

09 JULY 2018

# Introductory Meeting

# Agenda

1. Introduction to Our Activity
2. System Mapping Approach
3. Application to Health System
4. Next Steps

# 1. Introduction to Our Activity



# About the Market System Monitoring Activity

- Our mandate: to develop new methodologies for monitoring and measuring the impact of market facilitation activities on systemic change.
- Our activity falls under the USAID/Uganda Feed the Future Project, but our work is broadly applicable to measuring change in any complex system.
- Our research team is composed of systems engineers and social scientists from the Massachusetts Institute of Technology (MIT) and The George Washington University (GW).

# Our Team



**Professor Jarrod Goentzel (MIT)**

Founder and director of the MIT Humanitarian Supply Chain Lab in the MIT Center for Transportation & Logistics. His research focuses on meeting human needs in resource-constrained settings through better supply chain management, information systems and decision support technology.



**Professor Erica Gralla (GWU)**

Professor of Systems Engineering. Her research aims to support better decisions in disaster response, development, and system design, through a deeper understanding of human decision-making and the development of context-relevant models and analysis.



Tim Russell  
MIT Research Staff



Micaela Wiseman  
MIT MS Student



Courtney Blair  
Research Consultant



Megan Peters  
GWU PhD Student



Sophie Steinberg  
GWU Student



# Our background and toolkit

- Expertise
  - Systems engineering, supply chain management, behavioral economics
- Our philosophy: What's the right tool for this problem?
- We bring “fresh eyes” to the challenge: we are not your typical USAID M&E specialists
- Our toolkit: methodologies
  - Data collection and analysis
    - Qualitative
    - Quantitative
  - Modelling
    - Actor models: business/economic models, behavioral models
    - Supply chain models: analysis of bottlenecks, system capacity, risk, variability, disruptions, benchmarking
    - System models: system dynamics, social network analysis
  - ...

## The “big questions” we are answering...

- How to define and measure systemic change in Ugandan agricultural market systems?
- How is the Ugandan agricultural system changing (or not) and where are the important leverage points, barriers, and data gaps?

## We are answering these questions by...

- Developing and refining a system mapping methodology to understand how different parts of the system interact and overlap; using methodology to map market system.
- Developing and refining a methodology for identifying and measuring key indicators.
- “Deep dive” studies into parts of the system to refine system map and measure change

# MSM Work Products to date

- **System Map:**
  - Dynamic map of Ugandan agricultural market system
- **Methodologies:**
  - Behaviors-Relationships-Conditions system mapping tool
  - Indicators for measuring systemic change
- **Event:** Agricultural Market Systems Workshop
- **“Deep dive” Studies:**
  - Agricultural inputs subsystem
  - Quality-differentiated pricing for traders
  - Agribusiness business models
  - Indicators for finance and regulatory systems
- **System Dynamics Model:**
  - Simulation model of agricultural inputs adoption
- **Support for the Mission:**
  - Engagement with PAD planning
  - Consultation on M&E plan development
  - Engagement with SPACES team/USAID HQ
- **Engagement with Activities:**
  - Advocating for systems approach
  - Demonstrating how tools can be used
  - System map of regulatory subsystem

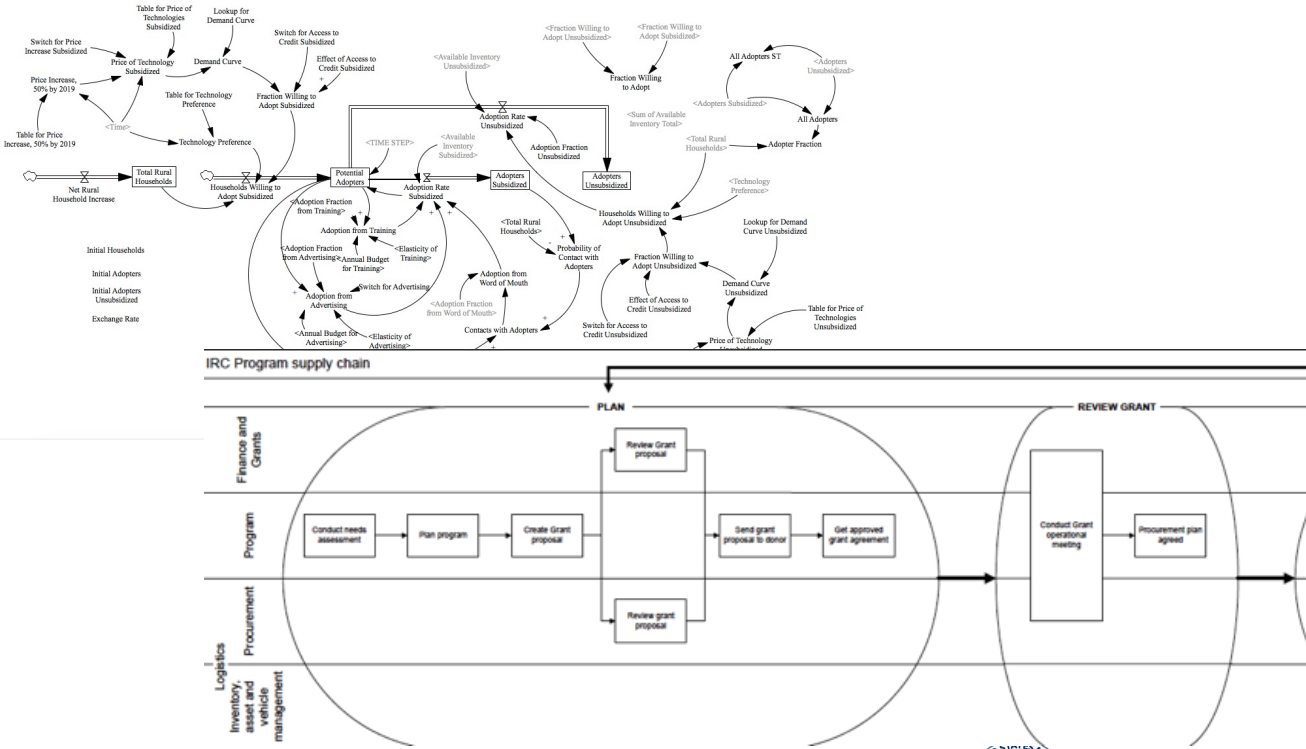
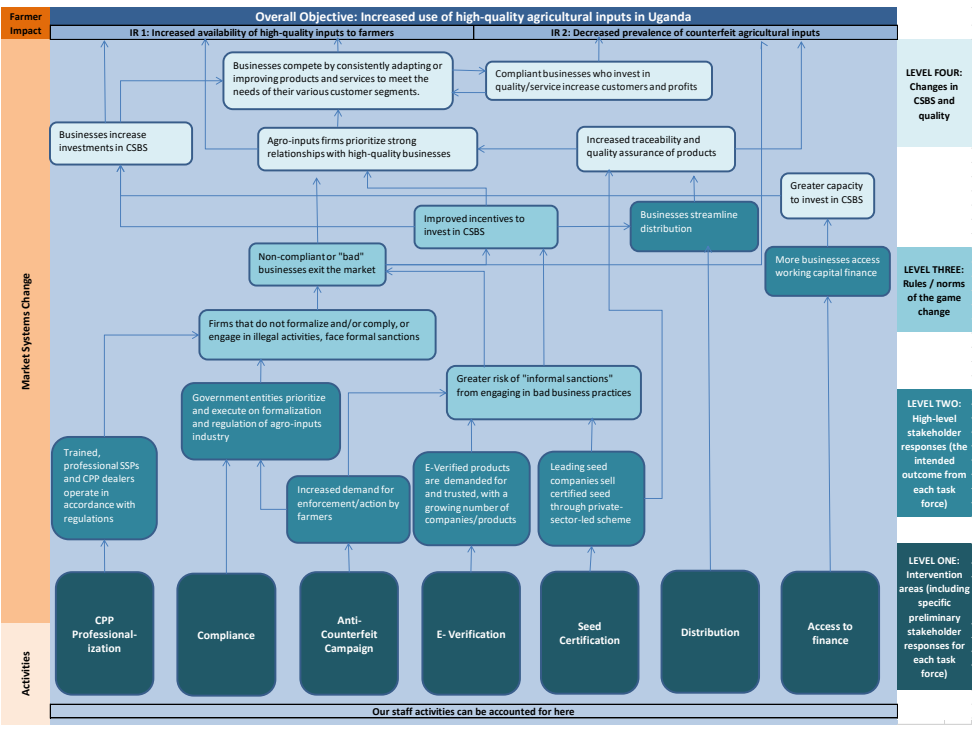


## 2. System Mapping Approach



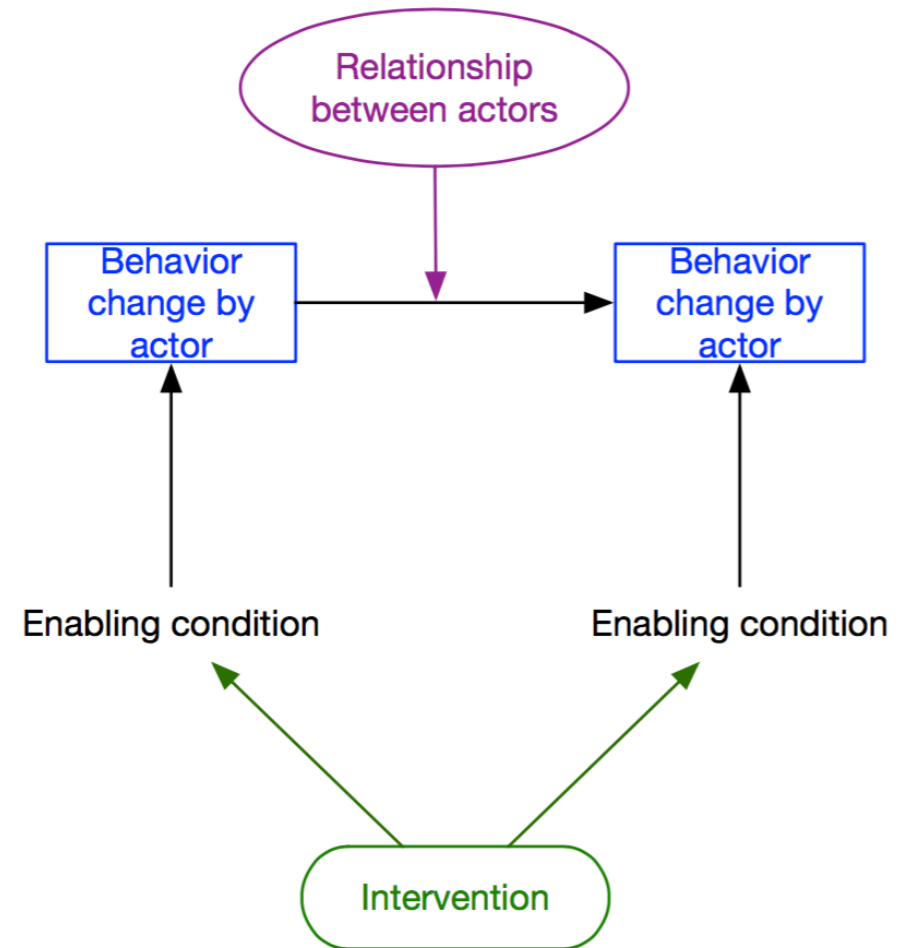
# Why map a system?

- Maps have long been used as a basis for understanding a complex system
- Maps can capture complex problems and make them tractable for analysis



# A mapping approach for systems-oriented development

- The “Behaviors-Relationships-Conditions” (BRC) approach depicts *how a system may change*
  - Identifies interacting pathways that drive systemic change
  - Builds on:
    - results chains
    - causal loop diagrams
    - definitions of the components of systemic change
- Depicts key concepts in market systems
  - **Behavior** changes by actors
  - **Relationships** strengthened among actors
  - Enabling **conditions**
- Connects key concepts by showing what enables what
  - Arrows indicate that A enables B (but may not cause B)
- System activity broken down into thematic subsystems



# How is the map developed?

- Initial draft developed through consultations with USAID activities and key external stakeholders
- Map is expanded, refined, and publicized through periodic meetings and workshops
- Additional detail gathered through “deep dive” studies into individual subsystems
- Map is continually updated as new knowledge is acquired

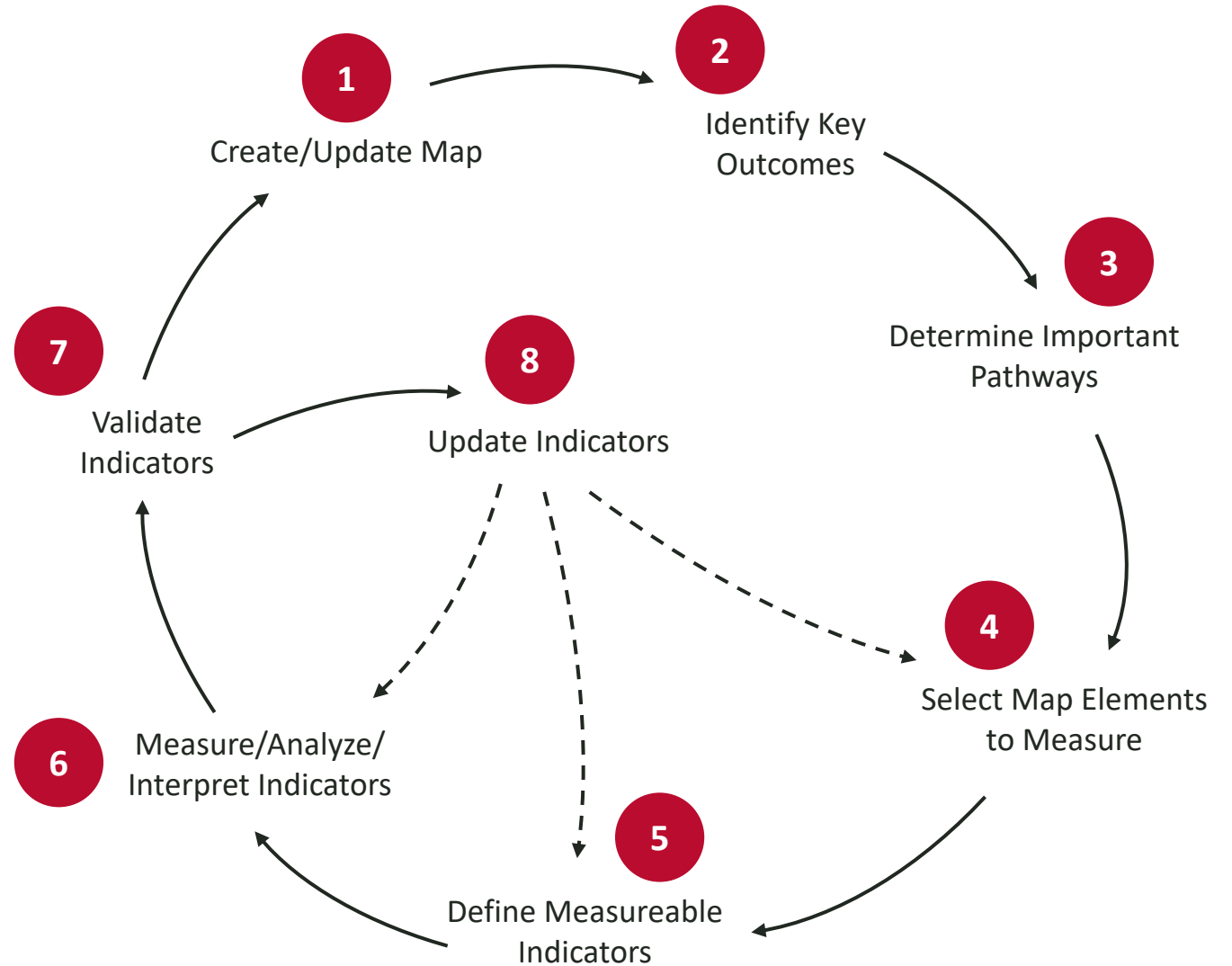


# Measuring systemic change

- Measuring systemic change is difficult
  - Various definitions of systemic change
  - Complexity of system
  - Indirect impact on beneficiaries
  - Unpredictable pace of change
  - ...
- Goals
  - Simple measurement approach
  - Measurement understood within system context
  - Enable interpretation at system level and detailed level: multiple “views” of impact
  - Build on multiple sources of data

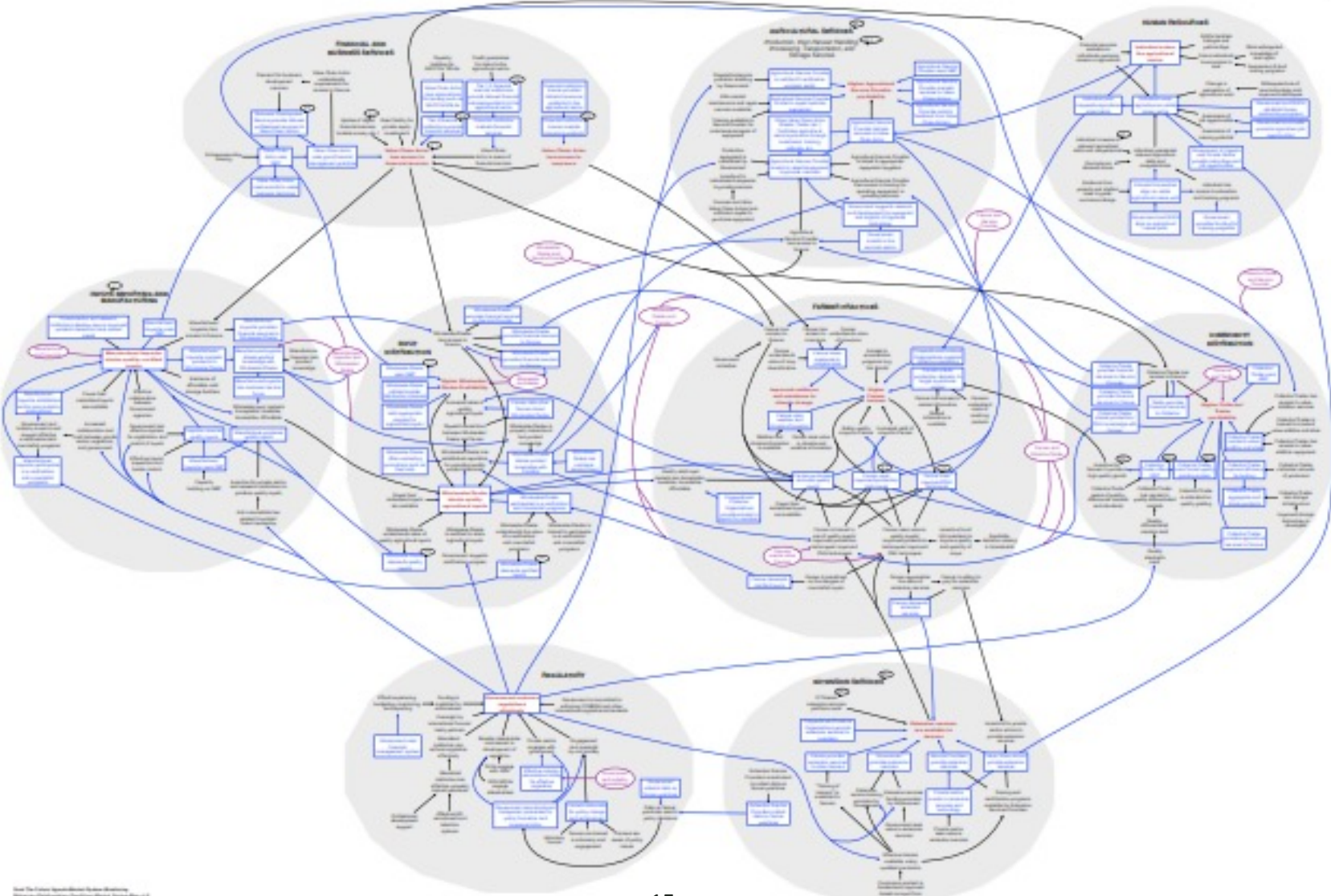
# Identifying Indicators

- Iterative cycle of steps to identify and validate indicators throughout the system
- Learn from and adapt measurement approaches as we learn about the system





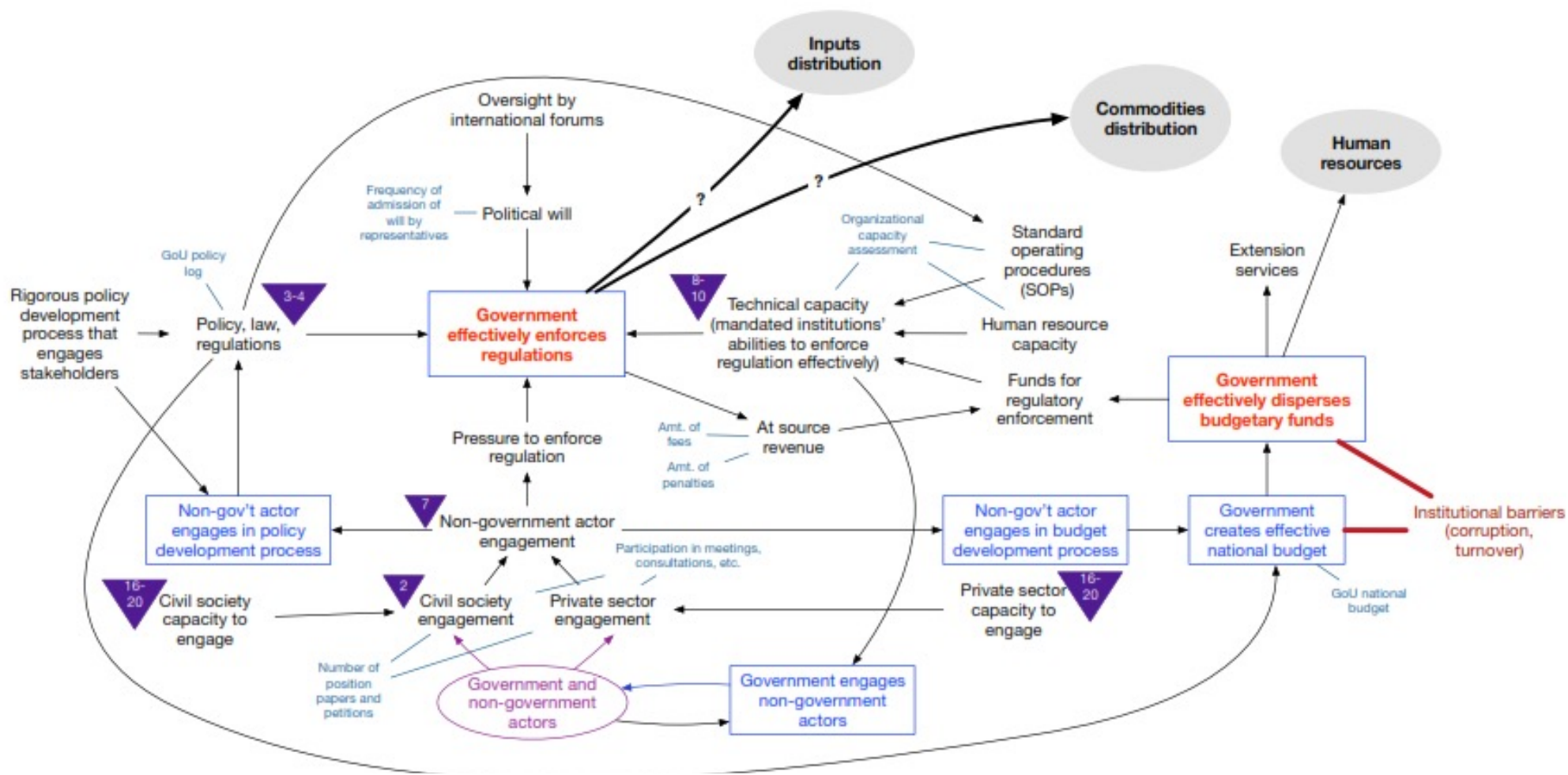
# Agriculture Market System Map



United States Agency for International Development



# Sample Subsystem: Regulatory Environment

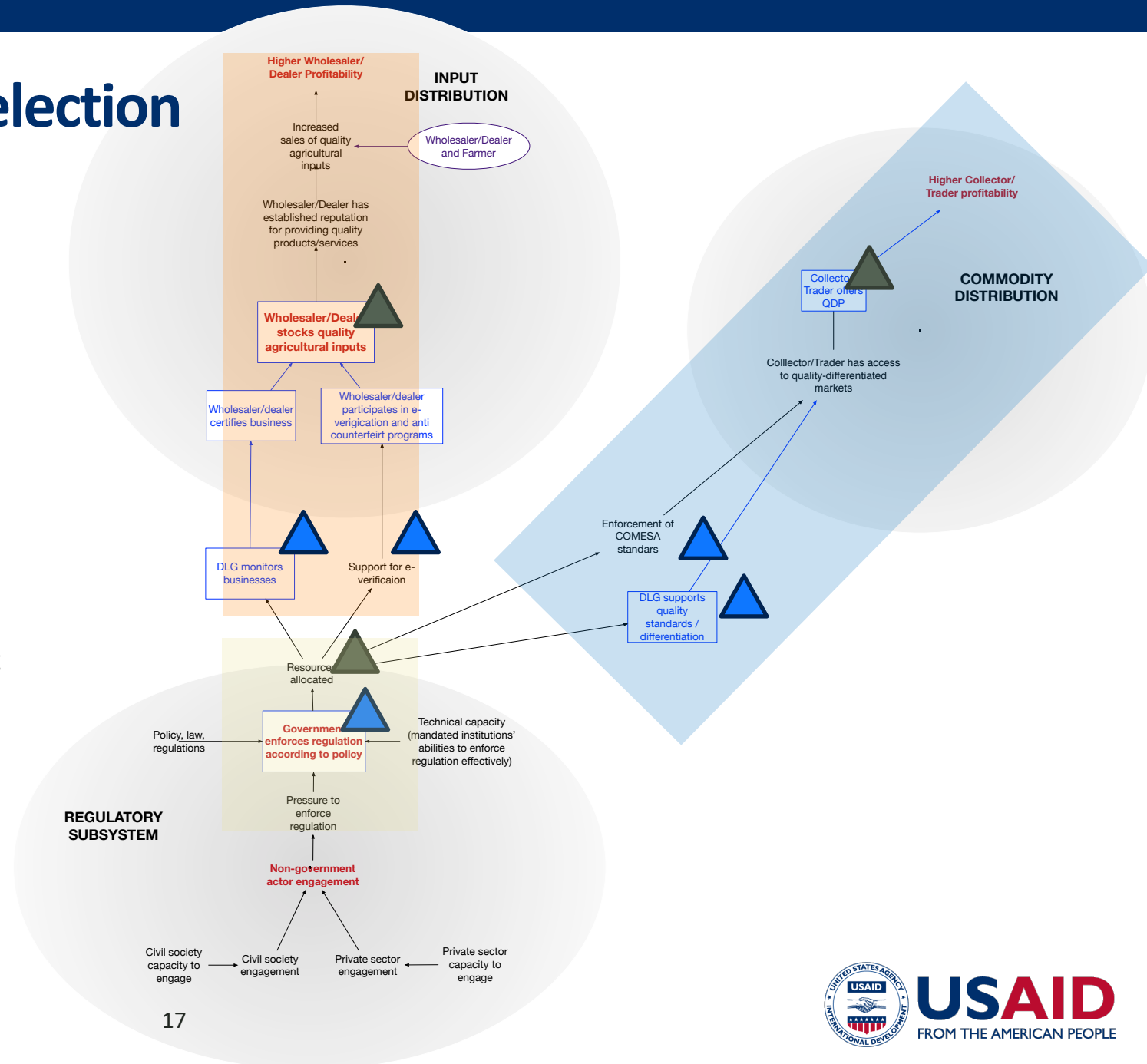




# Regulatory impact: indicator selection

- Identified many potential indicators based on methodology, prompting us to down-select.
- Down-selection led to categorization:
  - Key outcomes
  - Sentinel indicators
  - Diagnostic indicators
- These are in the context of a particular pathway, or subsystem:
  - i.e. there can be multiple diagnostic for a sentinel, and a sentinel along multiple pathways.

▲ Sentinel    ▲ Diagnostic



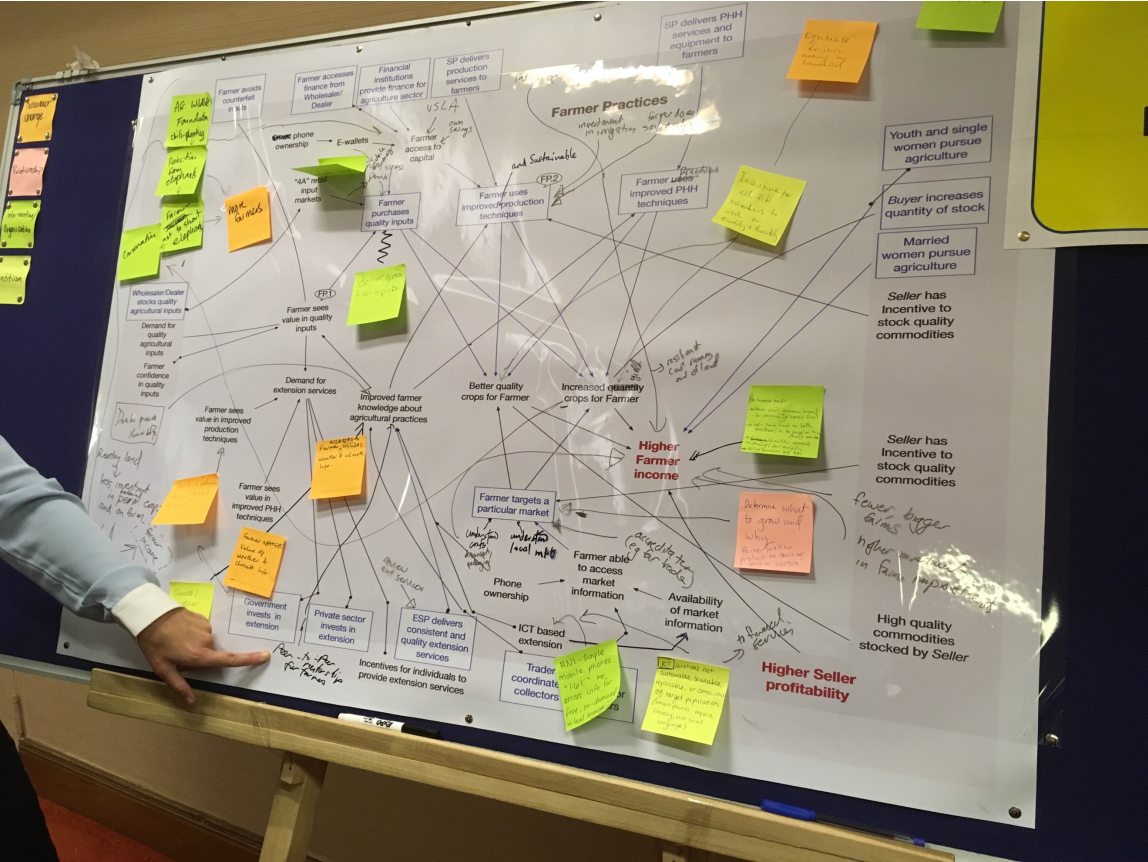
# Regulatory impact: indicator measurement

	Map element	Data source	Measurement	Sample
1.1	Government enforces regulation according to policy	GoU policy portal; survey government officials (EEA)	number agricultural policies with claimed evidence of enforcement by MAAIF employees / total agricultural policies developed*	10 ministry employees
1.2	Resources allocated to DLGs and programs according to policy	Interviews with DLG representatives*	average percent budgetary support for programs claimed by DLG representatives	5 DLG representatives per district
2.1	DLG monitors businesses	Wholesaler/dealer interviews	number wholesalers/dealers claiming visit by DLG to enforce agribusiness certification / total wholesalers/dealers interviewed	10 wholesaler/dealers per district
2.2	Participation in e-verification	Wholesaler/dealer interviews	number wholesalers/dealers participating in e-verification program / total wholesalers/dealers interviewed	10 wholesaler/dealers per district
2.3	Wholesaler/dealer stocks quality inputs	Wholesaler/dealer interviews, e-verification database	number wholesalers/dealers with e-verified product stocked / total wholesalers/dealers interviewed	10 wholesaler/dealers per district
3.1	Enforcement of COMESA standards	Interviews with DLG representatives*	number DLG representatives stating evidence of ag regulation enforcement / total DLG representatives interviewed	5 DLG representatives per district
3.2	DLG supports quality standards	Trader interviews	number traders reporting DLG offers quality standard/differentiation extension service / total wholesalers/dealers interviewed	5 traders per district
3.3	Trader/collector offers QDP	Trader interviews	number traders claiming to offer QDP (as defined by study) / total traders interviewed	5 traders per district

\*Interviews with DLG representatives will be very hard, and may require us to reconsider our indicators, or consider other proxy measures. This table is meant to describe how we might measure ideal indicators, regardless of constraints about data. It is a starting point for discussion. Also, GoU may be incentivized to claim evidence of enforcement, anyway.

# What can we do with these maps?

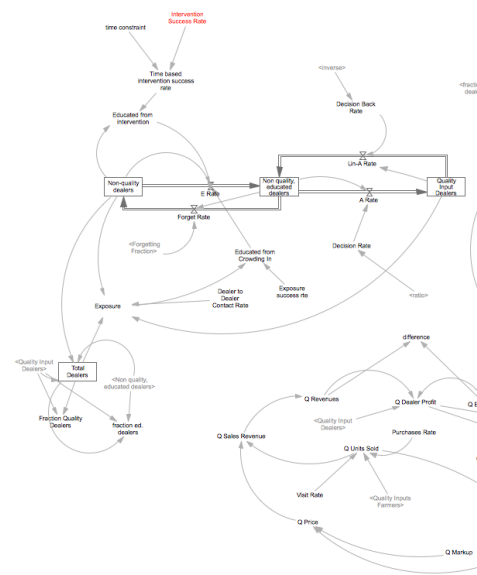
- Visualize complex dynamics using a simple and flexible tool
  - A few simple components, but can represent most of a system's complexity
  - Comparable across subsystems, projects, contexts
- Engage stakeholders
  - Provides a common picture
  - Accessible (with facilitation)
- Identify pathways and barriers to change
  - See results chains in context of other system components, identify possible barriers
- Enable measurement of results and impact
  - Choose indicators from view of whole system



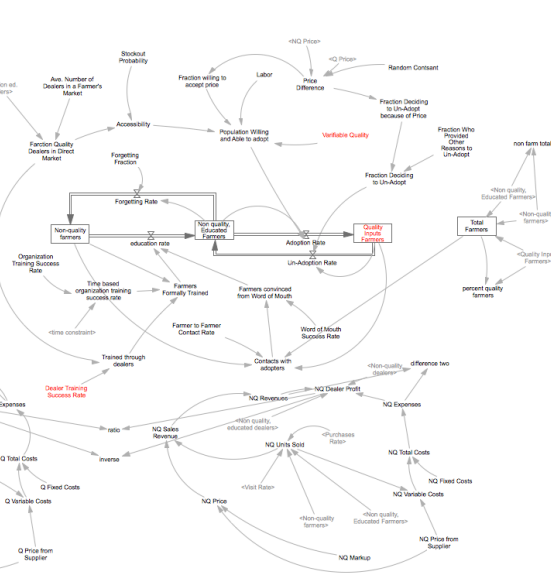
# ...and simulate outcomes under various conditions

Dealer and farmer training and e-verification

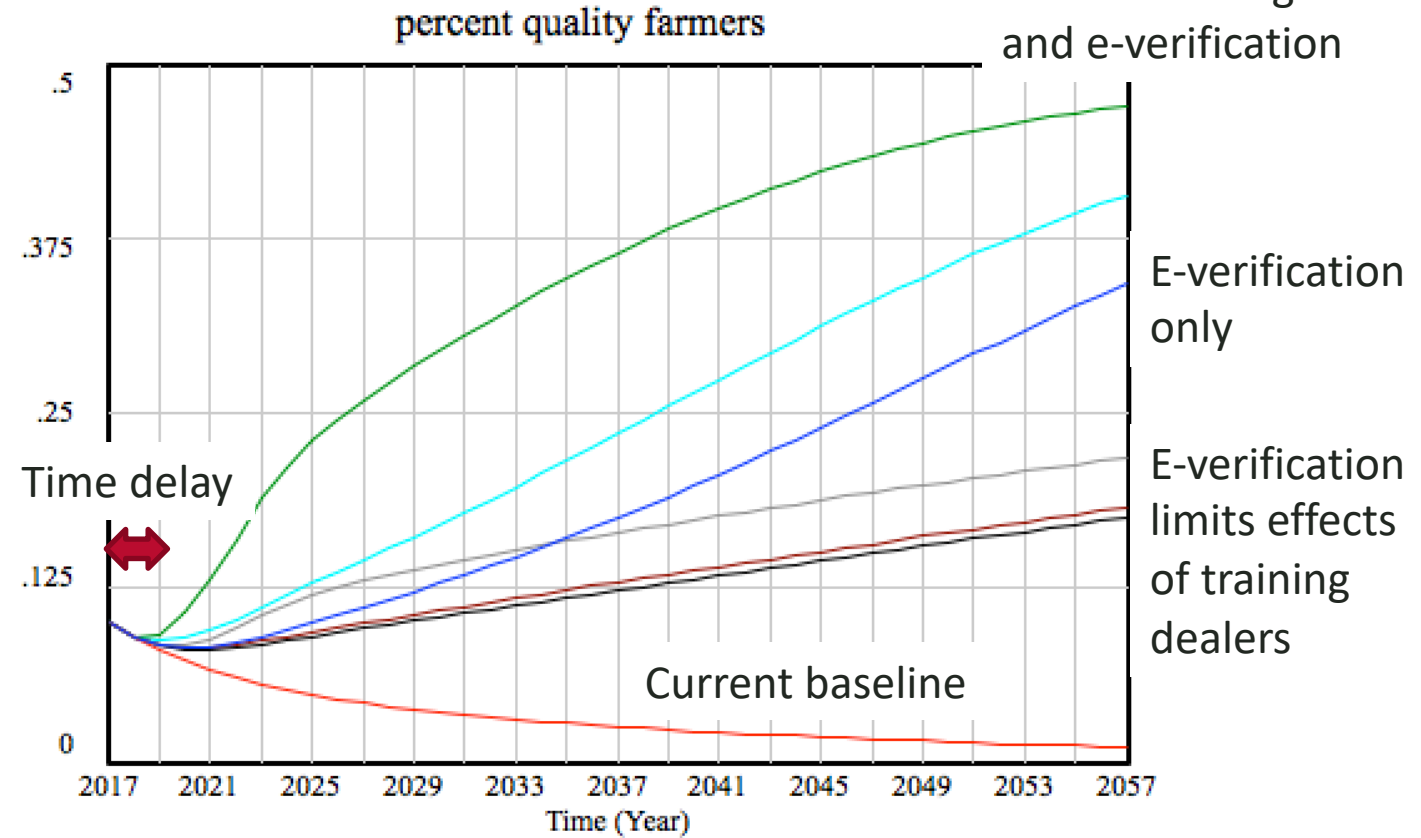
1. Dealers adopt quality inputs



2. Farmers adopt quality inputs



3. Dealer profitability depending on quality or non-quality sales



- percent quality farmers : 19V9
- percent quality farmers : baseline
- percent quality farmers : all19
- percent quality farmers : all15
- percent quality farmers : 15V5
- percent quality farmers : 19V5
- percent quality farmers : 19V9

Based on assumptions and available data put into the model; please understand the assumptions (documented elsewhere) before interpreting these results.

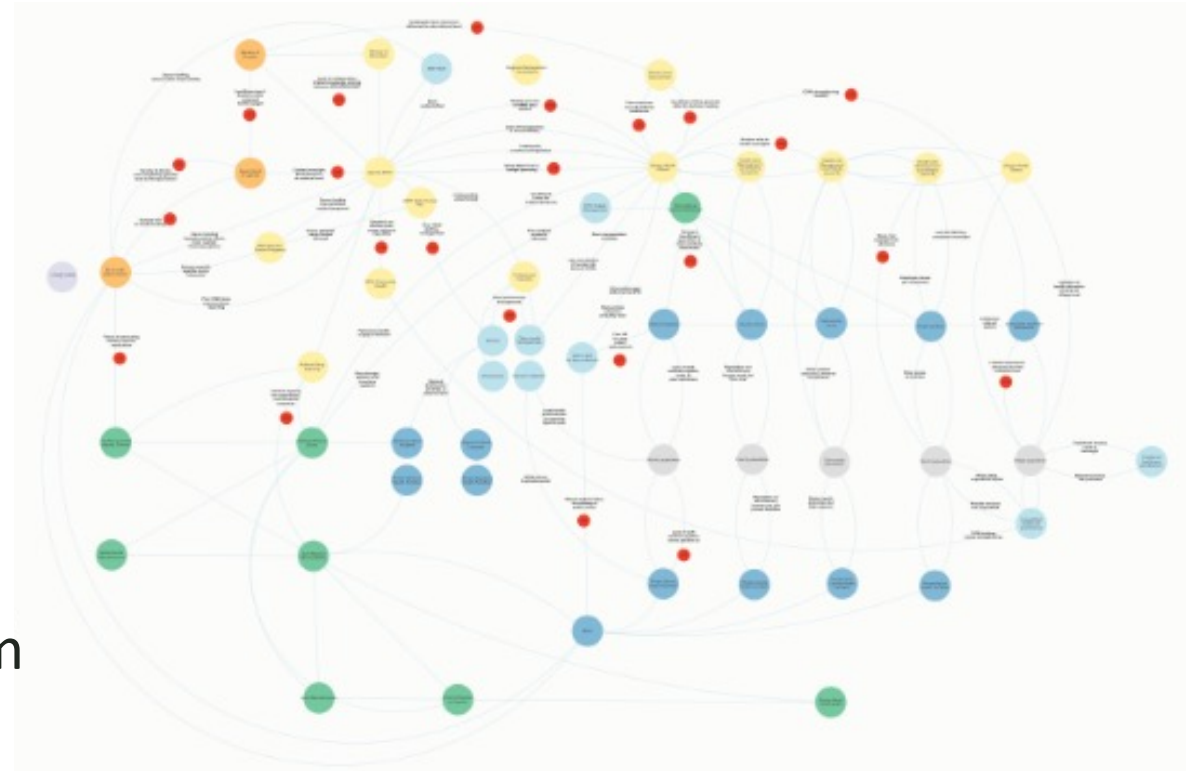
### 3. Application to Health System





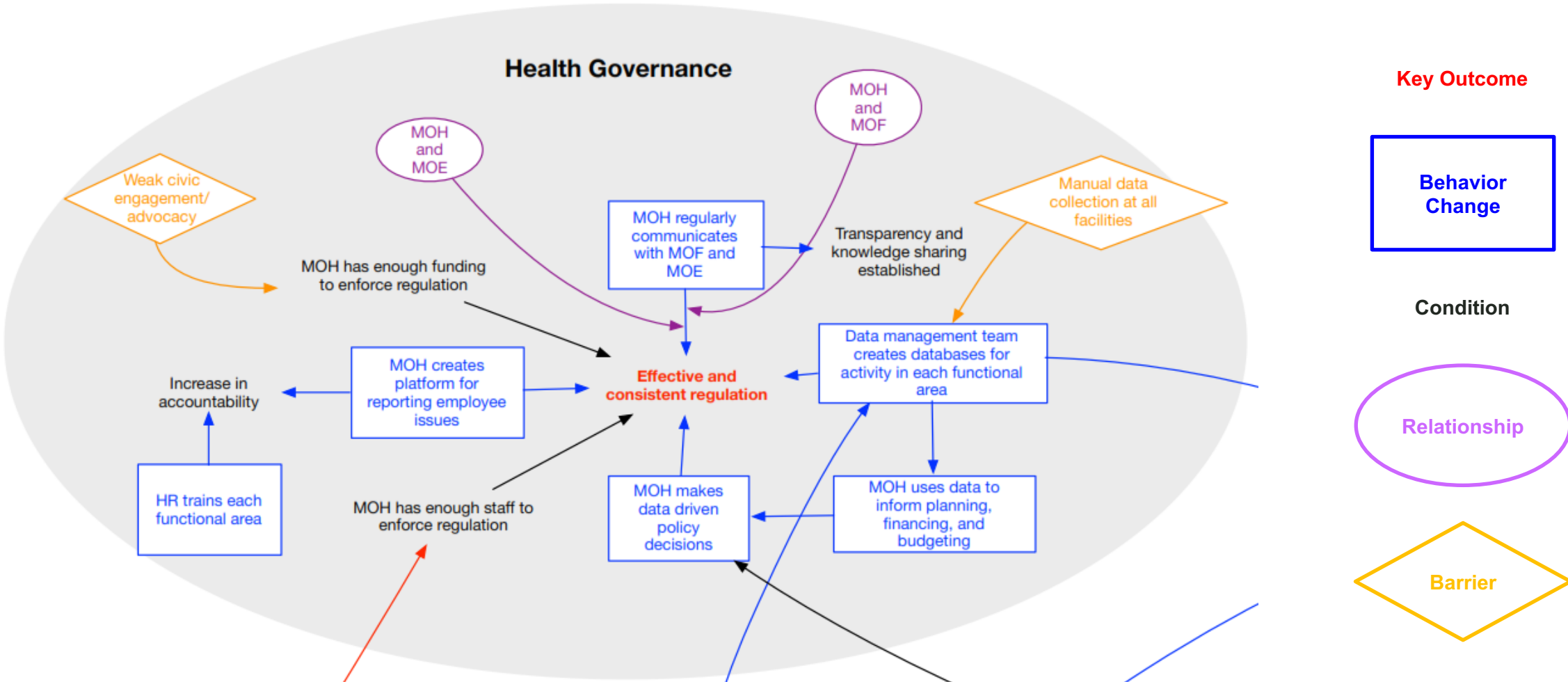
# Sample Map based on SPACES Health System Map

- Our team developed a sample map of the health system based on the report generated from the SPACES workshop in June 2017.
- Not meant to be exhaustive or complete; merely an example of what your map could look like.
- Framing the system in terms of behaviors, relationships, and conditions allows your team to identify key incentives/interventions that will generate broader system change.



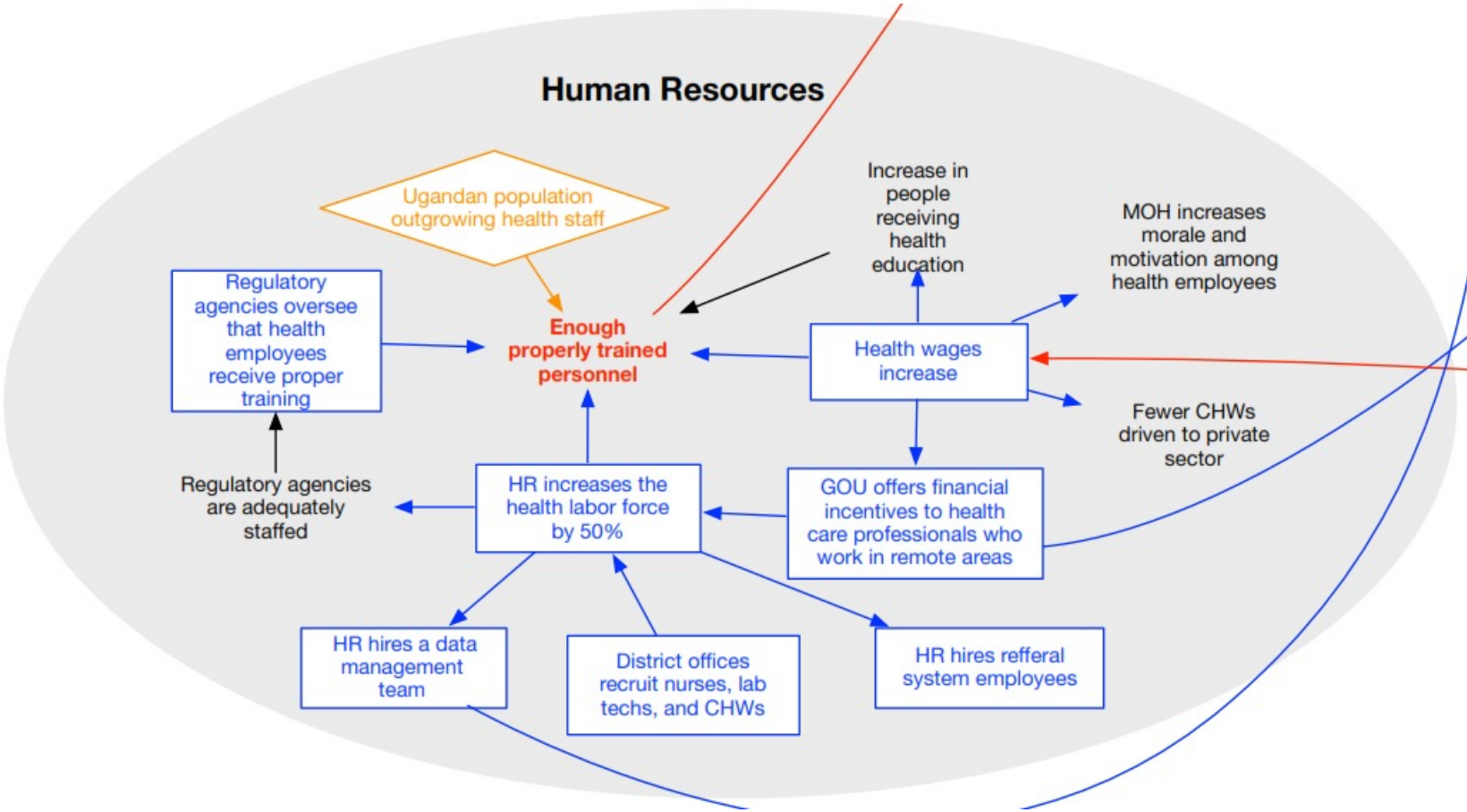


# Health Governance Subsystem





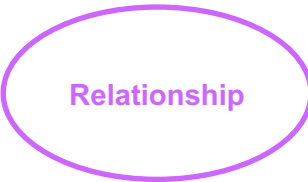
# Human Resources Subsystem



Key Outcome



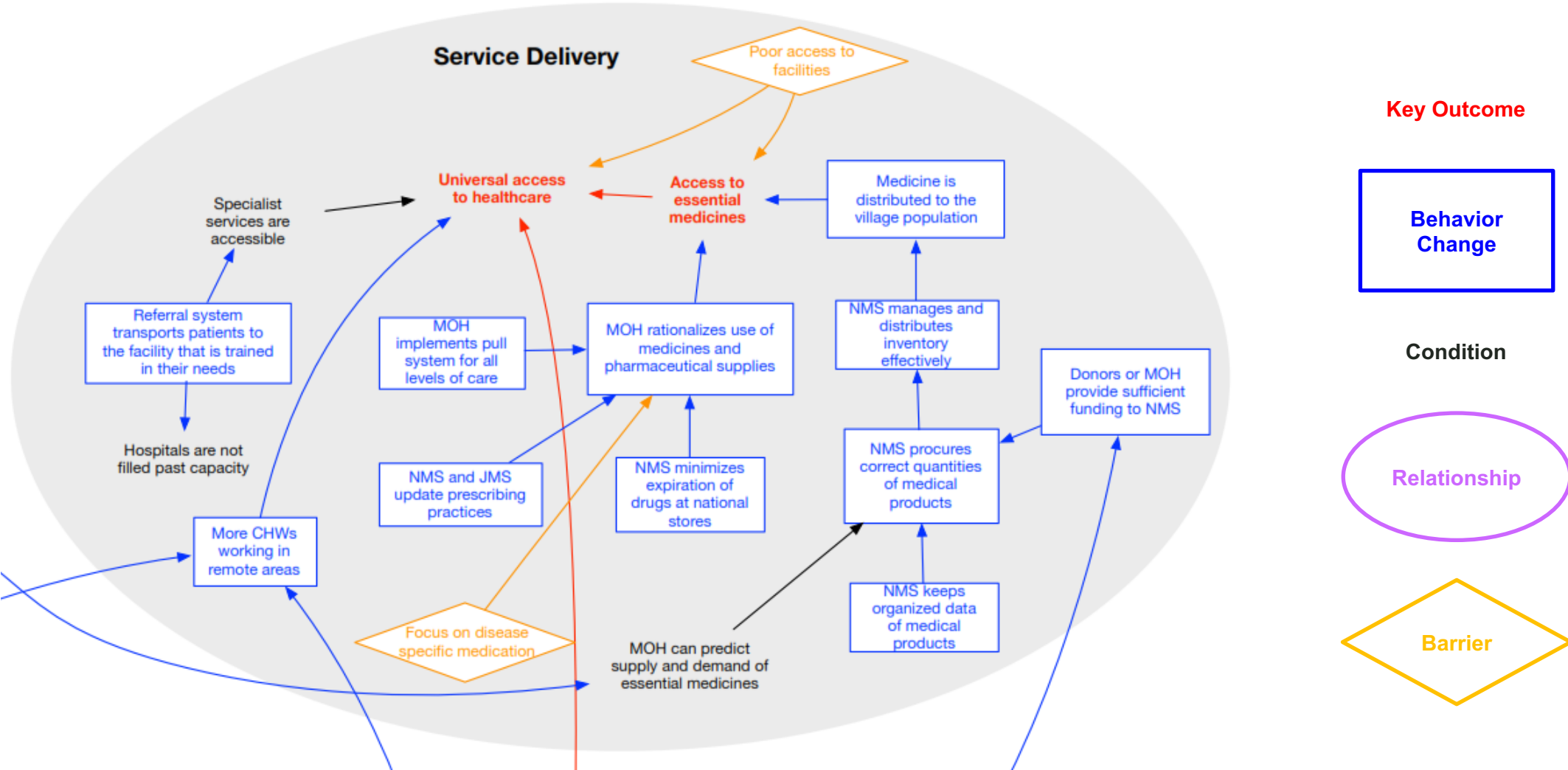
Condition



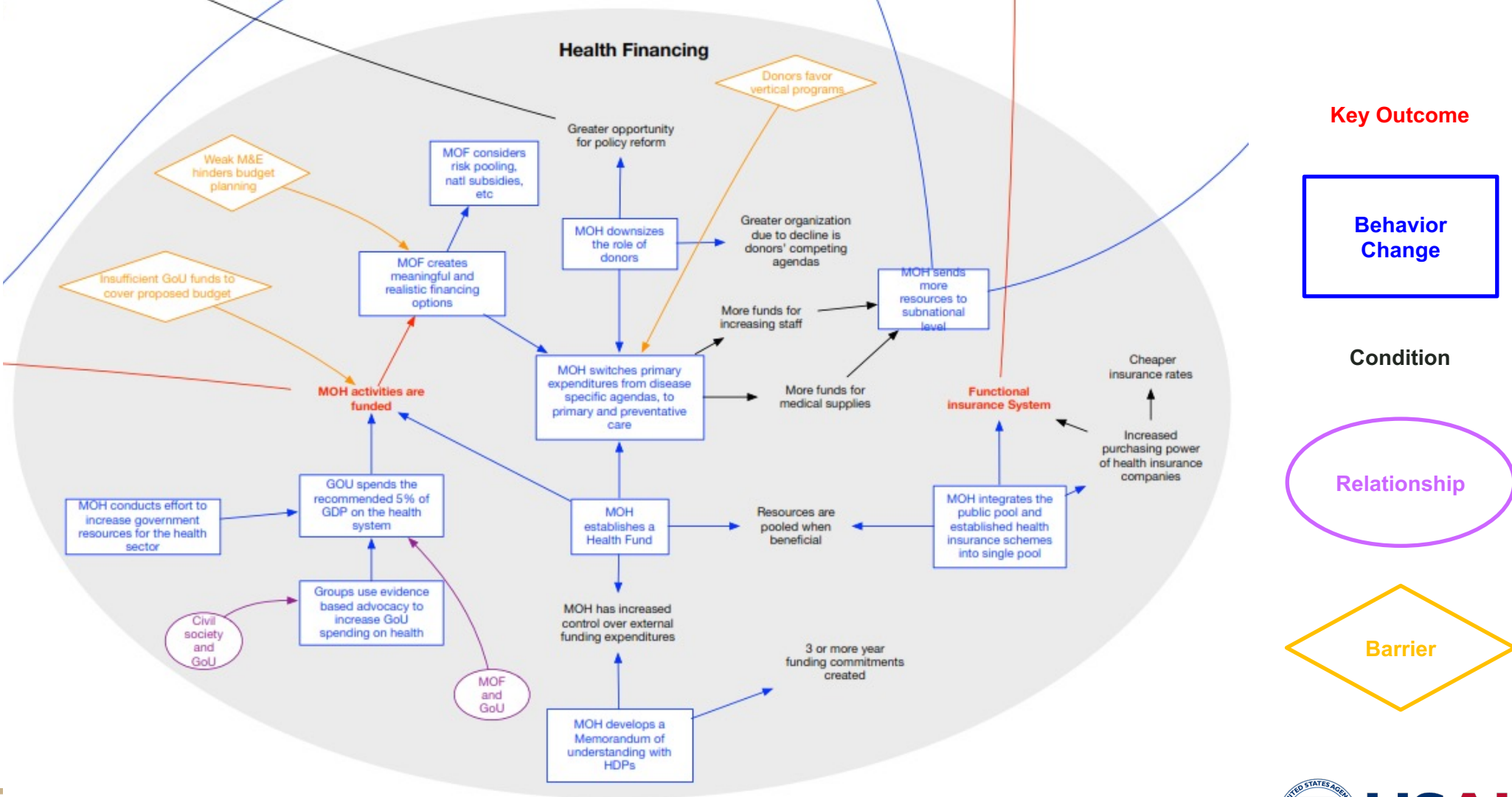
Barrier



# Service Delivery Subsystem



# Health Financing Subsystem



## 4. Next Steps



# What needs can we address? (What are the “use cases”?)

- **Potential needs**

- Identify interventions that lead to sustainable impact
- Develop results chains and monitoring, evaluation, and learning plans that embed systems thinking
- Identify sentinel indicators to measure changes in the system
- Integrate activities to achieve more holistic, inclusive and effective development



- **Potential use cases**

- Develop map of system and simulate system evolution based on different interventions
- Use BRC map to develop system-oriented results chains and MELPs that consider systemic change
- Use Indicator Methodology to pinpoint and measure key indicators on system map
- Co-develop system maps that connect activities and stakeholders

# Your feedback is welcome.

The Feed the Future Uganda Market System Monitoring (MSM) Activity is developing new approaches that assess the impact of market facilitation activities and systemic change in markets. It is a joint implementation from the Massachusetts Institute of Technology and The George Washington University.



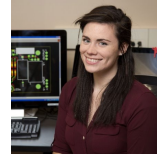
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