



# FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative



## TOOLKIT: AGRICULTURAL INDEX INSURANCE FOR DEVELOPMENT IMPACT

### STAGE I: ASSESSMENT



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This resource is part of the Feed the Future Innovation Lab for Assets and Market Access publication series, *Agricultural Index Insurance for Development Impact*. The series will lead you through steps to **Assess** the viability of agricultural index insurance for a population and commodity, to **Design** a high-quality index insurance product and to **Scale** the intervention to have the greatest development impact.

This series is part of the AMA Innovation Lab's Index Insurance Innovation Initiative (I4) at UC Davis, which since 2009 has led research and development on high-quality agricultural index insurance interventions worldwide. Learn more: [basis.ucdavis.edu/index-insurance-innovation-initiative-i4](https://basis.ucdavis.edu/index-insurance-innovation-initiative-i4).

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Author: Tara Chiu; Editing/Design: Alex Russell; Released January, 2019.

# INTRODUCTION

Agricultural index insurance is an exciting and promising tool to build resilience among small-scale farmers and pastoralists in developing economies. It provides protection from weather-related risks—such as drought and flood—while avoiding the costs of verifying individual claims by basing its payouts on an area’s weather, vegetation growth or average yields. Evidence has confirmed that in the right setting and with a carefully planned and executed intervention, agricultural index insurance can have significant development impacts.

It can be difficult, however, to determine whether and even where agricultural index insurance can have those big impacts. **Stage 1** of *Agricultural Index Insurance for Development Impact* is a framework that lays out initial steps to identifying the populations and commodities for which a safe and effective agricultural index insurance product can be designed to achieve your development objectives.

Each step in **Stage 1** of this toolkit has space to fill in information that will contribute to your initial index insurance assessment. Fill in these lines as you progress through each step. At the end is a matrix for adding those responses and detailed instructions on how to complete the analysis that will yield high-potential opportunities to bring to **Stage 2** of this toolkit.

It is important to note that responses to many of these steps can vary by stakeholder. For this reason, it’s highly recommended that **Stage 1** be completed with key stakeholders that can represent the range of your organization’s priorities, ensuring that everyone involved in building an index insurance intervention is on the same page as you move forward.

## Steps in Stage 1

1. Identify development objectives
2. Identify target populations and commodities
3. Identify growth opportunities
4. Find the “Sweet Spot” between growth potential and insurability
5. Compile a list of available resources
6. Complete assessment worksheets

Throughout **Stage 1** are puzzle pieces representing three parts needed for agricultural index insurance to have development impact. Ensuring that each piece fits helps ensure that the most promising opportunities move to **Stage 2: Design**.



# STEP I: DEVELOPMENT OBJECTIVES

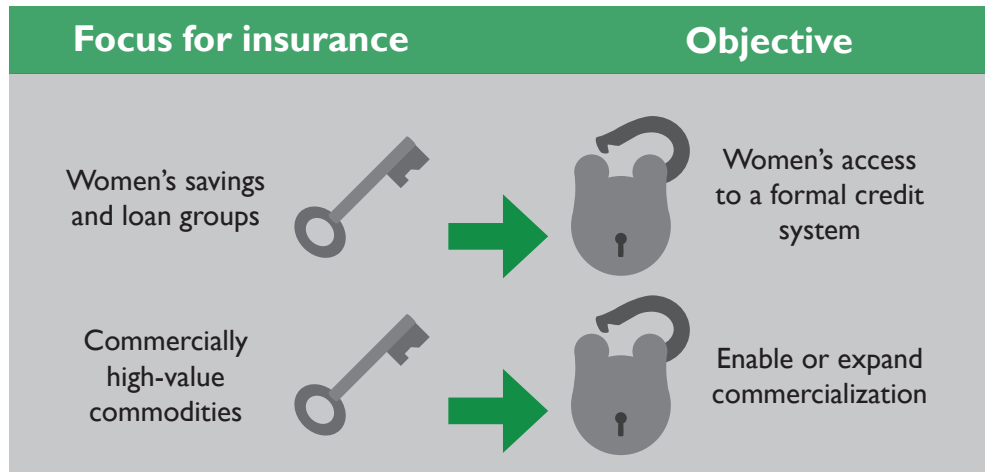
## Development objectives

Having goals is the first step to designing an agricultural index insurance intervention focused for a specific outcome. Look to your organization's goals for development to start your own list of development objectives for agricultural index insurance.

Index insurance can be a powerful tool to connect development objectives and specific focus opportunities. These two are examples of how index insurance can be developed for a specific focus for development impact.

Index insurance can significantly accelerate and protect economic growth. Even so, having specific development objectives before getting started will help you to develop a product tailored to accomplish those objectives. For example, objectives to protect household assets and prevent descents into poverty may lead to a different product than one seeking to improve on-farm investments and commercialization. Common objectives for agricultural index insurance include:

- Increasing household resilience to shocks
- Protecting assets for farmers
- Enhancing food security
- Enabling growth and investment
- Strengthening inclusive agricultural systems
- Drawing marginalized smallholders into the formal financial sector



## Development objectives

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

## Priorities and Limitations

At this point it is important to acknowledge whether your organization has priorities or limitations on populations or commodities. Both will influence the assessment and design of an index insurance product. They will also help determine whether your focus populations or commodities are likely to be well-served by agricultural index insurance. Examples of priorities and limitations include:

- Priority: specific value chains, populations or geographic areas
- Priority: specific outcomes, such as reduced malnutrition
- Limitation: Focus area mandated by organizational mission
- Limitation: Funding dedicated to a specific area or purpose

Some organizations have no specific target populations, value chains or even regions. If your organization does not have target populations or commodities already in mind, Steps 2 and 3 will help you determine the populations most likely to be both insurable and to have productive opportunities.

### Priorities:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_



### Limitations:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_



# STEP 2: AVAILABLE RESOURCES

It is important to make a full assessment of available resources and potential challenges early in the process of developing an agricultural index insurance intervention. Lacking the needed resources can hinder the creation of a responsible and effective index insurance intervention in a number of ways.

Resources include

- Financial commitments or resources available to support this work
- Data, including commodities and at what levels of aggregation
- Partners
- Leadership
- Technical Expertise
- Political support

This data is crucial to developing and testing an index for insurance. Data include weather and environmental data, production data, historical crop yields or livestock losses. Consider data availability for each commodity and region under consideration. Make sure also to verify the availability of this data before finalizing which commodities and regions should be carried into **Stage 2** of this Toolkit.

Other resources can also determine the success of an index insurance intervention. Lacking partners in the private sector, such as an insurance company, creates significant challenges for taking an insurance product to market. Other partners can increase the chances of broader success by providing access to groups of farmers, such as cooperatives or village savings and loan associations.

## Resources:



1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_

## STEP 3: POPULATIONS AND COMMODITIES

Having a development impact with agricultural index insurance depends largely on the extent that farmers in an area share weather-related risks *and* whether the area has a single dominant crop. Agricultural index insurance is meant to cover one or more risks that affect a large proportion of farmers in a community at the same time. Also, crops that determine the welfare of a community are a valuable focus to calibrate an insurance index to estimate losses.

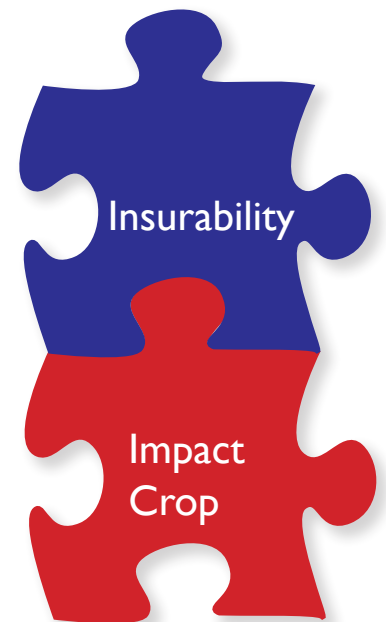
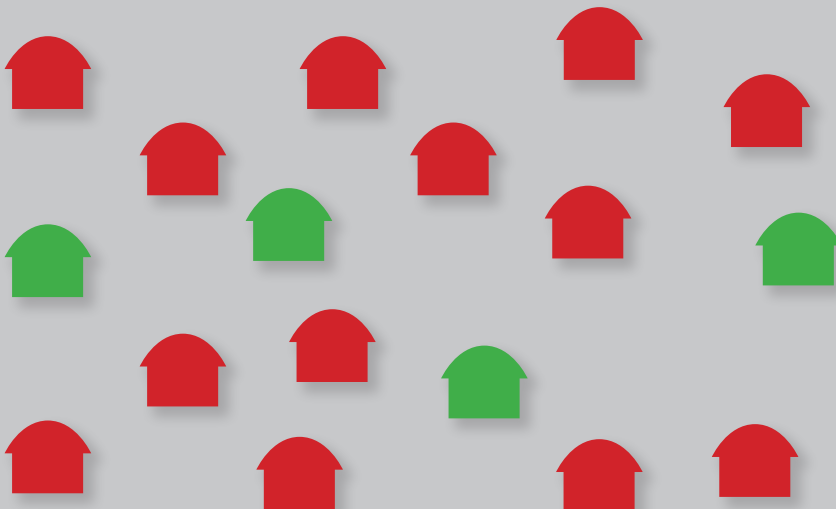
Step 2 in this assessment will help determine which **Focus Populations** and **Commodities** are most likely to be insurable with an index-based product. It may be useful to consult specific commodity/value chain experts. Shared risk will be rigorously analyzed in a future stage of this toolkit. For now, use common characteristics to roughly assess which populations, commodities and/or geographic regions have the highest potential for success with an index insurance product.

### Insurability

The level of “covariate,” or shared, risk helps determine which populations, commodities and/or geographic regions are “insurable” with an index-based product. We break insurability down into two essential questions:

- Is there evidence that farmers face shared risk(s)?
- Are farmers roughly equally exposed to that risk?

#### Is there evidence that farmers face shared risk(s)?

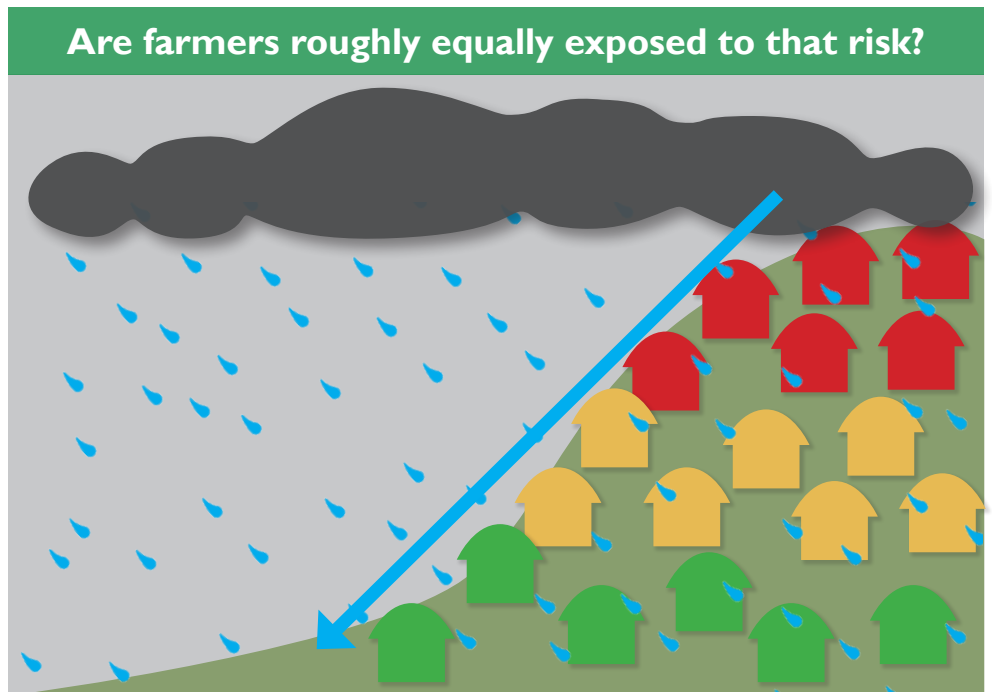


### Basis risk

The difference between an index’s predicted losses and actual losses is called “basis risk.” If farmers experience a high variation of losses because of highly variable conditions, index insurance is likely to have high basis risk, meaning a high chance that it does not pay accurately.

Significant geographic variation means that even neighboring farmers can have significantly different experiences. For example, a flood will impact rice farmers in small areas with both mountains and valleys differently depending on their elevation.

Index insurance is designed to have the greatest impact and most demand when the same risks affect many of most households in a community at the same time. However, households even in the same village may have very different experiences. In varying terrain, during heavy rains farmers at the top of a hill may suffer no losses while those further down may experience total losses due to flood.



Your **Populations** and **Commodities** should have a balanced level of specificity. For example, rice farmers who in areas with relatively flat and similar weather likely face similar challenges. Farmers with very different weather require specificity.

Population	Commodity
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____



# STEP 4: GROWTH OPPORTUNITIES

Index insurance interventions for small-scale farmers that have had significant impacts on growth all have one thing in common: opportunities for smallholder farmers to increase investment and production were already available. When risk is a main barrier to productive investments, a risk-transfer tool like insurance is likely to stimulate those productive investments.

This is not always the case. Index insurance alone will not overcome all barriers to technology adoption. These barriers may include:

- A minimal gap between current performance and what is possible
- A lack of technologies or inputs available locally
- Land or a local environment that has reached the limits of productivity
- Farmers lack the knowledge or skills to effectively use new technologies

Some areas may have no productive opportunities for insurance to unlock. For example, if yields are very near the most that is possible even with improved technologies, insuring farmers is unlikely to unlock increased investments. In this case, it may be possible to focus on crops that still have growth potential.

One way to identify growth opportunities aligned with your development objectives is to consult with experts in that commodity. These include NGOs, research institutions and national governments. These experts are likely to know:

1. What existing growth opportunities farmers are not taking, if any?
2. Are those opportunities physically accessible in the targeted area?
3. Which commodities/value chains have the greatest opportunities for increased production and profitability?
4. In what areas, both with regard to livelihood and geography, do farmers have demand for resources to take advantage of local opportunities?



## Growth opportunities

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

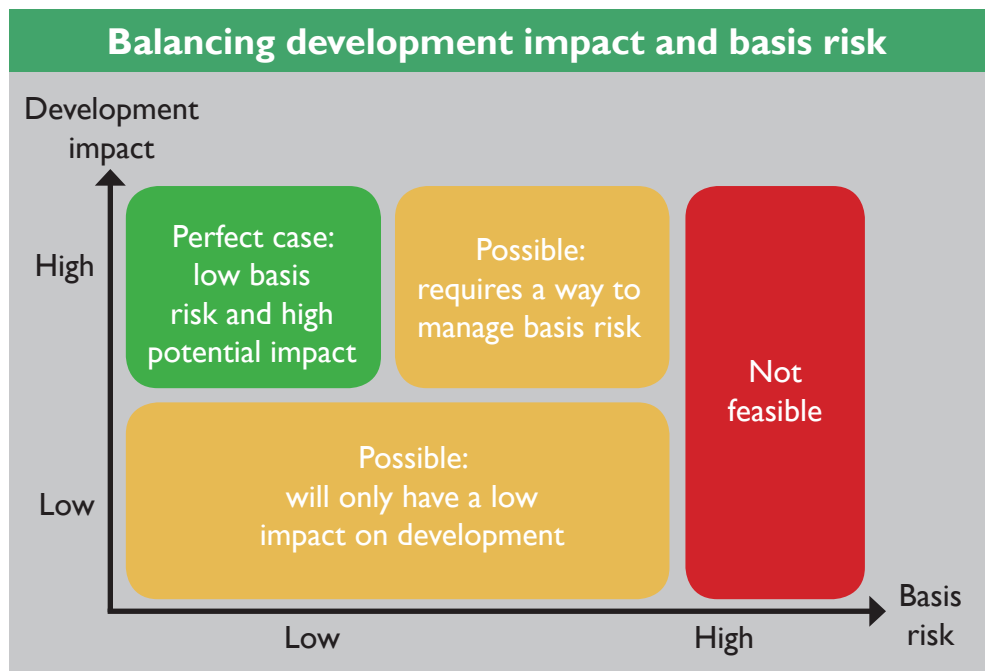


# STEP 5: GROWTH POTENTIAL AND INSURABILITY



Risk keeps farmers from trying potentially profitable but expensive and unknown opportunities. Agricultural index insurance will have the biggest development impact when farmers can access these investment opportunities **and** when the contract itself can accurately predict losses. Index insurance is less likely to have development impacts for either case on its own.

The diagram below illustrates this. The vertical axis represents the likelihood development impacts are possible for a particular activity. The horizontal axis represents the likelihood a population and commodity are insurable.



Looking back at the results of steps 2 and 3 when you complete the worksheet will help you identify what populations have both a high potential for development impacts and are most insurable.

Population/commodity	Potential impact (high/low)	Insurability (high/low)
1. _____	_____	_____
2. _____	_____	_____
3. _____	_____	_____
4. _____	_____	_____



# STEP 6: ASSESSMENT WORKSHEETS

By filling out responses in each section you have already begun to define the fundamental aspects of at least one agricultural index insurance intervention. This worksheet is an analysis that should help you think through what kinds of interventions to take to **Stage 2** of this toolkit, where precision and data both become much more important. For now, your team should use your best judgment. At the end of this worksheet you will have the best candidates for an agricultural index insurance intervention that has a chance to achieve your development objectives.

## Objectives, Populations and Commodities

Input your responses from p. 4 into the column for “Objective” and from p. 8 for “Population” and “Commodity.” Rate each objective by priority (ESSENTIAL, SECONDARY, IF POSSIBLE). You will also evaluate how well removing risk can help you achieve your **Objective** for a specific **Population** and **Commodity**. Not all objectives will be as achievable for every population and commodity by removing risk. Scoring will use a scale of 1-5:

1. Cannot achieve the desired objective for this population and commodity.
2. Unlikely to achieve the desired objective for this population and commodity.
3. May achieve the desired objective for this population and commodity.
4. Will likely achieve the desired objective for this population and commodity.
5. High potential to achieve the desired objective for this population and commodity.

Objective	Priority	Population/ commodity	Population/ commodity	Population/ commodity	Notes
1.					
2.					
3.					
4.					
5.					
<b>Scores</b>					

## Development Opportunities, Insurability and Feasibility

In this section of the worksheet you will add either a “1” or “0” depending on your estimations in prior steps. For example, in the worksheet row “Development Opportunities Exist,” mark “1” if there are accessible growth opportunities for that potential focus area. Mark “0” if no opportunities exist, or if the opportunities are inaccessible to the target population. Keep in mind that these scores do not have to be definitive, but rather a way to provide structure to your discussions. There are ways to overcome some zero scores.

The resulting numbers will be added to the score totals from p. 11 to determine whether index insurance for one of your Population/Commodities should be taken to **Stage 2**. Toted scores from the Objectives and Population/Commodity worksheet on their own will help you identify variation in potential projects. If one objective matters more than the rest, these numbers provide an indication of what you might want to carry forward.

- **Farmers face shared risk(s) (Step 2):** If the main risks are those that affect one farmer (pests, disease, fire, etc.) but not neighbors simultaneously (drought, flood, frost), it should receive a 0.
- **Shared risk is roughly equal (Step 2):** This takes some knowledge of the farming system and the area - for example, if it is a very hilly area and flood is the main risk, farmers at the top of the hill may be less exposed to that risk than those at the bottom. There is systematic variation in degrees of exposure to the identified risk.
- **Growth opportunities exist (Step 3):** If either 1) farmers are already achieving near what is technologically possible, and/or 2) the investment opportunities are not available for purchase in the target areas, this should receive a 0.
- **Data are available (Step 5):** If there is not historical yield data available at any lower-level of aggregation, this should receive a 0.
- **Politically feasible:** If this option is unlikely to get leadership support or dedicated funds, this should receive a 0.

Criteria	Population/ commodity	Population/ commodity	Population/ commodity	Notes
Farmers face shared risk(s)				
Shared risk is roughly equal				
Growth opportunities exist				
Data are available				
Politically feasible				
Scores from p. 11				
Total scores				
Carry into stage 2? (Y/N)				



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## Feed the Future Innovation Lab for Assets and Market Access

2133 Social Sciences & Humanities  
University of California, Davis  
1 Shields Avenue  
Davis, CA 95616

(530) 752-7252  
BASIS@ucdavis.edu

**[basis.ucdavis.edu](http://basis.ucdavis.edu)**



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