

*Indexed Based Solutions  
to Drought, Floods, and Typhoons*

Aaron Oxley

[aaron.oxley@microinsuranceagency.com](mailto:aaron.oxley@microinsuranceagency.com)

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## *Today's Presentation*

Framing the issue of Weather Indexed  
Insurance

Experiences in Malawi - the three phase model

Refinements in Malawi - introducing MAMP

Typhoon Insurance

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## *The Poor are Rural*

Over 2 billion people live on less than \$2 a day, and despite the increasing urbanisation of poverty, the majority (75%) are rural

In most parts of Africa and Asia, farm sizes have a long-term trend of shrinkage through inheritance and population growth

For example, in India, farm sizes went from 2.6h (1960) to just 1.4h (2000)

(World Development Report, World Bank 2008)



## *Why Crop Insurance?*

Agriculture has a special power in reducing poverty

**“Cross-country estimates show that GDP growth originating in agriculture is at least twice as effective in reducing poverty as GDP growth originating outside agriculture”**

(World Development Report, World Bank 2008)

Additionally, the poor are disproportionately affected by climate change and adverse weather

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## *Increasing Inputs = Increasing Income*

There is appetite amongst lenders to invest rurally, but the fear of drought/typhoon/storm wiping out the portfolio limits exposure

When given inputs, farm outputs can typically increase 3 to 4 times

- Yield per acre roughly doubles and can be much more
- Many farmers do not plant all their land due to lack of inputs and will increase the area cultivated

Increased income allows farmers to build resilience and independence

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## *“Normal” Micro Crop Insurance is Expensive*

Most existing crop insurance is “normal” insurance

The Philippines Crop Insurance Corporation (PCIC) has a mandate to insure smallholder farmer’s crops in the Philippines

PCIC operates an “indemnity” scheme: claim forms must be filled out and losses must be inspected and verified

This model is extremely difficult and expensive to manage when the average plot size is only an acre

This is reflected in the price - up to 20% of the sum insured

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## *Weather Indexed Insurance is Cheap*

Weather Indexed Crop Insurance gets around the expensive claims filing and verification processes that make regular indemnity insurance so cumbersome

Instead of inspecting each farm, weather information from a nearby weather station is used to determine if a loss has occurred

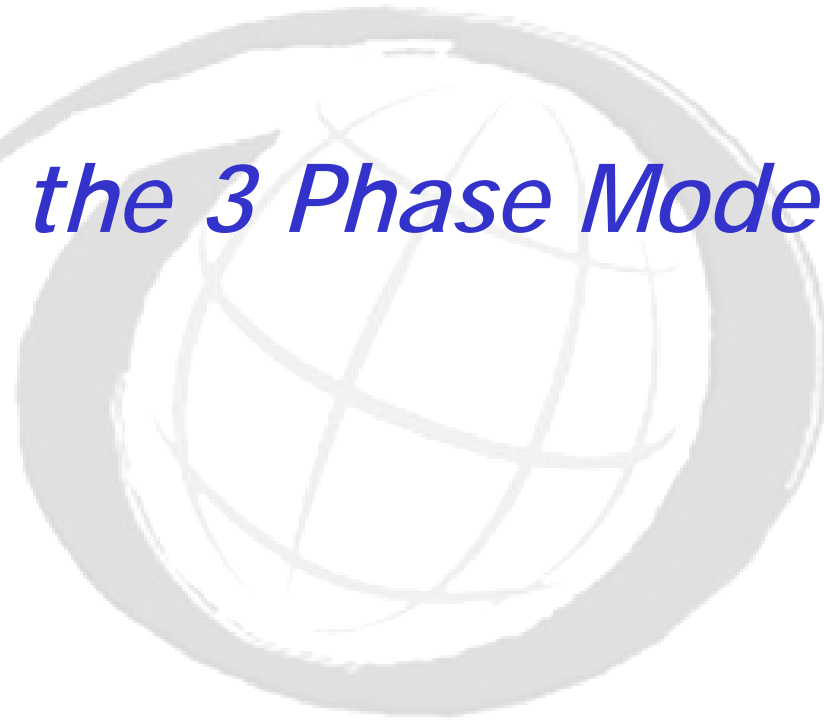
Payouts are automatic and no claim forms need to be filled out by the farmer, so they are fast

Weather Indexing makes crop insurance affordable and effective, between 5-10% of sum insured

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*Malawi - the 3 Phase Model*



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## *Ground Nuts*

In 2005/6, the MicroEnsure (then called the Micro Insurance Agency) was involved in a pilot of WII in Malawi

In the first growing season the crop insured was ground nuts (peanuts), and this was expanded to include Maize in year two

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## *What's Insured?*

The insurance is coupled to lending for farm inputs

The sum insured is the amount of the loan plus the interest

This is so that the farmer is left with no burdens in the case of a crop failure

The insurance then pays back the lender, with any remaining amount being returned to the farmer

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## *How It Works: Sowing Condition*

The farmer sows between 11 November and 20 December

The first dekad that receives 25mm of rain triggers the start of the insurance cover

If the sowing conditions are not met by January 20th, a full payout is made

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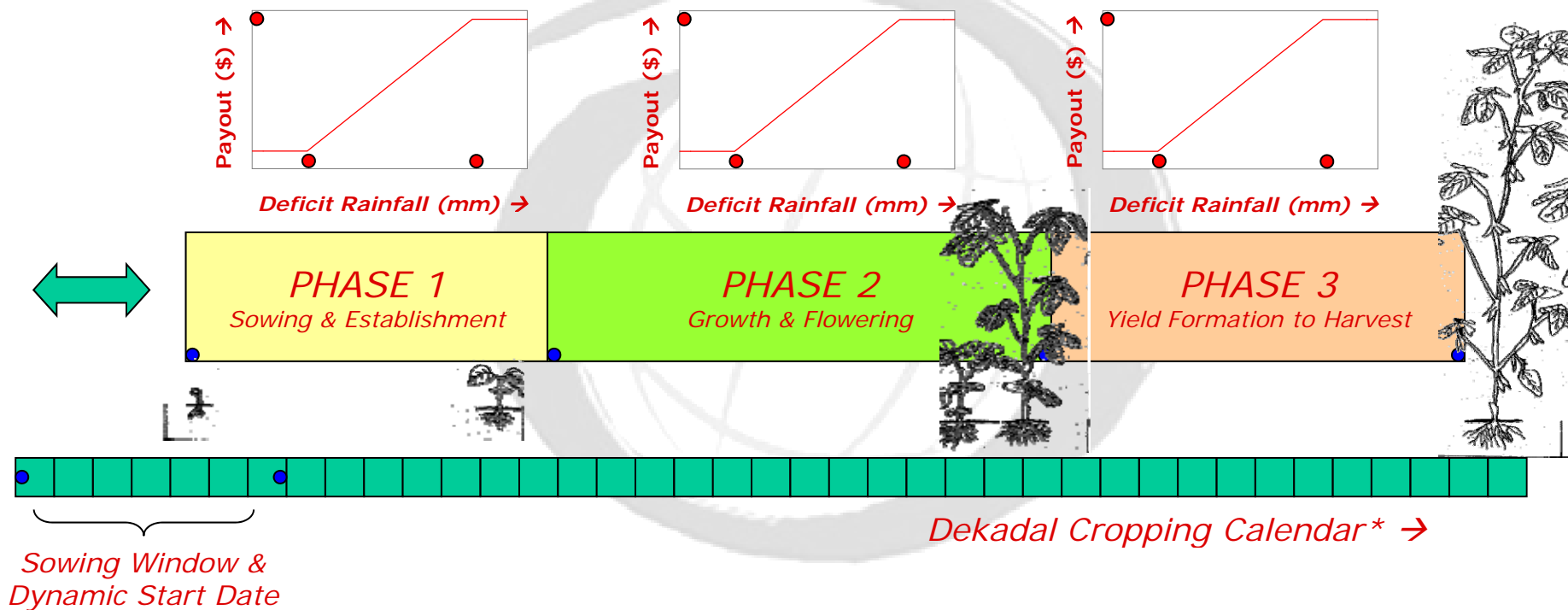
## *How It Works*

The growing cycle is divided into three phases, with each phase having distinct water needs (Sowing and Establishment, Growth and Flowering, and Yield Formation)

If rainfall is lower than a certain threshold, the crop is considered water stressed

Below a certain point, the crop is considered destroyed and a full payout is made

# How It Works



\* Cumulative rainfall per dekad is capped to prevent excessive rainfall impacting the phase-wise total

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## *Measuring Rainfall*

The rainfall at a nearby rain gauge or weather station is considered to be an accurate proxy for the rainfall experienced on the farm

While this assumption is reasonably accurate up to 20km, it does introduce Basis Risk



## *Basis Risk*

“Basis risk” is the risk of the experienced loss being different from the calculated loss

This has to be minimised through careful product design, excellent actuarial work, and the use of high quality data

It also involves customer education and expectation setting on exactly how the product works

So what happens if all the months rain falls in just a few days, and the rest of the month is dry?

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## *The MAMP Model*

We are moving from the three-phase model to a model we call “Moving Average, Multi-Phase” or MAMP

This looks at a weighted moving average of rainfall to more accurately reflect the water available to the crop at any point in time





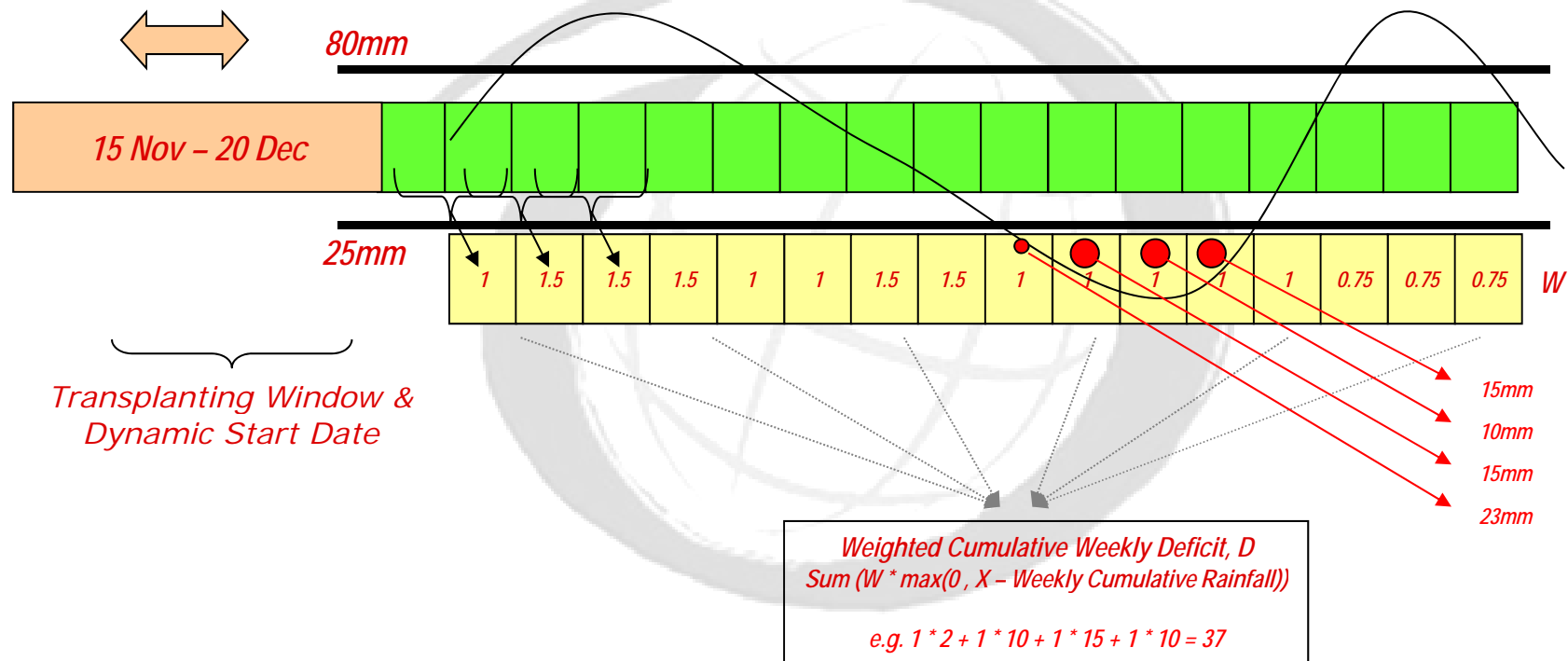
## *How MAMP Works*

By understanding the agronomy of the crops, the water needs in each dekad are more tightly defined and weightings are allocated

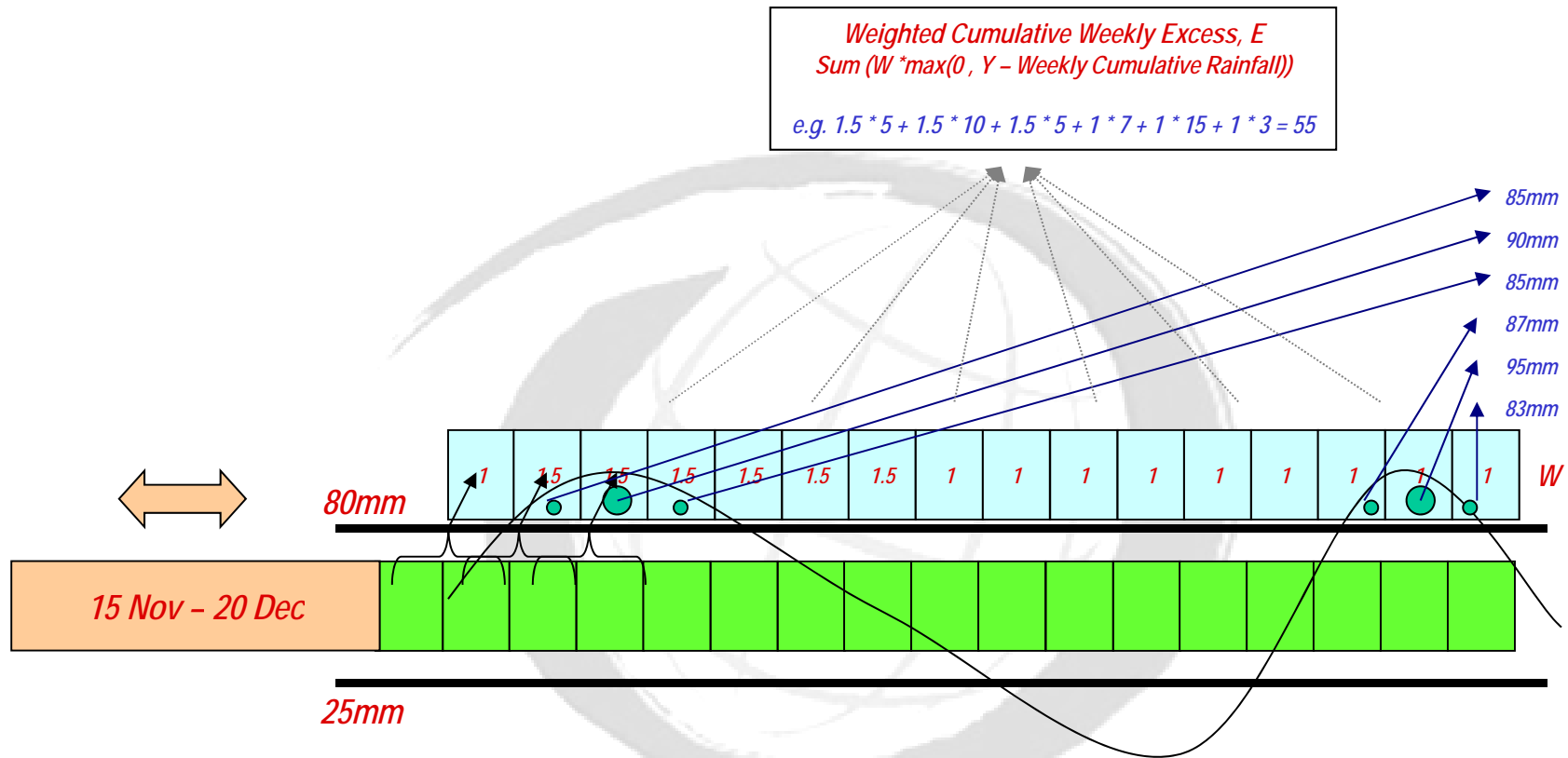
This higher granularity allows for the reality that the week fertilizer is applied, good rainfall is more important than in other weeks



# Deficit Rain



# Excess Rain



Transplanting Window & Dynamic Start Date

## *Summary - MAMP*

While MAMP is more complex to calculate and explain to farmers, it eliminates more of the basis risk and gives a more accurate representation of water availability and plant growth

We look forward to be able to report on lessons from the field

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# *Typhoon*

In February we are launching Typhoon insurance in the Philippines

The product protects farmers when a typhoon passes nearby their farm

The data to run this product is being supplied by the Japanese Meteorological Agency

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## *Typhoon Product Mechanics*

When farmers purchase crop insurance they are linked to a known GPS location, which must be no more than 2km from their farm

When a typhoon hits, the “Typhoon Track” is examined, checking the path of the typhoon and its windspeed

Farmers are automatically given a payout based on the severity of the typhoon and how close it passed to their farms



## *Prerequisites for Success*

- A competent local manager
- A committed meteorological service
- An adequate weather infrastructure
- Historical data for pricing
- A solid distribution model
- Well capitalised risk carriers



## *WII - The Promise*

WII has enormous promise

Innovations in the field are ongoing, in  
drought, flood, and typhoon

The industry is young, but in a growth phase  
as pilot projects begin to scale up and new  
data sources and products are identified to  
help drive scale

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*Thank You*

Questions not answered today?

[aaron.oxley@microinsuranceagency.com](mailto:aaron.oxley@microinsuranceagency.com)

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# *Challenges*

Basis Risk

Data

Local Insurance Capacity

Partnerships needed



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