

The 2021 Malawi
Annual Agricultural
Policy Conference

Operation Groundnuts:

Application of Behavioral Economics & Innovation
to Improve Smallholder Farmers' Incomes



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What Are The Challenges?

- Climate change is challenging agricultural productivity world wide
- Drought cycles accelerating: 20/100 years; 8/10 years
- Over 90% of crops rain-fed and farmer coping mechanisms stretched
- Primarily focus has been on the impacts of climate change and limited access to resources on productivity and economic challenges; little attention has been paid to managing behaviors to help farmers prevail in wicked environments (Taleb *et.al*, 2013).

Why Groundnuts

- Malawi's most widely produced legume crop, grown by 3 million smallholders
- Provides income, employment, and food rich in digestible crude protein, minerals and vitamins
- Farmgate production growth: USD \$123 million to \$400 million within 10 years**

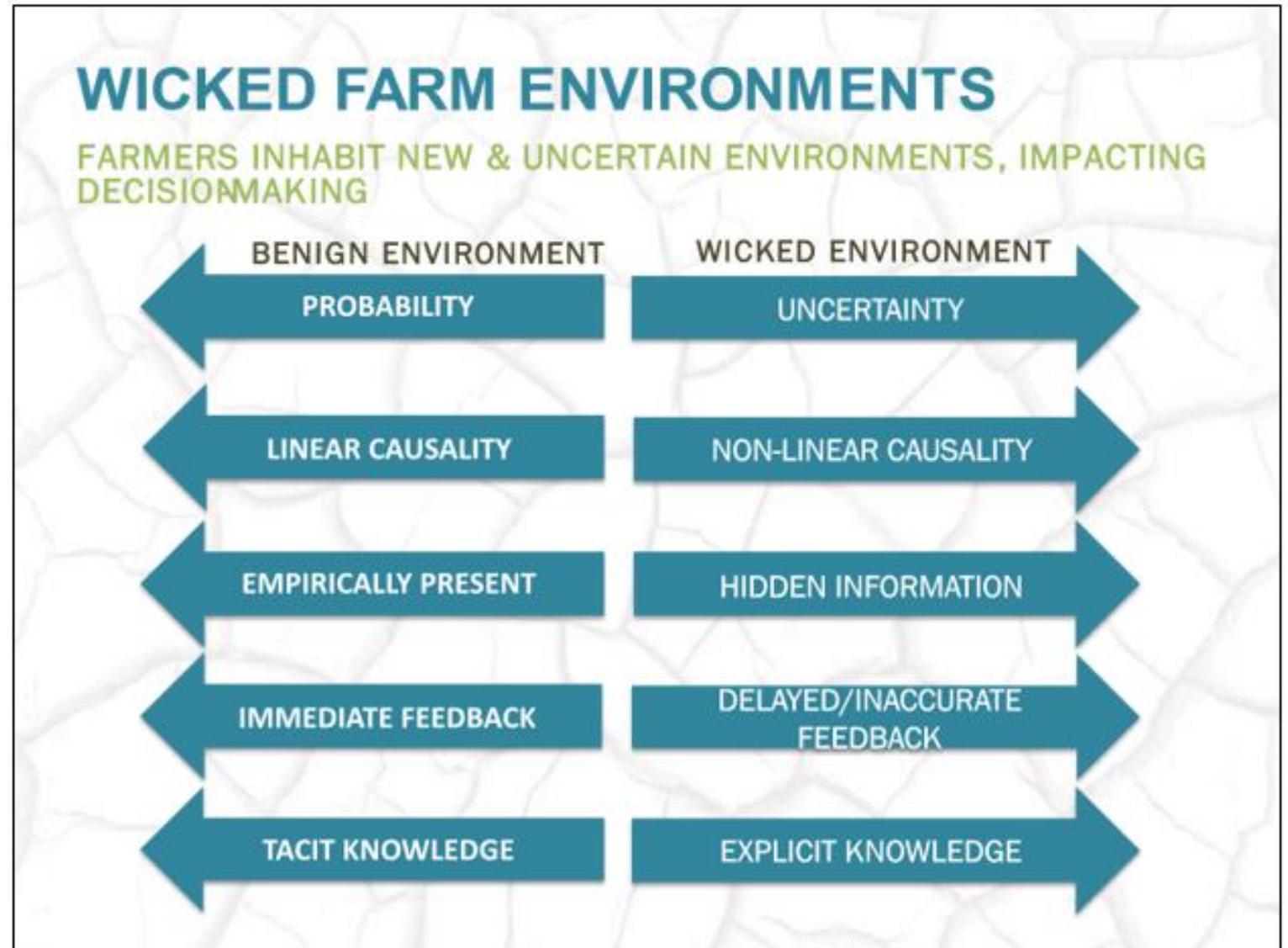
** 2017 estimate



Transformation of Farms

Climate change is transforming already precarious farm environments into 'wicked environments'.

Wicked environments are characterized by high levels of uncertainty, non-linear causality, hidden information, delayed/inaccurate feedback and dependency on explicit knowledge



Wicked farm environments & scarcity shatter 'rational' decision-making

- Scarcity increases stress levels: lack of money, inputs (fertilizer, quality seeds, irrigation, etc.), labor and time
- Increased stress levels result in degraded problem solving, decision-making, and loss aversion,
- Faulty learning as working memory suffers

Prospective cognition

- Prospective cognition is the representation of the present in terms of the near future
- Accurate representations of future states---planning and instruction---depend on the accuracy of causal associations that support actions to reach goals altered
- Prospective cognition is altered: discounted time (hyper-now), and cognitive load

Behavioral Agriculture

- Farmers require carefully designed behavioral and agriculture strategies set to address wicked environments and scarcity
- Behavioral psychology, economics and agriculture take center stage (perception, framing, cognitive decision-making, sequencing, etc.) to increase yield and farm efficiencies
- Pareto economics drives our strategies and outcomes: 80/20 rules of thumb.

BEHAVIORAL TARGETING: KEY BEHAVIORS, GROUNDNUTS & YIELD



- | | | | |
|--|--|--|---|
| <ul style="list-style-type: none"> • Density of planting & spacing | <ul style="list-style-type: none"> • Timing of planting to capture rain | <ul style="list-style-type: none"> • Methods to control evapotranspiration | <ul style="list-style-type: none"> • Aflatoxin prevention methods |
| <ul style="list-style-type: none"> • Seed selection: yield/drought tolerance | <ul style="list-style-type: none"> • Planting method to anticipate drought | <ul style="list-style-type: none"> • Gypsum application, amount & timing | |
| | | <ul style="list-style-type: none"> • Weeding strategies/behaviors | |
| | | <ul style="list-style-type: none"> • Pest management practices | |

FARMER BEHAVIORAL CHANGE

BEHAVIOR & FERTILIZER YIELD GAIN



RISK AVERSION

ACTION

FERTILIZER TIMING & PLACEMENT=YIELD

Inaction yield gain: 0 -5%



Action yield gain: 50 -75%

FRAME OF MIND

Risk aversion



"I can act without regret"

BEHAVIORAL PROBLEM

Farmers refrain from action at highest point of payoff



Targeted and rewarded micro behaviors

BLOCKED PROGRESS

"Being hurt"

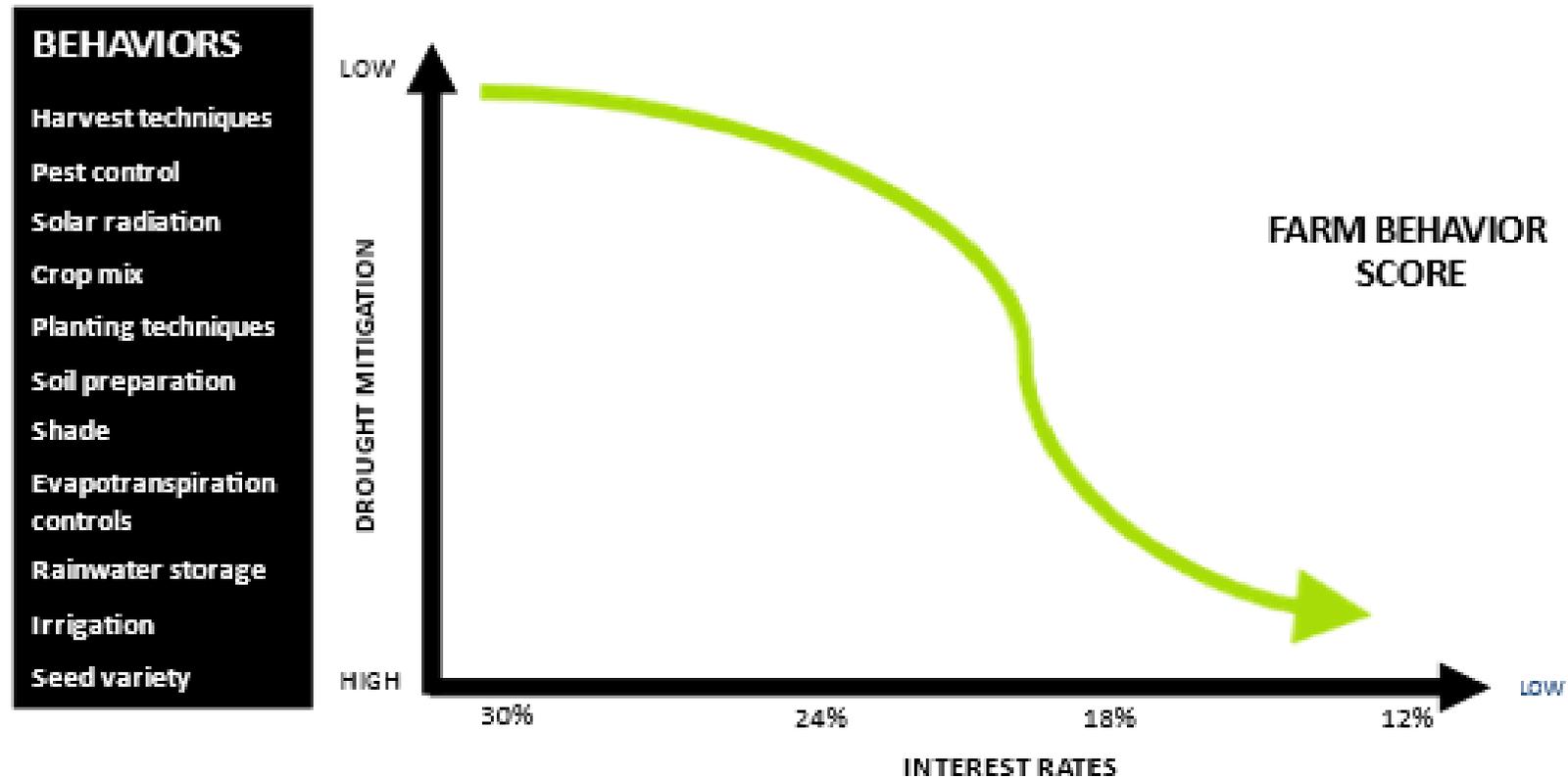


"I can take small steps"

"Much effort, little reward"

"I feel more in control"

DROUGHT MITIGATION BEHAVIORS & LOWER COST OF CAPITAL



BEHAVIORAL ECONOMIC PRINCIPLES APPLIED: GROUNDNUT PRODUCTIVITY

PRINCIPLE	DESCRIPTION	APPLICATION
Endowment effect	What we own we value most	Land ownership
Friction costs	Change made extremely easy	Build change on existing knowledge & behaviors
Temporal discounting	Immediate rewards more powerful than delayed rewards	Tokens delivered for scripted behaviors
Loss aversion	Pain of loss weighs more than gain	No regret choices
Anchoring	Rely heavily on the first information we receive	Pictures of successful farms/crops
Framing	The way choice is presented influences decisions	All positive choice- actions, lower risk, lower interest rate
Social norms	What society hopes that we'll do	What farmer coop hopes farmers will do, aligned with social ideals
Social proof	Make the change popular	Join other farmers in success
Mental accounting	Expenses viewed differently	Weighted expenditures across categories

EXAMPLES OF BEHAVIORAL PROGRAM SUCCESS

COUNTRY	PROCESS	OUTCOME
KENYA 	Nudging farmers to use fertilizer	Small, time-limited discounts on cost of acquiring fertilizer (free delivery), offered just after harvest, farmers have money, 4850% increase in fertilizer use
MALAWI 	Framing & use of information to encourage savings	Commitment accounts, which restrict farmer access to their own funds until future date of their choosing, developing self-control and time discounting. Farmers saved more, bought and used more fertilizers and inputs, higher crop sales
SOUTH AFRICA 	Cognitive design to increase loan uptake	Choice simplification, reducing number of interest rate loan offers. Results in increased loan uptake by equivalent of reducing loan by 2.3 percentage points
INDIA 	Micro-incentives to address present bias	Utilizing non-monetary rewards such as bags of lentils, vouchers and/or assistance with paperwork, increased program adherence

