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What's all the Buzz about Agricultural Index Insurance?

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Feed the Future Innovation Lab
for Assets and Market Access

*AGRICULTURAL INSURANCE IN TANZANIA
RAMADA ENCORE HOTEL, DAR ES SALAAM
19 JULY 2018*

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IMPACTS OF AGRICULTURAL RISK

Agriculture is inherently risky. However, the shocks farmers face can both make people poor and keep people poor.



Costly coping strategies after a shock occurs.



Missed opportunities even before a shock occurs.



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CHALLENGES OF TRADITIONAL INSURANCE



MORAL HAZARD



EXPENSIVE AND SLOW



COSTLY CLAIMS VERIFICATION



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So What is Index Insurance?

- Insurance is designed with an **external measure** highly correlated with yields (the index).
- Payouts are based on **estimated losses** without individual loss verification.
- Index Insurance has the potential to **reduce the cost** of insurance and to **speed up payouts**.

Quantifiable

Can be Verified

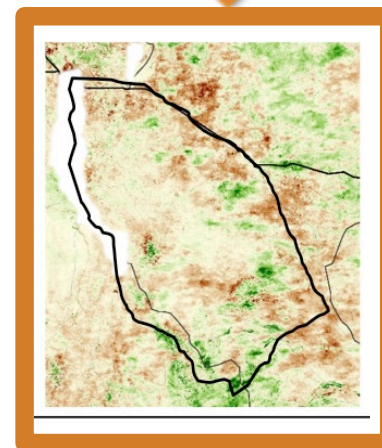
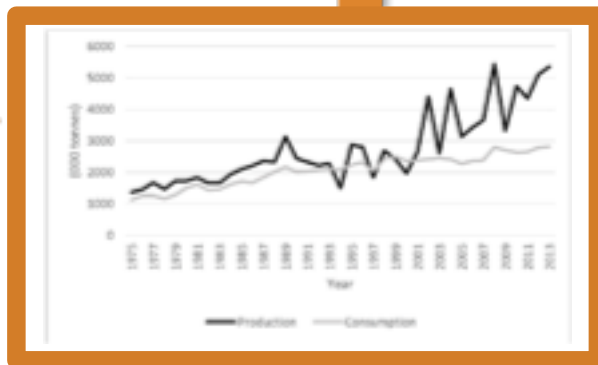
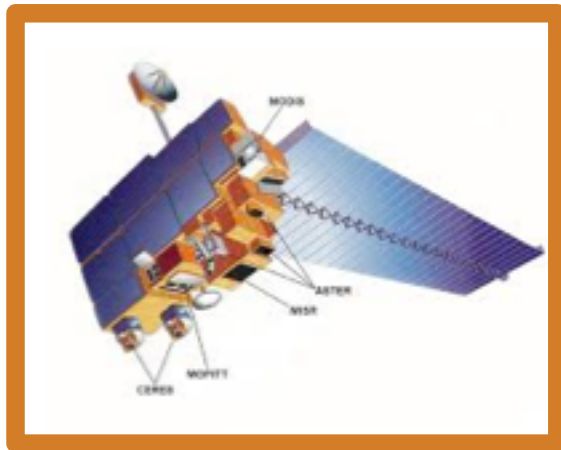
Can't Be Manipulated



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HOW INDEX INSURANCE WORKS



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INDICES USED FOR INDEX INSURANCE

There are a number of difference measures that are typically used in agricultural index insurance. Some can work better in certain situations than others and some are not feasible for certain commodities or regions.

Because of these issues, it can take some work to identify which index is the best fit for the target geography and commodity. And there may be times where it is not possible for a given target area/commodity.



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RAINFALL INSURANCE

A rainfall-based index insurance contract uses observed rainfall over a season for each insurance zone to trigger payouts based on estimated yields.

These estimates are designed by comparing, for the target crop in each insurance zone, historical index data compared to historical average yields.

However, traditionally rainfall insurance has not typically been able to effectively protect farmers.



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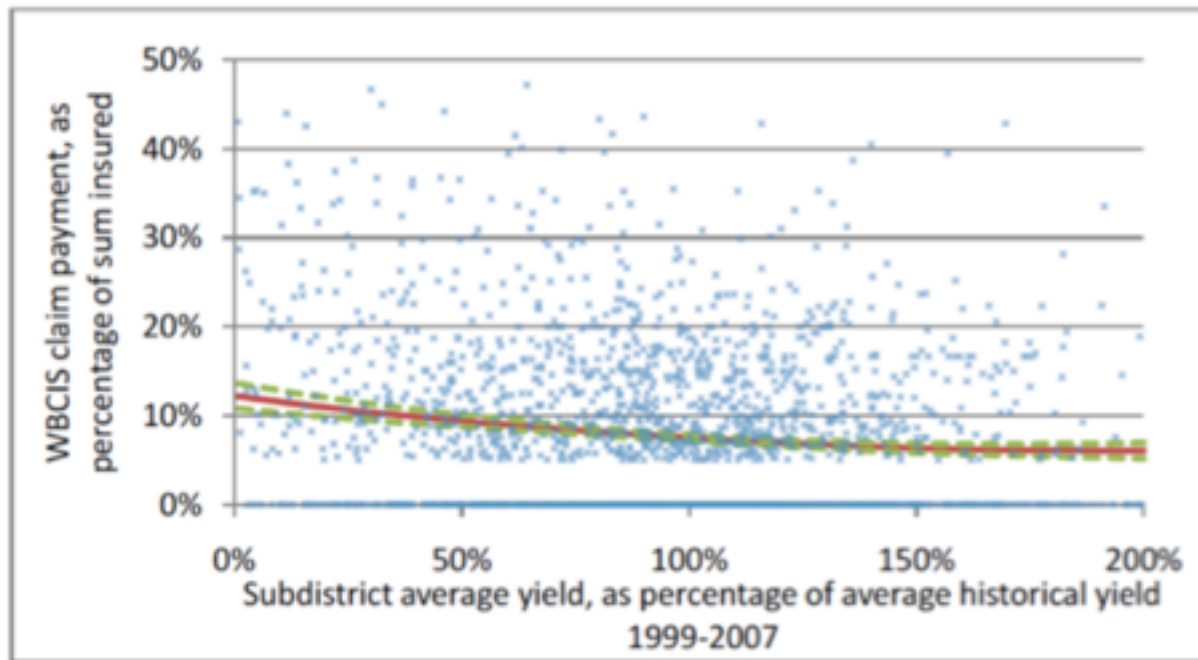
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IMPLICATIONS OF RAINFALL AS AN INDEX



The blue marks intersect at the money paid out by government-subsidized index insurance contracts as a proportion of the estimated loss (y-axis) and the area-wide average yield as a percentage of average historical yields in a representative state in India between 1999-2007. The red line is the average of those individual payments, **showing that the average was roughly the same whether farmers on average suffered a total crop loss or had a crop that was double the historical average.**



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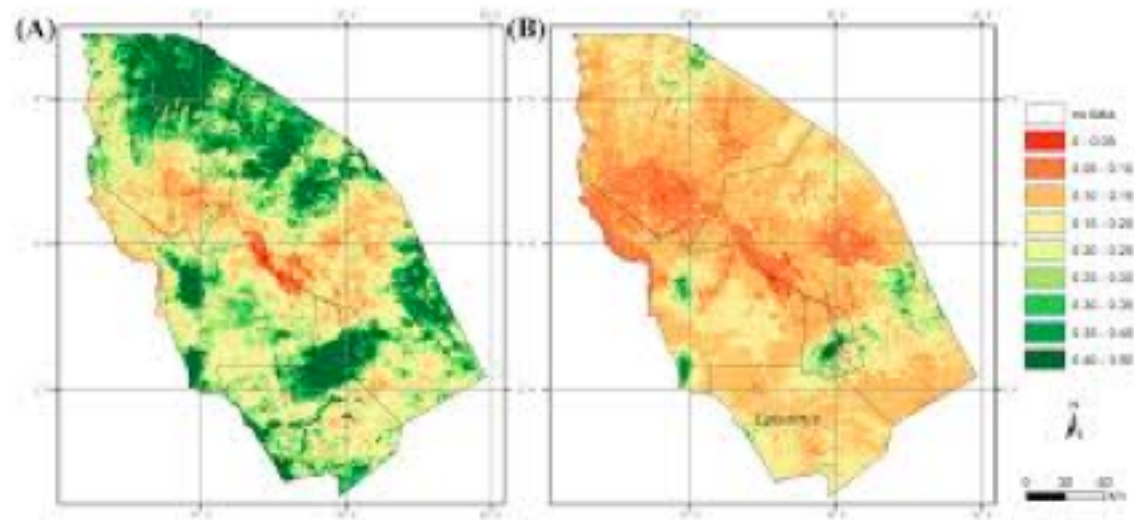
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SATELLITE (NDVI) MEASURES



One of the most common satellite measures used in index insurance is the a measurement of live, green vegetation. These images taken from satellite are made up of pixels, where a single pixel represents the average vegetation inside that area.

One of the most commonly used sources of satellite data takes measurements at 250 m², which is large compared to typical field sizes, so there can be a lot of variation.



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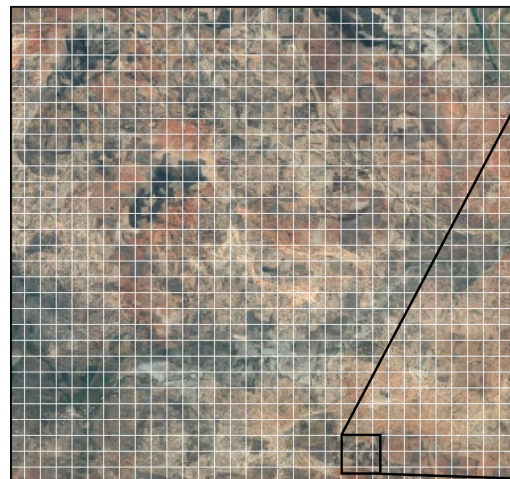
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HIGH-RESOLUTION SATELLITE

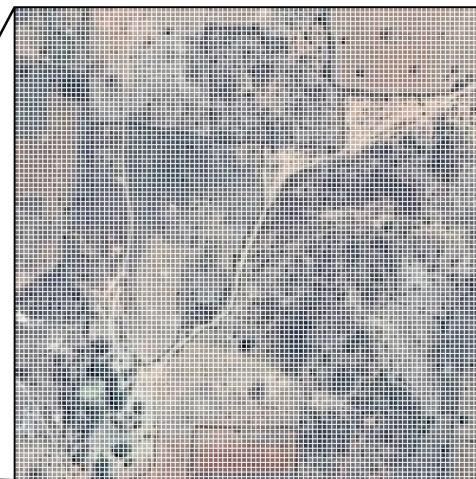
Dodoma, Tanzania

250-meter pixel resolution



1 kilometer

5-meter pixel resolution



100 meters

We are also experimenting with high resolution measurements of vegetation growth. These measurements do a better job of predicting small farm crop yields. These measurements, taken by a private earth science company's satellites, are 50 times more detailed than those used for many current satellite index insurance products.



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AREA YIELD-BASED INDEX INSURANCE

Benefits

- Actually a measure of losses (not an estimation)
- Avoids high costs of verifying individual crop losses

Challenges

- Expensive surveys for area yield measurements
- Timing of data availability delays timing of payment



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IDENTIFY GOOD “INSURABLE” OPPORTUNITIES

There are target area characteristics which we have found indicate a high probability of successful index insurance product such that:

- there will be a market for the product.
- it is possible to create a reliable index for a high-quality product.

Shared Risks

Dominant Livelihood

Dominant Risk

Equal Shock Impact

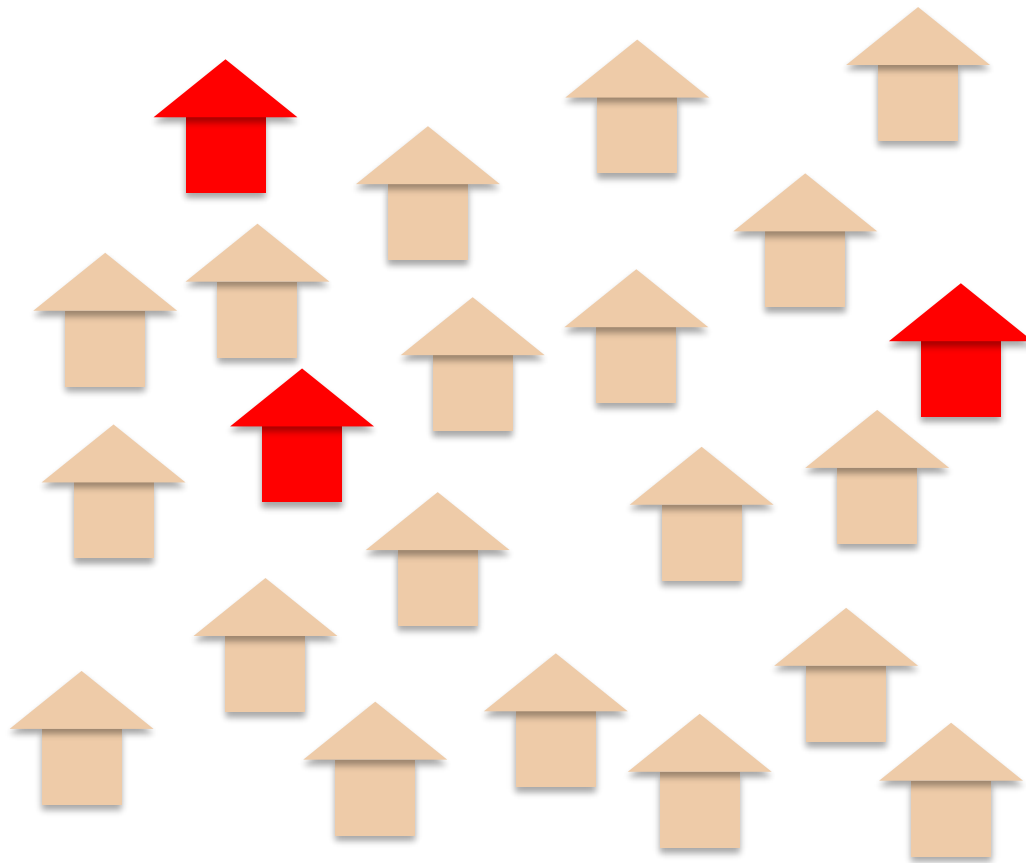




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WHAT WE LOOK FOR: SHARED RISKS



For certain risks in some communities, most risks affect only a few households at a time.

In many communities, the impacted households can rely on village groups or family networks to help them manage and recover from the shock.



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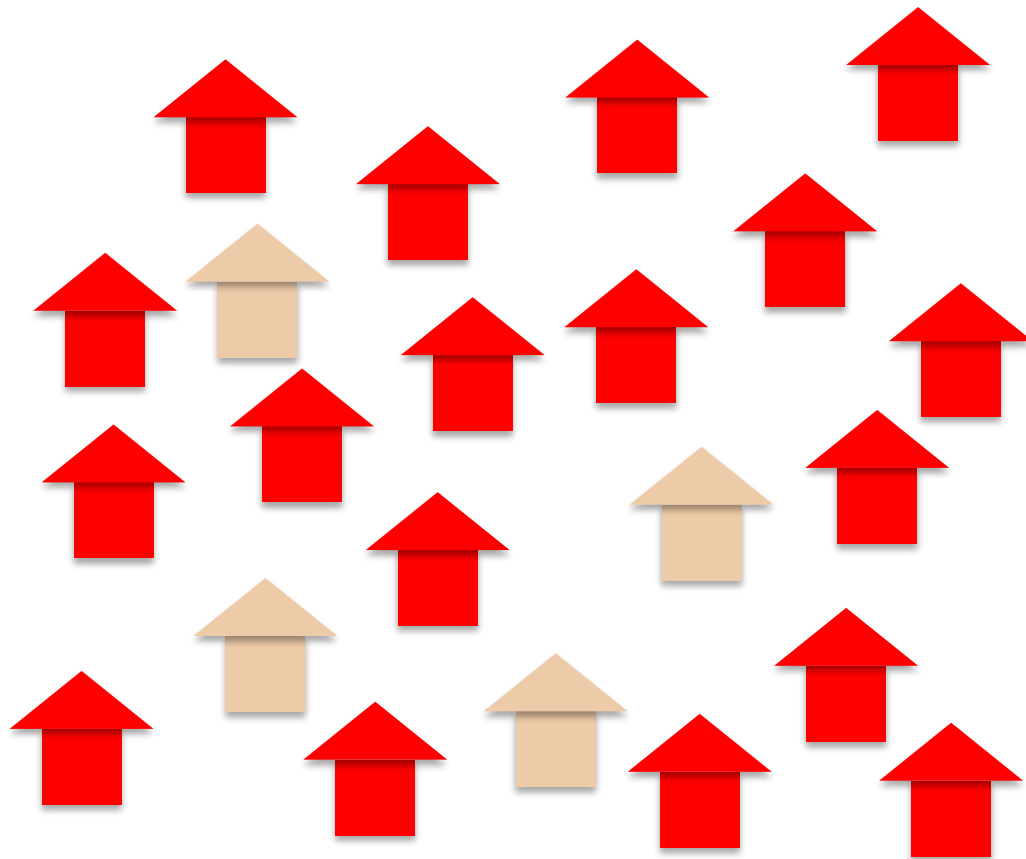
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WHAT WE LOOK FOR: SHARED RISKS



Index insurance is designed to have the greatest impact (and the most demand) for risks that affect many of most households in a community at the same time.

It is these risks that tend to have losses that can be effectively measured by an index insurance product.



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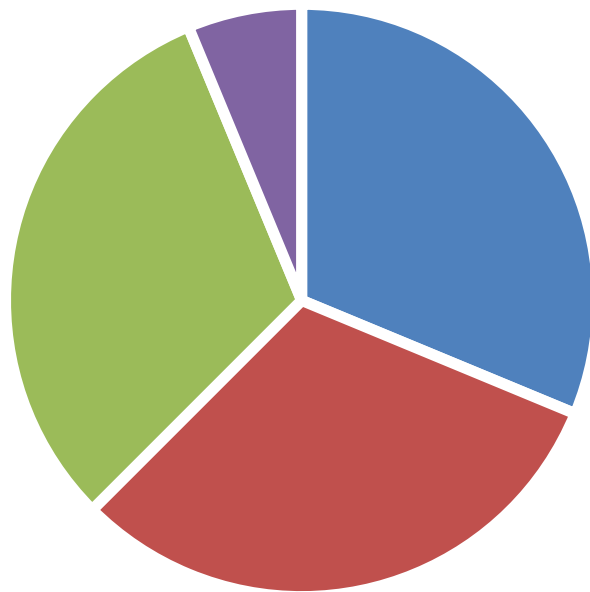


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WHAT WE LOOK FOR: DOMINANT LIVELIHOOD

Household Economy



- Maize
- Rice
- Livestock
- Vegetables

If you are not insuring a crop that is a dominant part of the household economy for most farmers in the area (or is only one of many equal parts), there may be less of a market for the product.

Even for those farmers who purchase the product – there may be less of a positive livelihood impact.



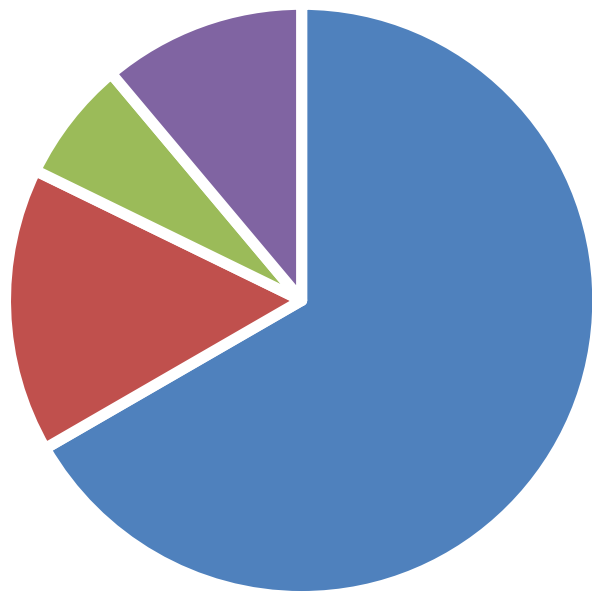


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WHAT WE LOOK FOR: DOMINANT LIVELIHOOD

Household Economy



- Maize
- Rice
- Vegetables
- Sorghum

If there is a crop that is obviously the dominant part of most households' livelihoods, this is more likely to be met with demand, and lead to development impact for farmers.



WHAT WE LOOK FOR: THE DOMINANT RISK

It is important to understand what the greatest risks are to the commodity in the target area.

If you cannot come up with a quality index insurance product for the most significant risks, it is unlikely that the product will have a large market or have large development impacts.

Risks to Livestock



■ Drought
■ Disease

■ Accident
■ Crime/Theft





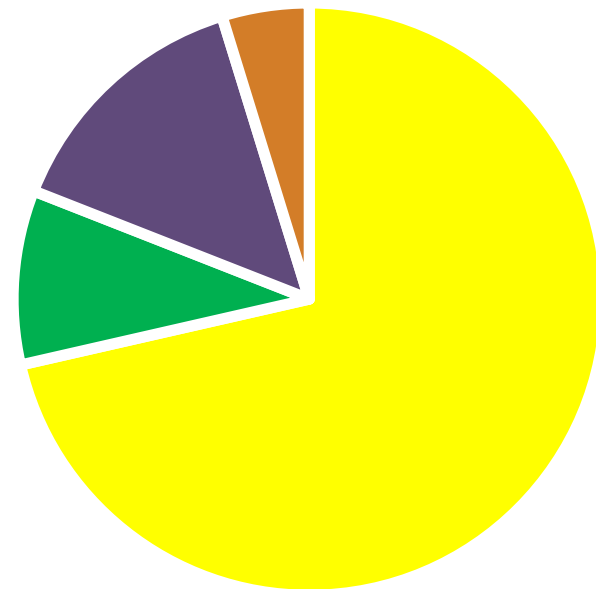
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WHAT WE LOOK FOR: THE DOMINANT RISK

When a single risk is a big driver of losses in that commodity areas, and an index can be designed to effectively estimate those losses, the product is more likely to find success.

Risks to Livestock



■ Drought
■ Disease

■ Accident
■ Crime/Theft



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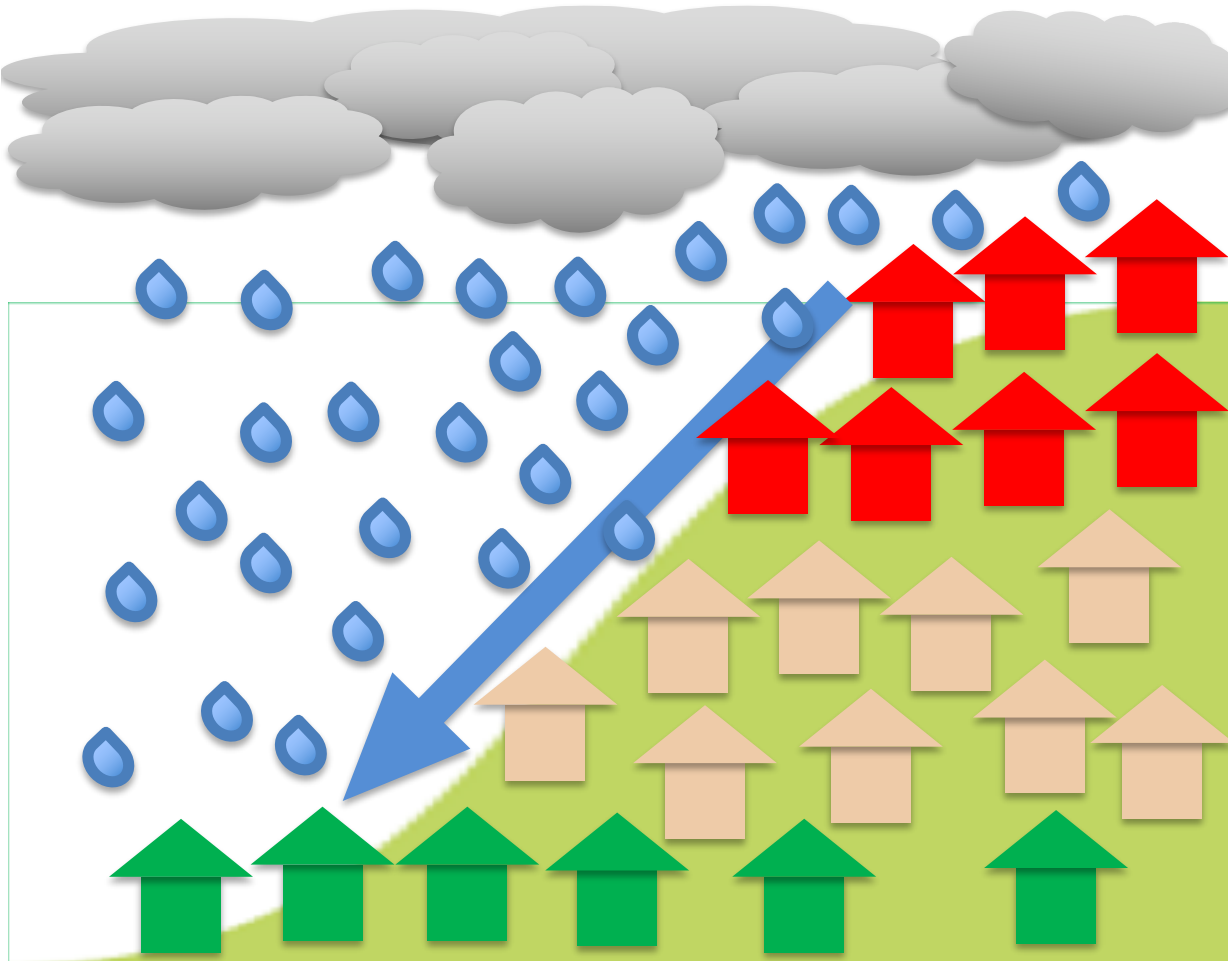
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WHAT WE LOOK FOR: EQUAL SHOCK IMPACT



In variable terrain, households may have very different experiences, even within the same village.

The top of a hill, for example, may suffer dramatic losses, even though the total rainfall amount was considered to not trigger the index.

Satellite measures may also have difficulty in observing differences, because there may be few or no pixels for the area.



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THE STAKES FOR QUALITY ARE HIGH

When an index insurance contract fails, a farmer may be left worse off than she would have been without insurance:

- she lost both her crop and the cost of the premium.
- she must default on loans she has taken.
- she may resort to costly coping mechanisms.

Further, these failures create distrust for an otherwise promising tool, sabotaging future high-quality contracts.



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“3D” Client Value Assessment Tool

Dimension	Indicator
Design	<ul style="list-style-type: none">1. Index reliably predicts farmers' experience2. Covers appropriate activities3. Covers appropriate risks4. Enables productive investment decision-making5. Minimizes gaps in coverage
Distribution	<ul style="list-style-type: none">6. Covered farmers are adequately informed of product details7. Staff and sales agents are adequately trained, incentivized, and supervised to inform clients and sell responsibly8. Payment processes minimize liquidity constraints9. Product is inclusive
Delivery	<ul style="list-style-type: none">10. Product delivers adequate coverage for money11. Benefits are delivered in a timely manner12. Procedure to deliver benefits is reliable and understood13. Provider is responsive and proactive about questions, problems, and complaints14. Covered farmers receive evidence of coverage



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THANK YOU



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