



CITY REGION FOOD SYSTEM TOOLKIT

Assessing and planning resilient and sustainable city region food systems

Guidance: Analysis of In-depth assessment findings

Brief description	This tool sets out a logical process for analysing the findings of the In-depth assessment for the multi-risk track, allowing the project team to make sense of the answers to the qualitative research questions.
Expected outcome	The project team is able to analyse the findings of the In-depth assessment, identifying which risk determinants (exposure, vulnerabilities, (lack of) resilience capacities), and which drivers of these risk determinants, result in the most serious risks to the CRFS.
Expected output	A clear picture of the most serious risk determinants and their drivers, which may be priorities for action planning.
Scale of application	Project level
Expertise required	Project management
Examples of application	
Year of development	2021
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Relevant CRFS Handbook modules; related tools, examples and activities	In-depth assessment module

Full description and justification

This tool sets out a logical process for analyzing the findings of the In-depth assessment for the multi-risk track. While the assessment itself allows the project team to answer the qualitative research questions, the analysis enables them to make sense of those answers.

The process involves, firstly, building up a picture of the risk of impacts on the CRFS from specific hazards based on the risk determinants detected; and secondly by considering the knock-on implications of the impacts on assets, people, ecosystems, culture that are most vulnerable and have least resilience capacities, across all CRFS components.

As a result of this analysis it will be possible to identify which risk determinants (exposure, vulnerabilities, (lack of) resilience capacities), and which drivers of these risk determinants, result in

the most serious risks to the CRFS. These may be priorities for action planning (possibly alongside other criteria) with the aim of increasing overall CRFS resilience.

1 How to analyze the findings

- 1) Using the tool *Developing a research method for the in-depth assessment*, project teams will have drawn up a set of quantitative and qualitative research questions for each of the priority areas and related indicators.

The table used for this process can be adapted to include three new columns: one for answers to the research questions; one to build up a story by taking into account the answers to the *what, how, who, which* questions; and one for the drivers that are identified from the answers to the *why* questions.

For example, the indicator and research questions in Table 1 below are related to Kigali's priority area: *'Farmers would like to have a more affordable and subsidized irrigation system'*. The project team has already identified that lack of irrigation system is a risk determinant for farmers in the CRFS to be impacted by drought, but there was no information on the current state of irrigation equipment by farmers – i.e. who has systems and who does not; where they are; what kind of systems are being used and by whom; are the present irrigation systems suitable or not; and why these farmers have systems and others do not.

Finding out which groups of farmers have / have not (suitable) irrigation systems tells the project team which groups of farmers have more or less resilience capacity to the impacts of drought; finding out any underlying social, economic and environmental factors associated with these groups of farmers tells the team about vulnerabilities; finding out where these farmers are located (in a drought prone area or not) tells the team about exposure to the drought hazard.

Once the team knows all these pieces of information they will be able to build a narrative of which farmers (as well as their livelihoods, assets, infrastructure, and ecosystems on which they rely) are most at risk of negative impacts of drought, using the model $\text{risk} = \text{hazard} + \text{exposure} + \text{vulnerabilities} + \text{resilience capacities}$ (see *Risk assessment explanation*)

The answers to the why questions – why some people have irrigation systems and why some do not – point to the drivers of resilience capacity and any underlying vulnerability. For example:

- Some people may have irrigations systems because they could take out loans to purchase equipment; others have no loan collateral, or are not considered eligible by banks due to their gender or status as a female head of household. In this case, inequitable access to loans or other finance is a driver that needs to be addressed in the action planning.
- Some farmers received visits from extension agents who shared with them knowledge or skills in rainwater irrigation methods that they were able to implement cheaply and easily themselves. However a shortage of extension agents in other areas meant others did not receive the same detailed guidance and have not been able to make changes on their farms.

In this case, poor extension agent:farmer ratio is the driver that needs to be addressed in action planning.

Table 1: Example of how answer to research questions contribute to story development and identification of drivers of risk determinants

Indicators	Research questions	Answer	Vulnerabilities	Resilience capacities	Driver of risk determinant (exposure, vulnerabilities, resilience capacities)
1. (Increase in) proportion of hillside farmers who are equipped with water harvesting techniques for irrigation purposes during dry season at community and household level	<i>Quantitative</i> What proportion of hillside farmers are equipped with water harvesting techniques for irrigation purposes during dry season at community and household level?				
	<i>Qualitative</i> Who are the hillside farmers who are equipped with water harvesting techniques? Which water harvesting techniques are the farmers equipped with? By age? Gender? Socio-economic group? District? By crop?				

	<p>Are the present water harvesting techniques (and irrigation systems) suitable or not;</p> <p>Why do these farmers have access to water harvesting techniques?</p> <p>Why do others not?</p>				
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NOTE: This tabulation of answers is a working document only. For the report of the in-depth assessment the vulnerabilities, lack of resilience capacities, their drivers, and the implications for the CRFS as a whole (point 2 below) should be written up as narrative by priority area and indicator.

- 2) The next step is to consider the implication of each of the vulnerabilities, lack of resilience capacities for the CRFS as a whole. To do this, it may be helpful to refer to the tool *Understanding food systems*.

You will need to:

- i. identify the actual or likely knock-on impacts on other food value chain nodes. For each knock-on impact you will need to build up a picture of risk, considering the exposure, vulnerabilities, and resilience capacities.
- ii. consider the impacts on the outer circle of contextual components (food security and nutrition, social inclusion and equity, environmental and eco-system services; livelihoods and economic development).

Consequently, you will be able to see which of the vulnerabilities/lack of capacities have relatively localized impacts on the CRFS and which have the widest impacts, across multiple parts of the CRFS.

Box 1 contains a step-wise process for identifying actual or likely knock-on effects; Box 2 contains an example fictional food systems analysis.

Box 1: Identifying knock-on impacts of vulnerabilities / lack of resilience capacities through the food system

NOTE: It is strongly recommended that the exercise of identifying implications for the CRFS be conducted by the core team rather than the project coordinator in isolation. This is because no one person has a complete understanding of all areas of the food system, and several people will be able to complement each other's ideas by drawing on their experiences and expertise. It may also be necessary to call on experts to give their opinion if the core team lacks the knowledge to identify potential impacts on certain components, especially those in the outer (contextual) circle.

This exercise is conducted for each identified vulnerability/resilience capacity in turn.

First, the team needs to identify knock-on impacts of the hazard's initial impact within the value chain (see Figure 1):

1. Label the stakeholders who are vulnerable to the initial impact as V0.
2. Identify the direct value chain contacts of the stakeholders who are vulnerable to the initial impact, such as their suppliers and their customers. Label these stakeholders V1.
3. Consider how each of the V1 stakeholders – and the assets, infrastructures, livelihoods, and ecosystems on which they depend – might be impacted if the original vulnerability leads to the predicted impacts of the hazard. Consider their vulnerabilities and resilience capacities in the face of this impact to build up a picture of the risk of the impact occurring.

Box 2: Example scenario of knock-on effects of impacts on the CRFS, considering precise vulnerabilities / resilience capacities**Initial impact:**

Due to heavy rain, farmland beside the river is flooded. This land is used to grow vegetables by women- and marginal farmers who have been unable to secure use of land elsewhere; the farmers lose their entire seasonal crop, and with it their income.

The loss of crops and income has serious food security implications for the farmers and their families; it also prevents them from contributing to the local economy.

The floods, coming on the back of drought earlier in the same year, caused significant soil erosion and nutrient loss. This amounts to impaired environmental and ecosystem services, and will have implications on future production on the riverside land.

Knock-on impact 1:

The women and marginal farmers usually sell their tomatoes to middle-men, who suffer a knock-on impact on their livelihoods as they cannot source sufficient quantities to sell on. However, they are able to adapt to some extent by raising prices.

The impact on the middle-men's livelihoods has implications for livelihoods and economic development.

Knock-on impact 2a:

The shortage of vegetables means processors whom the middle-men supply must acquire raw materials at a higher price, thereby affecting their margins. They are unable to secure enough tomatoes to continue operations for two months, so have to let some of their staff go.

This has implications for livelihoods and economic development. There is also a risk that the laid-off staff and their families may become food insecure.

Knock-on impact 2b:

Processed vegetables are usually supplied to high-end retailers or restaurants. The lack of local supply means the retailers buy from suppliers in other regions that were not affected by the rains. This resilience capacity (adaptation) means the risk to the retailers is minimal; the next season the retailers continue to buy from the alternative sources, meaning the processors have lost their market and experience negative impacts on their livelihoods in the longer term.

The producers find they are unable to sell their next harvest (which is smaller due to nutrient loss) because of the loss of the processor market. This leads to increased organic and food waste. It also compounds the previous implications on livelihoods and economic development and food and nutrition security of farmers and their families.

Knock-on impact 3a:

The middle-men usually sell some of the tomatoes to stall holders in the central market, where most of the customers are low- and lower-middle income households. The middle-men already sold almost all the vegetables to the processors, who were able to pay higher prices, meaning there is a shortage of vegetables on the market for a season. Some stall-holders have alternative sources that are able to breach the gap, but with supply and demand out of step prices are 10% higher. Since the market already had to close for a week when the trading floor was flooded, leading to lost business, few traders have resources available to absorb the higher cost (resilience capacity).

(Box 2 continued)

Knock-on impact 3b:

Low and lower-middle income consumers are unable to afford the higher prices for fresh vegetables. They buy fewer vegetables than previously, limiting their selection to cheapest varieties.

The vegetables that are available at the household level are reserved for the men and the boys; this has implications for food and nutrition security of women and girls; undernourishment leads to girls' under-performance at school, with potential implications on livelihoods and economic development in the long-term. It also perpetuates social and economic inequality.

2 Criteria for selecting priorities for action planning

- 3) The third step is to determine some criteria against which you will select possible priorities for action planning. Remember that action planning addresses the drivers of the vulnerabilities / lack of resilience capacities.

Considering the food systems approach of this project, it is suggested that the primary criterion be the breadth of the impact on the CRFS – that is, the number of CRFS components affected. (You could rank the vulnerabilities on a scale of 1-10, with 10 representing the number of components in the CRFS diagram).

Possible alternative or additional criteria are:

- the proportion of a stakeholder group affected by the vulnerability/lack of capacity, as per the answer to the quantitative question.

E.g. if the answer to the question, 'what percentage of farmers are equipped with water harvesting techniques at community and household level?' is 60%, 40% may be vulnerable/lack capacities.

NOTE: This is somewhat crude as there may be multiple vulnerabilities/lack of capacities that prevent farmers (for example) accessing the early warning system.

There is also a risk of overlooking the needs of the poorest/most vulnerable minorities and perpetuating inequalities. For example, if 90% of farmers have access to early warning systems and only 10% of farmers do not, it is likely that the 10% is made up of the most vulnerable and excluded people in the food system.

- the effect on specific group(s) of people who are vulnerable / lack capacities, such as women, elderly, religious groups, OR those that affect people who are most exposed to a hazard (due to geographical location)

- the number of vulnerabilities/lack of capacities caused by driver [if there are recurring drivers].
 - the drivers that, at first glance, seem more straightforward to address considering the stakeholders and government departments that are engaged in the project and their priorities. It is recommended that this is not the sole criteria, however, as new capacities to address other drivers are likely to be identified at the multistakeholder workshop to kick-off action planning.
- 4) If you base your selection of drivers to be prioritised based on just one of the above criteria it will be quite straightforward to identify the drivers by looking at the results of point 2 above or by looking at your completed table of answers / drivers.

If you wish to take more than one criteria into account, it may be helpful to plot the drivers on a scatter chart.

In the chart below, the potential priority drivers to be addressed through action planning are determined by considering the greatest number of vulnerabilities/lack of capacities caused (y axis) and the total number of CRFS components affected (x axis). The most promising candidates are located towards the top right of the chart.

