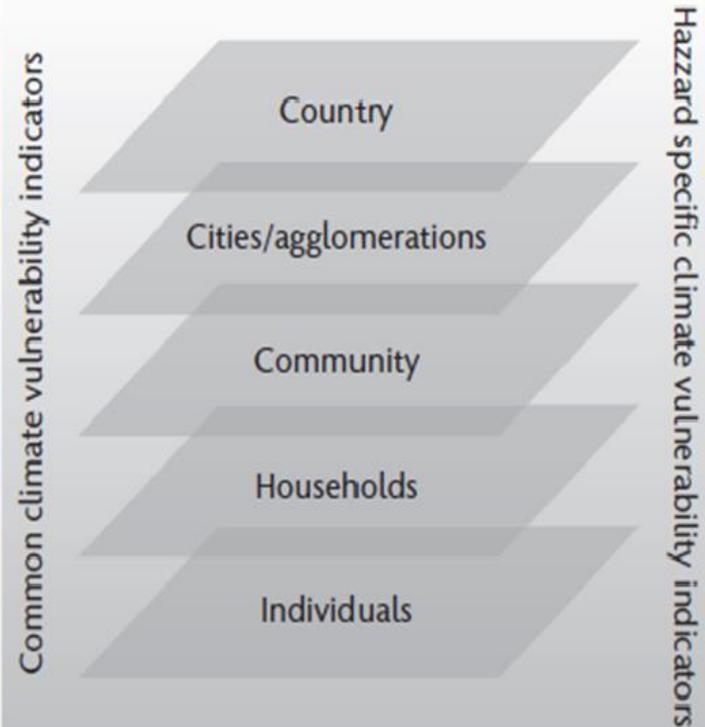
Community

Households

Individuals
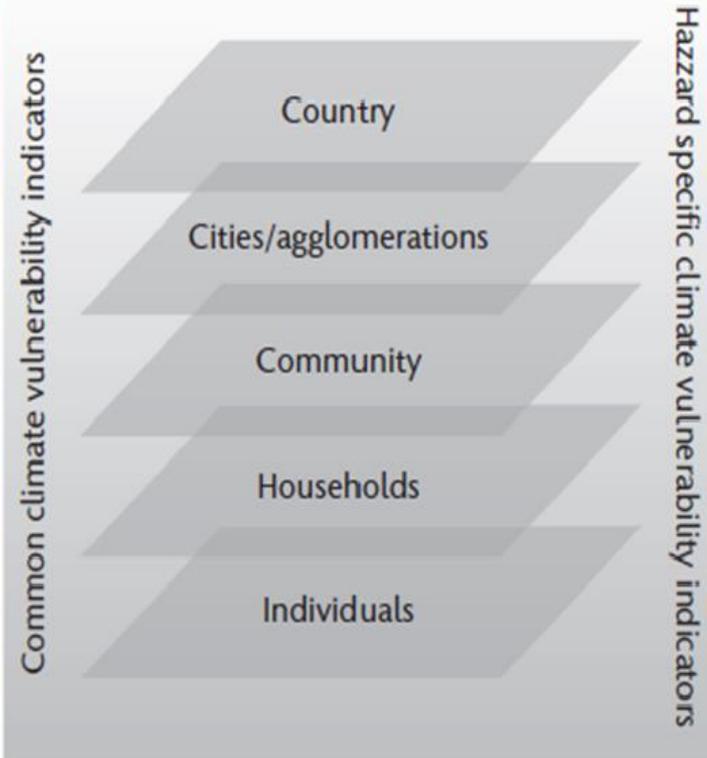
A Framework

Understanding the effects of climate change and responding to them

Finally, we need to consider that with **demographic change,** each one of these levels is a **moving target**.

Rapid urbanization and high population growth generates dynamic processes that need to be considered in planning for adaptation

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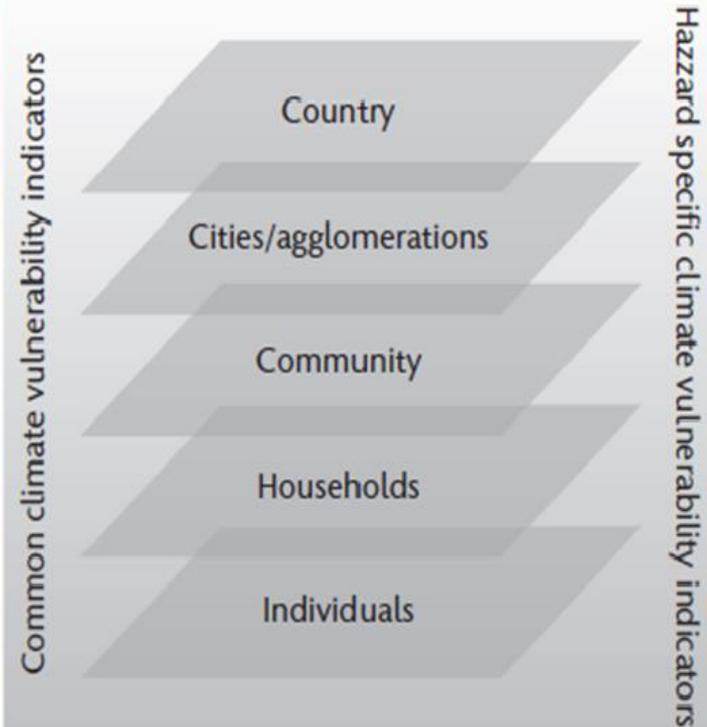Individuals

Census and Survey Data: Type of indicators

Census (and survey data) can be used to calculate indicators for each of these layers, starting in the lower layers (individuals and households).

Three types:

a) Demographic
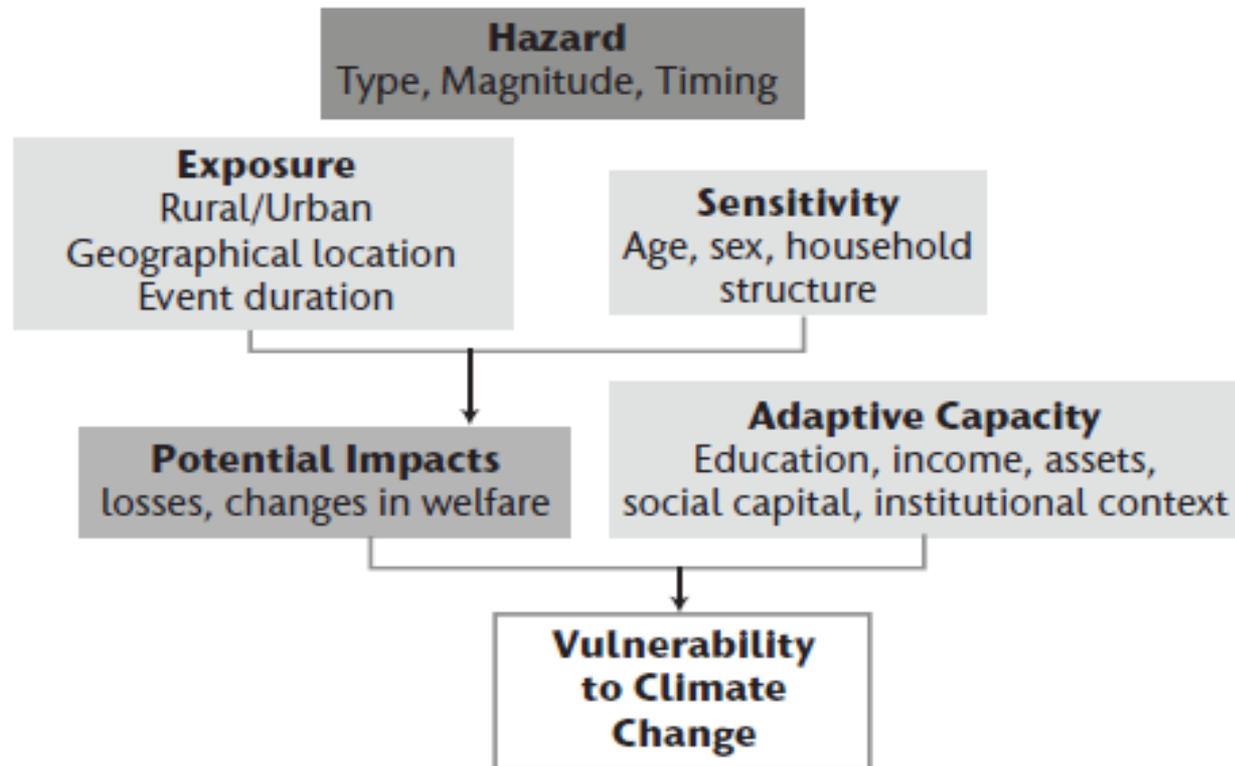b) Human and social capital
c) Built environment

Census provide data on all of these components and on those issues is the only source with comprehensive data available for small areas.

Figure 4.1: Layers of Vulnerabilities/Adaptive Capacity

Common climate vulnerability indicators

Hazzard specific climate vulnerability indicators

- Country
- Cities/agglomerations
- Community
- Households
- Individuals

Another Way to Look at the Census and Household Surveys Data

Figure 6.1: Household Surveys and Vulnerability Analysis

Hazard
Type, Magnitude, Timing

Exposure
Rural/Urban
Geographical location
Event duration

Sensitivity
Age, sex, household
structure

Potential Impacts
losses, changes in welfare

Adaptive Capacity
Education, income, assets,
social capital, institutional context

**Vulnerability
to Climate
Change**

Source: Adapted from Ionescou et al., 2009.

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Indicators based on census data: Some examples

<u>Common Climate Vulnerability indicators (CCVi) Component</u>
* Number, proportion or density of population by age, e.g., 0-4; 65 and over
* Number, proportion or density of population by ethnic groups
* Number, proportion or density of population by gender
* Number, proportion or density of population living alone/socially isolated

<u>Hazard Specific Vulnerability Indicators (HSVI): Flood</u>
* Number and proportion of population by geography:
* Location in areas exposed to coastal flooding; susceptibility areas under rising sea level scenarios
* Proportion of population located in the areas exposed to flood susceptibility
* Number and proportion of households with pit latrines/unimproved toilets
* Number and proportion of households without piped system connected to a public sewage disposal plant

Surveys Data: The use of DHS and other national household surveys

At ICF International, under the **Climate Change Resilient Development (**CCRD)**,** there is an interest on the potential use of DHS for climate-resilient development.

New ideas are being developed in order to increase the synergies between the work doing on DHS and the work doing in the area of climate-resilient development. The areas being considered are:

1) The use of DHS data to develop climate change-related **indicators and indexes**, including a composite resilience Index (as the one shown in following Figure).

2) The use of DHS to **understand vulnerability** to climate-related health impacts (research on linkages).

3) Supporting the **planning, monitoring & evaluation** of climate change adaptation and integrated programming

Source: CCRD, ICF International

Surveys Data: The use of DHS and other national household surveys

This may requires:

* Enhancing DHS and other household surveys to 'better inform climate-resilient development'.

  Selective addition of questions: Introducing specific questions and/or changing categories of already existing questions; Developing specific climate change modules; Developing new questionnaires for upper levels (clusters/communities/cities).

  Oversampling of specific areas

* Linking survey data to more detailed data as from census

Source: CCRD, ICF International

Surveys Data and Remote sensing data

* By connecting the information on individuals and households with remote sensing data on built environment, it is possible to know about the resources upon which households ordinarily depend, both at home and in the community.

* Remote sensing images, assessed at different points in time, coupled with longitudinal household information can provide valuable insights into changing living conditions.

* Potentials of linking individual-level data with remotely sensed geophysical data, land coverage and administrative records is still in the early stage of development and should be fostered to improve the usability of household survey records.

Final comments:
Challenges and the Way Ahead

* Census and household surveys data are incredible sources of good and adequate data to face these challenges. They are available, but...

* In order to use them, we need to:
    1. Identify and define which are the best indicators
    2. Know how we can use them in a consistent framework
    3. Decide what other information is needed and how could be collected (more climate variables and impacts on households welfare must be included in household surveys)
    4. Promote more open access to disaggregated data
    5. Increase the links between population related information and remote sensing information
    6. Better conceptual links must help to increase the institutional links between Statistical offices and Ministries of environment and other national

* Population data helps to provide the foundation for a more human centered approach to adaptation to climate change

Thanks

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Use of DHS data in the case of Malawi:
Example of a **Resilience Index** produced by CCRD Program