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Malawi Analytics and The Geocenter

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West Virginia University
USAID GeoCenter

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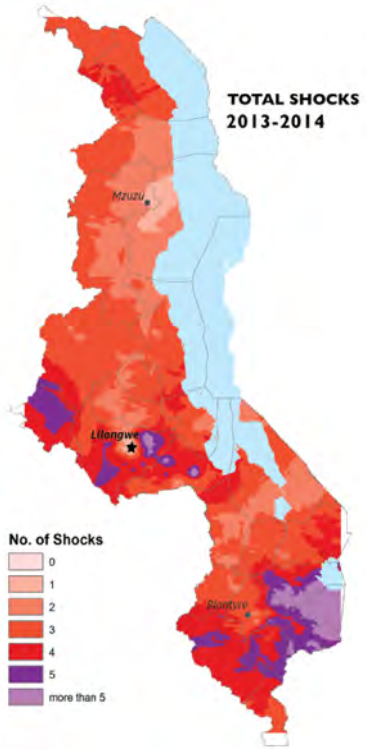
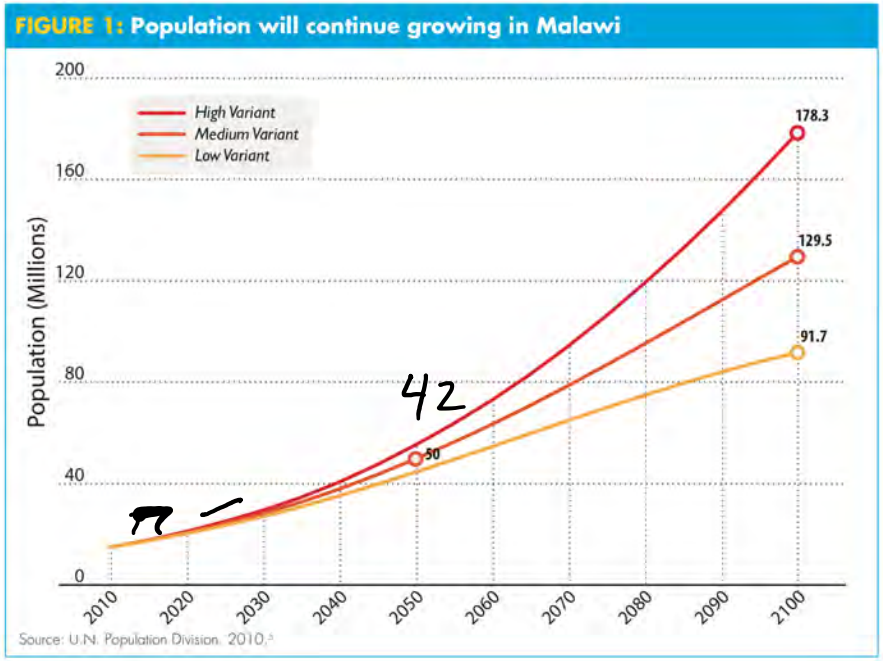
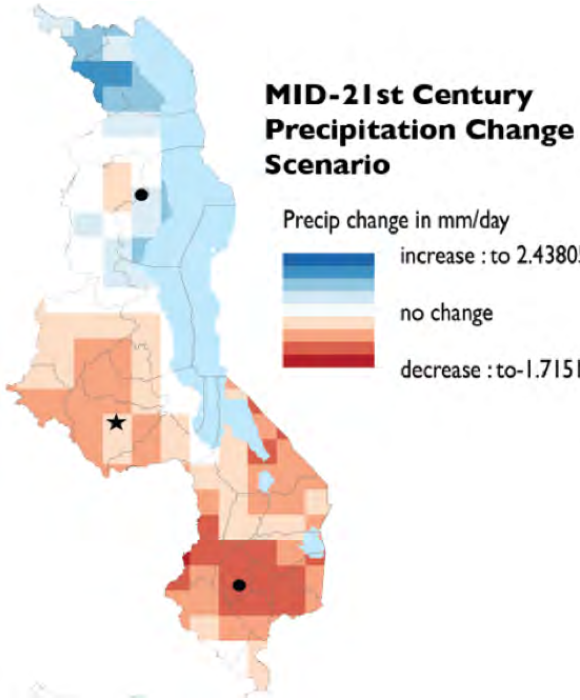
The Depth of the Challenge

Recent Shocks + Population Projection + Future Climate &







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Livelihoods Analysis & Mapping

Three Most Prevalent Shocks %

(Niger, Uganda, Ethiopia, Bangladesh)

1. Natural Hazards (drought, floods, fire, landslides)
2. Health (illness, injury, death in household)
3. Food prices

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Factors Contributing to Shocks

(determined through regression testing)

1. Gender
2. Education
3. Age
4. Household assets & infrastructure
5. Household size

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Most Common Contributing Factors to Shocks

	NIGER	UGANDA	ETHIOPIA	B.DESH
EDUCATION		√	√	
FEMALE EDUCATION			√	√
MALE-FEMALE RATIO	√	√	√	
FEMALE HEADED HH	√			√
HOUSEHOLD SIZE		√		
AGE (YOUTH)	√	√		
AGE OF HH HEAD	√			√
ETHNICITY	√			
HH INFRASTRUCTURE		√		
COMMUNITY SERVICES	√			
HH ASSETS (WEALTH)	√	√	√	√
LAND (OWN/ACCESS)			√	√

NIGER: VULNERABILITY ANALYSIS SERIES
VULNERABILITY TO AGRICULTURAL & LIVESTOCK PRODUCTION SHOCKS

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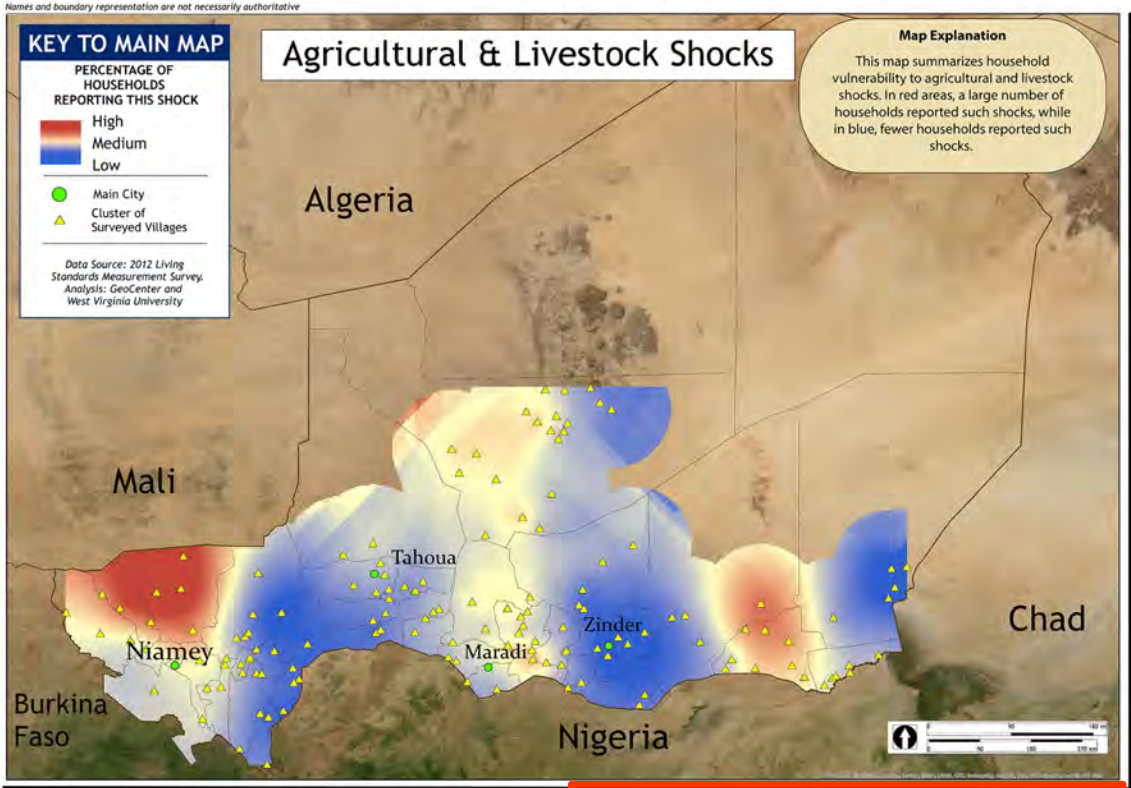
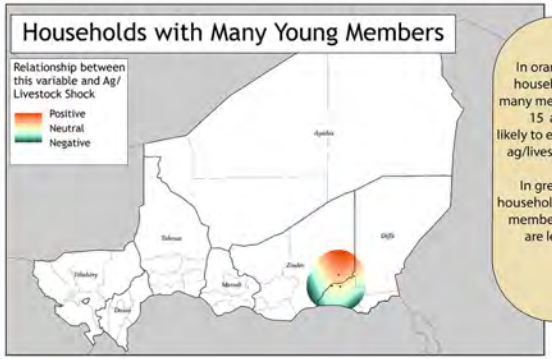
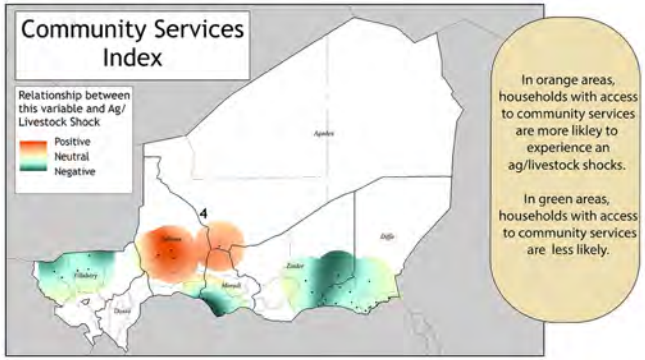
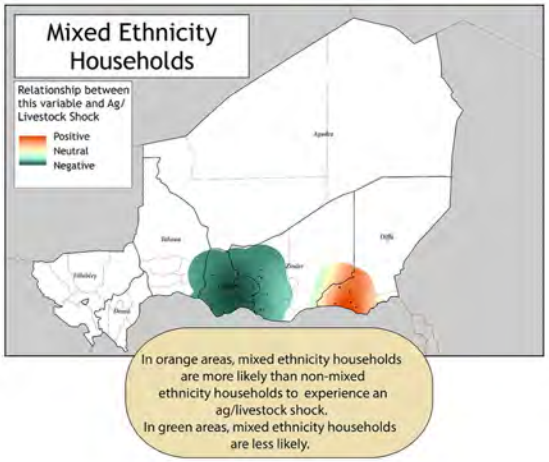
Names and boundary representation are not necessarily authoritative

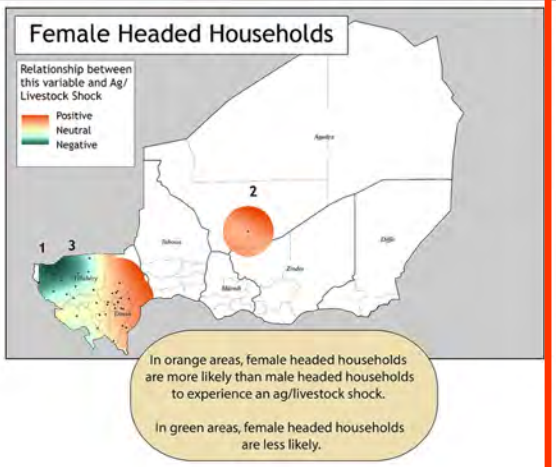


These variables are related to agricultural and livestock shocks.









Development Questions:

1. Why might female headed households in the green areas be less likely to experience an ag/livestock shock than male headed households in the same areas?
2. Why might female headed households in orange areas be more likely more to experience ag/livestock shocks than male headed households in the same area?
3. Could female headed households in green areas be less likely to have ag/livestock shocks because they rely more on remittances?
4. Why do some places with more community services have more shocks? Why do they experience shocks differently?

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UGANDA LIVELIHOOD ANALYSIS : TOTAL HOUSEHOLD SHOCKS 2009-2012

The total number of shocks in Uganda was highest between Nakasongola and Moroto in 2009/10. Shocks are the disruptions to people's livelihoods that can cause high levels of vulnerability. This map shows the total number of shocks for households in each year of the analysis. The main factors that contributed to shocks include the number of young people under age 15, gender ratio (male to females), agricultural wealth index (access to farming tools, etc.), infrastructure index (type of roof, home construction, etc.) and availability of male labor.

1 Total Household Shocks 2009/10

Total Shocks

High

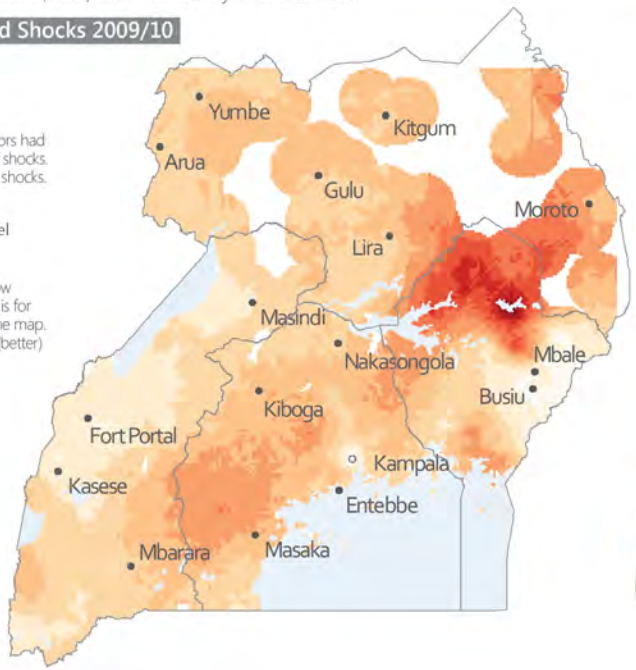
Low

Areas in the deepest red colors had the highest total numbers of shocks. Lighter colors indicate fewer shocks.

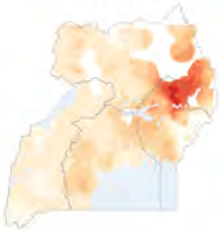
2009/10 Confidence Level

Low High

The map below indicates how strong the statistical analysis is for the places represented on the map. Darker areas have stronger (better) statistical confidence.



Total Shocks 2010/11



Total Shocks 2011/12

2 Contributing Factors 2009/10

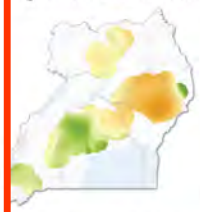
Youth

In orange areas, households with many young people under age 15 experienced more shocks. In green areas, they experienced fewer shocks.

Gender Ratio

In orange areas, households with more men had more shocks. In green areas, they had fewer shocks.

Agriculture Wealth Index



Households in orange areas were more exposed to shocks due to agriculture wealth. Because they had more wealth, they had more to lose during a shock.

Infrastructure Index

In orange areas, the better infrastructure a household had, the more it had to lose during a shock. In green areas, households were not as exposed.

Male Labor

In orange areas, households with more male labor had more shocks. In green areas, the had fewer shocks.

Note: "Total shocks" include: natural hazards (58%), health (18%), crime (10%) loss of assets (8%), food price changes (4%) and loss of employment (1%). The percentages refer to the proportion of households that experienced each shock in 2009/10, the main shock year.

Date Created: May 2015 Data Source: UBOS UNPS, FAO RIGA GEOCENTER

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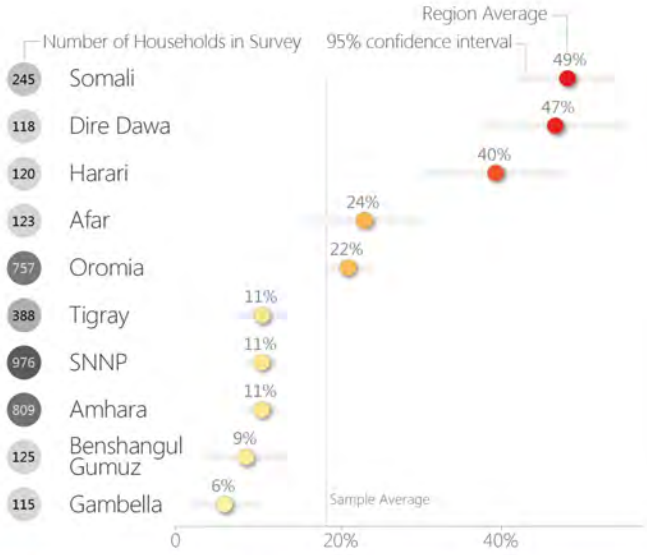
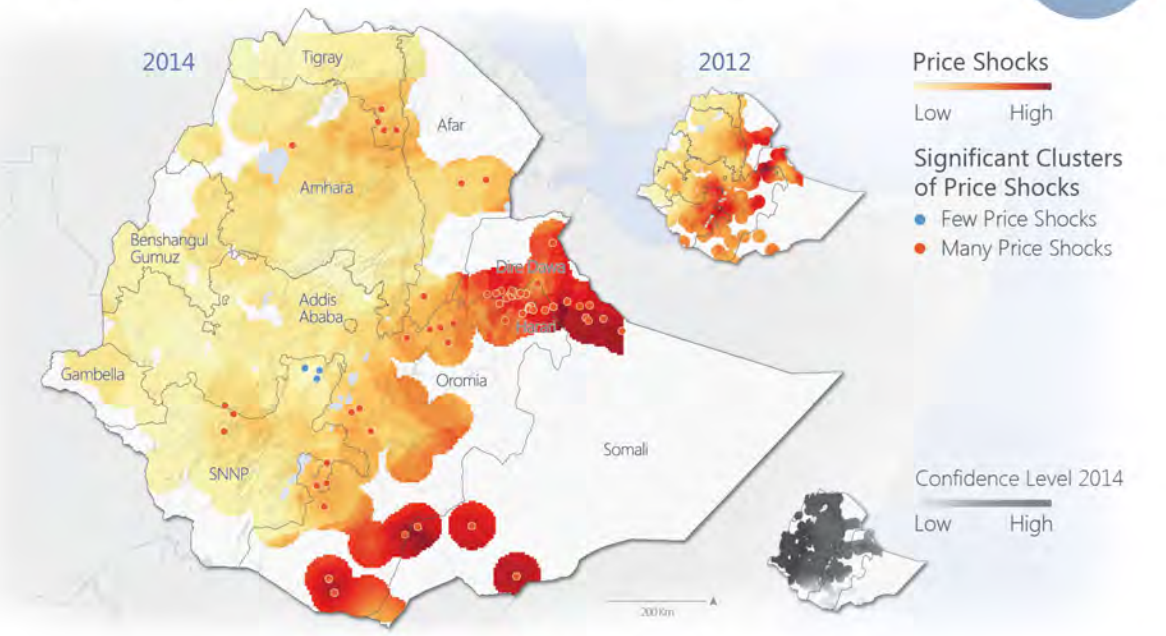
ETHIOPIA LIVELIHOOD ANALYSIS: HOUSEHOLD PRICE SHOCKS

Price shocks affected households more than any other type of shock in 2012/2014. Prices are a key indicator of properly functioning markets and rapidly changing prices contribute to household vulnerability. In areas with severe or repeated shocks, markets may not be functioning properly due to isolation, local issues or other broader problems.

1 Price Shocks 2014

Percent of Households with Price Shock





2 Contributing Factors 2014

The southern and eastern parts of Ethiopia had the most frequent price shocks. Shocks in these regions were far more prevalent than in other parts of the country.

Married Head of Household

In brown areas, households with married heads of household have more shocks. In blue areas, they have fewer shocks.

Wealth (Asset Ownership)

Households in brown areas are more exposed to shocks due to wealth. Because they have more wealth, they have more to lose during a shock..

Female Education

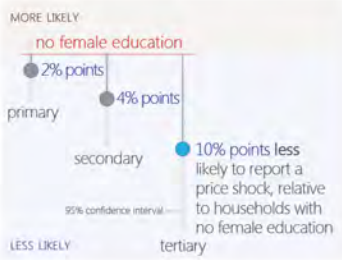
In brown areas, households with more educated females have more shocks. In blue areas, they have fewer shocks.

3 Significant Relationships

Education and religion affect whether households experience price shocks.

Education

Households with **higher female education** report **fewer** price shocks.



Religion

Muslim-headed households report **more** price shocks compared to Orthodox households.

5-15% points **more** likely to report a price shock, relative to Orthodox households

Date Created: September 2015 Data Source: 2011/2012, 2013/2014 Ethiopia Socioeconomic Survey

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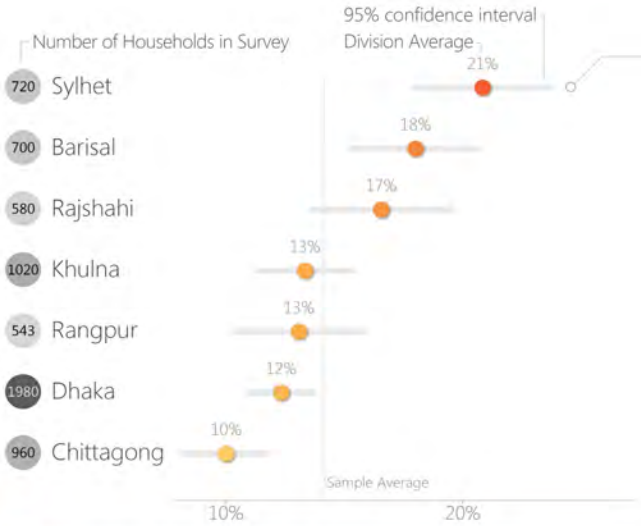
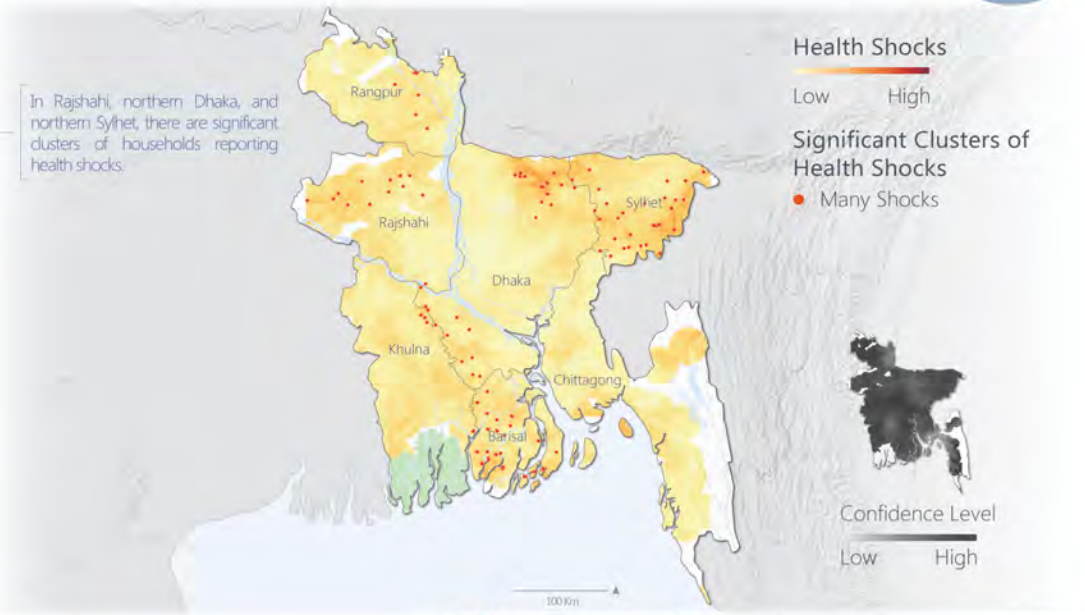
BANGLADESH LIVELIHOOD ANALYSIS: HOUSEHOLD HEALTH SHOCKS

Health shocks were greatest in the northeast, northwest, and south-central parts of Bangladesh in 2011. Health shocks deplete savings and can force households into undesirable coping behaviors, such as liquidating productive assets.

1 Health Shocks 2011

Percent of Households with Health Shock





2 Contributing Factors 2011

Head of household gender, dependency ratio and households with no land were the main contributing factors to hazard shocks.

Female Head of Household

In brown areas, female headed households were more likely to experience a health shock. In blue areas, they are less likely to experience this shock.

Households with No Land

In brown areas, households with no land were more likely to experience a health shock.

Bad Good

Dependency Ratio

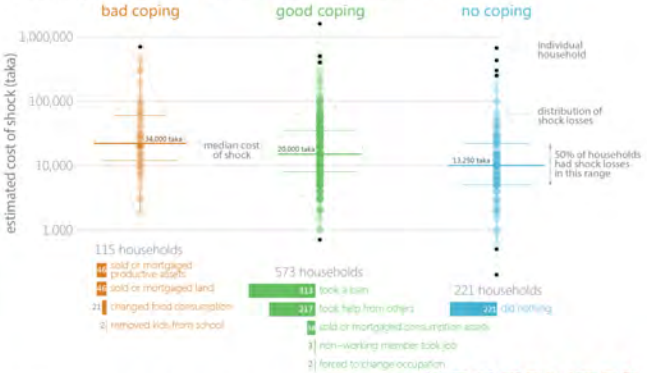
In brown areas, households with more dependents were more likely to experience a health shock.

Dependency Ratio

Households with **higher proportions of dependents** – adults over 64 and children under 15 – were more likely to report medical expense shocks.

3 How do people cope?

Households with more severe medical expense shocks tend to primarily cope through less sustainable means.



Date Created: September 2015 Data Source: 2011/2012 Bangladesh Integrated Household Survey GEOCENTER

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Shocks in Malawi

**PRELIMINARY ANALYSIS*

1. Agriculture / Natural Hazards
2. Food Prices
3. Health

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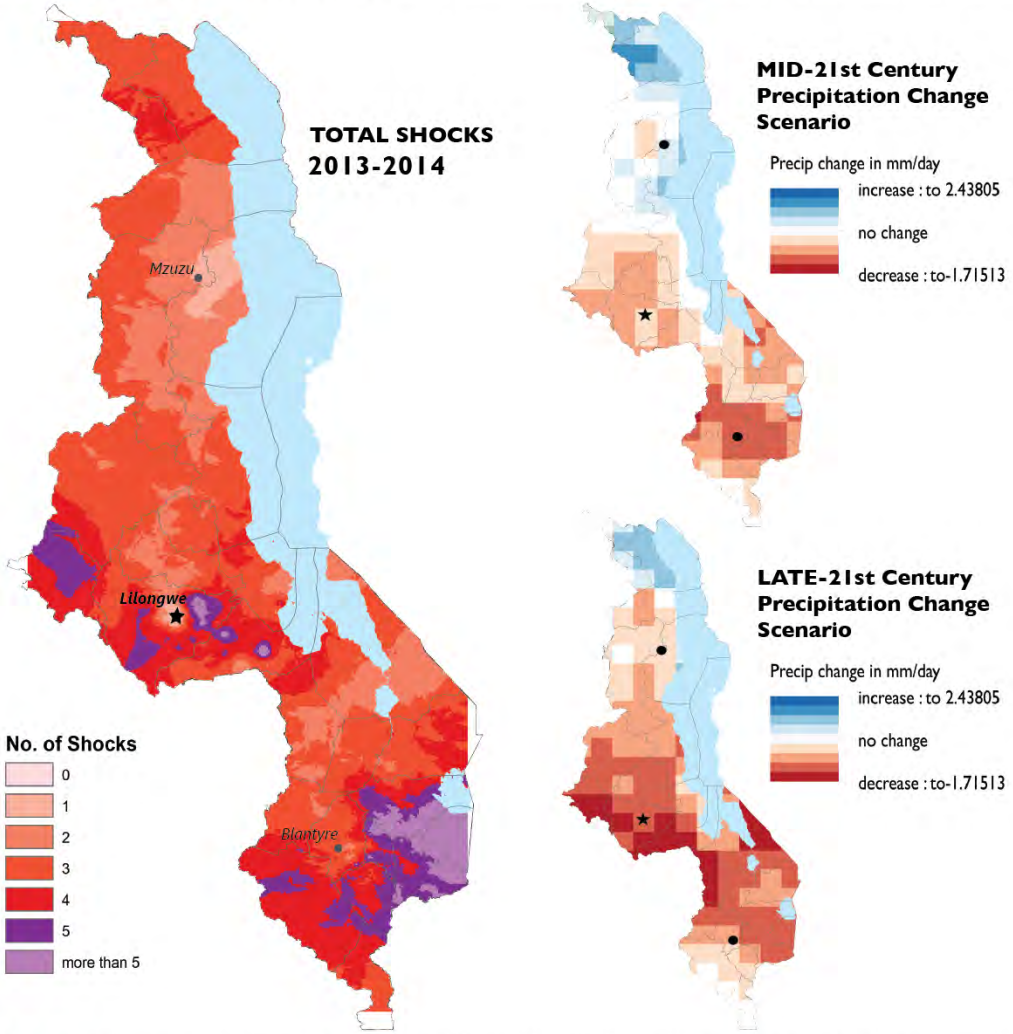
MALAWI BASEMAPS: PRECIPITATION SCENARIOS

Precipitation change scenarios portend acute development challenges for Malawi.

Drastic reductions in precipitation are possible in southern Malawi by the mid-2000s and in central Malawi for the late-2000s. Given that the Southern Region is the main subsistence maize growing area and the Central Region is the main commercial tobacco area, Malawian agriculture will be seriously affected by such changes. Note that these are climate ***scenarios***, not predictions, meaning that they were developed based on known exisiting climate conditions and anticipated future changes based on carbon emission scenarios.



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Data Sources: Malawi Third Integrated Household Survey, 2012 and Malawi Integrated Household Survey Panel, 2014.
Data Analysis and Cartography: West Virginia U., U. Texas-Austin, & USAID Geocenter. Funding: USAID & NSF.

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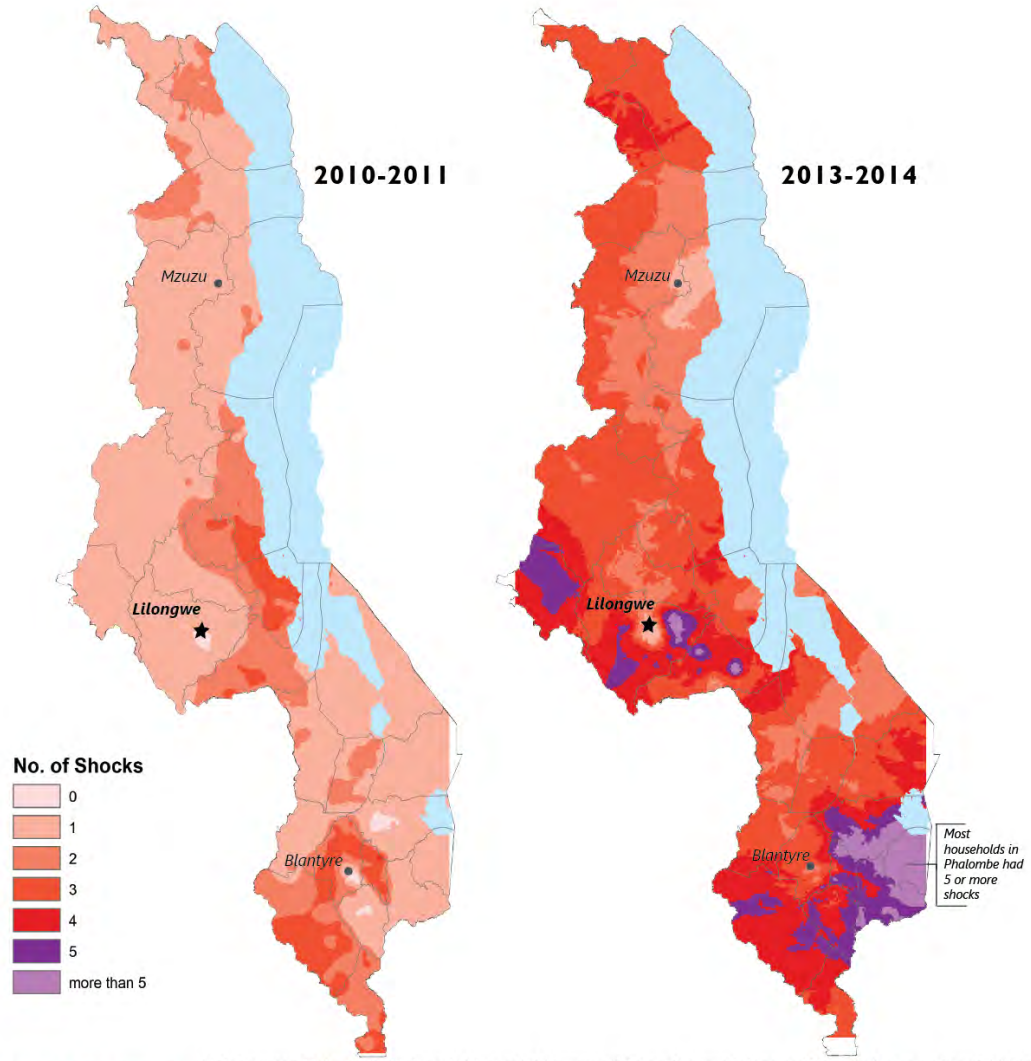
MALAWI LIVELIHOOD ANALYSIS: TOTAL SHOCKS

Vulnerability in Malawi was highest in the south, where farm plot sizes were typically less than 0.25ha. Shocks are disruptions to household income or subsistence, as reported by the household itself. Many households experienced five or more discrete shocks in 2013-14. The single largest shock was agricultural, which included crop failure and high input prices. High fuel prices created additional difficulty.



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Data Analysis and Cartography: West Virginia University and USAID Geocenter

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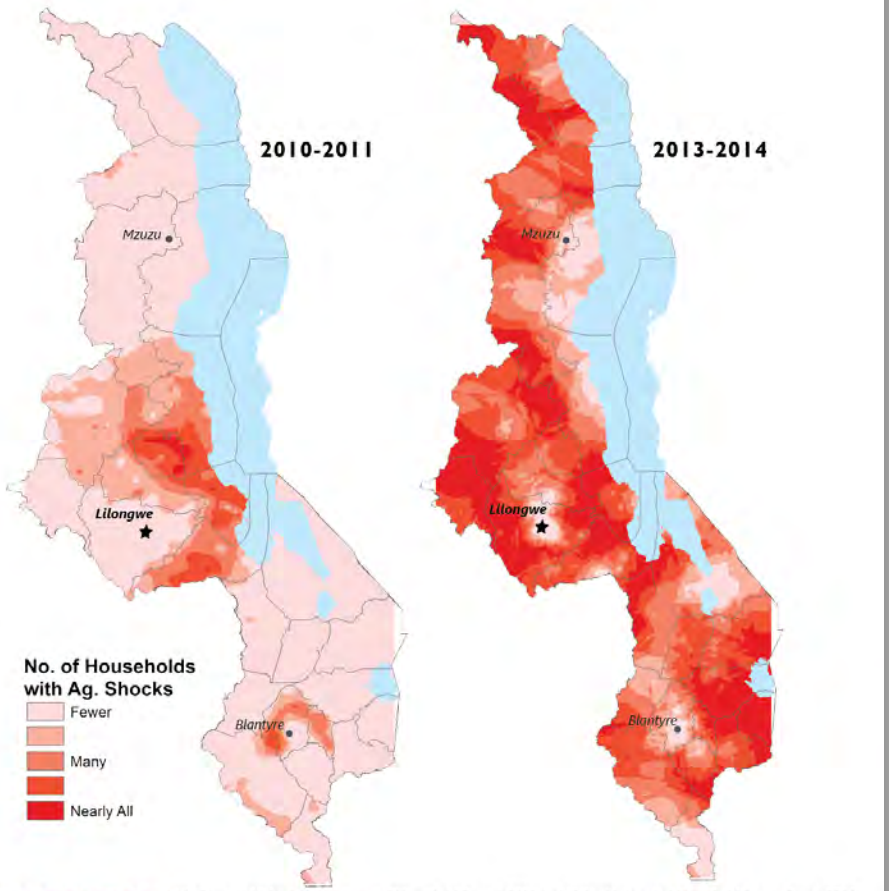
MALAWI LIVELIHOOD ANALYSIS: AGRICULTURAL SHOCKS

Most rural Malawian households experienced agricultural shocks in 2013-14.

Agricultural shocks included crop failure, lack of fertilizer and high input prices. Most households are overly reliant on maize or cassava for their staple crops and have remarkably low dietary diversity. High fuel prices created additional difficulty.



GEOCENTER *Data Sources: Malawi Third Integrated Household Survey, 2012 and Malawi Integrated Household Survey Panel, 2014.*
Data Analysis and Cartography: West Virginia University and USAID Geocenter

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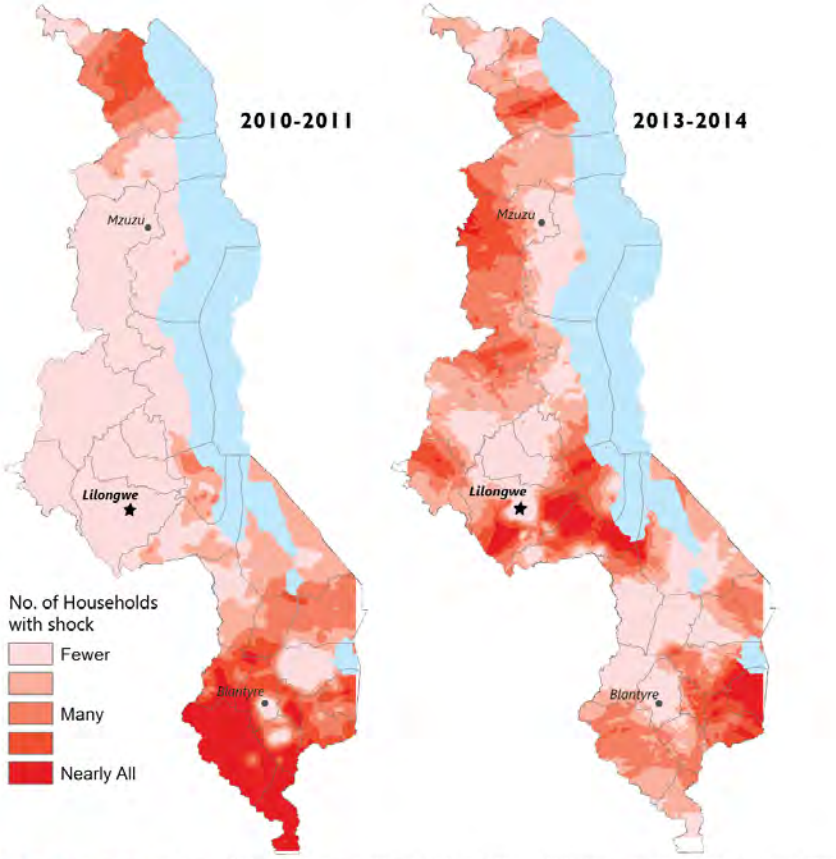
MALAWI LIVELIHOOD ANALYSIS: NATURAL HAZARD SHOCKS

Natural hazards were frequent, severe and highly localized in Malawi.

Droughts, floods, landslides and earthquakes consituted natural hazard shocks in the dataset. These shocks did not consistently result in agricultural shocks. Chikwawa and Nsanje suffered the most severe shock in 2010-11. Households in Phalombe, Dedza and Lilongwe Rural reported the most hazard shocks in 2013-14.



GEOCENTER *Data Sources: Malawi Third Integrated Household Survey, 2012 and Malawi Integrated Household Survey Panel, 2014.*
Data Analysis and Cartography: West Virginia University and USAID Geocenter

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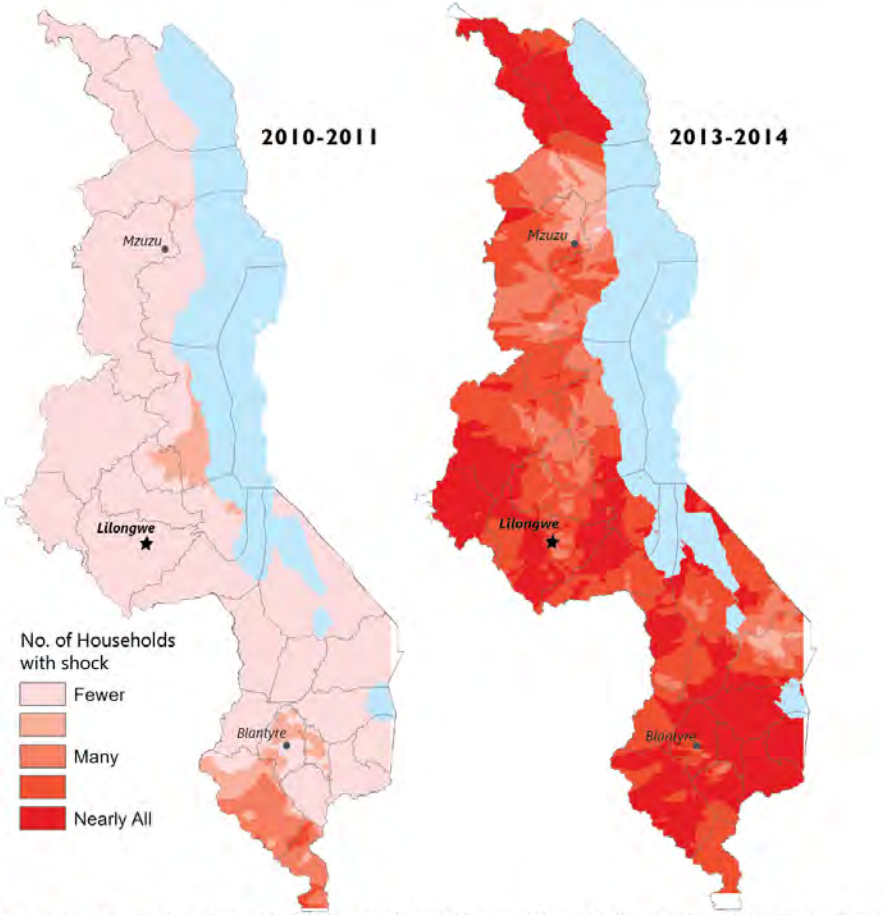
MALAWI LIVELIHOOD ANALYSIS: FOOD PRICE SHOCKS

Food price shocks were widespread and severe in Malawi in 2013-14. As in most of the developing world, Malawian households are very sensitve to the price of food. Many households do not grow enough food for their own consumption and must purchase food. Even in years where shocks were not widespread, such as 2010-11, some communities in the south still experienced a food price shock.



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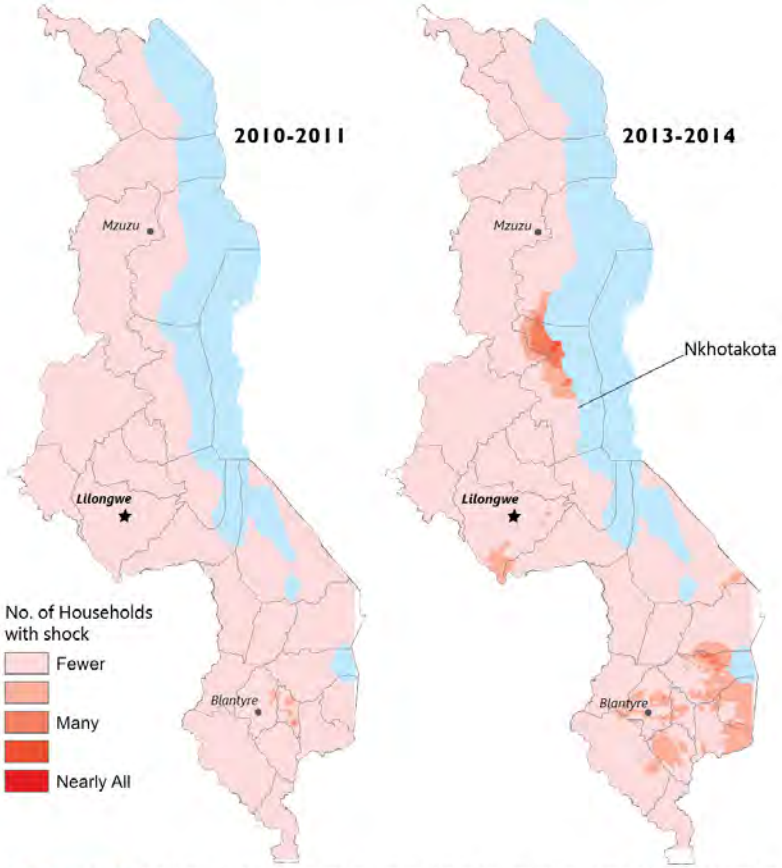
MALAWI LIVELIHOOD ANALYSIS: HEALTH SHOCKS

Health shocks in Malawi were most pronounced near Nkhotakota in 2013-14 .
These maps show the distribution of households suffering a death, birth, or significant illness in 2010-11 and 2013-2014. Health shocks are often masked by natural hazards but are not always correlated to them. Longer term health issues, such as HIV/AIDS prevalence, are not adequately reflected here.



GEOCENTER *Data Sources: Malawi Third Integrated Household Survey, 2012 and Malawi Integrated Household Survey Panel, 2014.*
Data Analysis and Cartography: West Virginia University and USAID Geocenter

NSF/USAID Study on Household Adaptation

- &Study conducted with 2000 households in Nkhata Bay, Balaka, Machinga, and Mulanje, 2008-2015.

- &Household profile...

  20% of households could not afford fired bricks

  40% of households have thatch roofs

  63% have not completed primary school

  44% were born in the village (heavily biased by southern sites)

  50% of households have borehole water (untreated)

  95.6% of households do NOT own any cattle.

NSF/USAID Study on Household Adaptation

- &Household profile...

  70% do not have a goat

  64% of households have a cellphone

  67% of own/access less than 2 ha of land

  41% have 1 or fewer ha of land

  76% used 1 or fewer (shared) FISP fertilizer coupons

  55% did not see an extension agent in the previous year

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NSF/USAID Study on Household Adaptation

- On Climate and Environmental Change, households report... &

  90% say dry spells are increasing in frequency &

  72% say late onset rains disrupted their livelihoods in the at least once in the last 10 years

  76% consider themselves "highly vulnerable" to climate change

  50% increased their use of *ganyu* labor in the last 10 years

NSF/USAID Study on Household Adaptation

Climate and Adaptation

- &Households accurately recall rainfall and temperature anomalies up to 10 years prior to survey
- &Beyond 10 years, fidelity is lower

- &Coping is relatively thin
  - Ganyu labor is the first and most prevalent coping mechanism
  - followed by switching foods or purchasing food
  - then diversifying into a "business" usually some sort of petty trading or petty commodity production
  - then selling a consumptive asset
  - then selling a productive asset
  - **78% of households say they will not move to the local city**

NSF/USAID Study on Household Adaptation

- &Moving from Coping to Adaptation

- &Intervening factors are important in understanding which mechanisms stay and which fall away
  - &Other shocks &
    - health &
    - food prices &
    - other commodity prices (fuel) &
  - &uncertainty in land tenure arrangements/institutions
  - &"crowding" and lack of land
  - &lack of educational attainment of children
  - &gender relations

- &Adaptation is heavily reliant on ganyu labor and petty business activity &

Taking Stock: Resilience in the face of adversity

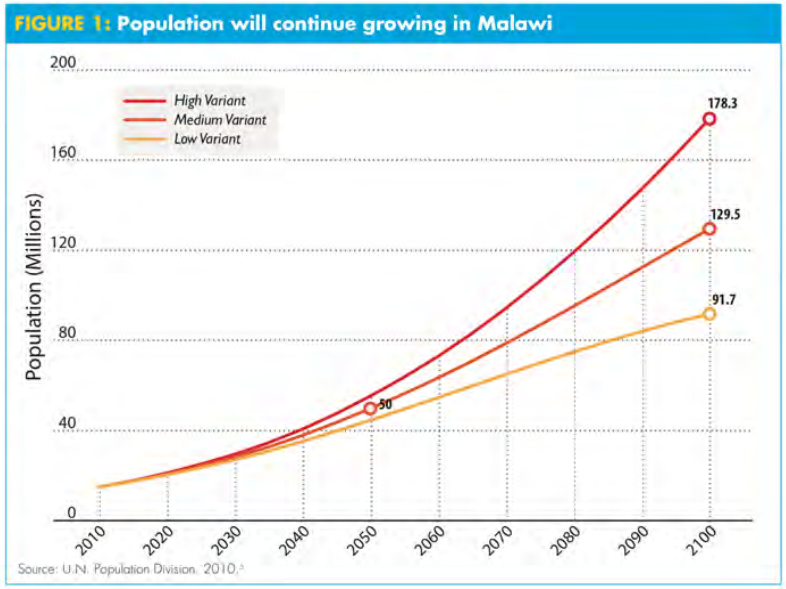
- Two TDYs to Malawi in 2013 to assess how innovative farmers succeeded.

- Examined climate resilient natural resource management techniques
  - Conservation agriculture
  - Community afforestation
  - Use of improved cook stoves
  - Community managed fisheries
  - Production of high value export crops (macadamia).

- We asked the questions – "how did this farmer succeed where others have failed"? And "could this be replicated to promote climate smart adaptation"?

Taking Stock: Resilience in the face of adversity

- The answer is "yes", but not in the face of...



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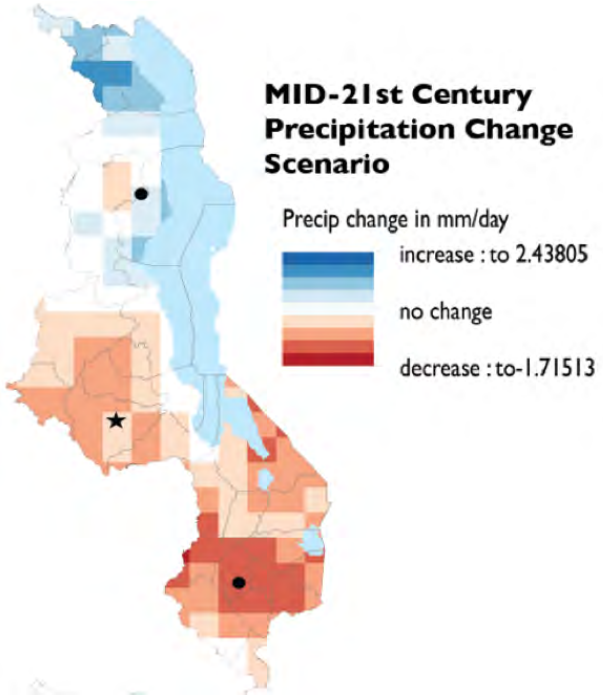

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Geocenter Services

- Analytics to help address these challenges:

  1) Full Livelihoods Analysis & Mapping with correlating factors

  2) Futures Scenarios

  3) Mapping for Resilience/Youth Mapping

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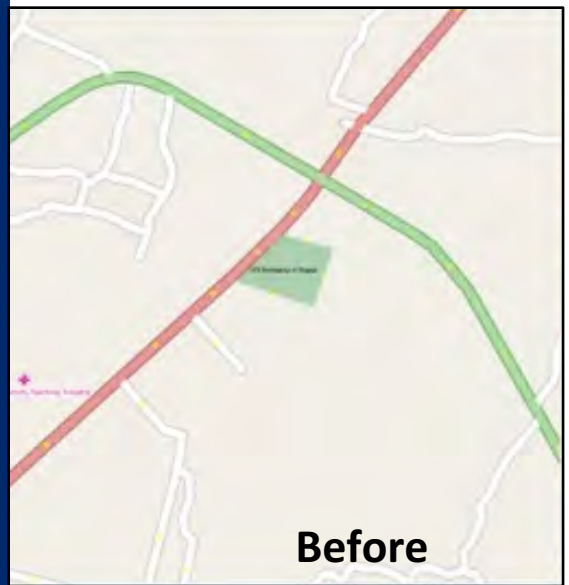
Youth Mappers Program

Chapters @ Chancellor College and Univ. of Pretoria

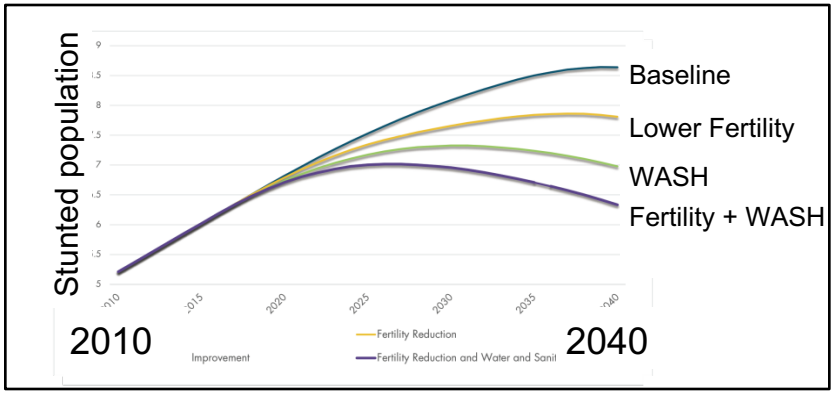


youth mappers

Futures Analysis

Trends Analysis

Long-term socioeconomic trend data + consequences of development interventions



Scenario Planning

Stakeholders question assumptions, assess risks, opportunities, & determine alternative future scenarios