



PONTIFEX
consulting

From Maps to Meaning

Leveraging Stock and Flow Thinking for Operational Insights at PepsiCo

A Presentation for the International System Dynamics Conference

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INTRODUCTION

Project Overview

Macro-level challenges continue to generate significant headwinds for our potato chip business



CLIMATE IMPACT



Climate change, diseases & pest resistance, poor soil health and water scarcity all pose an existential threat to our growers and to our business

Take climate into account for planning, **build farm level resilience**, deliver new varietal traits, leverage digital; **improve capabilities of our Ag teams & growers to adapt to change**

STAKEHOLDER EXPECTATIONS



Increasing expectations and requirements by governments, customers and consumers **increase cost pressure and risk profile**

Tell the great stories we have to highlight that **our products come from real food & real farmers**, leverage our supply chain to **connect stakeholders to the farm**

LAND COMPETITION



Growers have choices; our potato varieties and food ingredient specifications can introduce more cost & risk vs other crops, customers & alternative land uses

Deliver **winning varieties** to growers & a value proposition that positions PepsiCo as the **farmers' customer of choice**; leverage our size and scale to advocate for **farmer-first policies**

SEED-TO-SHELF VALUE



Competitive threats increase the importance of **differentiated grower through consumer value delivery** to achieve competitive pricing

Provide consistent ingredient supply, quality and other benefits to **deliver end-end value that enables competitive pricing** while protecting margin

Challenge

Action

To address macro-level challenges, a Global Ag Strategy was launched in 2024 to drive growth & build resilience



The end-to-end strategy will deliver these impacts:

- Ensure our **future growth**
- Establish PepsiCo as the **grower's "partner of choice"**
- Accelerate **penetration of advantaged varieties** for market context
- Drive **supply assurance, quality and productivity**
- Support our pep+ **Positive Ag** goals
- Build global agricultural **leadership and front-line capability**

Vision/ Ambition

Delight our consumers and deliver advantaged, digitized, sustainable and resilient growth, powered by our people and our trusted thriving network of farmers & partners

Strategic Pillars

Transform
our seed
and variety
program

Ensure
sourcing for
future
growth

Attract,
develop and
retain
growers

Accelerate
productivity

Key Enablers

Agriculture E2E Data, Digitization and Technology

Positive Agriculture

Org model and capabilities

Strategic partnerships

The GAO was formed to drive value creation through implementation of the Global Strategy



GAO Mission

Establish the agriculture strategy as a competitive advantage, leveraging our scale to build critical capabilities, ensure future growth and create value for our business and our farmers.



Objectives

Set strategic direction, align on ways-of-working and standardize global processes and frameworks

Establish bold goals and scorecard progress

Develop and manage strategic global partnerships

Maintain SME capability, build talent and develop playbooks for BMP lift-and-shift

Align PEC, key functions and sectors on strategic investments

Accelerate adoption and scale of variety and technology solutions



Context

Framing the Challenge

TYPES OF PROBLEMS

Continuum from Routine Problems to Adaptive Challenges

Bias = ACTION

Bias = LEARNING

Routine Problems

- ✓ Easily **defined**
- ✓ An obvious, proven **solution**
- ✓ Often an **expert** on whom we can call to solve the problem for us

There is a **routine** (protocol) for dealing with the problem

Adaptive Challenges

- ❖ Often **hard to define**
- ❖ **No** clear **solution**, and different people hold different views about its source
- ❖ **No expert** who can solve the problem for us

They are **fundamentally different** from routine problems

The more adaptive the challenge, the more learning is needed!

LEADING EXPERT ON ADAPTIVE LEARNING

Ron Heifetz, Kennedy School of Government

“

Someone exercising leadership is orchestrating the process of getting factions with competing definitions of the problem to start **learning** from one another.

”



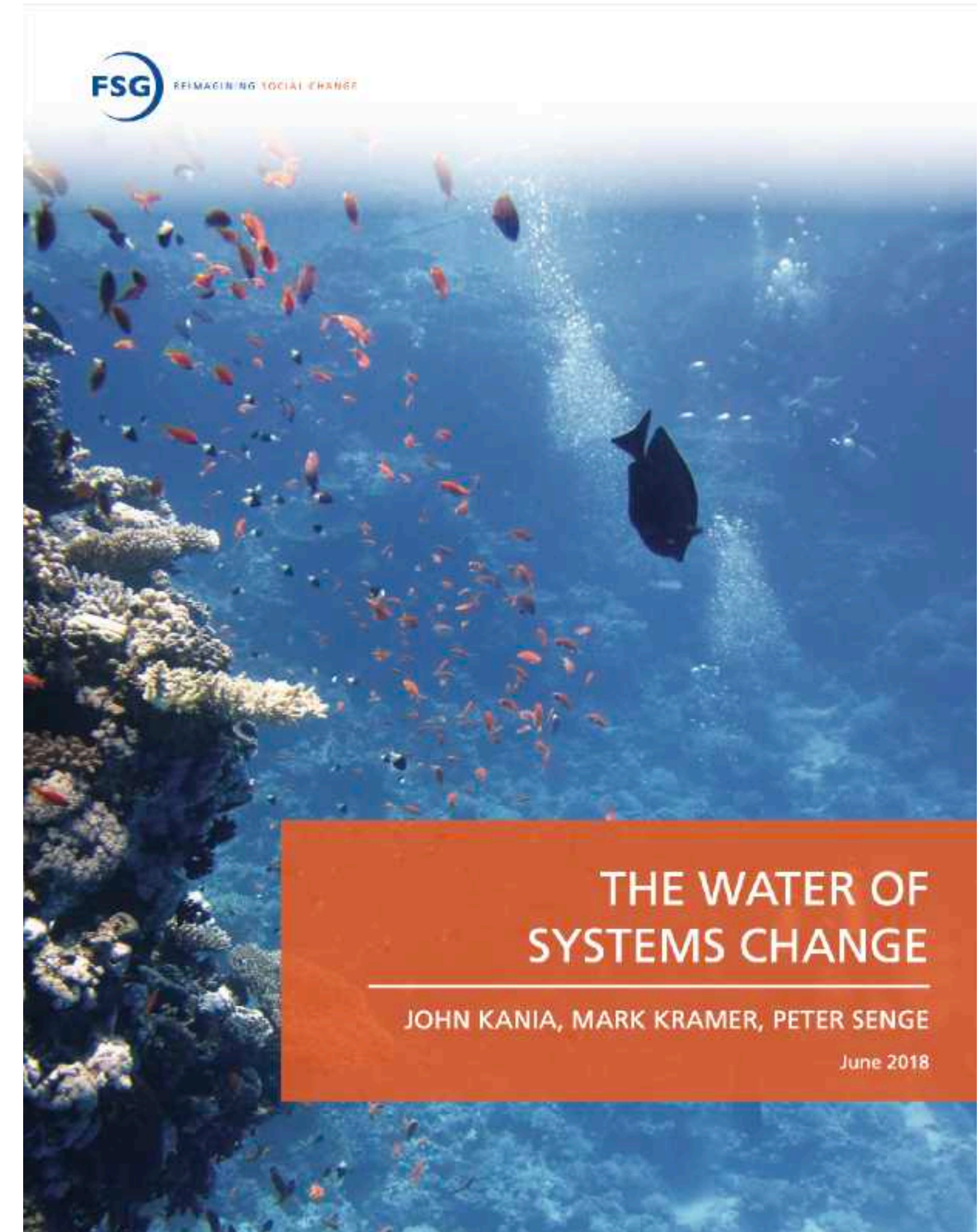
http://en.wikipedia.org/wiki/Ronald_Heifetz

STRUCTURAL DRIVERS OF ECOSYSTEM PERFORMANCE

The Truth About Systems Change

Attempting to foster systems change without building the capacity to “see” systems leads to a lot of talk and very little results.

– Kania, Kramer & Senge
[The Water of Systems Change](#)



CONSTRAINTS

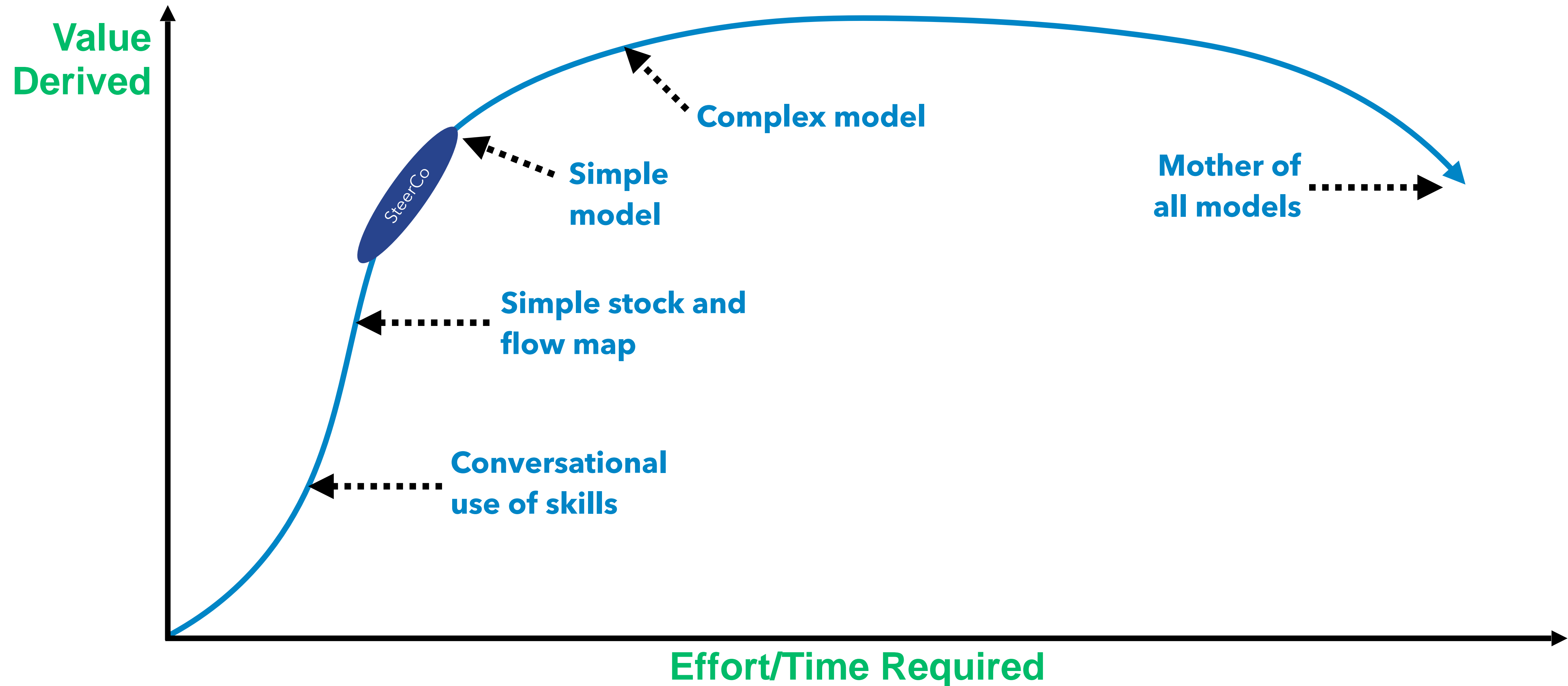
Limitations for Supporting Systemic Inquiry

- Referred to PEPSICO by Don Seville, Sustainable Food Labs
- Pitched as a “mapping” effort
- Short timeframe
- Low appetite and little time (and resources) to model

How to provide systemic insight given constraints?

VALUE / EFFORT CURVE*

Selecting the Appropriate Systems Thinking-Based Artifact





Process

Developing and Using a Comprehensive Stock / Flow Map

OVERVIEW

Steps in the Process

1. SKILL BUILDING

Create, Consume, and Communicate

- Strengthen core mapping team's systems thinking skills
- Improve contributions to map – ensure map is operational and (at least) mentally simulatable
- See implications of map assumptions – viscerally feel time delays, trace out feedback loops, and anticipate unintended consequences
- Engage others in using map in facilitated dialogue

2. MAPPING SESSIONS

Develop and Explore Assumptions

- Frame up the performance challenges – using BOTGs
- Determine map “sectors”
- Draw out main stock and flow chains
- Create online interactive map
- Operationalize abstract concepts like organizational knowledge and skills
- Connect sectors
- Extract main feedback loops
- Search for leverage

3. STEERCO SESSION

Facilitate Strategic Dialogue

- Design session
- Prepare participants
- Train-the-trainer for core mapping team
- Rapid systems thinking skill-building
- Breakout sessions facilitated by core team
- Large group debrief
- Strategy implications
- Next steps

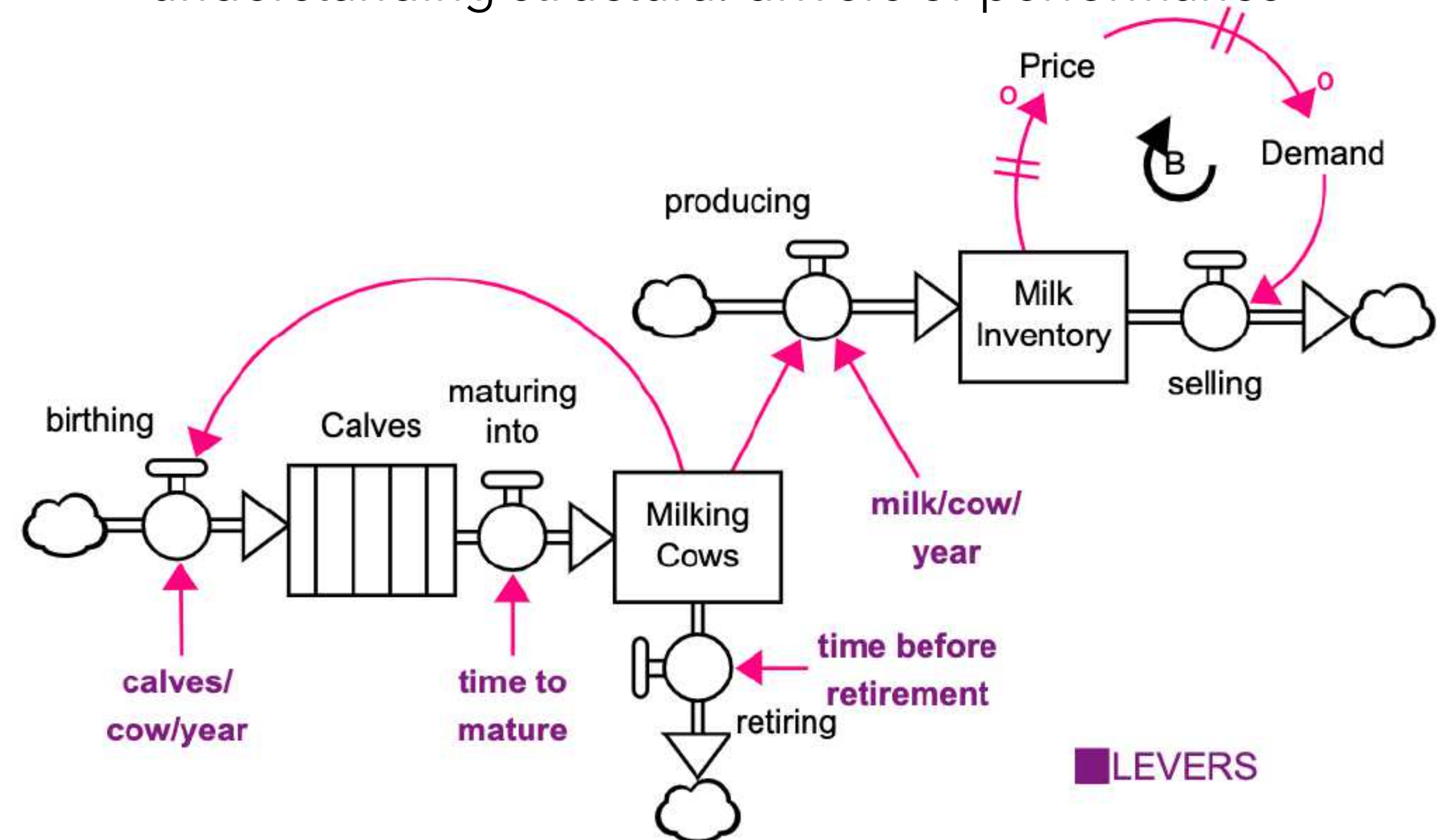
SKILL-BUILDING

Creating Effective Contributors, Consumers, and Communicators

Systems Thinking Concepts / Skills

- Behavior Over Time Graphing / Visualization (**BOTGs**)
- Time delays
- **Stocks** and **flows**
- **Feedback** loops
- Unintended consequences
- Systems archetypes
- Levers and leverage

Applying **OPERATIONAL THINKING** to understanding structural drivers of performance



NOTE

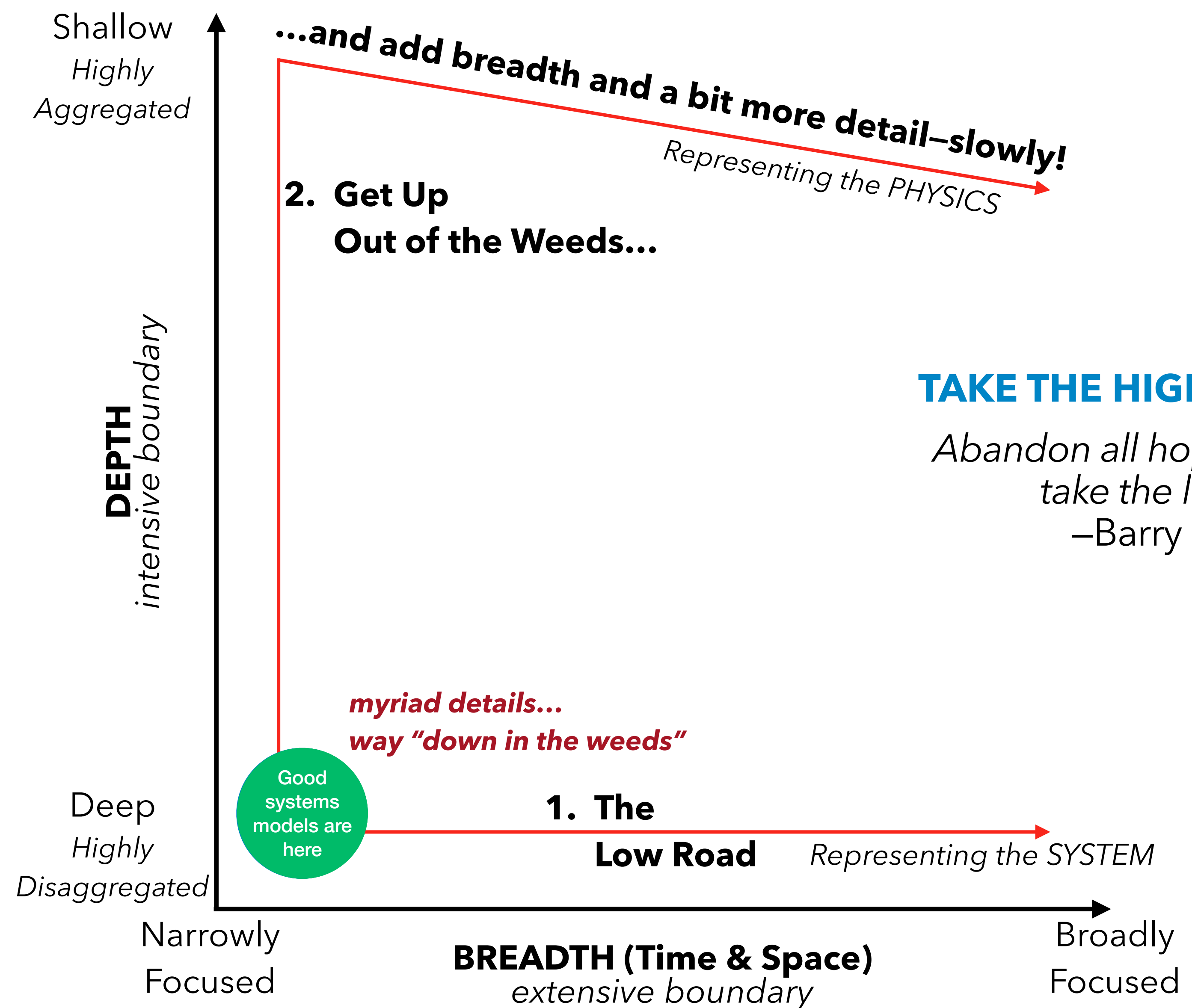
Skills were introduced in a just-in-time-just-what's-needed approach. They were scaffolded in *while the core team developed the map.*

PROCESS

Taking the High Road

1. Expand boundaries of BOTGs
 - Temporally (years)
 - Spatially (30,000 foot)
2. Sectoral map
3. Key stocks and flows in each sector
4. Feedback loops within sectors
5. Feedback loops (and unintended consequences) across sectors

Ask questions *and* generate learning along the way...



FRAMING THE CHALLENGE

1. Expand Boundaries

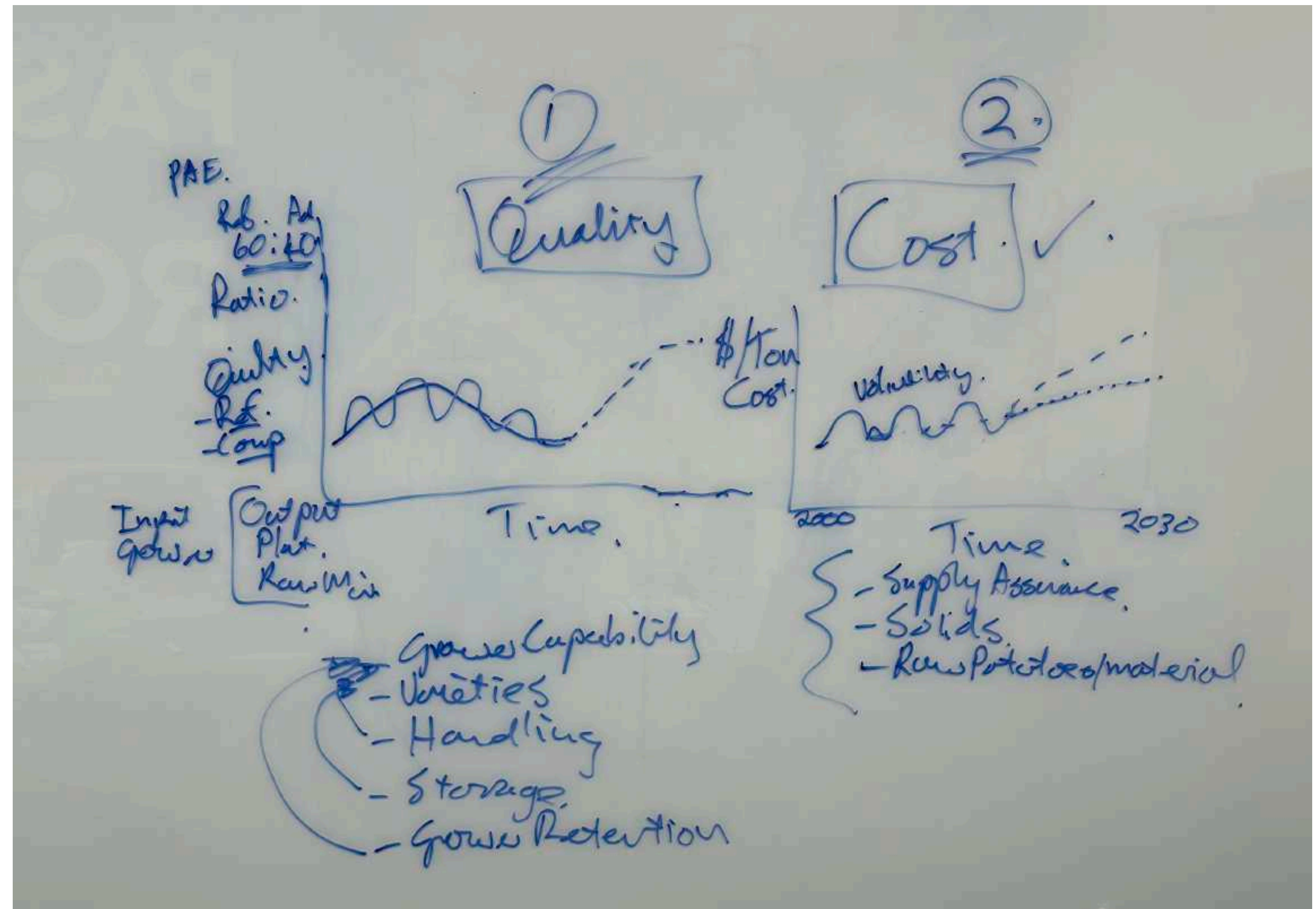
Apply modified Delphi approach

Individually draw out 1-2 POTGs each team member captures the most significant strategic challenge

Small group synthesis

Presentations to large group

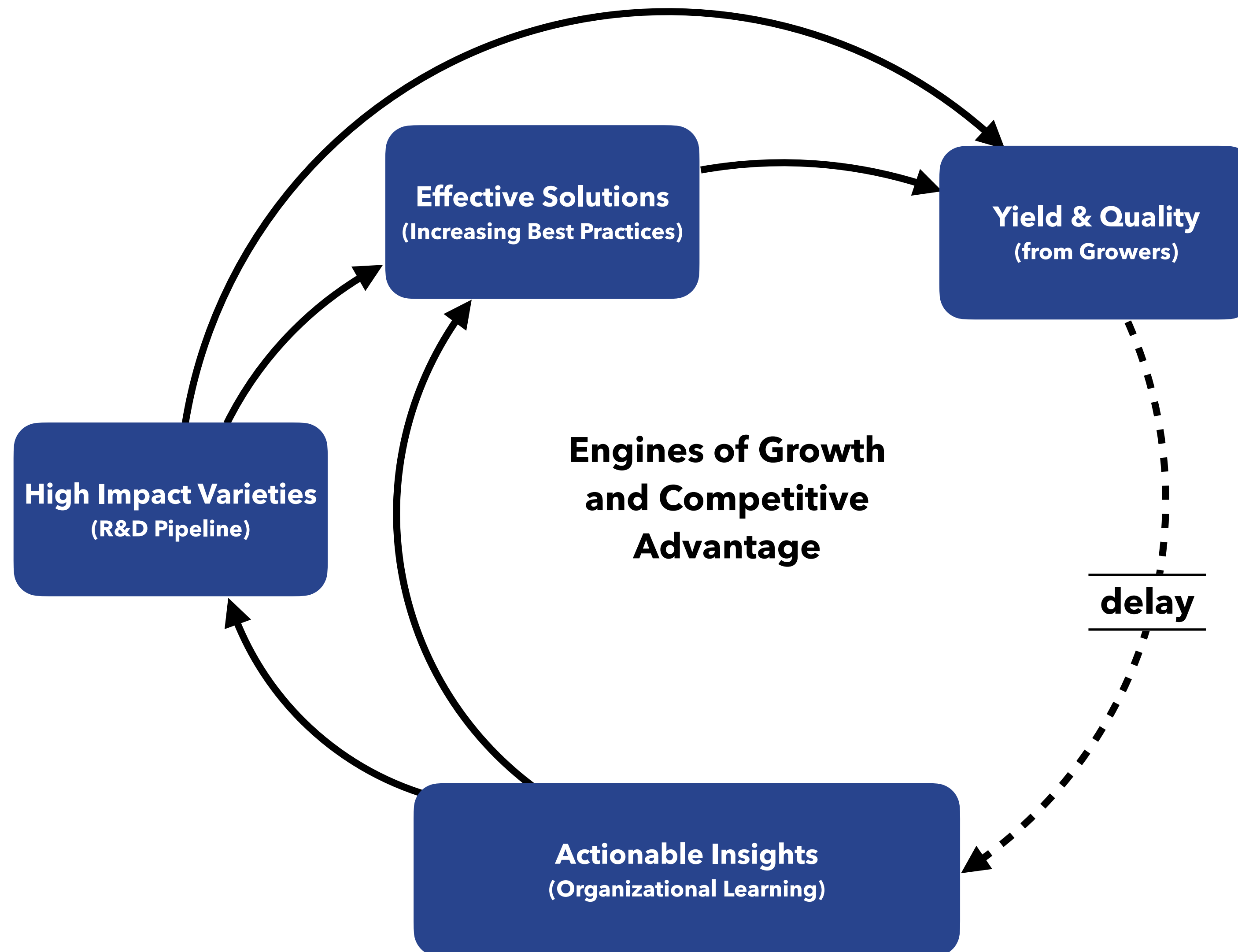
Large group sense-making and synthesis



EXAMPLE: One small group's BOTGs

SECTORAL VIEW

2. Develop Sectoral Map: *Reinforcing Loops of Growth*

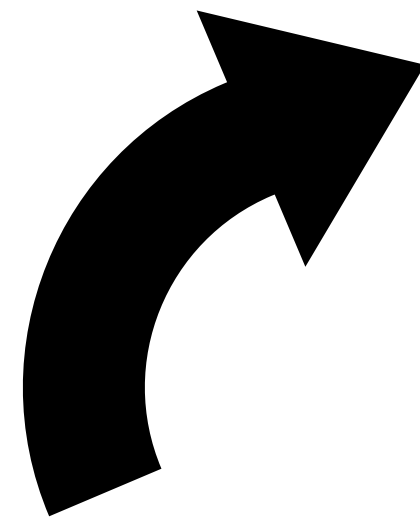




ITERATIVE MAPPING

3. Key Stock and Flow Chains + 4. Add Feedback Loops

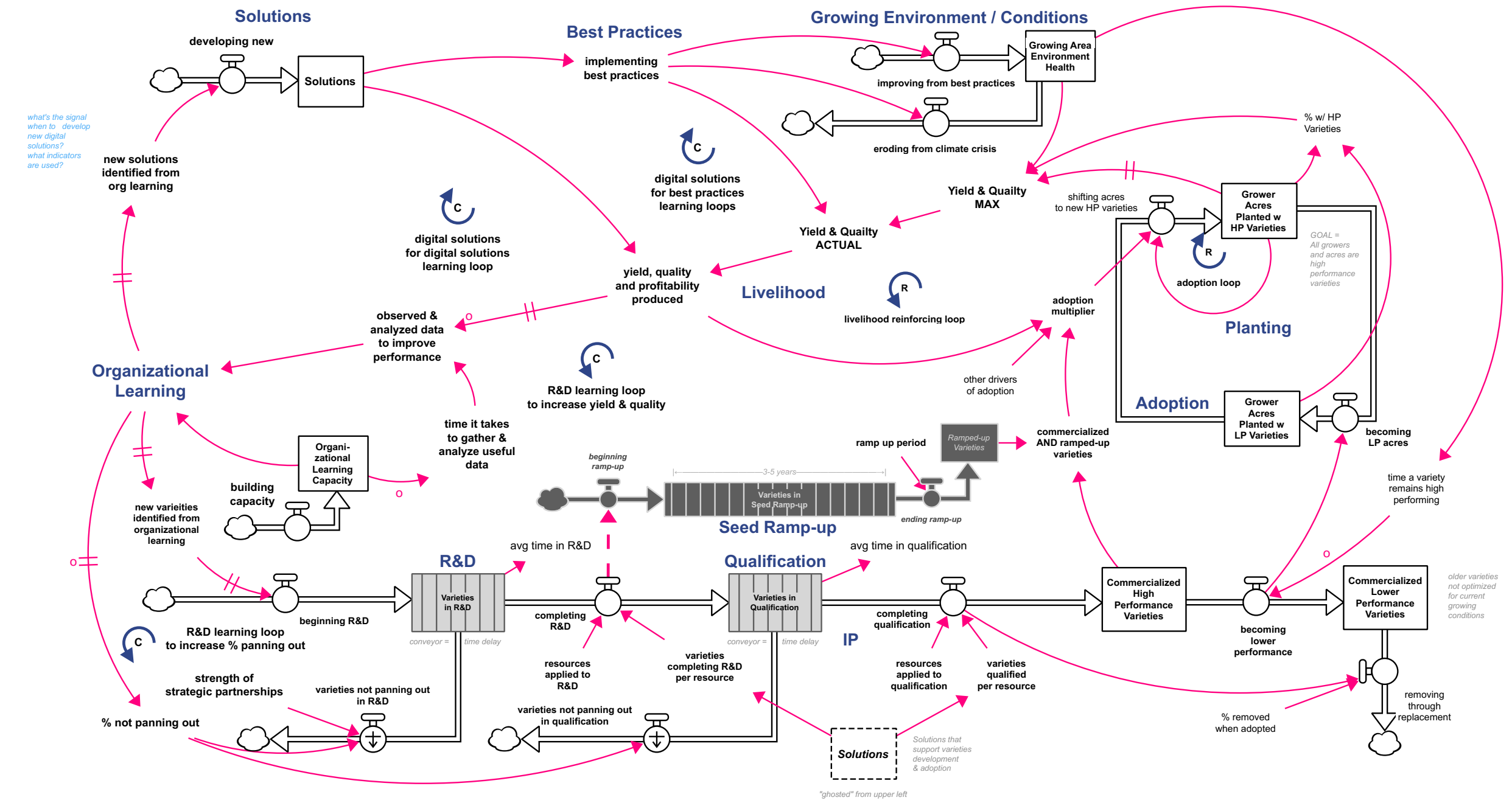
Ask questions along the way to
generate and document insights



4

Key Insights

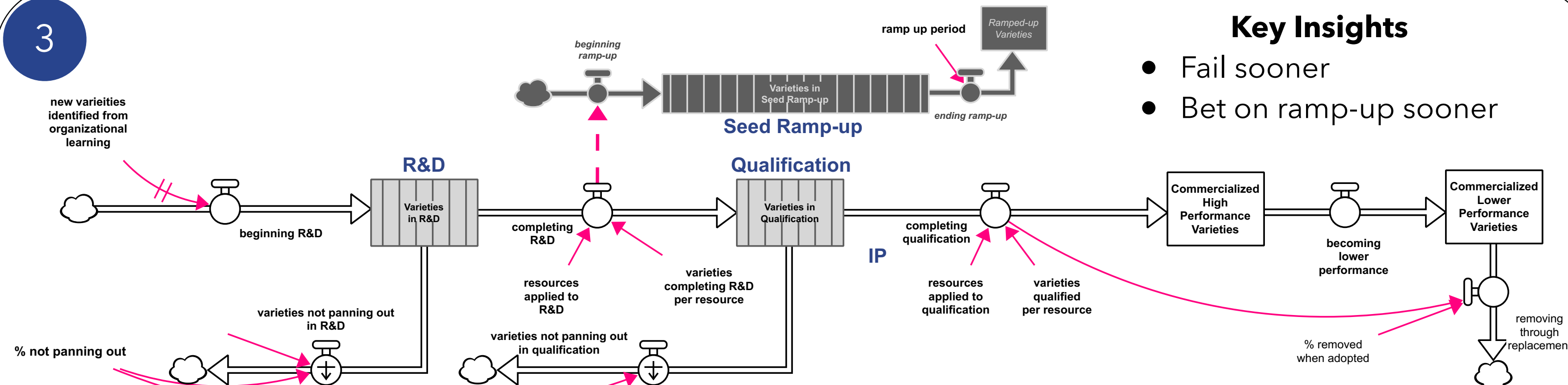
- Address time delays in learning loops
- Build grower capacity to apply best practices



3

Key Insights

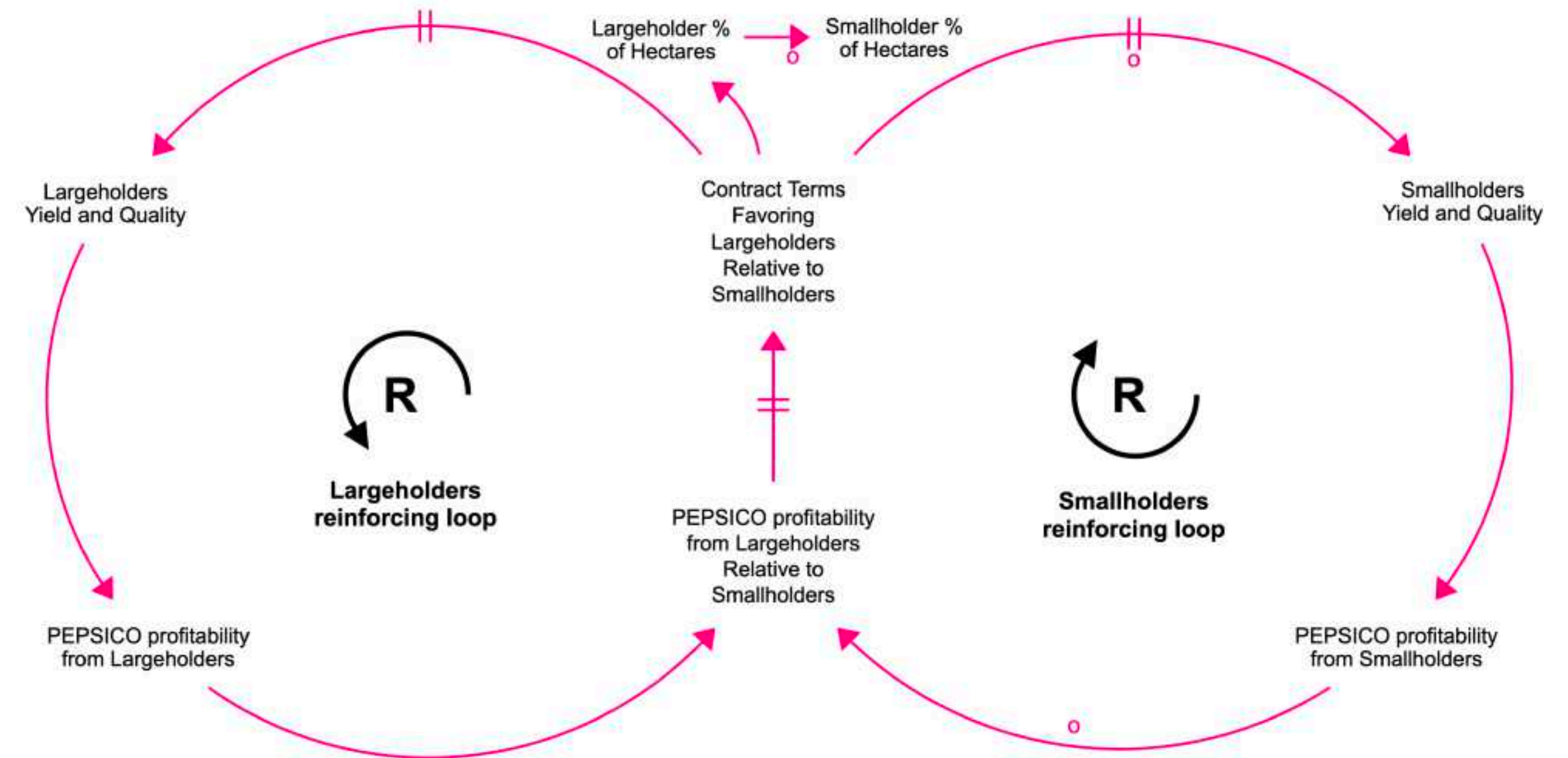
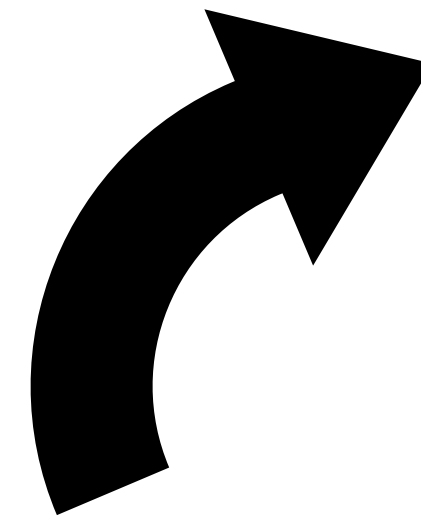
- Fail sooner
- Bet on ramp-up sooner



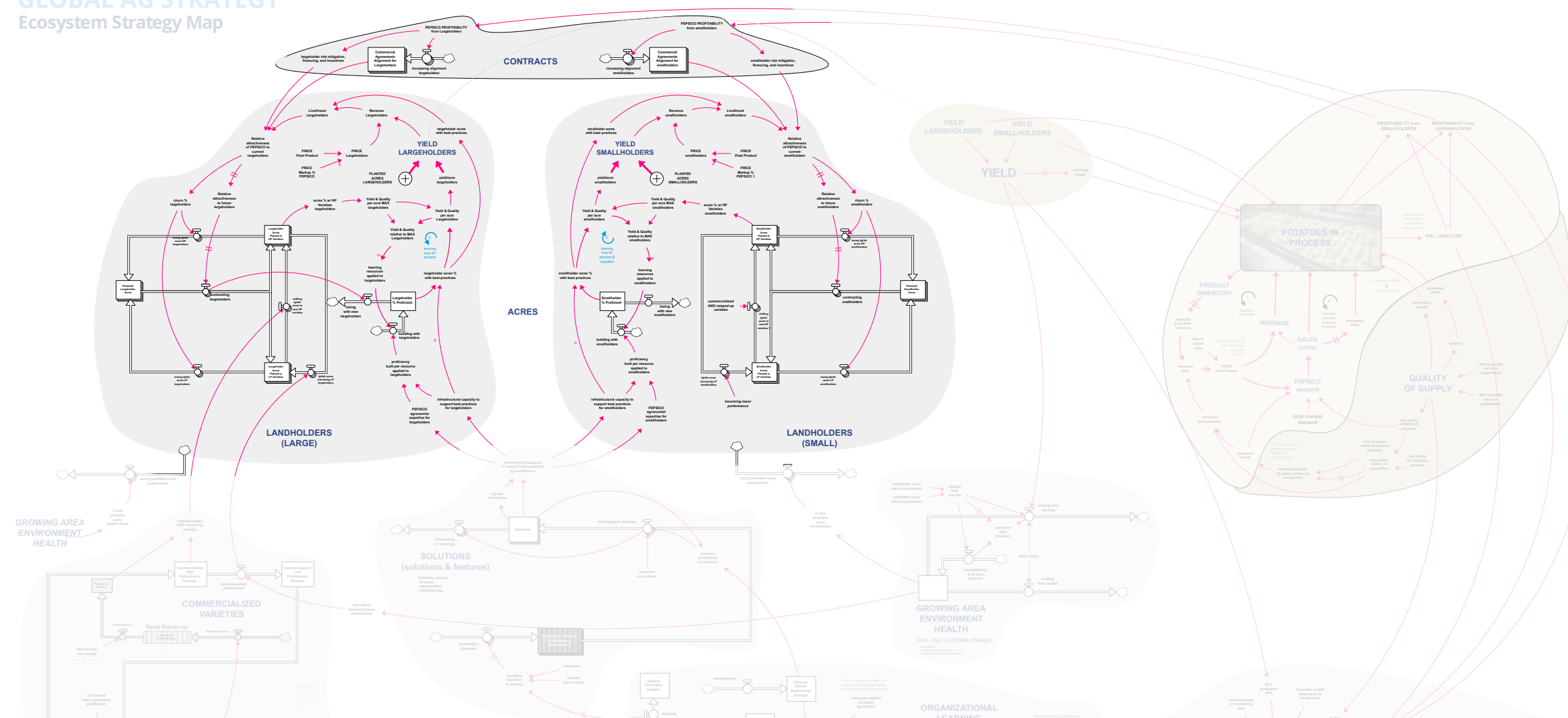
SYSTEMS ARCHETYPE: SUCCESS TO THE SUCCESSFUL

5. Identify Cross-sectoral Feedback Loops + Unintended Consequences

Looking at comprehensive map the
Success to the Successful archetype
“pops out”!



GLOBAL AG STRATEGY
Ecosystem Strategy Map



Incentives to maximize profit will lead
to more attractive contracts for
largeholders – negatively impacting
goal to improve smallholder livelihood
and create resilient production

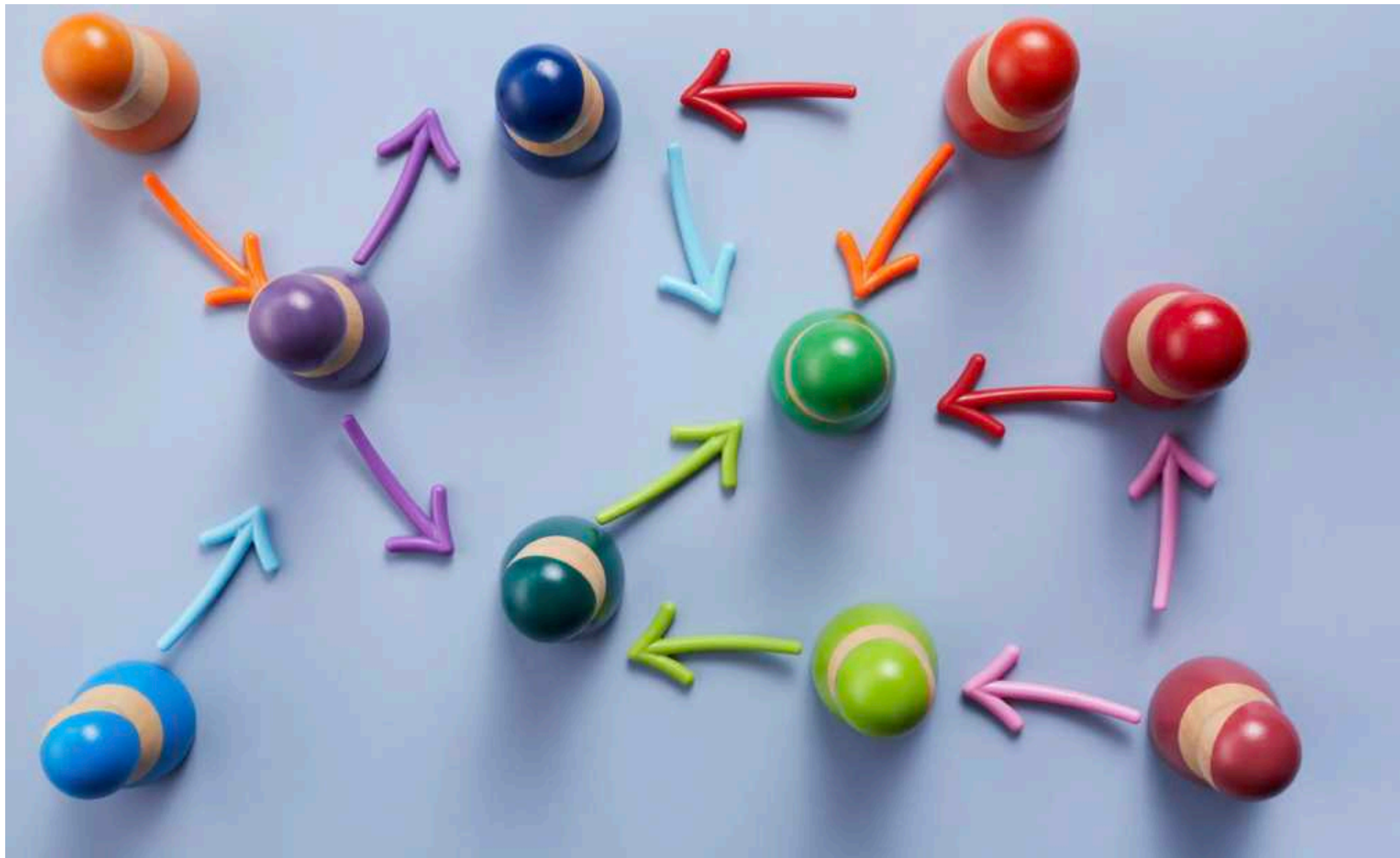


SteerCo Summit

Core Team Facilitates Strategic Dialogue

OVERVIEW

Building the Capacity for Cross-siloed Systemic Inquiry

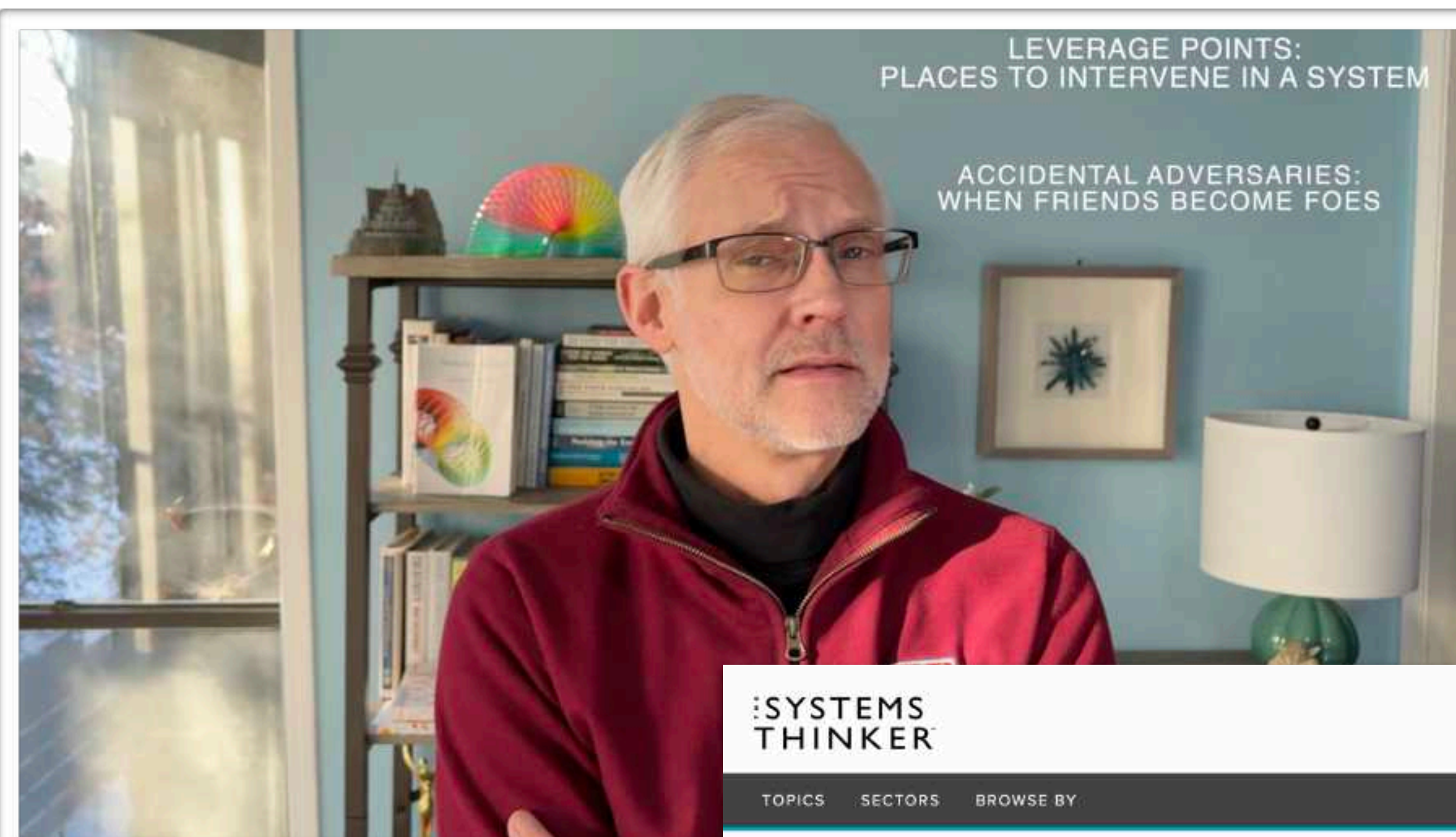


1. Prepare Participants
2. Develop Interactive Learning Lab
3. Build Core Team Facilitation Capacity
4. Facilitate Session \Rightarrow Identify Insights and Next Steps

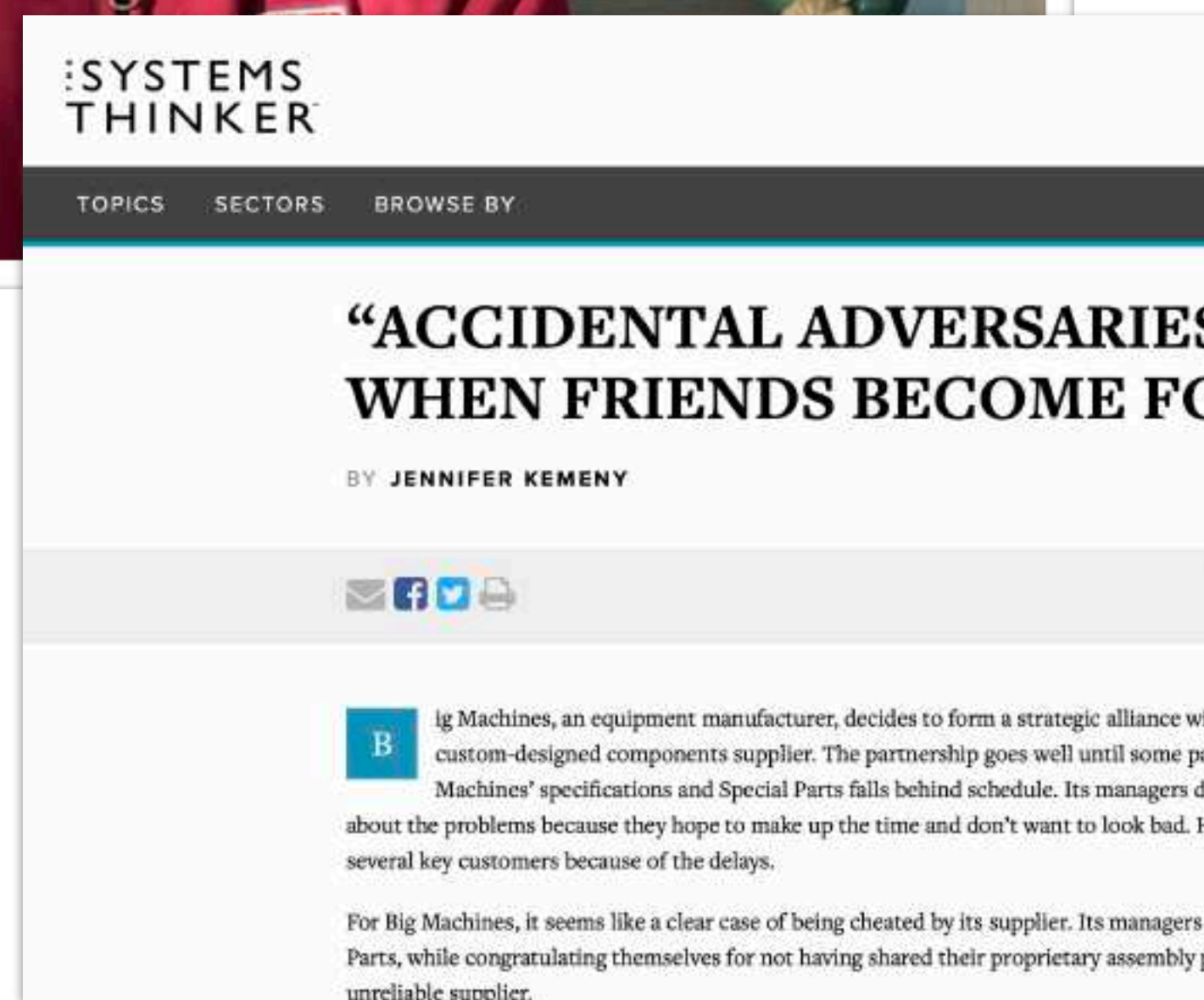


1. PREPARE PARTICIPANTS

Provide video + articles for pre-reads – ensure attend with learning mindset



Video introduces key concepts and suggests the mindset required for collaborative inquiry



Articles provide valuable insight into key systemic concepts

2. Develop Interactive Learning Lab

Use STELLA's Storytelling Feature to Create Interactive Maps

Ecosystem Strategy Map

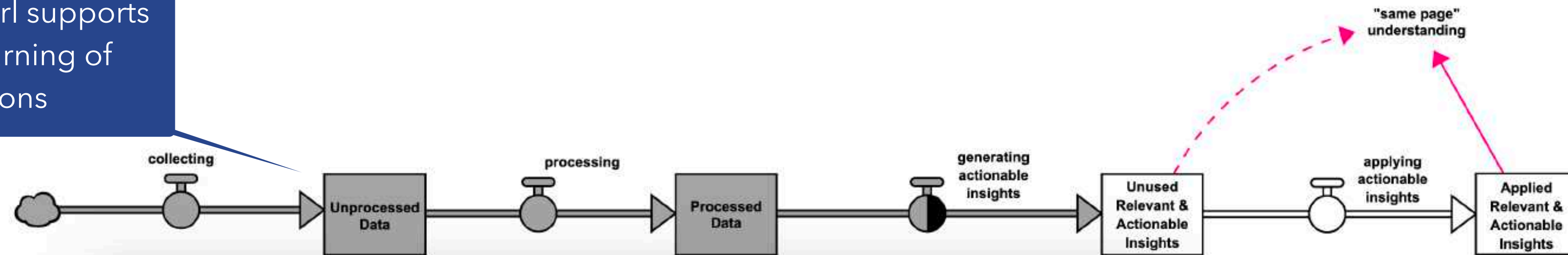
GLOBAL AG STRATEGY

Organizational Learning — Generating Actionable Insights

version 1.0 © 2024



Storytelling unfurl supports scaffolded learning of assumptions



Applied Actionable Insights come from converting **Processed Data** into **Unused (but) Actionable Insights**. The flow regulator is shaded to indicate that activity of conversion.

Data is collected into the **Unprocessed Data** stock. It sits there until resources are applied to processing that data. A huge amount of data can be sitting in the *Unprocessed Data* stock — even the *Processed Data* stock.

How well PEPSICO **manages this pipeline** determines its performance at creating useful, Applied Actionable Insights.

Reflection comments & questions built into tool leads to focused discussion

Pop up text supports facilitator "in the moment"

Intuitive navigation accelerates exploration

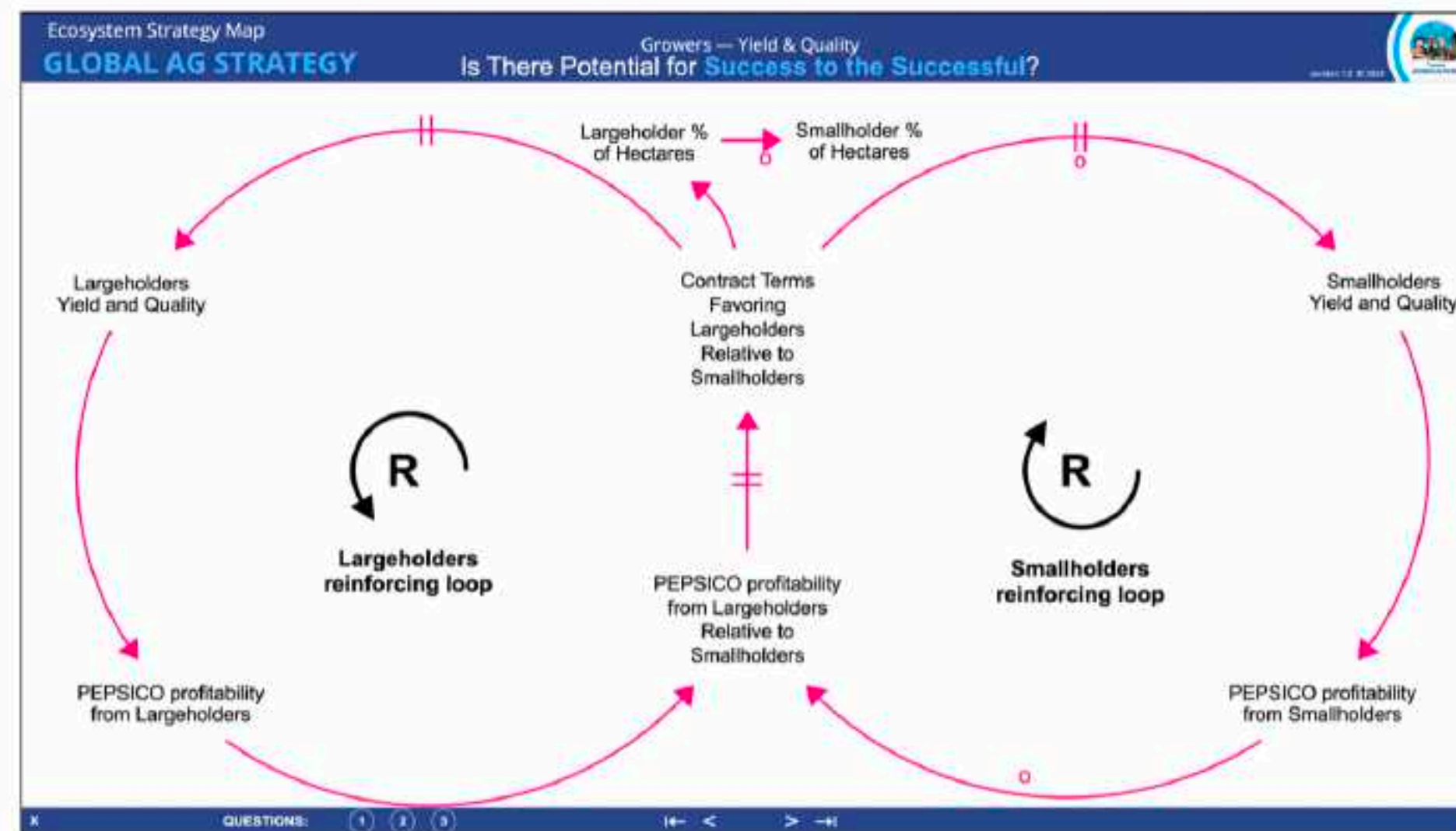
3. Build Core Team Facilitation Capacity

Train Pairs Responsible for Facilitating Each Map Sector

ECOSYSTEM STRATEGY MAP EXERCISES

Growers – *Success to the Successful* + Growers Component

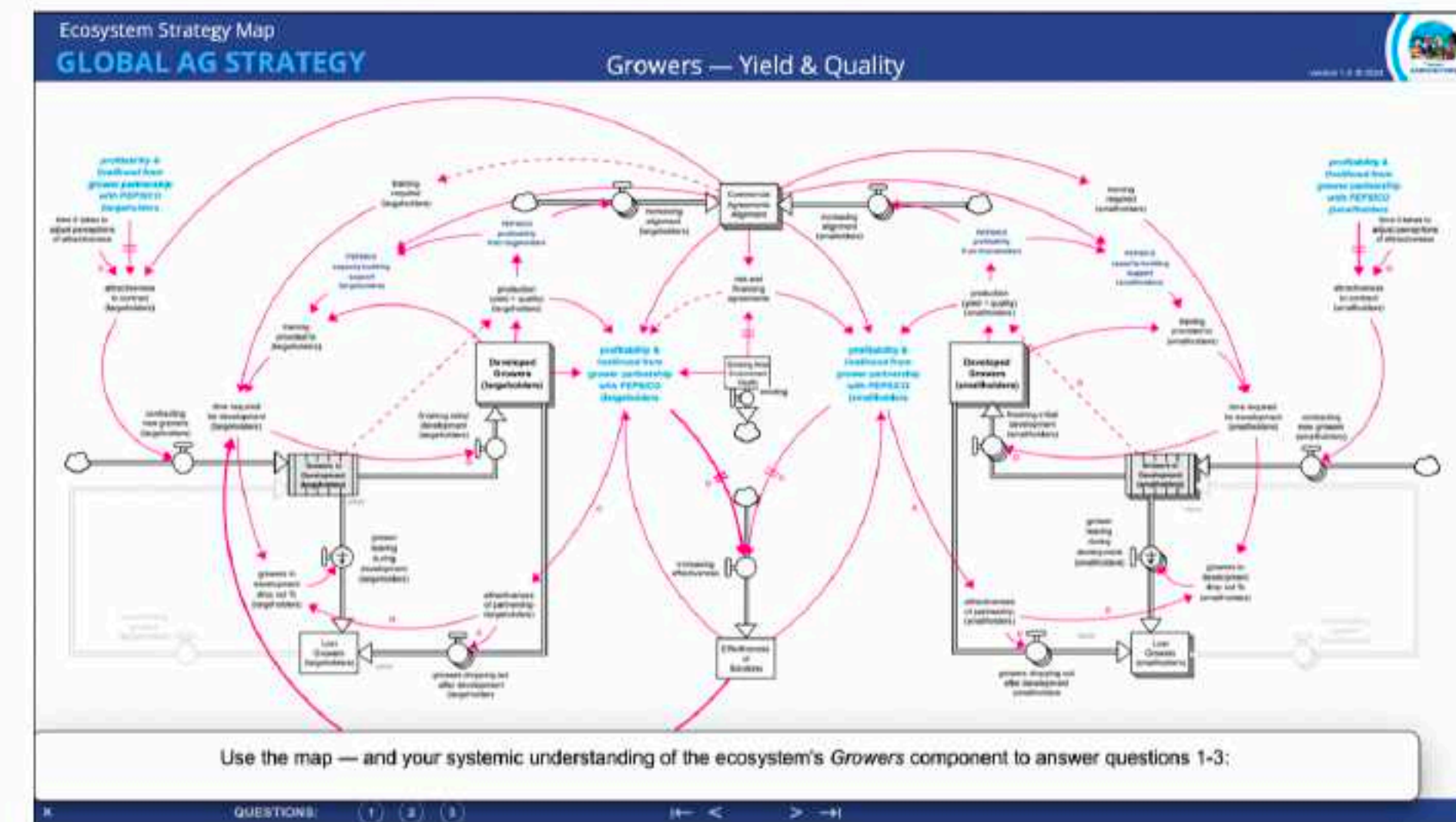
PROCESS



Success to the Successful

- Unfurl the map
- Light discussion during
- Answer 3 questions at end (flipcharts)

Time Goal = 15 minutes



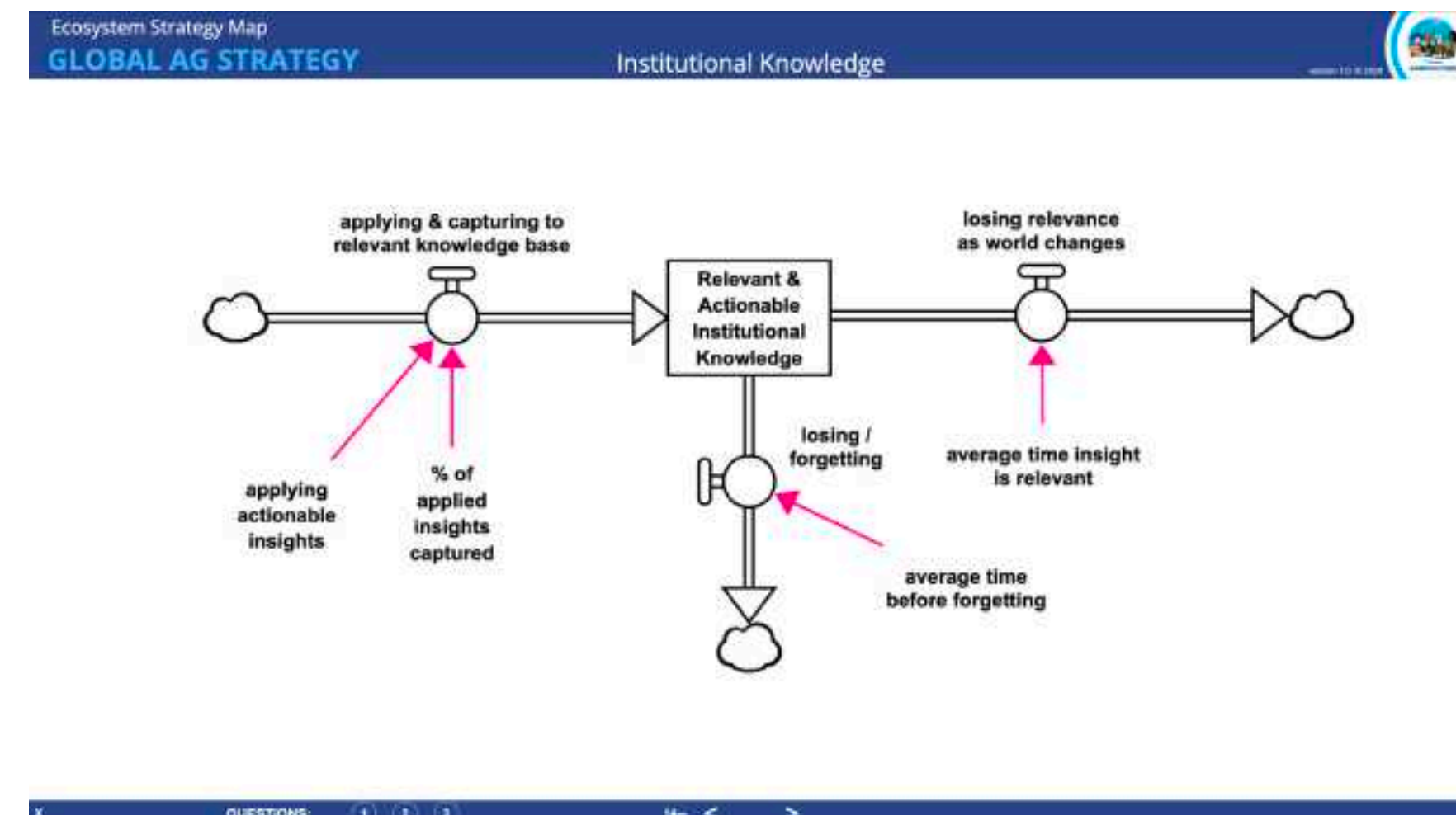
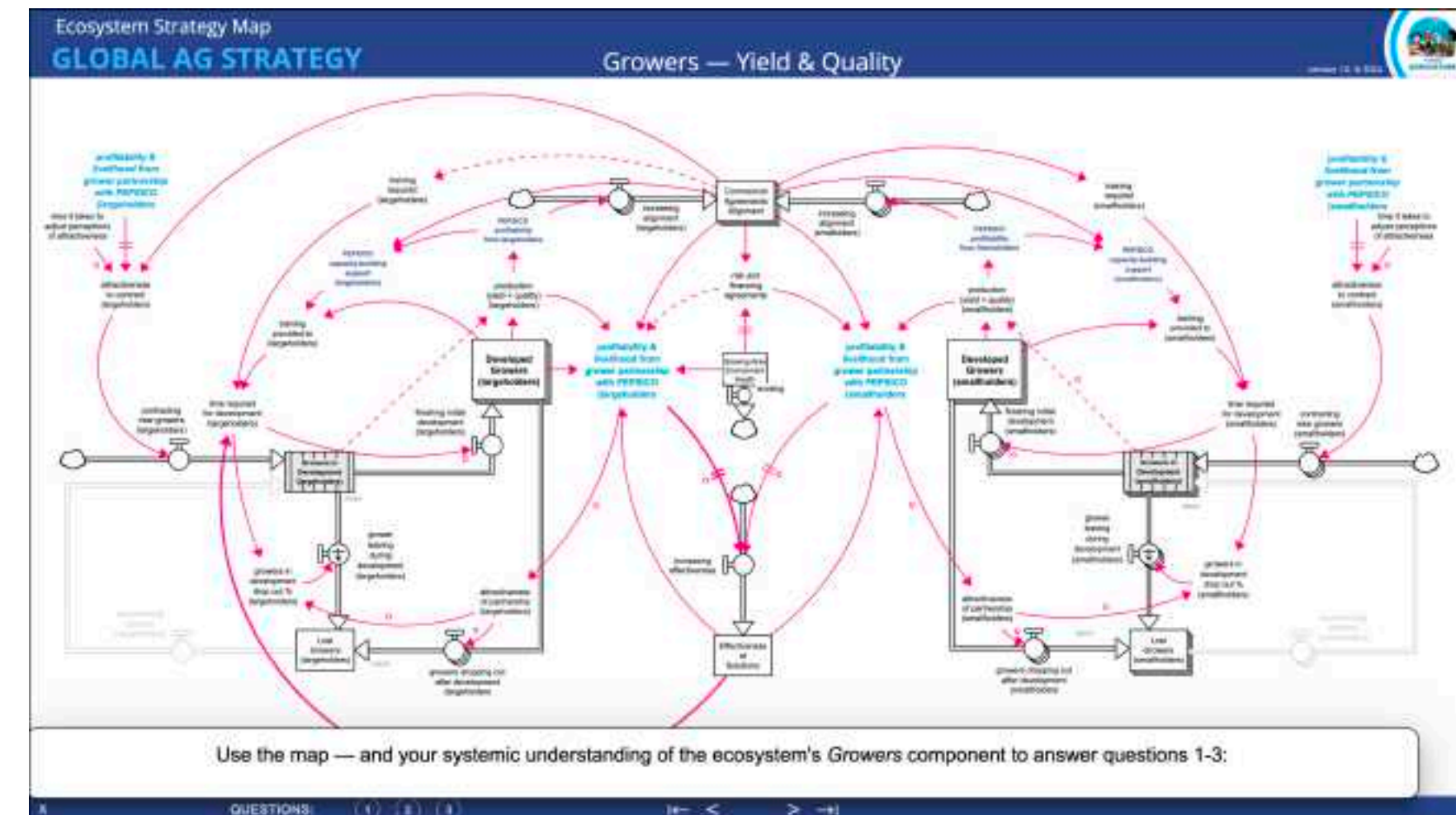
Growers Component (Largeholders & Smallholders)

- Unfurl the map
- Light discussion during
- Answer 3 questions at end (flipcharts)

Time Goal = 45 minutes

4. Facilitate Session

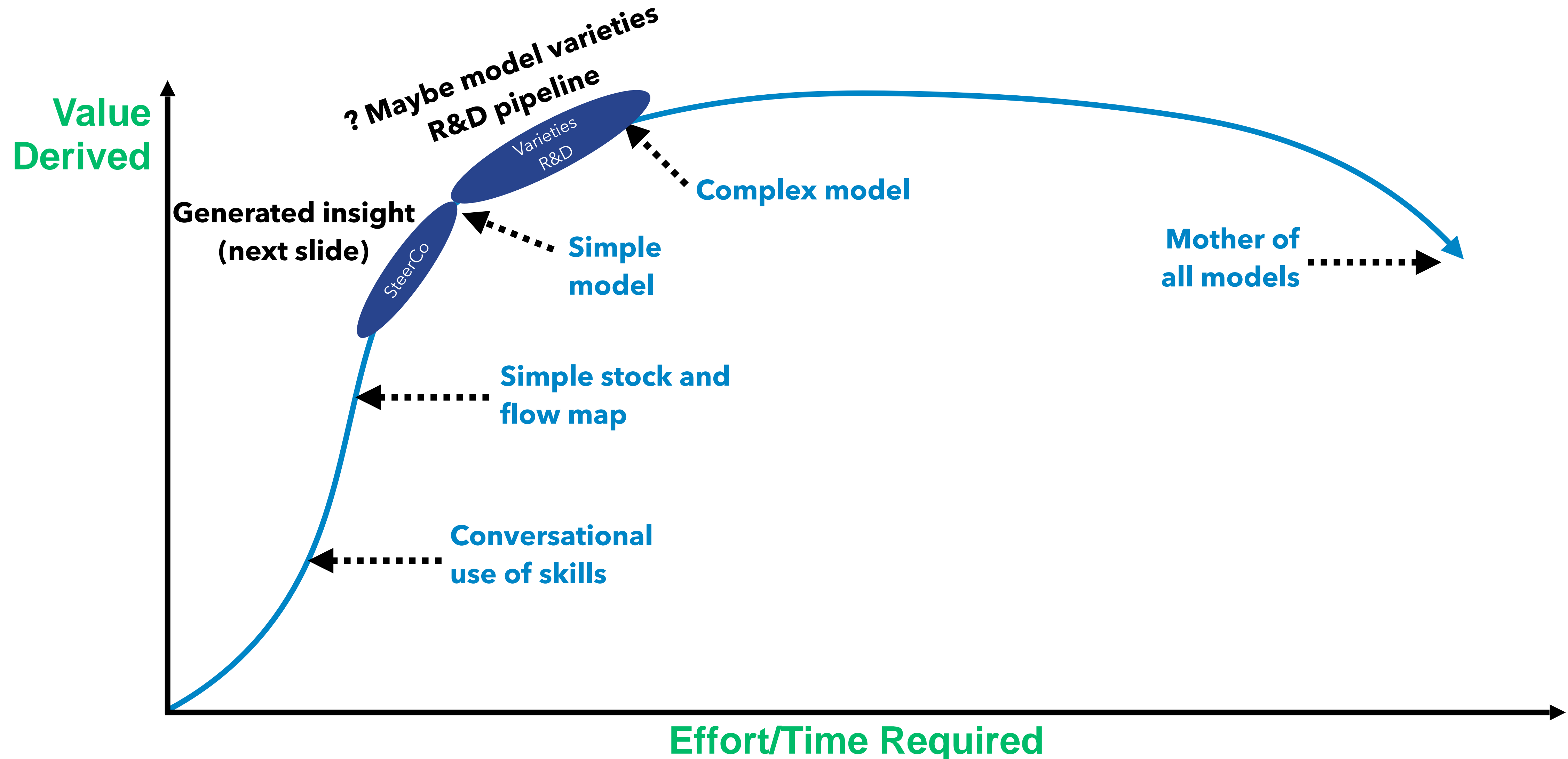
Use Large & Small Groups to Identify Insights and Next Steps



- Learn and apply concepts of **working smarter** versus **working harder** (Repenning and Sterman)
- Understand implications of ***Success to the Successful*** on ESG
- Operationalize **organizational learning** and identify capacity gaps
- Raise awareness of “betting” on varieties — and when to **ramp up**
- Realize **solutions *without* skills** won't lead to significant improvement from best practices

VALUE / EFFORT CURVE*

Selecting the Appropriate Systems Thinking-Based Artifact

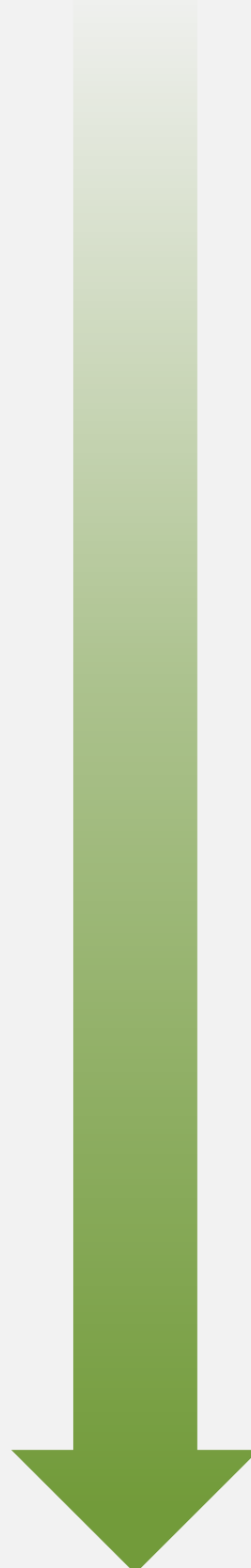


Leverage points are the parts of an ecosystem where a small change can produce big changes across the system



There are 12 places to intervene in a system¹

Level of effectiveness



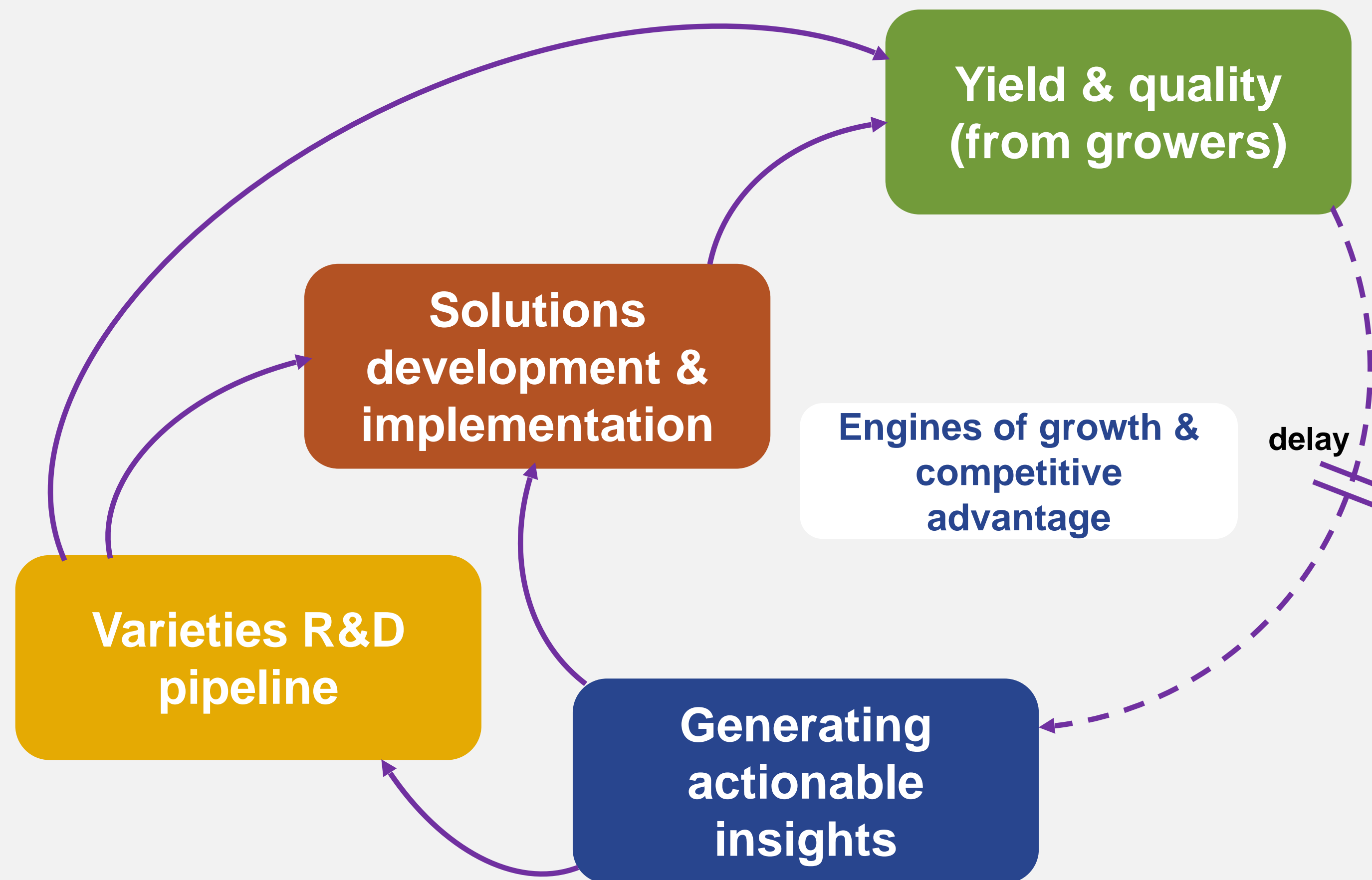
1. **Constants, parameters, numbers** (i.e., wages, prices, % defects allowed)
2. **The sizes of buffers and other stabilizing stocks, relative to their inflows** (i.e., growing area, storage capacity)
3. **The physical structure of material stocks & flows** (i.e., transport networks, growing & plant locations)
4. **The lengths of delays relative to the rate of system change** (i.e., growing cycles, variety development)
5. **The strength of negative feedback loops, relative to the impacts they are trying to correct against** (i.e., demand forecast, # of growers)
6. **The gain around driving positive feedback loops** (i.e., grower learning, capability adoption)
7. **The structure of information flows & access to information** (i.e., knowledge management, data, timely insights)
8. **The rules of the system** (i.e., incentives, regulations, policies)
9. **The power to add, change, evolve, or self-organize system structure** (i.e., connectivity, operating model)
10. **The goals of the system** (i.e., mission statement, champion KPIs)
11. **The mindset or paradigm out of which the system – it's goals, structure, rules, delays, parameters – arises** (i.e., aligned shared vision, norms, behaviors)
12. **The power to transcend paradigms** (i.e., organizational adaptability, flexibility)

Points of leverages that:

- Can be done w/o global support
or
- Are difficult and/or resource-intensive to change, limiting net impact

Areas of greater impact which GAO is driving globally

A systems-level approach helps to create a common understanding and prioritize “big changes to big things”



Use the **Global Ag Ecosystem Strategy Map** to:

- ✓ Focus **conversations**
- ✓ Communicate **insights**
- ✓ Strengthen **collaboration**
- ✓ Identify **leverage points**

Additional detail on
following page

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