APPLYING SYSTEM MAPPING TECHNIQUES TO UNDERSTANDING RESILIENCE
MAPPING KARAMOJA CLUSTER HIGH-LEVEL OUTCOMES

EXECUTIVE SUMMARY

System maps can be used to connect high-level outcomes to the technical details of interventions, and show how a complex set of interventions and conditions are needed to achieve these high-level outcomes.

This document outlines how to use a system map to examine high-level outcomes and their corresponding measures of success. This document is focusing on the Karamoja Cluster, but the methods could be applied to other situations where we are trying to achieve specific goals within a complex system. The document is made up of three sections:

1. **Finding the High-Level Outcomes** on a system map: We show where the Karamoja Cluster's high-level outcomes are located on a system map.

2. **Examining the High-Level Outcomes** on a system map: We take a closer look at one high-level outcome to examine what enables it.

3. **Examining the Measures of Success** on a system map: We take a closer look at two measures of success for the high-level outcome to examine what enables them, and how to infer their status with limited information.

FINDING THE HIGH-LEVEL OUTCOMES ON A SYSTEM MAP

At the time of writing, the Karamoja Cluster Goal was set as "Improve Livelihoods in Cluster Districts", with High-Level Outcomes set as:

- **Increased incomes**

- **Improved governance and leadership**

- **Improved capacity to mitigate and manage risk**

The high-level outcomes of the Karamoja Cluster can be represented on the three Karamoja systems maps developed by the MSM activity with USAID implementing partners:

Karamoja Beans Market System Map	Developed in Sept-Dec 2020 with Apolou, Nuyok, and IAM	
	Scope:	Inputs distribution and commodity distribution for beans in Abim and Kotido
	Subsystems:	Inputs Distribution, Farmer Practices, Aggregation, Commodity Distribution

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	Link: https://kumu.io/MSM/msm-karamoja-market-system-maps#agriculture
Karamoja Livestock System Map	Developed in Sept-Dec 2020 with KRSU, Apolou, Nuyok, and IAM Scope: Livestock production in Karamoja Subsystems: Herd Management, Natural Resource Management, Social Institutions, Household Resilience Link: https://kumu.io/MSM/msm-karamoja-market-system-maps#livestock
Karamoja Household Resilience Map	Developed in Sept 2019 – Jan 2020 with Apolou, ICAN, Ekisil, B4R, IAM, MENU, KRSU, and WFP Scope: Household resilience in Karenga, Kaabong, and Kotido Subsystems: • Income generation: agriculture, pastoralism, non-ag • Human capital: WASH, health, gender issues, nutrition, education • Enabling environment: access to finance, social capital, government, emergency management, conflict, land, water Link: https://kumu.io/MSM/msm-karamoja-household-resilience-system-map

At a glance, we can use the household resilience map to see where each of the high-level outcomes are captured, shown on the next page. Note that some of these outcomes can be captured on the other maps as well, which can help explore different aspects of the outcomes.

This document will then take a more detailed look at the first outcome (increased incomes), but a similar process can be applied to the other outcomes as well.

Note that many of the images of the system maps in this document have been simplified for easier reading. Some elements have been omitted or moved. In Kumu, the free online tool that can be used to view the maps, elements can be dynamically hidden and the whole map can be easily zoomed and panned around.
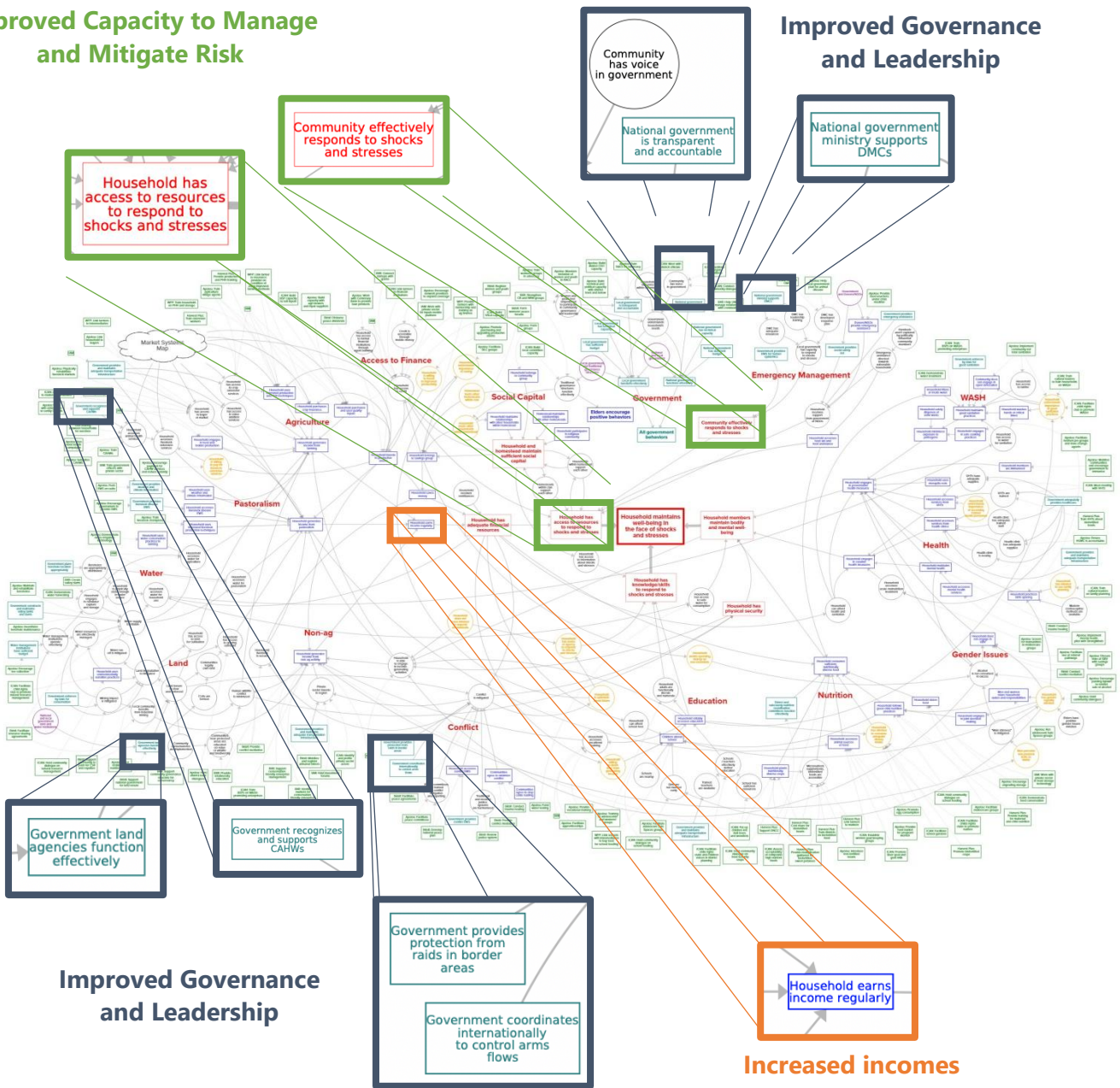
All three high-level cluster outcomes are shown below on the Karamoja Household Resilience Map. This placement is not exhaustive – the outcomes can also be represented elsewhere in the map. One interesting note is that "Increased incomes" is placed very clearly, and is easy to conceptualize as a single element. However, "Improved Governance and Leadership" is more fragmented. This shows how there is a wide range of governance functions that influence various parts of the map, which may make the outcome harder to measure.

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Improved Capacity to Manage and Mitigate Risk

Improved Governance and Leadership

Community has voice in government

National government is transparent and accountable

National government ministry supports DMCs

Community effectively responds to shocks and stresses

Household has access to resources to respond to shocks and stresses

Improved Governance and Leadership

Government land agencies function effectively

Government recognizes and supports CAHWs

Government provides protection from raids in border areas

Government coordinates internationally to control arms flows

Household earns income regularly

Increased incomes

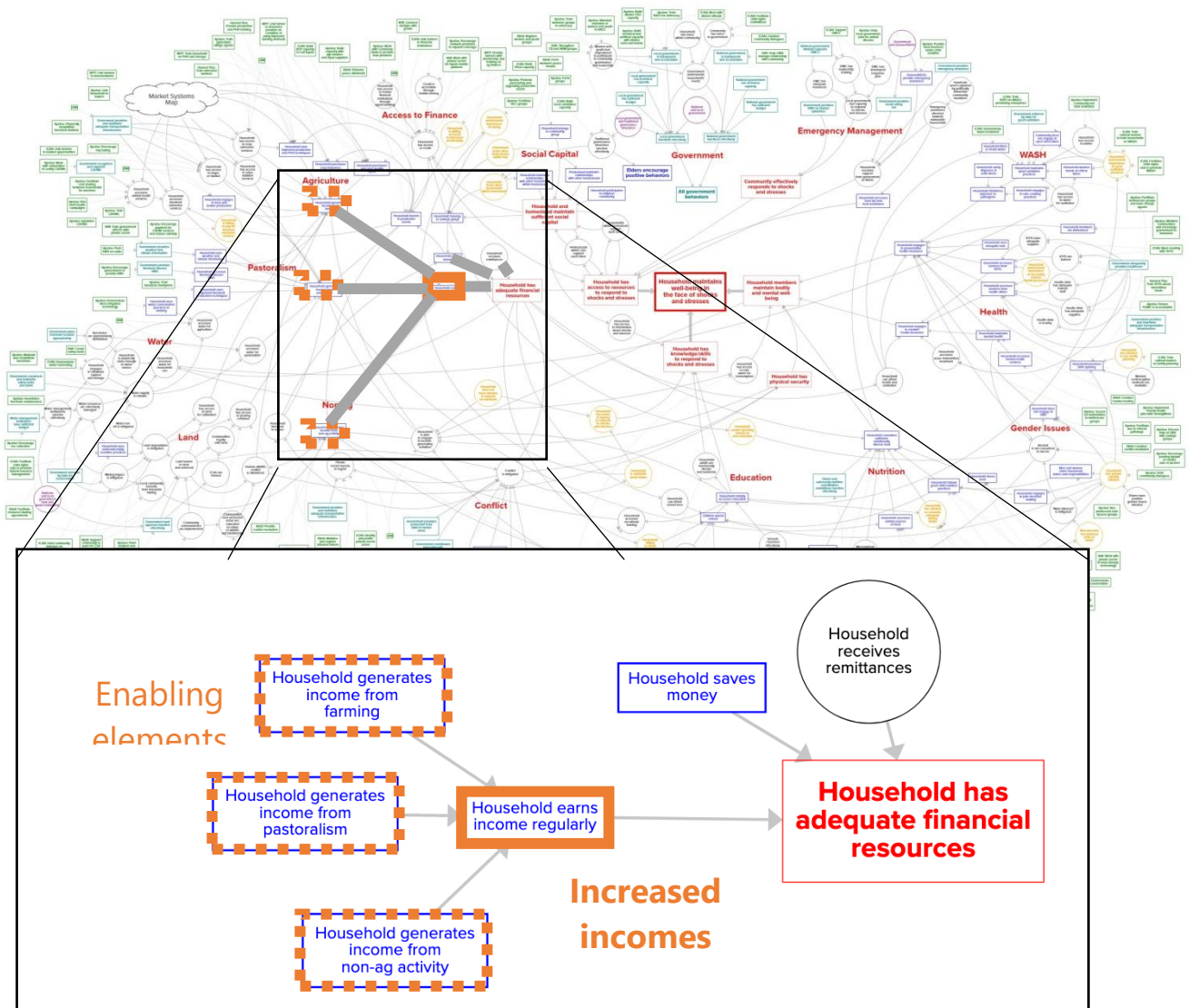## MAPPING KARAMOJA CLUSTER HIGH-LEVEL OUTCOMES

EXAMINING THE HIGH-LEVEL OUTCOMES ON A SYSTEM MAP

This section explores how we can see high-level outcomes on a system map. This is important because we can then use the system maps to further explore how to achieve the high-level outcomes, and what interventions are currently contributing to the outcome.

We will look at the Karamoja Cluster High-Level Outcome of "Increased incomes". The concept of "Increased incomes" appears in various places on the three maps. Let's first take a more detailed look at the household resilience map.
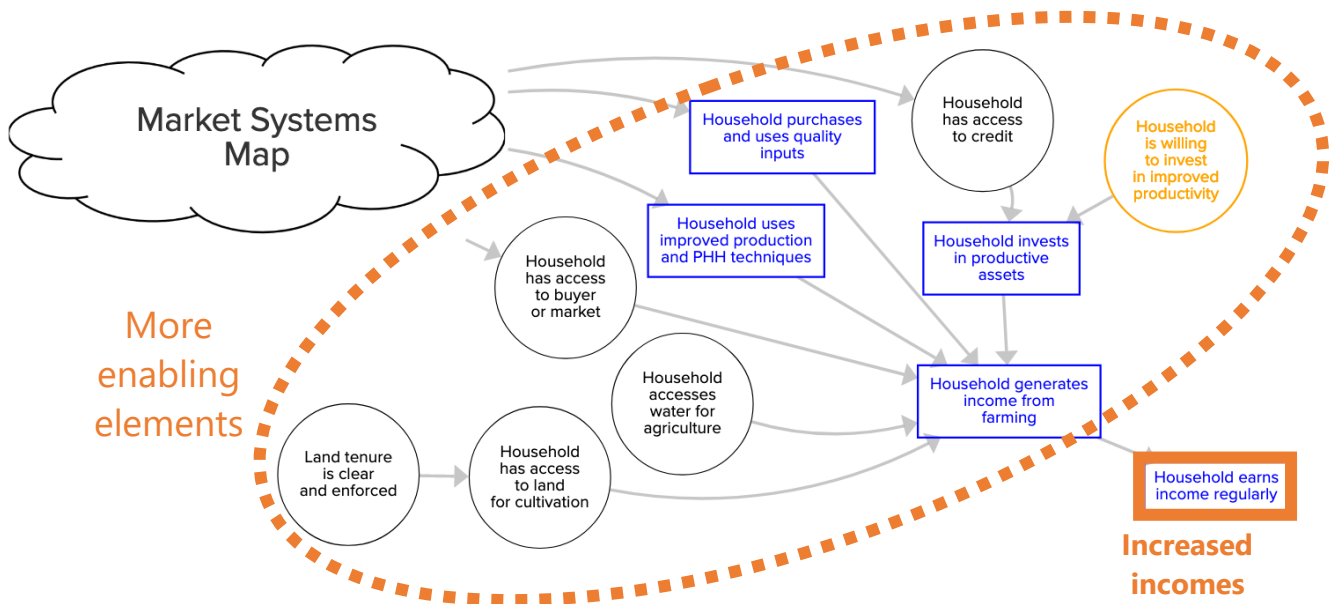
Karamoja Household Resilience Map

In the inset below, we can see the concept of "Increased incomes" between the three key income generating activities, appearing as "Household earns income regularly". We can also see where this shows up in the broader map. In this document, we've shown this with some screenshots from the map, but this can be viewed dynamically in Kumu, the free online tool used to create and view these maps.

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Earning income regularly is enabled by three elements – "Household generates income from farming", "Household generates income from pastoralism", and "Household generates income from non-ag activity". It also enables the broader outcome (in the case of this map, a Key Outcome element) of "Household has adequate financial resources", which is also enabled by "Household saves money" and "Household receives remittances". As an aside, if we're interested in income generation, we might also be more broadly interested in financial resources, and it may be useful to consider household savings and remittances as well.

However, for the Karamoja Cluster, the high-level outcome has already been set as simply "Increased incomes", so let's look at what enables that.

Right away, we can see many more enabling elements – elements with connections pointing to "Household generates income from farming". Note that the actual household resilience map has been simplified for this image – on the full map, there are even more enabling elements.

The elements that enable "Household generates income from farming" will be important to consider when working to achieve the broader "Increased incomes" outcome. Are they being adequately addressed? Do we have enough information to assess them? For example, many conditions could be satisfied ("Household uses improved production and PHH techniques", "Household accesses water for agriculture", etc), but income generation may be limited if "Household invests in productive assets" is not satisfied. This, in turn, could be in difficulties with "Household has access to credit", or "Household is willing to invest in improved productivity". In this sense, the systems map can be used as a sort of root cause analysis to examine why certain outcomes may not be met.
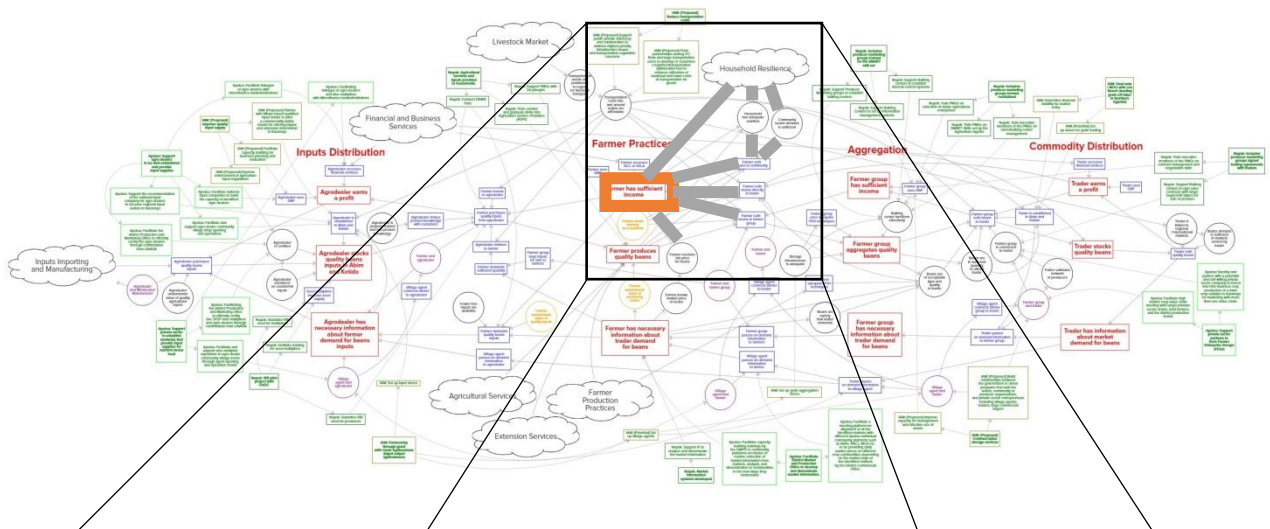
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Some of these elements are in turn enabled by market conditions, shown by the "Market Systems Map" cloud. This cloud is a simplification of the market system, and indicates that it would be useful to look at the Market Systems Map for more information about that element. For example, "Household purchases and uses quality inputs" will be enabled by whether there are quality inputs in the market, represented as a connection from the "Market Systems Map" cloud.

Thus, it makes sense to also look at "Increased incomes" on the Karamoja Beans Market Systems Map. While the ag map is focused specifically at the beans value chain in Abim and Kotido, there are more general concepts that are useful for this example. By looking at the beans map, this is like "zooming in" on a specific component of income generation.

Karamoja Beans Market System Map

Like with the household resilience map, we can see where "Increased incomes" fits within the beans market system. The full beans market system map is shown below, with a zoomed-in portion focusing on the part that represents "Increased incomes".

Here we can see "Increased incomes" being represented as the Key Outcome "Farmer has sufficient income". Enabling these are sales through different channels ("Farmer sells beans to community", "Farmer sells beans directly to trader", "Farmer sells beans to farmer group"), "Farmer accesses SILC or VSLA", and "Farmer receives fair price for beans". We can also see the connection to the "Household Resilience" cloud – representing the household resilience map – via nutrition and community demand.

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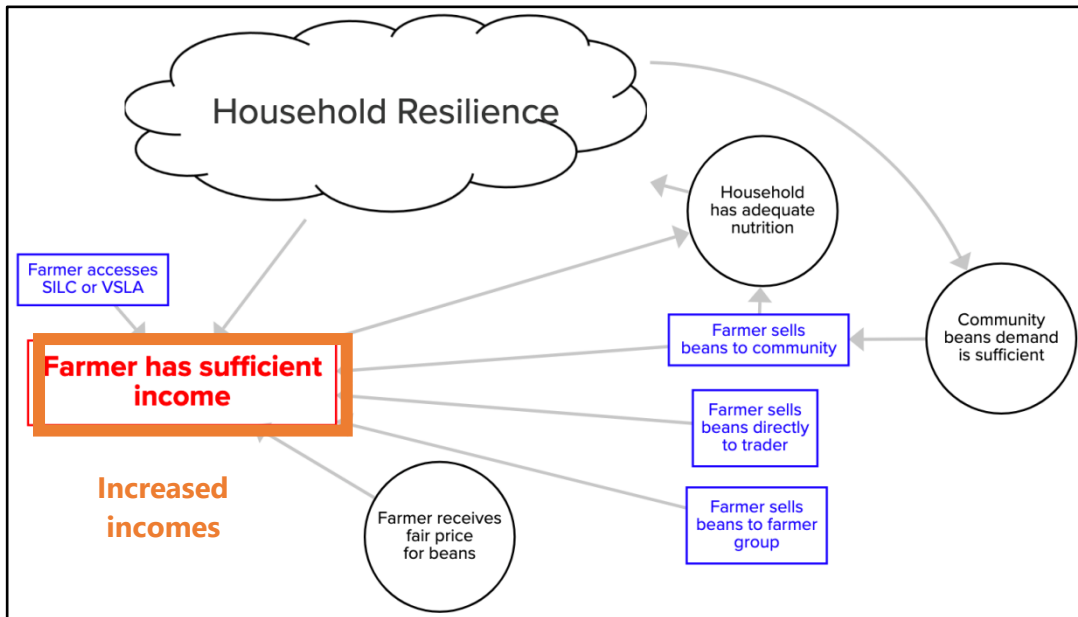
Of course, beans sales have many enabling elements. Looking just at one channel – "Farmer sells beans to farmer group" – we can see how other dynamics influence farmer income, and could provide insight on why this outcome is or isn't being achieved.
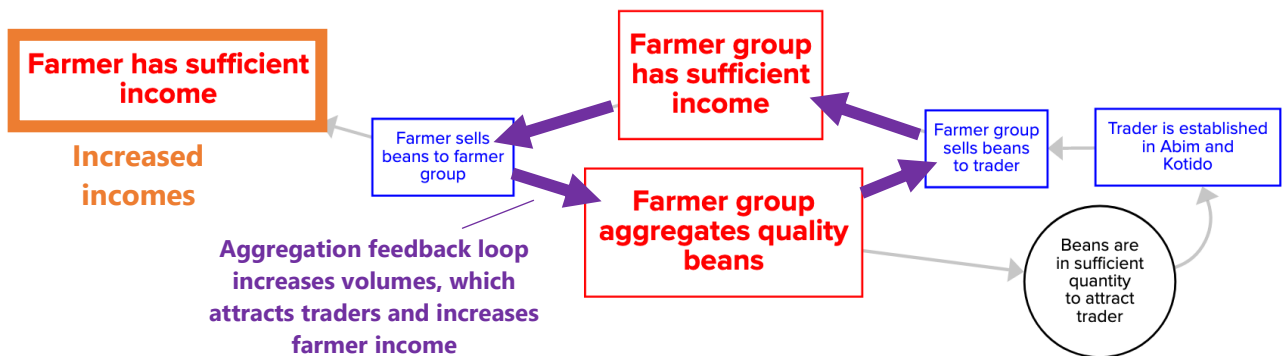
"Farmer sells beans to farmer group" is enabled by "Farmer group has sufficient income", which is in turn enabled by "Farmer group sells beans to trader". For sales to a trader to happen, the trader needs to be in the region. Thus, "Farmer group sells beans to trader" is enabled by "Trader is established in Abim and Kotido", which in turn is enabled by "Beans are in sufficient quantity to attract trader". This shows how producing and sells beans in large enough volumes can enable increased incomes for the farmer.

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As with the example from the household resilience map, looking at these enabling elements can help us examine a high-level cluster outcome, and help determine where more work may be needed to contribute to the outcome.

EXAMINING THE MEASURES OF SUCCESS ON A SYSTEM MAP

This section explores how we can find Measures of Success on a system map. This is important because we can use the system map to infer the status of these measures, and from this infer the status of the high-level outcomes. This shows how systems maps can help us learn about different aspects of the system even with limited data.

Just as we can see the high-level outcomes on a system map, we can also see their Measures of Success. The Karamoja Cluster High-Level Outcome "Increased incomes" has the following Measures of Success:

- EG 10.2-3:   Number of people with improved economic benefits derived from sustainable natural resource management and/or biodiversity conservation as a result of USG assistance (B4R, UBF)

- EG.3.2-26:   Value of annual sales of producers and firms receiving USG assistance (Apolou, MENU, Nuyok, IAM, B4R)

- EG.3.2-27:   Value of agriculture-related financing accessed as a result of USG assistance (IAM)

- EG.3.2-19:   Value of small-holder incremental sales generated with USG assistance (MENU, Nuyok)

- EG.3.2-25:   Number of hectares under improved management practices or technologies with USG assistance [IM-level] (IAM)

- 1B: Percentage of households with diversified sources of income as a result of USG assistance (ICAN, B4R)

- M SUB IR 1.4:   Diversity of sources of household income (Nuyok)

These can all be shown on the system maps, and the system maps can be used to examine which interventions might be impacting specific measures. This document will only take a detailed look at two measures of success in detail – *EG.3.2-26 Value of annual sales of producers and firms receiving USG assistance*, and *1B: Percentage of households with diversified sources of income as a result of USG assistance* – but all the others, including the measures from the other high-level outcomes, can be placed on the map in a similar way.
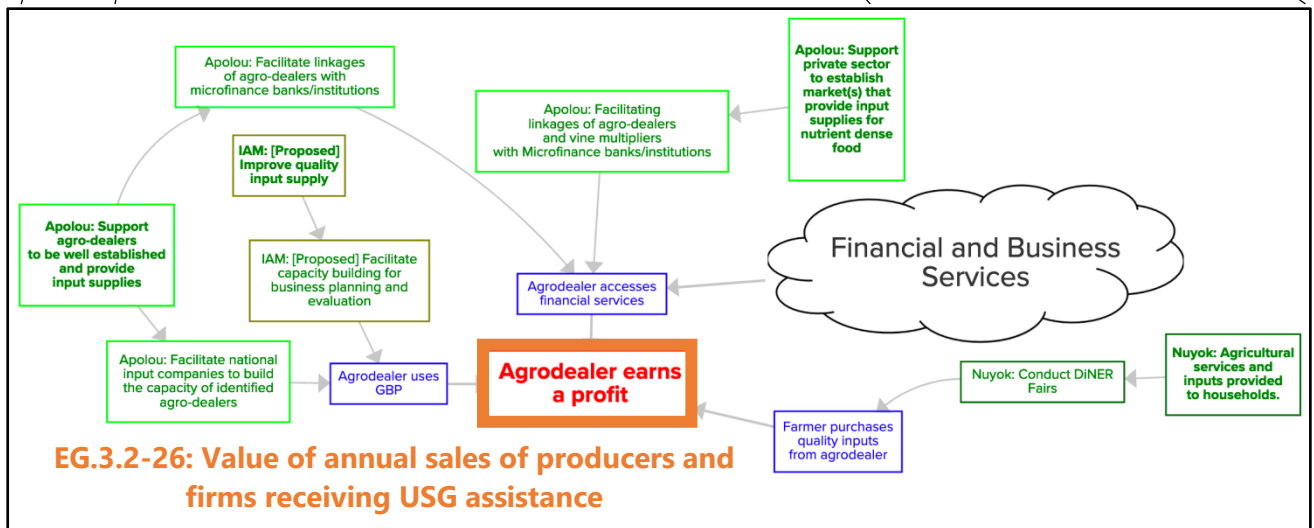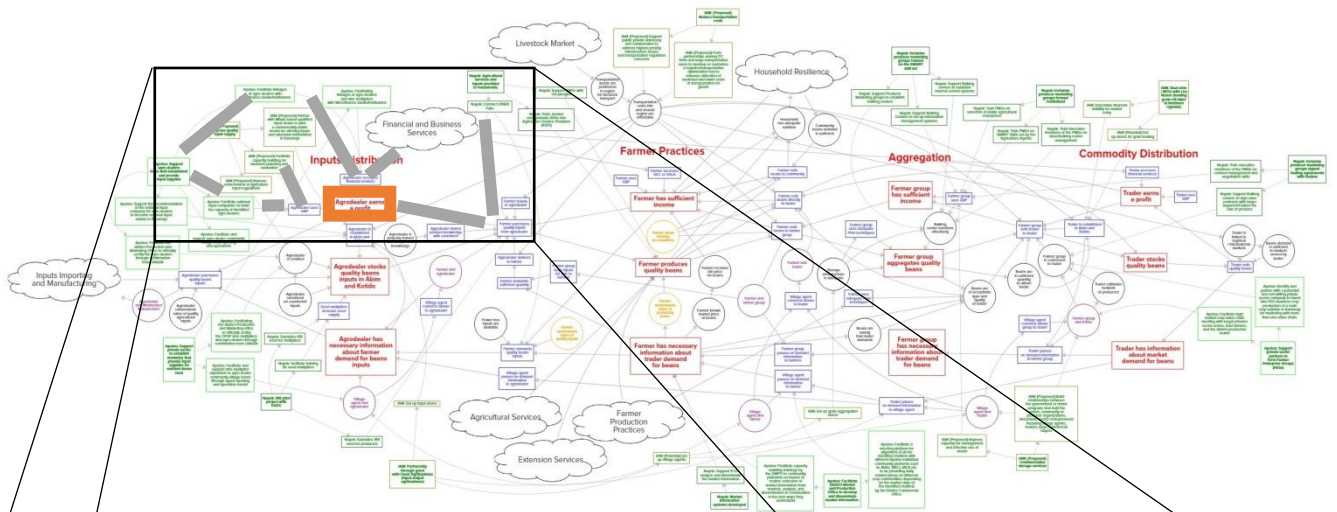
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Value of annual sales of producers and firms receiving USG assistance

"Value of annual sales of producers and firms receiving USG assistance" shows up most clearly on the beans market map, as the elements "Agrodealer earns a profit", "Farmer has sufficient income", "Farmer group has sufficient income", and "Trader earns a profit". We'll choose just one for this example.

Zooming in on "Agrodealer earns a profit" on the beans market system map, we can see not only the elements that enable it, but also some of the interventions that are intended to influence it, shown in green. As before, note that some elements have been omitted from this zoomed-in screenshot for clarity.


EG.3.2-26: Value of annual sales of producers and firms receiving USG assistance

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If we have data for any of these elements, we can assign them statuses. A good place to start is with interventions and the elements they point at, as this is where we might be most likely to have data. For example, we might know from Apolou's intervention "Facilitating linkages of agro-dealers and vine multipliers with Microfinance banks/institutions" that some, but not all, agrodealers access financial services. We might then assign this element a "yellow" status. For more information about assign statuses to elements, see the MSM activity's Market System Measurement Toolkit.

We might also know from Nuyok's intervention "Conduct DiNER Fairs" that farmers rarely purchase quality inputs from agrodealers. This would lead us to assign a "red" status to the element "Farmer purchases quality inputs from agrodealer". Likewise, we might know from IAM's proposed intervention "Facilitate capacity building for business planning and evaluation" and Apolou's intervention "Facilitate national input companies to build the capacity of identified agro-dealers" that some, but not all, agrodealers use good business practices. Thus, the element "Agrodealer uses GBP" would be assigned a "yellow" status. Had any of these elements been healthy – meaning that they are true for the majority of actors – they would have been assigned a "green" status.

The assigned statuses are shown in the image below.
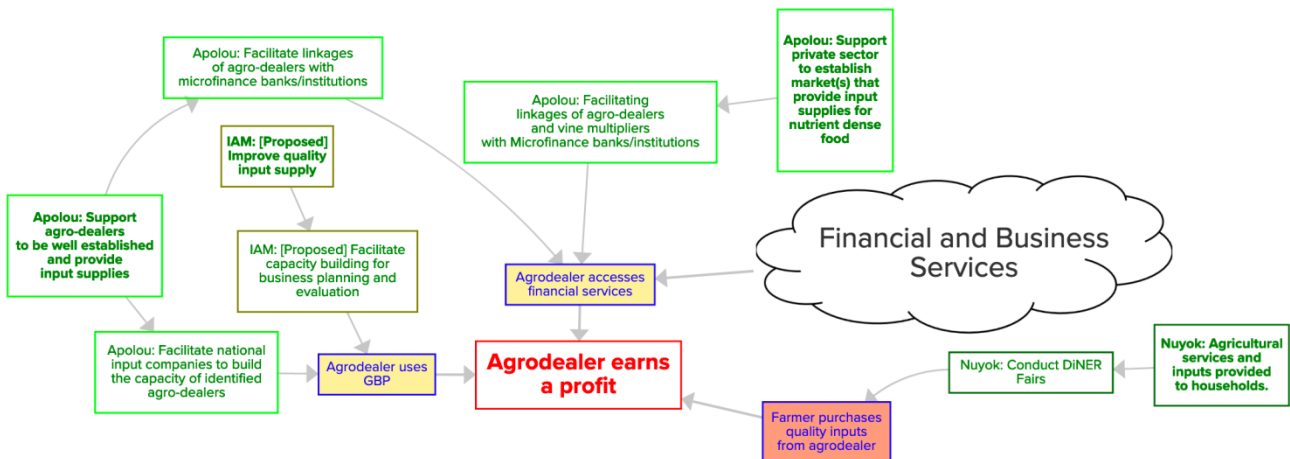
From this, we can infer a couple of insights. First and most importantly, our Measure of Success element "Agrodealer earns a profit" is likely "red". In absence of direct information about this element's status, we can infer its status from its enabling elements.

Secondly, we can also predict the downstream effects of this Measure of Success' status. If "Agrodealer earns a profit" is red, it's likely that "Agrodealer purchases quality beans inputs", and subsequently "Agrodealer stocks quality beans inputs in Abim and Kotido", "Farmer purchases quality inputs from agrodealer", and "Farmer produces quality beans" are also red. In other words, we can infer farmer quality bean production from agrodealer profitability.

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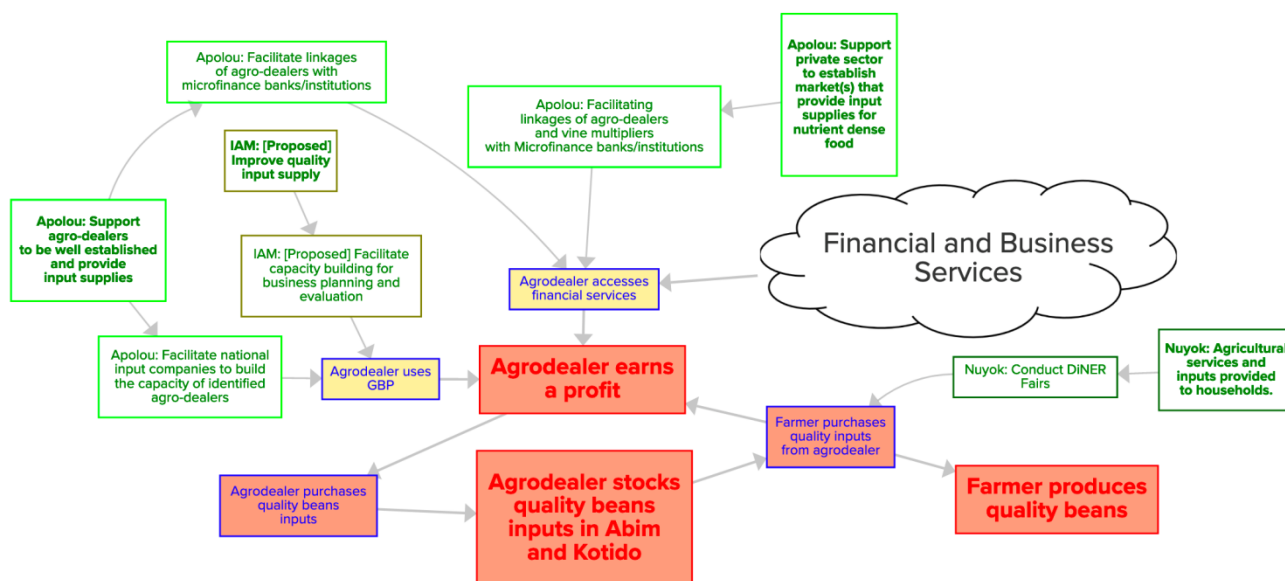
While this example is oversimplified, it indicates how Measures of Success can be used to examine broader parts of the system.
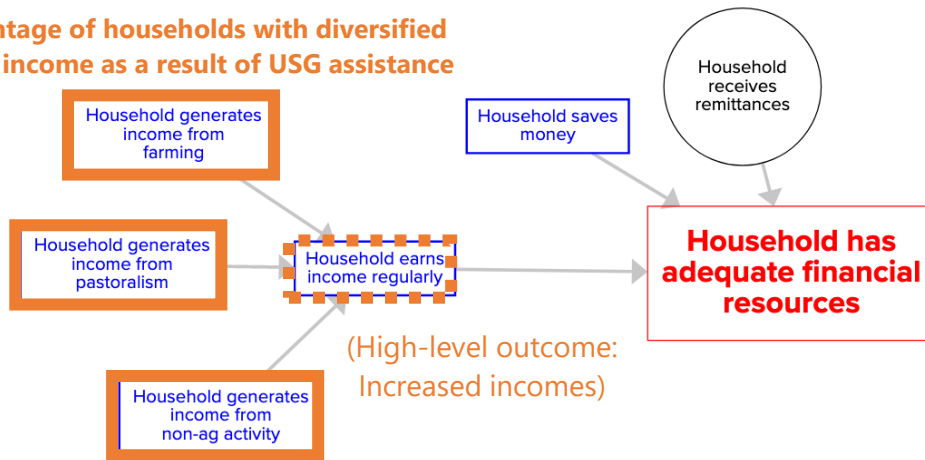
As an aside, we also see the element "Agrodealer accesses financial services", which captures the Measure of Success "EG.3.2-27: Value of agriculture-related financing accessed as a result of USG assistance". Other than the two interventions pictured, the main thing enabling this element is the "Financial and Business Services" cloud. This cloud element represents the more detailed Financial and Business Services subsystem, which is available in full in the Uganda-wide Agriculture Market Systems map, available here: https://kumu.io/MSM/usaid-uganda-ftf-msm-activity-agricultural-market-system-map. This map can be used to explore more detailed pathways relating to Financial and Business Services, and by extension, the Measure of Success "EG.3.2-27: Value of agriculture-related financing accessed as a result of USG assistance".

Percentage of households with diversified sources of income as a result of USG assistance

We can also place the Measure of Success "1B: Percentage of households with diversified sources of income as a result of USG assistance" on a system map. It shows up most clearly on the household resilience map, and we've already taken a look at this earlier in the document. The image below shows this Measure of Success in the context of the high-level outcome – which we've already looked at in the previous section.
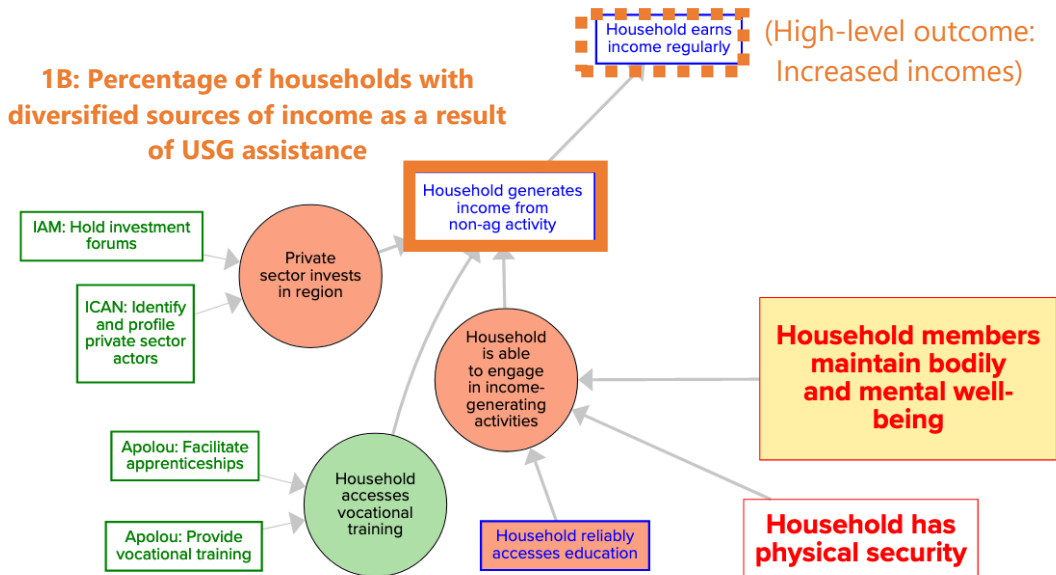
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1B: Percentage of households with diversified sources of income as a result of USG assistance

Household generates income from farming

Household saves money

Household receives remittances

Household generates income from pastoralism

Household earns income regularly

Household has adequate financial resources

Household generates income from non-ag activity

(High-level outcome: Increased incomes)

To examine the measures of success further, we can zoom in on just one income source and apply the same analysis as in the previous example.

As we can see below, "Household generates income from non-ag activity" has a few enabling elements, some with a few specific interventions from activities. Now, consider the case where we have information about some of these enabling elements, but not the Measure of Success itself. We can use the system map to infer the status of the Measure of Success.

Household earns income regularly

(High-level outcome: Increased incomes)

1B: Percentage of households with diversified sources of income as a result of USG assistance

Household generates income from non-ag activity

IAM: Hold investment forums

ICAN: Identify and profile private sector actors

Private sector invests in region

Household is able to engage in income-generating activities

Household members maintain bodily and mental well-being

Apolou: Facilitate apprenticeships

Apolou: Provide vocational training

Household accesses vocational training

Household reliably accesses education

Household has physical security

For example, we might have information that indicates "Private sector invest in region" is red (very limited investment), "Household accesses vocational training" is green (nearly all households access vocational training), "Household reliably accesses education" is red (very few household access education), and "Household members maintain bodily and mental well-being" is yellow (some

household members maintain good health). From this, we can infer that "Household is able to engage in income-generating activities" is red, since one of its key enabling elements is also red. We can then infer that "Household generates income from non-ag activity" is also red – even though the household may access vocational training, limits on private sector investment and the ability to actually engage in work will limit the household's ability to generate income from a non-ag activity.

Of course, this example is also hypothetical and simplified, but it shows how a system map can be used to infer the status of a Measure of Success without actually having data specifically for it.