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# Training Toolkit for Weather Index Insurance

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Prepared for Climate  
Change Adaptation  
Project

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## **Acknowledgement**

The concept of using participatory games to make farmers understand about probabilistic nature of risk and returns is quite new. This document is greatly influenced by a few experiments conducted in the field of index insurance in the recent years, chiefly by select academicians.

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## **Introduction**

This document discusses the methodology of designing training modules for Weather Index Based Insurance (WIBI) product under Climate Change Adaptation Project (CCAP) in a select few sites in Agusan del Norte, a province of Caraga region on Mindanao islands of Philippines. CCAP is a part of a larger initiative named “Joint Programme on Strengthening the Philippines’ Institutional Capacity to Adapt to Climate Change” implemented jointly by United Nations with the Government of Philippines with support from Spanish government through the United Nation’s MDG-Achievement Fund. CCAP is being implemented by the International Labour Organization (ILO), a specialized agency of the United Nations together with the Department of Labor and Employment (DOLE), Department of Trade and Industry (DTI) and the Province of Agusan del Norte.

The specific project objectives are:

- To develop and test financial safety nets for vulnerable populations, especially women
- To develop the capacities of vulnerable populations to participate and avail of the benefits under economic diversification and a democratized governance system.

After conducting a baseline study in all of the municipalities of Agusan del Norte, ILO along with its partners selected four municipalities as the priority areas for intervention. These are namely Buenavista, Jabonga, Las Nieves and Remedios T. Romualdez (RTR). Within the duration of three years (2009 to 2011), CCAP is envisaged to develop and test several financial safety nets in these municipalities, one of such products being WIBI. Philippines Crop Insurance Company (PCIC) would underwrite these products. The current weather data availability suggests that it would be feasible to start with a couple of municipalities (RTR and Buenavista) first for launching these products.

## **Background of Index Insurance and Games**

Weather index insurance, in true sense, is a ‘bet’ on the index formed from weather parameters. In fact some contend that it is actually a derivative, with weather index as the underlying entity. To work as insurance, the index of this derivative should reflect actual losses of the insured. It is observed that bad weather usually causes decrease in the production which results in loss of income for the farmers. A weather index designed in such a way that it highly correlates with the production losses could be used as an underlying for the derivatives. One of the market players for such derivatives could be farmers whereas the other party could be insurer. However, it must be understood that this type of insurance would be difficult for the farmers to understand because of the following inherent characteristics:

1. The farmers do not have to claim under this insurance structure. The payouts happen automatically once the index conditions are satisfied. In other words, the farmer has to be vigilant to understand conditions at which index payments would be triggered to anticipate claims. This would not be possible unless the farmer has a good understanding of the index.
2. The index itself is built based on the local conditions, keeping in mind the insurance principles, where a part of the risk is supposed to be retained and the catastrophic risks are to be transferred to insurer. The farmer has to develop good sense of probabilities and risk-return concepts to appreciate such products, or else the implementers are likely to face the risk of loss of reputations in the event where farmers' expectations do not match the actual payments.

There have been many attempts to 'train' farmers on the concepts of index insurance. In the earlier years, when the index insurance market in the developing countries was just opening, often top-down approach was followed with most of the insurance education was delivered through speeches, information brochures and audio-visual presentations etc. However lately, there have been attempts to increase the involvement of the farmers in the process of the training and participatory approaches like games have been tried at a few pilot sites. Some of the notable attempts are described below:

1. Carter et al (2008) describe the experiences of using insurance games for area yield index insurance in Peru and stress the importance of "designing an experimental economics game to make sure that the game incentives closely match those of the real world". Dinku et al (2009) and Peterson and Mullally (2009) too describe similar efforts in Ethiopia.
2. Patt et al (2009) describe insurance games designed for Ethiopia and Malawi with three different objectives. First objective was to understand the relative preferences for insured loan, uninsured loan and insured loan along with extra insurance for livelihood needs. Second was to understand the sensitivity of the farmers to risk premiums and the third was to understand how well the games perform vis a vis traditional education tools.

Though there are several challenges involved in the implementation of accurate games, a set of basic modules could be developed to introduce the concept of insurance to the farmers in the CCAP area. We describe the modules in this document in detail.

## Target Participants for the Training

Assuming that the uptake ratio of the insurance scheme will be approximately 40 percent, the total number of farmers to be insured will be 200, and the total number of farmer participants to the financial literacy programme would be 500. Keeping this as the benchmark, and working based on the proportion of the land under rice and corn in both the municipalities, the distribution of the farmers could be given as follows:

Municipality	Area under	Value in Hectares	Percentage contribution	Farmers to be	Value	Rounded value	Probable uptake	Rounded value
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	<b>crops</b>			<b>educated</b>				
Buenavista	Corn	367	11.3019	Corn	56.51	57	22.8	23
Buenavista	Rice	1138	35.0527	Rice	175.3	175	70	70
RTR	Rice	1742	53.6454	Rice	268.2	268	107.2	107
	Total	3247		Total	500		Total	200

The exact farmers are identified with extensive help from the municipal agriculturists.

## Expected Outcomes

The training modules are needed to be developed to ensure that:

1. The farmers understand various risks posed by climate change, particularly affecting their agriculture portfolio.
2. The farmers understand the concept of insurance and various types of insurance policies like life insurance, health insurance, agriculture insurance etc.
3. The farmers understand the concept of traditional crop insurance and modern weather index insurance and appreciate the differences between them.
4. The farmers understand some of the most fundamental concepts of index insurance like basis risk, index structure etc.

## Flow of the Training

The training would be arranged well before the sales season begins to make sure that the farmers have sufficient time to take an informed decision. For convenience the number of participants could be restricted to 25. The training team would include a coordinator, two assistants, a representative from the insurer and two staff from the local municipal team. The training could be covered in a single day as follows:

<b>Module</b>	<b>Expected Time</b>
<b>Module 1. Introduction to Climate Change</b> <ul style="list-style-type: none"> <li>• Screening of the video prepared by ILO - CCAP</li> <li>• Discussion on the agricultural and other risks faced by the farmers</li> <li>• Game – 1</li> </ul>	<b>2.5 hours</b>
<b>Module 2. Introduction to insurance and weather index insurance</b> <ul style="list-style-type: none"> <li>• Discussion on the insurance experience</li> <li>• Game – 2</li> </ul>	<b>2 hours</b>
<b>Module 3. Introduction to the actual products</b> <ul style="list-style-type: none"> <li>• Presentation and discussion</li> </ul>	<b>1 hour</b>
<b>Module 4. Introduction to the farm technology</b> <ul style="list-style-type: none"> <li>• Synchronous planting, integrated pest management, organic farming and their implications to WIBI</li> </ul>	<b>1.5 hour</b>
<b>Module 5. Quiz</b>	<b>0.5 hour</b>

<b>Total</b>	<b>7.5 hours</b>
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The modules are discussed in detail below:

## Module 1

This module is an introductory module for the farmers to understand their agriculture portfolio and risks better.

**Tools required: Projector, laptop/computer system, electronic copy of the ILO CCAP video, manila papers, markets of at least 3 different colors, chips or cards indicating various risks (refer to Annexure), souvenir notes, template for recording scores in each round of the Game #1**

1. The module will begin with the ILO-CCAP video introducing the farmers to the risks of climate change and the steps planned under the project. The video could be downloaded from: <http://www.youtube.com/watch?v=fRtLdxj3PT8>
2. After that a brief discussion would be held to understand from the farmers about the peculiarities of the risks. **Note the findings on a Manila paper.** The desired flow of this discussion is as follows:
  1. Ask the farmers to categorize the risks according to the calamities according to the seasons. Summarize the categories as flood, drought, pests/diseases, typhoon and any other. The output would look somewhat like this:

Calamities striking the farmers of Barangay XXX	Season
Flood	January, February
Drought	August
Typhoon	No particular season
Pests and diseases	Across the year

2. Ask the farmers their experiences of the impacts of various calamities – specifically, flood, drought, pests/diseases, typhoon and any other. Add this as a column to the already recorded table above. The records would look somewhat like this:

Calamities striking the farmers of Barangay XXX	Season	Impacts
Flood	January, February	Loss of sown crop, dampening of the harvested crops
Drought	August	Loss of standing crop, reduction in the grain size etc.
Typhoon	No particular season	Loss of standing crop
Pests and diseases	Across the year	Reduction in the quality and quantity of the yield

3. Ask the farmers their coping strategies for each of the risks. Categorize them into **ex-ante and ex-post** mechanisms and discuss the difference between these two categories. Discuss how ex-ante mechanisms could be useful in general and why ex-post mechanisms are to be used as the last resort. The records would look somewhat like this:

Calamities striking the farmers of Barangay XXX	Season	Impacts	Coping strategy and category
Flood	January, February	Loss of sown crop, dampening of the harvested crops	Ex – ante: Insurance
Drought	August	Loss of standing crop, reduction in the grain size etc.	Ex – ante: Insurance Ex – post: Arranging irrigation
Typhoon	No particular season	Loss of standing crop	Ex – ante: Insurance
Pests and diseases	Across the year	Reduction in the quality and quantity of the yield	Ex – ante: Insurance Ex – ante: Using pesticides and insecticides

- Next to this, a small game would be played with the farmers to make them understand the quantified effect of various risks on their farming.

#### **Game 1: Sensitizing to the climatic risks for agriculture**

This game is intended to make farmers understand effect of various climatic risks on the farming. The procedure for conducting the game is given below:

- Prepare a group of 3 farmers each.
- For a group of 25 farmers, you will have 8 groups and one extra farmer, who would not participate in the game but rather act as one of the facilitators.
- The farmer group would be given a total land of two hectares. The farmer is allowed to grow only palay crop.
- The farmer group would be given default irrigation. For RTR farmers, the land would be irrigated and for Buenavista it would be unirrigated.
- The facilitator farmer would then start the game. The game would have three rounds. In each round, the score would be computed and total scores after three rounds would decide the winners.
- The farmer can take loan or can self finance. They can till one hectare without assistance of loan. But they can not till the other hectare without loan. They can not avail insurance though. They have to pay 25% as an interest to the loan they have taken. Each year, their portfolio gets updated based on the past year performance. They could be given some default savings at the start of the game so that they do not go bankrupt in the very first year of the game if a calamity strikes.
- In each round, weather events would decide the fate of the crop.

Various possible weather events:

1. Excess rainfall in the flowering stage - 50% loss
2. Excess rainfall in the flowering stage and maturity stage - 100% loss
3. Drought - 50% loss
4. Severe drought - 100% loss
5. Normal weather - 0% loss

Loss is measured in terms of the percentage yield received w.r.t. highest yield possible

Note the scores on Manila paper. Discuss the possible reasons of winning for a particular team and possible reasons of losing for a particular team. At the end of the game, discuss how they are affected by the stress of the climate risks and also how some external risk transfer mechanism is necessary to save them in bad years.

## Module 2

Discussion 2 would focus on concepts of insurance.

**Tools required: Power-Point presentation discussing traditional crop insurance and weather insurance, Manila papers, markets of at least 3 different colors, chips or cards indicating various risks at barangay level as well as the individual level (refer to Annexure), souvenir notes, template for recording scores in each round of the Game #2**

1. A discussion would be first held to understand from the farmers what insurance means to them. Note different perspectives on the Manila paper and point out which answer is the closest to the actual meaning of insurance. Discuss the concept of **retention or self insurance** at the end.

Possible outputs could look like this:

Number	Meaning of insurance	How many of you agree to this?
1	Insurance is savings. You need to pay money to insurer periodically and you will get lots of money back at the end of some definite number of years.	
2	Insurance is a form of assistance. In case of any problem, a random insurance company comes to your doorstep and pays you. It does not matter whether you know the insurance company beforehand, or you pay the insurance company beforehand.	
3	Insurance is like lottery. You need to pay to insurance company some gamble amount, and insurance company pays lots of prize money to the person winning a lucky draw.	
4	Insurance is a form of assistance when calamity strikes. But you need to pay insurance company some definite amount to be eligible for this assistance.	



5	Insurance is donation. You donate money to the insurance company in the form of periodic premium. The money never comes back.	
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If the farmers are unable to come up with specific options, display the above table through PowerPoint presentation and take voting to understand how many people agree with a particular answer option.



What is insurance.pptx

2. Note the name of the farmers who had some exposure to insurance earlier and discuss their experiences. Use Manila paper for noting the names and interesting experiences.
3. Discuss crop insurance concepts with the farmers. First, describe the traditional crop insurance and then index insurance concept. Use Power-Point presentation if needed.



Traditional Crop insurance vs Weather

4. At the end, the same game would be played with an option of availing index insurance.

### **Game 2: Effect of various risks on farming and their partial hedging using index insurance**

1. Prepare a group of 3 farmers each.
2. For a group of 25 farmers, you will have 8 groups and one extra farmer, who would not participate in the game but rather act as one of the facilitators.
4. The farmer group would be given a total land of two hectares. The farmer is allowed to grow only palay crop.
5. The farmer group would be given default irrigation. For RTR farmers, the land would be irrigated and for Buenavista it would be unirrigated.
6. The facilitator farmer would then start the game. The game would have 3 rounds. In each round, the score would be computed and total scores after three rounds would decide the winners.
7. The farmer can take loan or can self finance. They can till one hectare without assistance of loan. But they can not till the other hectare without loan. In this game, they can avail weather index insurance. Weather insurance protects them from bad weather but not from pests. For pests they can take normal insurance if they wish so. For weather insurance, they need to pay 5% of the investment cost and for pest insurance too they need to pay 5% of the investment cost. They have to pay 25% as an interest to the loan they have taken.
8. In each round, weather events would decide the fate of the crop.

Various possible weather events:

1. Excess rainfall in the flowering stage - 50% loss
2. Excess rainfall in the flowering stage and maturity stage - 100% loss
3. Drought - 50% loss
4. Severe drought - 100% loss
5. Normal weather - 0% loss

Further, for each farmer group, group yield would be slightly different than the one estimated by the weather event. Thus there could be three cases:

1. Excess yield than the predicted yield – (25% more)
2. Yield equaling to the predicted yield
3. Less yield than the predicted yield – (25% less)

The individual yield factor would be decided by drawing cards for each group of the farmer. Loss is measured in terms of the percentage yield received w.r.t. highest yield possible.

### Module 3

**Tools required: Power-Point presentation discussing proposed index insurance covers and payout situations, policy details like exclusion, settlement basis etc. and Manila paper**

During this module, final product would be presented to the farmers and the index would be explained.

**Possible payout conditions would be explained in detail on Manila paper.** Allow the farmers to raise their queries and specifically ask them to come up with hypothetical weather conditions and see if the payouts happen in those cases. Explain at least the following three different cases:

1. Possible payouts when the index crosses Strike but does not cross Exit
2. Possible payouts when index crosses Exit
3. Condition when no payouts occur because the index does not cross Strike

Further exclusions would be explicitly explained to remove any confusion.



WIBI Policy  
Details.pptx

### Module 4

In this module, importance of synchronous planting, integrated pest management and organic farming and their implications to WIBI would be discussed by the local municipal agriculturists. The module contents would be largely derived from the already existing training programmes conducted by the local agriculturists in this area.

## Module 5

**Tools required: Printed questionnaires for quiz, pens/pencils, PowerPoint presentation of correct answers, projector.**

This would be the concluding module, consisting of a short quiz. The quiz would be a part of the monitoring and evaluation and would be useful to understand how well the training objectives are met. A sample quiz is given below:

### Sample question bank for Post Training Survey

This survey needs to be conducted immediately after the training on WIBI policies. The survey is intended to reveal the effectiveness of training, particularly the insurance games. The survey would be in the form of quiz, with mostly true and false answer options. Following information would be collected first:

1. Write the basic profiling information like name, barangay, gender, age and education.
2. Give four different possible meanings of insurance and ask the farmers to choose the correct one.
3. TRUE/FALSE: Weather index insurance requires the insurer to assess the farm at least once.
4. TRUE/FALSE: Weather index insurance is based on the measurement of the rainfall at the farmers' location rather than at the stipulated weather station.
5. TRUE/FALSE: Sum insured is always equal to the actual input costs incurred by the farmer irrespective of the premium amount paid.
6. TRUE/FALSE: It is impossible to have losses different than the payouts under index insurance.
7. TRUE/FALSE: One has to pay premium to buy insurance.
8. TRUE/FALSE: One has to pay compulsory premium to avail loan. The premium could be repaid as a part of the loan.
9. TRUE/FALSE: It is good to buy index insurance every year because weather is unpredictable.
10. TRUE/FALSE: There are more floods in Agusan del Norte than droughts. Hence premium for droughts would be more than premium for floods.
11. TRUE/FALSE: Weather index insurance policy conditions are same for corn and palay.
12. TRUE/FALSE: If on an average 1 typhoon strikes Agusan del Norte in 10 years, then it is okay to pay premium of 1/5 of the sum insured to the insurer for such risk.

At the end of the quiz, discuss the correct answers using PowerPoint.



Quiz.pptx

## References

McPeak John, Chantarat Sommarat, Mude Andrew, “Explaining Index Based Livestock Insurance to Pastoralists”, Index Insurance Innovation Initiative

Lybbert Travis, Galarza Francisco, McPeak John, Barrett Christopher, Boucher Stephen, Carter Michael, Chantarat Sommarat, Fadlaoui Aziz, Mude Andrew, “Dynamic Field Experiments in Development Economics: Risk Valuation in Morocco, Kenya, and Peru”, *Agricultural and Resource Economics Review*, 39/2, 1–17, 2010

Carter Michael, Barrett Christopher, Boucher Stephen, Chantarat Sommarat, Galarza Francisco, McPeak John, Mude Andrew, Trivelli Carolina, “Insuring the never before insured: Explaining index insurance through financial education games”, BASIS Brief, 2008

Dinku, T et al “Designing index-based weather insurance for farmers in Adi Ha, Ethiopia”. International Research Institute for Climate and Society, Columbia University 2009

Gaurav Sarthak, Cole Shawn, Tobacman Jeremy, “Randomized evaluation of the impact of financial literacy on rainfall insurance take-up in Gujarat”, ILO-MIF Research Grant Paper 1, 2010

Patt, A.G., P.Suarez and U.Hess, “How Do Small-holder Farmers Understand Insurance, and How Do They Want It? Evidence from Africa”, *Global Environmental Change*, 20, pp.153-61, 2010

Peterson, N., Mullally, C., “Index Insurance Games in Adi Ha Tabia, Tigray Regional State, Ethiopia” Oxfam America, Boston, 2009