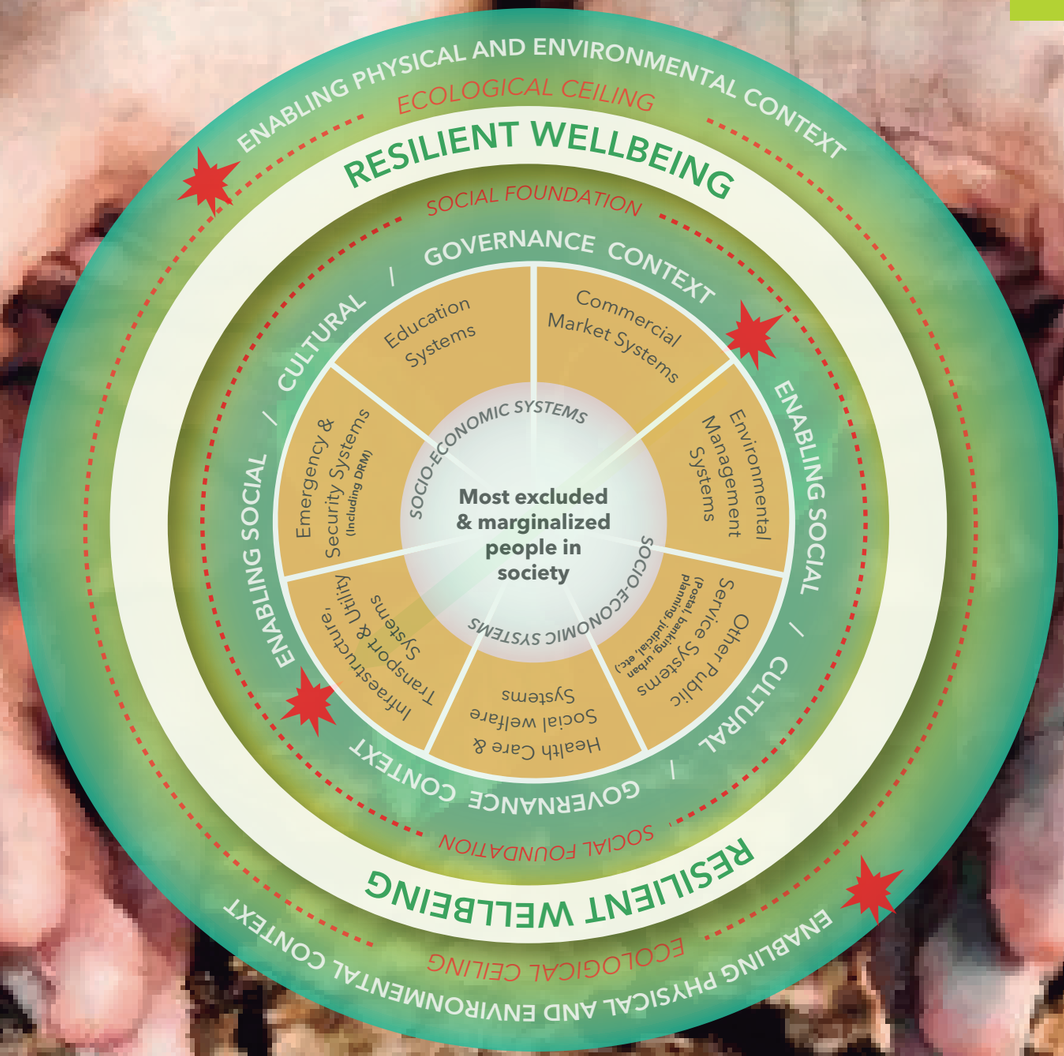
RESILIENCE FOR SOCIAL SYSTEMS

R4S APPROACH
USER GUIDANCE MANUAL
MAY 2019 - PRELIMINARY EDITION



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Credits

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"The R4S is an Innovative Practical Approach for Alligning Human Efforts to Achieve More Resilient and Inclusive Societies"

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Acronyms

ARC-D	Analysis of Resilience of Communities to Disaster
BA	Barrier Analysis
CHS	Core Humanitarian Standard
DBC	Designing for Behaviour Change
DCED	Donor Committee for Enterprise Development
DDG	Digital Data Gathering
DFRs	Determinant Factors of Resilience
FGD	Focal Group Discussions
KAP	Knowledge, Attitude and Practices
KPIs	Key Performance Indicators
LAC	Latin America and the Caribbean
LQAs	Lot Quality Assurance Sampling
M&E	Monitoring & Evaluation
M4P	The Making Markets Work for the Poor Approach
OECD	Organisation for Economic Co-operation and Development
PME	Participatory Monitoring and Evaluation
PMEAL	Participatory Monitoring, Evaluation, Accountability and Learning
R4S	Resilience for Social Systems
RAM	Risk Assessment Matrix
RSM	Resilient Systems Matrix
SAC	Social Auditing Committee
SAM	Stakeholder Assessment Matrix
SAs	Supervision Areas
SBC	Social and Behaviour Change
SBCC	Social & Behaviour Change Communication
SEM	Social Ecological Model
ToC	Theory of Change
WASH	Water, Sanitation and Hygiene
WEE	Women's Economic Empowerment

A Introduction

Who is GOAL?

GOAL is an international humanitarian and development organization founded in Ireland in 1977. Since its inception, GOAL has responded to most of the world's major humanitarian crises, working with vulnerable communities in more than 60 countries. GOAL believes that by building on the inherent capacities of communities and strengthening the systems in which they live and work, then poor and vulnerable households will achieve greater resilience and wellbeing.

Figure 1. GOAL's approach to inclusive societies and resilient wellbeing

GOAL has been developing practical guidance on resilience measurement and analysis since 2010. GOAL published the Analysis of Resilience of Communities to Disaster (ARC-D) Toolkit in 2014 and subsequently published an updated version in 2016 following 2 years of field testing in 11 countries. Over the past 10 years GOAL has also been developing learning and innovations in building resilience of informal urban settlements and coastal communities dependent on the Blue Economy and also developed a number of tools relating to Disaster Early Warning and Response. In 2016 GOAL completed the first Resilience for Social Systems (R4S) Approach guidance manual and has been applying this approach in its programmes as an internal publication in the Latin America and Caribbean region over the past 2 years in small scale fisheries and a number of other market systems aswell as in socio economic systems relating to water governance and risk management systems in advance of this publication. In 2018 GOAL established a Resilience Innovation and Learning Hub (RILH) as a dynamic and collaborative platform to continue to foster learning and innovation in resilience within the organization and with the wider development and humanitarian community.

GOAL is grateful to the support from the IrishAid Programme Fund to complete this updated publication of the Resilience for Social Systems Approach Guidance Manual.

True to the approach described for the R4S, the development of this guidance manual is also an adaptive management process and it is envisaged that this manual will evolve and improve as new learning emerges. GOAL welcomes suggestions and constructive feedback at the following address; resilience@goal.ie, and will be happy to recognize significant contributions to the development of the guidance in future revisions.

What is 'R4S'?

'R4S' *or* **Resilience for Social Systems** is an approach developed by GOAL for analysing the resilience of socio-economic systems. GOAL recognizes that societies are made up of socio-economic systems which service the needs of their populations and that addressing recurrent crises and effectively building resilience requires an integrated systems approach. Where these systems are fragile and large portions of the population are socially or economically marginalized, communities are highly susceptible to external shocks and stresses; coordination among stakeholders to strengthen these systems will ultimately improve resilience and lead to resilient and inclusive development. *R4S* is an innovative approach to design and guide interventions which aim to work towards more resilient and inclusive societies using systems thinking and social and behaviour change techniques.

The R4S approach to resilience helps to understand how various system components (stakeholders (including the Target Group), resources, regulations) interact and interconnect, as well as assessing the potential impacts from risk scenarios. In other words, when applying the R4S Approach to building resilience, the User can anticipate better how natural hazards can trigger economic shocks, how conflicts can leave people more exposed to additional shocks or stresses (e.g., an outbreak of cholera can be triggered when water, sanitation and hygiene systems are destroyed or become inaccessible), and how long-term stresses such as environmental degradation can lower agricultural productivity, weakening food security and income levels, and impacting a household's ability to pay for health care or education. GOAL strives to strengthen understanding of these dynamics, to enable better programming that addresses root causes of constraints rather than symptoms alone.

The *R4S Approach* is based on best practice in Systems Thinking, Network Theory, Scenario Thinking[1], Social and Behaviour Change[2], Inclusion and Resilience approaches and provides a logical step by step process for assessing resilience of socio-economic systems. This Guidance Manual draws on GOAL's experience over 40 years in responding to major humanitarian crises and operating in fragile contexts as well as GOALs work over the past 10 years in developing innovations and practical approaches in resilience measurement and analysis. The approach will continue to be improved with continued

1 Refer to Glossary of Terms to Annex 1.
2 For further information on Behaviour Change refer to Annex 3

application in different contexts and sectors. This Guidance manual can be downloaded from GOALs website (www.GOALGlobal.org) and GOAL invites those interested in contributing to the development of the *R4S* approach to contact GOAL via email at resilience@goal.ie and to engage in GOALs Resilience Innovation and Learning Hub (www.resiliencenexus.com).

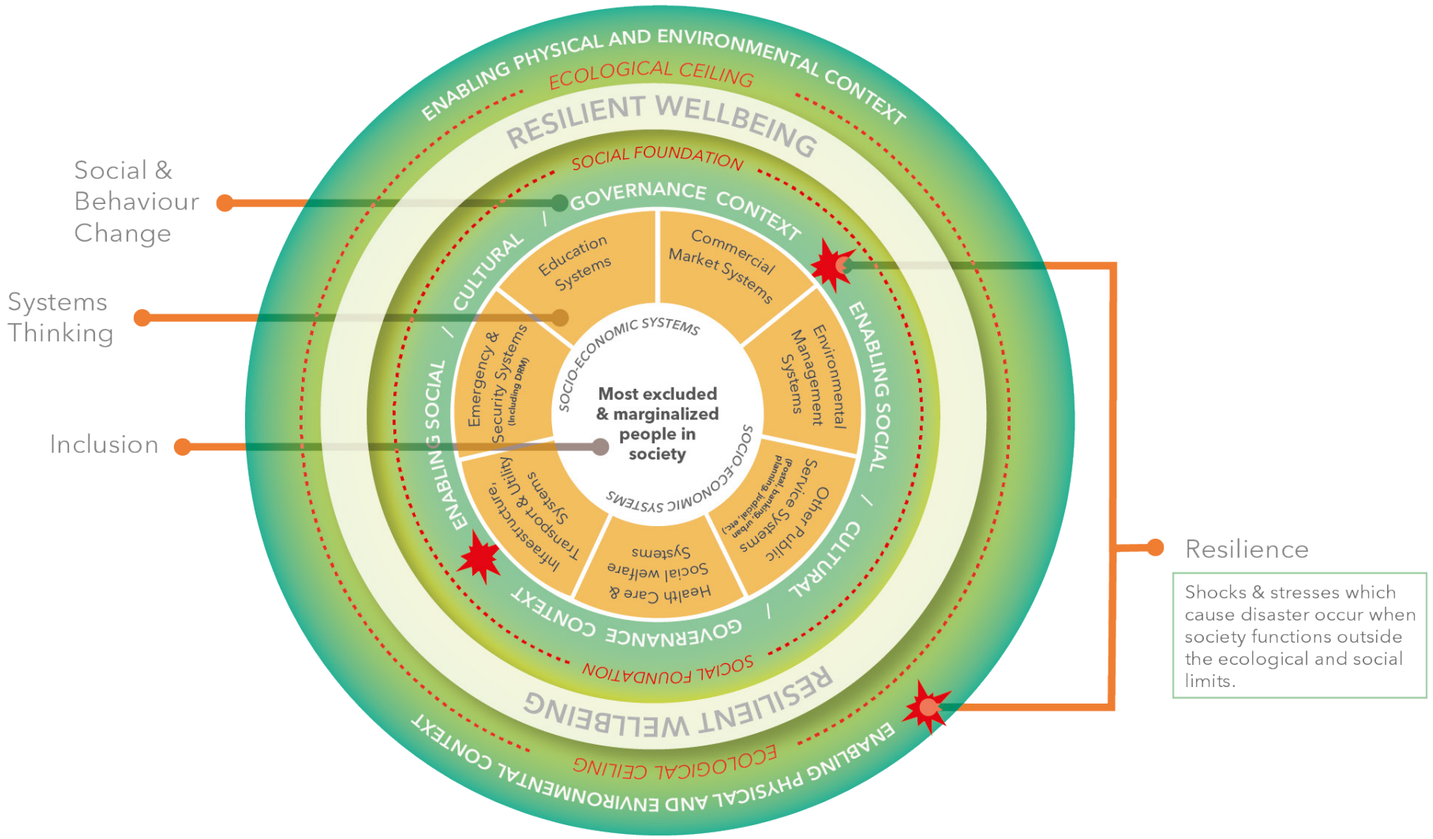
R4S is designed to be applied to assess a socio-economic system's resilience in a *pre-crisis, emergency or post-crisis* state. It is designed for assessing socio-economic systems that involve interacting and interdependent actors, where both non-commercial and commercial transactions take place, and where the Target Group is found either on the receiving end of an Input/output System Transaction Chain, as a 'recipient' of a service (e.g., healthcare, education, security services, etc.) or product (equipment, food items, etc), or at the beginning of a Transaction Chain, as 'producers' of goods and services or at any point in between.

GOAL's *Analytical Framework for Resilience of Social Systems* is described in GOALs *Resilience Wheel* which is shown in ***Figure 2***. It depicts the Target Group in the middle of the Resilience Wheel, operating within and interacting with socio-economic systems[3] that influence the Target Group's overall well-being, which are in turn immersed in a general and broader encompassing context (composed of two levels[4] –the 'Social/Cultural/Governance' enabling environment and the 'Physical and Environmental' one). The objective of the *R4S* Approach is to build/strengthen the resilience of critical socio-economic systems through effective programme designs and interventions to contribute to the resilience and inclusiveness of the overall broader encompassing context.

This framework recognizes that for societies to be resilient and inclusive they must exist in the niche space which is bounded by upper limit of the ecological ceiling defined by sustainable extraction from the environment and also by the social foundation defined by ensuring minimum level of access to basic services and social welfare.

3 First middle rim of *Resilience Wheel* labeled 'Socio-Economic Systems' (Refer to Figure 1)

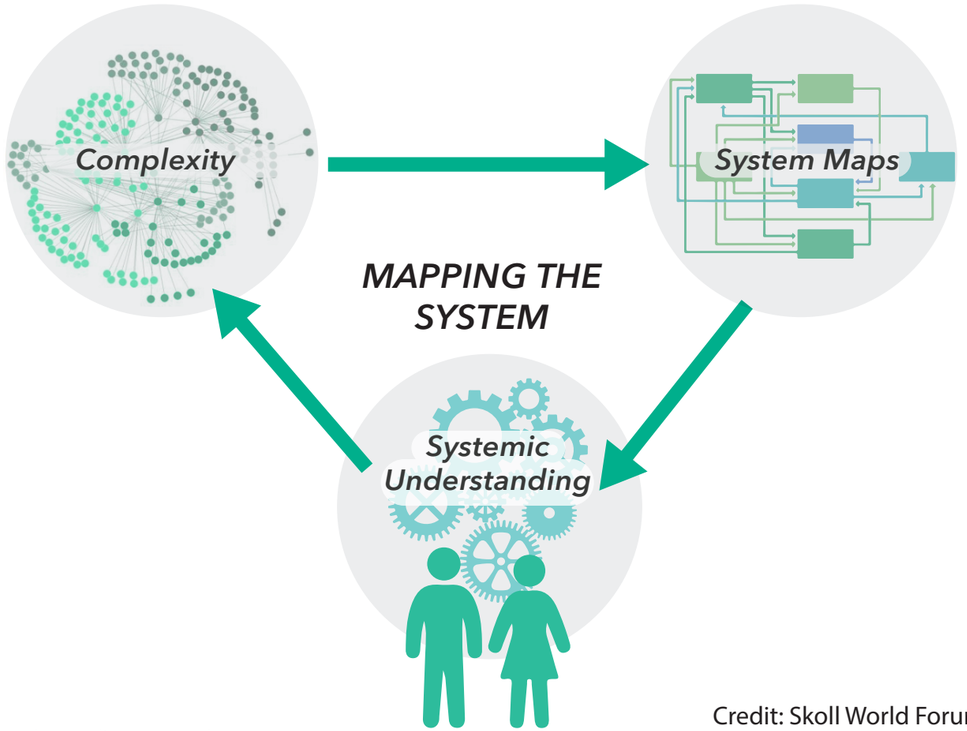
4 Two outer rims of Resilience Wheel labeled 'Enabling Social/Cultural/Governance Context' and 'Enabling Physical and Environmental Context' (Refer to Figure 1)



7 Categories of Socio-Economic Systems (Resilience Wheel)

1. Education Systems
2. Emergency & Security Systems (includes Disaster Risk Management)
3. Infrastructure, Transport & Utility Systems
4. Health Care and Social Welfare Systems
5. Commercial Market Systems
6. Environmental Management Systems
7. Other Public Administration Systems (Urban planning, judicial, etc.)

Figure 2. GOAL's Resilience Wheel



Credit: Skoll World Forum

Figure 3. Systemic understanding to complex systems

Why was it developed?

Shocks and stresses impact on social systems and reverse hard-earned development gains disproportionately affecting the poorest and most vulnerable. Resilience of vulnerable populations to risks is related to how well critical social systems are functioning for vulnerable populations in normal times and during and after crisis. The *R4S Approach* was developed to inform a resilience approach to the implementation of humanitarian and development interventions by improving understanding of socio-economic systems and how they react to shocks and stresses. Humanitarian and development programmes which do not account for the resilience of vulnerable groups or the socio-economic systems on which they depend are much more likely to result in negative unintended consequences in the short and/or long-term. The *R4S Approach* intends to address this need by providing a mechanism for selecting and analysing the current resilience state of critical socio-economic systems and provide recommendations on how to build or strengthen the resilience of these systems, ultimately contributing to more inclusive and resilient societies.

How is it different from other diagnostic tools?

The *R4S Approach* applies Systems Thinking, Network Theory, Scenario Thinking, Social and Behaviour Change, Inclusion and Resilience tools to provide a practical and structured step by step process to assess the resilience of complex socio-economic systems. One of the central innovations in *R4S* is its mapping tool which aims to improve understanding of complex socio-economic systems and facilitate analysis of these systems. *R4S* also provides new guidance on analysing determinant factors of resilient systems including Connectivity, Diversity, Redundancy, Governance, Participation and Learning.

How can it be used?

The *R4S Operational Guide* has been designed as a diagnostic tool which compliments other systems development best practice approaches such as the *Making Markets Work for the Poor (M4P) Approach* published by The Springfield Centre for Business in Development[5]. R4S may be used in conjunction with GOAL's Analysis of Resilience of Communities to Disaster Toolkit (ARC-D)[6]. The *ARC-D Toolkit* is a structured community consultation toolkit to analyse characteristics of disaster resilient communities to give a comprehensive overview of resilience of a community. The application of the *ARC-D Toolkit* serves as a valuable entry point into systems and behaviour change analysis. Each of its 30 components of a disaster resilient community can be correlated with the socio-economic systems shown in *GOAL's Resilience Wheel* (see ***Figure 2***). The ARC-D assessment can be interpreted as a "vital signs" check on critical systems for disaster resilience and can be used as an indicator of how well these systems are functioning for communities and in this way inform the selection of critical socio-economic systems to build resilience.

The Making Markets Work for the Poor (M4P) Approach is one of the most widely used (worldwide) of the market systems development approaches[7] and it converges naturally with resilience building of socio-economic systems. The *Resilience for Social Systems (R4S) Operational Guide* directly complements M4P, particularly informing the diagnostic processes of M4P to achieve the systemic and behavioural change needed to achieve inclusive and resilient socio-economic systems.

The application of the R4S Approach in a Humanitarian context needs specific consideration on the timing to not compromise a humanitarian lifesaving imperative. Nonetheless, it is recommended that R4S is a very relevant approach for informing humanitarian interventions to

5 Download the Making Markets Work Approach Synthesis document at https://www.springfieldcentre.com/a-synthesis-of-the-making-markets-work-for-the-poor-m4p-approach/

6 Download the ARC-D at https://www.goalglobal.org/disaster-resilience or visit http://resiliencenexus.org/ where resilience measurement assessments applying the ARC-D toolkit are available.

7 Market systems approaches: A literature review (BEAM Exchange, December 2014)

mitigate negative impacts on existing social systems and also to promote early recovery and facilitate transition from relief to longer term recovery and development.

The *R4S Approach* can also be theoretically utilized to analyse the resilience and function of organizational systems and processes, particularly for larger complex organizations, to analyse operational systems and how these are likely to function in response to shocks and stresses.

Who should use the R4S Approach?

Any organization in the process of shaping its thinking in resilience or which needs a comprehensive understanding of socio-economic systems.

National and local governments and authorities who want to understand the disaster resilience of key systems to identify areas of weakness and better coordinate their efforts and those of organizations working in their functional areas.

Investors, private businesses and business networks who want to maximise the contribution of their commercial activities to building inclusive and resilient societies.

Organizations active in advocacy and government agencies shaping policy in favour of inclusive and resilient societies.

What are the Final Products from the Application of the R4S Approach?

The *R4S Approach* is designed to be a flexible tool and can be applied in whole or in part. For example, it can be applied to guide a stakeholder analysis, map an existing socio-economic system or guide a longer-term adaptive management process of systems change to build resilience.

The R4S Approach is an iterative approach and a full application of a single iteration should produce an assessment report which is based on a process of close collaboration with the key system stakeholders. R4S is designed to produce graphic and structured data which is easy to digest and without the need for lengthy descriptive text. An R4S report should include a summary of the main analysis, results and products of each component of the guidance in the most appropriate visual way possible. The main products expected from the R4S and which can be incorporated into the report are:

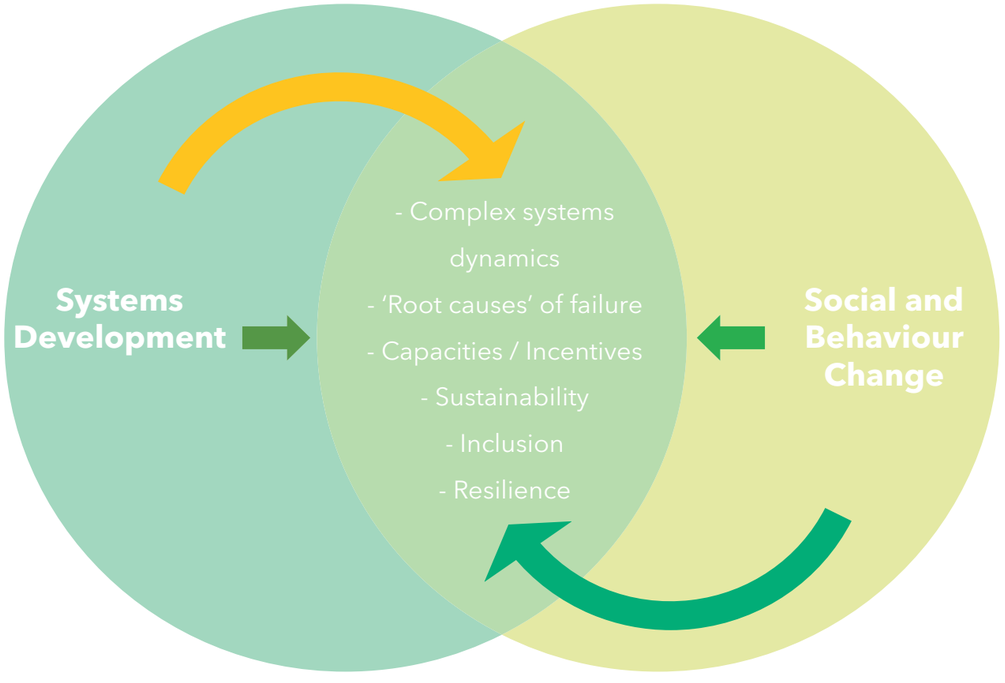


Figure 4. Systems development and social behaviour change for resilience and inclusion

1. Matrix on the Selection of the socio-economic System
2. Stakeholder Assessment Matrix(SAM) for System Mapping
3. Resilience Assessment Matrix (RAM)
4. Resilient System Matrix (RSM)
5. Maps of the selected socio-economic system
   - 5.1 Current System Map
   - 5.2 System's Vulnerability Maps
   - 5.3 Geographic Hazard Map (where this is Relevant)
   - 5.4 System Change Map
   - 5.5 Stakeholder Engagement Map
6. Causal Loop Diagrams for current system analysis and for system theory of change
7. Results Chain for an intervention
8. Strategy for Participatory Monitoring, Evaluation, Accountability and Learning

Applying social & behaviour change and systems development to achieve inclusive and resilient societies

Systems Development and Social & Behaviour Change are *overlapping and complementary*. Both approaches deal with *complex systems* and aim to address the *'root causes'* of underperformance of socio-economic systems and recognize the importance of the *capacities and incentives* in being able to effectively address the root causes of vulnerabiity and exclusion. *System dynamics*, or

the interaction/interdependence, cause and effect links and power structures at different levels in the same system, are identified by both. Likewise, both understand that they *interact and are interdependent with other complex systems* (USAID). *From the R4S perspective inclusion* and *resilience* of the most vulnerable, is a key element where these two approaches meet. *(Refer to* ***Figure 4****).*

Given that behaviours are influenced by a person's context and are not entirely isolated practices or actions on an individual level, SBC approach considers the Social Ecological Model (SEM)[8], where individual behaviours take place at an intrapersonal (i.e. individual level) level but also can be impacted and influenced by higher levels such as an interpersonal level, community level, organizational level and finally at a system level. By considering these 5 social spheres on the SBC programming, behaviours are more likely to change and be sustainable by identifying and analysing 12 determinants[9] influencing the Target Group at individual and higher levels and designing evidence-based and culturally relevant interventions including Social and Behaviour Change Communications. Sensitive to the fact that individual behavioural changes cannot take places if determinants and barriers such as social norms, cultural practices and policies are interfering with the promoted behaviour, the Designing for Behaviour Change (DBC) approach breaks down determinants and links them to Social & Behaviour Change Communication (SBCC) tailored to the reduction or removal of specific barriers, within the Designing for Behaviour Change framework.

In other words, R4S recognizes that individuals, families and communities are not islands, they live and function within multiple complex socio-economic systems (commercial market systems, healthcare and social welfare systems, public administration systems, etc) that they affect and are affected by. The stronger these systems are, the more capacity communities have to achieve their development goals and the more resilient they will be when facing adversity. On the contrary, the weaker and less inclusive these systems are, the more vulnerable they will be to disturbances.

In the same way when systemic change is broken into its constituent parts it is fundamentally about behaviour change of the system actors. Also, having an overall picture of the system informs specifically what behaviours need to change. A key factor, that is often overlooked, is the critical importance of people's level of confidence in a social economic system in catalysing changes in their behaviour. If people believe that a system is inclusive and functional then they are much more likely to adapt their behaviours to conform to behaviour that supports the functioning of that system.

Thus, systems development and social and behaviour change are two sides of the same coin and by applying Systems Thinking, Social & Behaviour Change approach simultaneously in development and humanitarian programmes interventions will be more effective at reducing dependence on external aid (including during times of crisis) and building resilience and inclusion.

8 `MODULE 1: What are the Social Ecological Model (SEM), Communication for Development (C4D)?' https://www.unicef.org/cbsc/files/Module_1_SEM-C4D.docx

9 'Designing for Behaviour Change: A Practical Field Guide' (2017) http://fsnnetwork.org/sites/default/files/designing_for_behaviour_change_a_practical_field_guide.pdf

B The Resilience for Social Systems (R4S) Approach

Structure of the R4S Approach

The *Resilience for Social Systems (R4S) Approach* is structured into five key components as follows:

Component 1: *Identification and selection of critical socio-economic system(s).*

Component 2: *Mapping of the current status of selected socio-economic system(s).*

Component 3: *Identification of principal risk scenarios with potential to impact the selected socio-economic system(s).*

Component 4: *Resilience analysis and synthesis of selected socio-economic system(s) considering 6 Determinant Factors of Resilience (DFRs).*

Component 5: *Participatory Monitoring, Evaluation, Accountability and Learning*

The R4S Approach Guidance Manual also includes a number of annexes providing detailed guidance on the type of information that needs to be gathered per Component and the methods and techniques and instruments to use in the data gathering process.

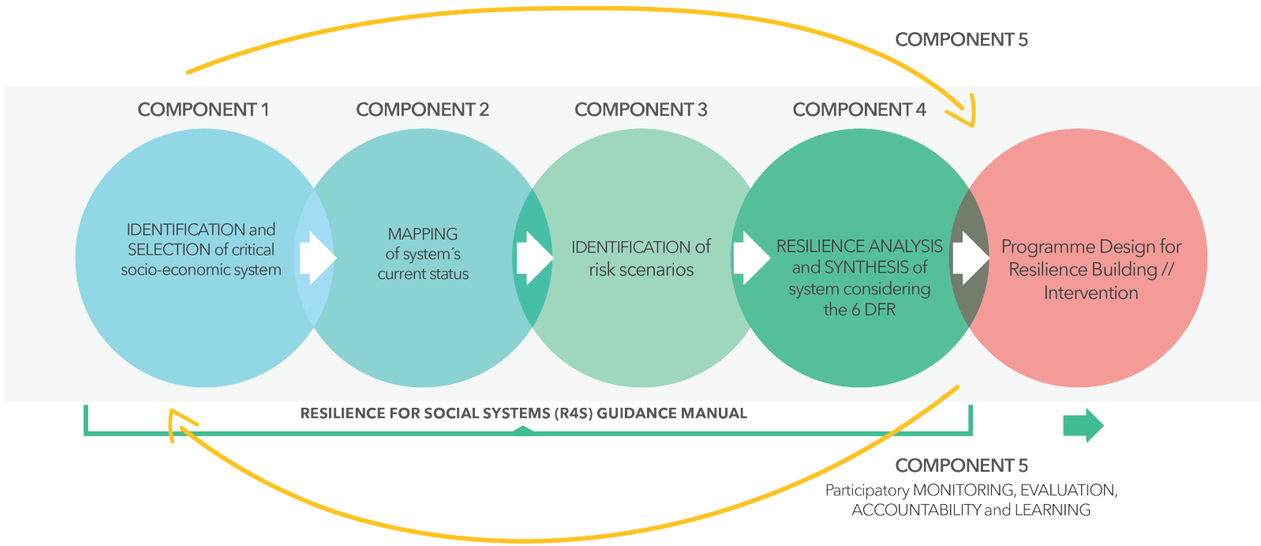


Figure 5.Upper right figure. Key Componets of the Resilience for Social Systems (R4S) Approach

Figure 6.Steps of the R4S Approach shown across all Components

COMPONENT 1
IDENTIFICATION & SELECTION OF CRITICAL SOCIO-ECONOMIC SYSTEM(S)

- **STEP 1.1** Context analysis
- **STEP 1.2** Determine target group
- **STEP 1.3** Identify the shocks and Stresses to which the Target Group are exposed
- **STEP 1.4** Identify and Analyse the Socio-Economic Systems Associated with the Chosen Form of Resilience Building
- **STEP 1.5** Determine 'Key Performance Indicators' (KPIs) of Selected Critical Socio-Economic System

COMPONENT 2
MAPPING OF THE CURRENT STATUS OF SELECTED SOCIO-ECONOMIC SYSTEM(S)

- **STEP 2.1** Overall System Functions (using the M4P Donut)
- **STEP 2.2** Transaction Chain Map
- **STEP 2.3** Stakeholder Consultation and Assessment
- **STEP 2.4** Current Systems Map

COMPONENT 3
IDENTIFICATION OF RISK SCENARIOS

- **STEP 3.1** Determine Scope of Risk Analysis
- **STEP 3.2** Determine Primary Risks and Secondary Risks (Cause and Effect)
- **STEP 3.3** Prioritize Risk Scenarios according the probability of Occurrence and level of Impact on System Function

COMPONENT 4
RESILIENCE ANALYSIS OF SYSTEM USING THE 6 DFR

- **STEP 4.1** Analysis of the impact of the selected Risk Scenarios on the System
- **STEP 4.2** Resilience Assessment against the 6 Determinant Factors of Resilience
- **STEP 4.3** Develop Vision for System Change
- **STEP 4.4** Stakeholder Engagement Strategy and Results Chain

COMPONENT 5
PARTICIPATORY MONITORING EVALUATION ACCOUNTABILITY AND LEARNING

- **STEP 5.1** Set the basis for a Participatory Monitoring, Evaluation, Accountability & Learning (PMEAL) for socio-economic system development.
- **STEP 5.2** Monitoring & Evaluation
- **STEP 5.3** Resilience Measurement and Adaptive Management
- **STEP 5.4** Accountability & Learning

COMPONENT 1 Identification and Selection of Critical Socio-Economic System(s) for Resilience Building

In order to reduce poverty and increase access to basic services for vulnerable populations in a way that enables these populations move towards resilient wellbeing, the specific socio-economic systems most relevant to the Target Group must be identified in order to select the most critical system(s) to develop through programme interventions.

It is important to recognize two different perspectives on resilience which are key to understanding the R4S approach. First, there is the perspective of the Target Group and the key considerations regarding the risk scenarios to which they are exposed which is addressed primarily in Component 1. Here the Risk Scenarios which directly impact on the Target Group are identified. These risk scenarios will then be used to inform the selection of the socio- economic systems which are most relevant to building resilience of the Target Group. The other key perspective relates to the resilience of the system and the risk scenarios to which the system is exposed which may be different to those of the Target Group and this is addressed under Component 3. In other words, resilient and inclusive socio-economic systems contribute to resilient and inclusive communities and societies. Note that often both perspectives may identify the same risk scenarios. ***Figure 7*** summarizes these two perspectives.

Therefore, for Component 1, to identify and select critical socio-economic systems the Target Groups perspective on resilience is the most relevant and for Components 2, 3 and 4 the perspective of the system is more relevant. The process for identifying and selecting the critical socio-economic system builds upon the *M4P Approach*[10] with the incorporation of a resilience lens. Hence, the selection of the most critical system(s) (directly affecting the Target Group), is based on four key elements: *Relevance, Opportunity, Feasibility and Resilience*. *(Refer to **Figure 8** below).*

COMPONENT 1

IDENTIFICATION & SELECTION OF CRITICAL SOCIO-ECONOMIC SYSTEM(S)

STEP 1.1 Context analysis

STEP 1.2 Determine target group

STEP 1.3 Identify the shocks and Stresses to which the Target Group are exposed

STEP 1.4 Identify and Analyse the Socio-Economic Systems Associated with the Chosen Form of Resilience Building

STEP 1.5 Determine 'Key Performance Indicators' (KPIs) of Selected Critical Socio-Economic System

Implementers of the *R4S Approach* may decide to select more than one critical socio-economic system at a time and work to develop them simultaneously through programme interventions. If the socio economic system has already been selected, for example through ongoing established programme interventions and the R4S Approach is being used to assess the resilience of that system then Skip Component 1 and proceed directly to Component 2.

STEP 1.1 –Context Analysis

Getting Started

What is needed to get started

**Secondary and Primary Information*

*For the elaboration of Component 1 it is recommended to investigate and review all relevant key secondary information. The user may also need to carry out consultations with key informants or carry out high level investigations in the field should the secondary information be incomplete or unreliable. For Steps 1.3, 1.4 and 1.5 users may gather primary information by performing 'ad-hoc' visits in the field to key actors or through field instruments applied to a reduced population sample. (Refer to **Annex 3: Synthesis Table of Data Gathering Process for further guidance)***

A general context analysis of the target region, country or province must be carried out utilizing the existing secondary information including a preliminary analysis of the general risk landscape. This will identify and increase understanding of the key issues of the economic, social,

10 'Basis for market systems selection', Operational Guide for The Making Markets Work for The Poor (M4P) Approach, Second Edition, 2015

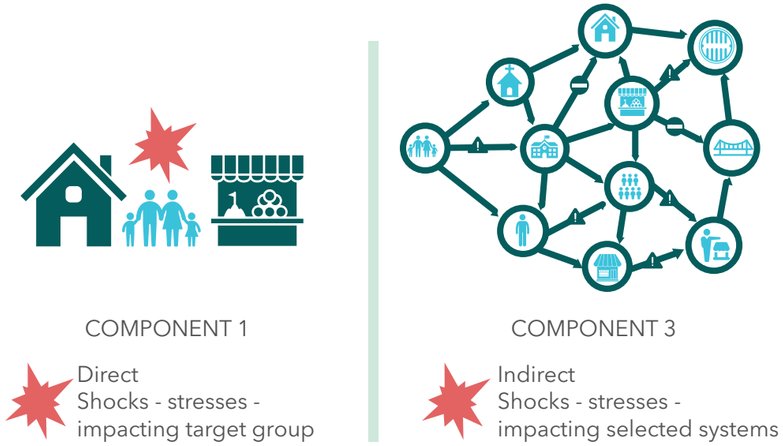


Figure 7. The two perspectives on Resilience – that of the Target Group (DIRECT) and that of the selected Socio-Economic System (INDIRECT)

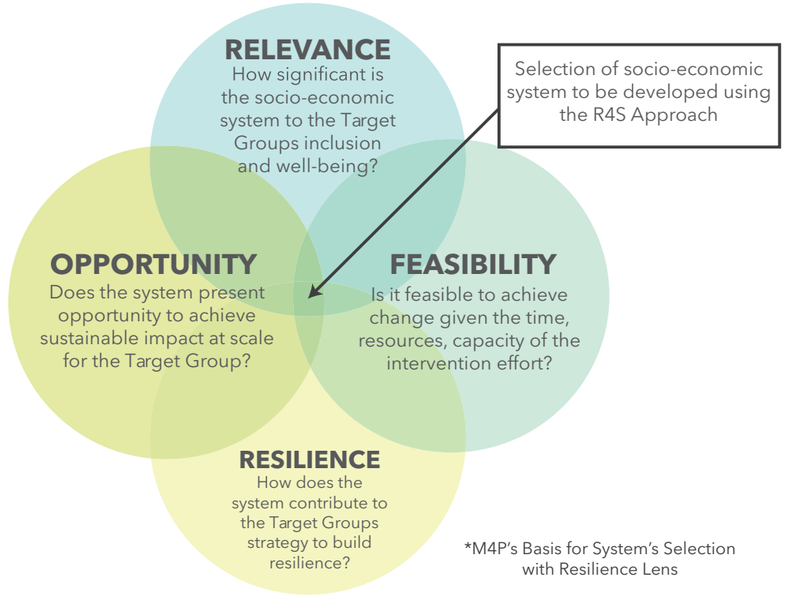


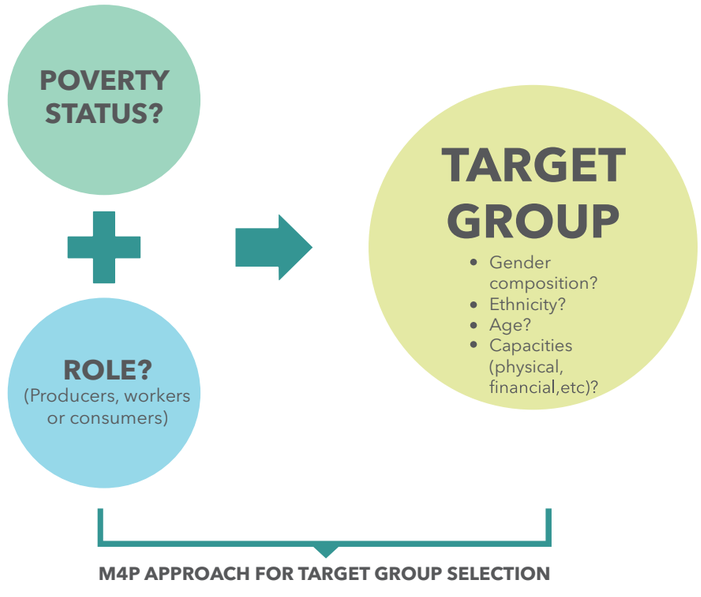
Figure 8. Basis for Socio-Economic System Selection with Resilience Lens, adapted from the Making Markets Work for the Poor (M4P) Approach

political, environmental, health, geopolitical, technological, infrastructure context and other aspects of the Target Group and the area of particular interest. Use GOAL's Resilience Wheel and ARC-D Toolkit to inform the process of determining what data is to be analysed. Once a good understanding of the context exists, proceed to select the Target Troup. *(Refer to **Annex 5: Key Questions Component 1**)*

STEP 1.2 – Determine Target Group

Social exclusion, or marginalization, is the social disadvantage felt by individuals or groups who are at the "fringe" of their society and that share those characteristics of vulnerability and level of marginalization such as: gender, ethnicity, age, capacities (physical, financial, social, natural, political, human) and geographic location. The R4S Approach aims to contribute to more resilient and inclusive societies and therefore, the selection of the Target Group will be primarily based on criteria to select the most vulnerable and excluded within a societal grouping or priority territory.

Figure 9. Target Group Selection, adapted from the Making Markets Work for the Poor (M4P) Approach.



Use secondary information to gain a deeper understanding of the Target Group. The Target Group should be identified and selected by defining its basic social and economic profile (Refer to ***Figure 9***). First, determine the levels of poverty and social exclusion of the Target Group and disaggregate the data by sex, age and other relevant characteristics such as conditions of discrimination. Second, determine the economic role of the group disaggregated by sex, for example, are they producers, workers, consumers, etc? [11]

Part A of the community consultation questionnaire of the ARC-D Toolkit can be used to inform this process. A comprehensive gender analysis is recommended due to the critical role women play in increasing resilience; R4S postition is that if women are economically empowered, have equitable control over assets and participate in the decision-making process of the household, more money will be invested in education, health, food security and positive coping strategies to be used against the impact of shocks and stresses. (Refer to ***Annex 5: Key Questions Component 1***).

In general, the process of determining a Target Group should always be: transparent and clearly defined; fit-for-purpose in achieving the desired objectives; consider priority and influencing groups, their needs, capacities, context in which they live; participatory in nature; and focused on inclusion. Additionally, the selection of a Target Group in any programme should never result in harm to the participant, it should promote participation and reduce inequality.

STEP 1.3 –Identify the Shocks and Stresses to which the Target Group are Exposed

People and systems respond differently to shocks and stresses. The range of characteristics that determine the level of impact from a risk event on a community is described more completely in GOALs ARC-D toolkit. In contrast, the characteristics, components and dynamics of systems determine systemic impact. An understanding of the types of shocks/stresses the Target Group has faced in the past and how they responded to them is pivotal to understanding how to build resilience in the future. Useful guidance on analysing the impact of risk events on the Target Group is provided in ***Figure 10.***

An analysis of shocks and stresses for the Target Group should be carried out through a participatory consultation process including focus group discussions with representatives of the Target Group.

The matrix on identified risk scenarios provided in ***Table 1*** has been taken from the ARC-D Toolkit and can be used to facilitate the discussion with the Target Group in order to identify the principle [12] risk scenarios which could impact them. Using this matrix, the main disaster risk scenarios are identified in three steps: first, by selecting all of the shocks that could affect the Target Group (Part A); then by selecting the stresses that affect the Target Group (Part B); lastly, in Part C, by analysing the following four points to determine "priority" disaster risk scenarios (typically up to three):

- A prioritization of shocks and identification of the causal relationships among these,
- The exacerbating effect of stresses on the identified shocks,
- The degree of damage/loss caused by the "risk scenario",
- And the Target Groups coping strategy (coping mechanisms, both positive and negative) to overcome this.

These risk scenarios can be a single-hazard, e.g. an earthquake, or multi-hazard, featuring causally connected hazards, e.g. a mayor storm that triggers landslide. The following ***Table 1***, ***Section A*** on primary and secondary shocks may be useful in formulating multi-hazard risk scenarios though their description and selection should ultimately result from consultation with the Target Group.[13] When completing ***Section A*** the R4S user should begin to identify key resilience capacities of the Target Group taking into account the Absorptive, Adaptive and Transformative capacities as described in ***Figure 11***.

11 M4P Operational Guide, Second Edition, 2015

12 Refer to pg. 33 of the ARC-D Manual for further information.

13 Idem

Elements to analyse from past shocks/stresses:

1.– Duration?
2.– Frequency?
a. One time, seasonal or recurring?
3.– Magnitude?
a. Acute or chronic?
b. Covariate or idiosyncratic?
4.– Response?
a. Absorptive Capacity
b. Adaptive Capacity
c. Transformative Capacity
5.– General effect of shock/stress over Target Group)?

-Acute: Short and severe
-Chronic: Prolonged
-Covariate: Infrequent but affecting most of the system (or Target Group), produces a correlated risk and has a broad(er) impact. *Examples: violent conflict, volcanic eruption, new technology. (Examples: OECD)*
-Idiosyncratic: Isolated, independent that significantly affects only one component (i.e., individuals or families). *Examples: death of breadwinner or loss of income. (Examples: OECD)*
-Seasonal: Depending on a season; cyclical. *Example: annual flooding linked to rainy season. (Example: OECD)*
-Recurring: Repetitive, regular, continual. *Example: frequent displacement or endemic cholera. (Example: OECD)*

Duration: Length of time event lasts
Frequency: Number of times event takes place
Magnitude: Greatness of size, extent, significance of event

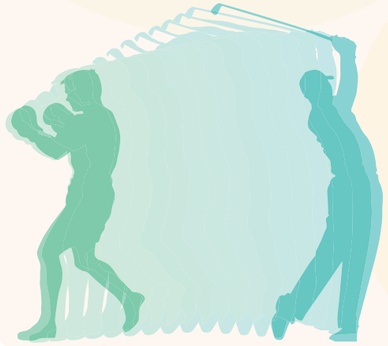
Figure 10. Elements of Past Shocks/Stresses

Absorptive Capacity (Boxer absorbs punches to tire opponent out)

The ability of a Target Group/ Community to prepare for, mitigate or prevent negative impacts by using predetermined coping mechanisms in order to preserve and restore basic structures and functions. [Resist and maintain stability without having basic needs negatively impacted (USAID). Examples: Early harvest, early evacuation from school, delaying debt repayments (OECD).

Adaptive Capacity *(Boxer ducks, manoeuvers to avoid punches and strikes opponent)*

The ability of a Target Group/ Community to *adjust, modify* or *change* its characteristics and actions by alleviating potential future impacts and taking advantage of opportunities in order to continue functioning without major qualitative changes. [Learn/adjust/be flexible to shocks and stresses that are incrementing in intensity, frequency or duration to continue operating (USAID)]. *Examples: Diversification of livelihoods, involvement of the private sector in delivering basic services, introducing drought resistant seeds (OECD).*



Transformative Capacity *(Boxer chooses different career and takes up golf)*

The ability of a Target Group/ Community to *completely change and become new* when its core structure has ceased being untenable due to the severe shocks/stresses it has endured (especially in the ecological, economic and social realms). This is the most complex of the 3 capacities; it requires functional inclusive governance systems to produce change. *Examples: Conflict resolution mechanisms, urban planning measures, actions to stamp out corruption (OECD).*

Figure 11. Capacities of Resilience– 'AAT Framework'

Table 1. Part A, B &C of the Identification and Analysis of Shocks and Stresses: "Analysis of principle risk scenarios impacting on the Target Group" with examples.

	A. Shocks (Sudden events that impact on Target Group[a]):	Mark X	Frequency (e.g. 1 earthquake in 25 years, or 5 landslides per rainy season)	Active? (Y/N, if not, explain)	Comments
Geological shocks	Earthquake				
	Tsunami				
	Volcanic Eruption	*X*	*1 every 10 years*	*Y*	*Volcano is currently active.*
	Landslide	*X*	*3-4 per rainy season*	*N*	
	Other:				
Hydro-meteorological shocks	Flood				
	Cyclone/Hurricane/Typhoon				
	Tornado/Twister				
	Storm surge				
	Severe winter weather				
	Drought				
	Heatwave				
	Other:				
Biological shocks	Human disease epidemic				
	Specify human epidemic:				
	Specify human epidemic:				
	Specify human epidemic:				

	A. Shocks (Sudden events that impact on the vulnerability of Target Group[a]):	Mark X	Frequency (e.g. 1 earthquake in 25 years, or 5 landslides per rainy season)	Active? (Y/N, if not, explain)	Comments
Biological shocks	Animal disease epidemic				
	Specify animal epidemic:				
	Specify animal epidemic:				
	Crop infestation/disease				
	Specify infestation/disease:				
	Specify infestation/disease:				
	Other:				
Human-caused shocks	Economic/market crisis (severe price fluctuation, severe market disruption)				
	Conflict/violence outbreak				
	Inter- or intra-communal conflict (e.g. cattle rustling, gang violence, disputes over natural resources, etc):				
	State-involved conflict				
	Nuclear/radioactive accident				
	Chemical accident				
	Fire spread (including forest fires)				
	Other:				
	Other:				
	Other:				

a - Drought is a slow-onset shock and not a "sudden" event as the definition suggests, however, when the event passes its tipping point and becomes an extreme event, it is considered a shock.
b - Both definitions of shocks and stresses were taken from the 2013 DFID approach paper on disaster resilience. In this case, "system" can be interpreted as the community.

	B. Stresses (Long-term trends that undermine the wellbeing of the Target Group[b]):	Mark X	Comments
Environmental or Biological Stresses	Environmental degradation (e.g. erosion, desertification, soil fertility depletion, water and air pollution etc.)	*eg. X*	*Eg. For the past 10 years, the Target Group has noted that the forest has lost a great deal of plant and animal species. There is also considerable water pollution caused by specific sources (a hospital, non-treated residual waters, garbage dumps)*
	Negative effects of climate change	*eg. X*	*Eg. The Target Group describes how the droughts and rainfall have changed in intensity and frequency which has had negative consequences on their food production.*
	Public health concerns (HIV, malaria, malnutrition etc)	*X*	*Eg. There have been many cases of malaria in current years, and the Target Group has not been able to completely erradicate this disease that is especially affecting young children and newborns.*
	Other:		
Economic Stresses	Economic instability (food and fuel price fluctuation) and/or decline		
	Unemployment		
	Other:		
Social Stresses	Unplanned urbanisation		
	Rapid population growth		
	Food insecurity and/or income insecurity		
	Gender-Based Violence		
	Gender Inequality		
	Discrimination		
	Substance abuse		
	Insecurity		
	Other:		
Political Stresses	Protracted conflict		
	Political Instability and/or tension		
	Land disputes		
	Other:		

C. Principle Risk Scenario Analysis

Based on the above information, please identify and analyse the main risk scenarios that affect the Target Group.

Risk scenario 1

Description

Shock
Which shock is the most devastating and, if applicable, how does it lead to other shocks?

Stresses
In what ways is the identified shock(s) exacerbated by the identified stresses?

Impact
What is the extent of impact (damage, loss, etc.) from this risk scenario (i.e. the shocks and stresses identified above)?

Coping Mechanisms
What coping mechanisms (both positive and negative) does theTarget Group use to deal with this risk scenario?

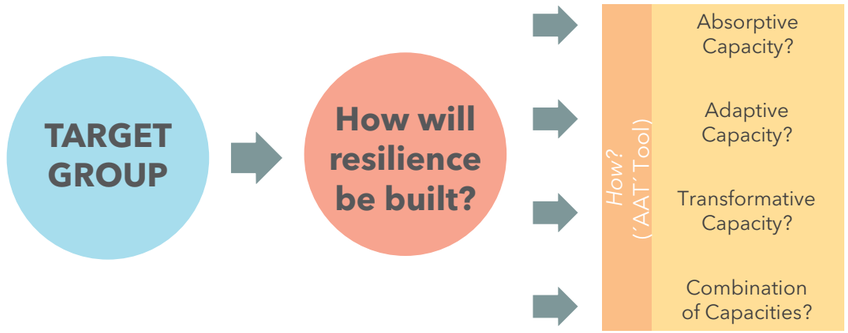


Figure 12. How will resilience be built?

How the Target Group becomes resilient is defined by the Absorptive, Adaptive and Transformative framework. Investigate what are the most appropriate or relevant strategies for the Target Group to become more resilient, for example how has the Target Group responded to emergencies in the past: (1) By increasing absorptive capacity, or (2) By improving adaptive capacity? Or (3) through transformative capacity or (4) some combination of these capacities?

To complete the last element of Part C (Actions to reduce future impact), it is recommended to apply GOAL's *ARC-D Toolkit* in each, or a representative sample, of the target communities. The *ARC-D* will help provide important insight into the status of resilience at community level and the relevant strategies for resilience of the Target Group.

STEP 1.4 –Identify and Analyse the Socio-Economic Systems Associated with the Chosen Form of Resilience Building

1.4.1 Thoroughly list the critical socio-economic systems using GOAL's Resilience Wheel and the socio economic system categories as a guide. (Refer to Figure 13).

1.4.2 Analyse the Relevance, Opportunity, Feasibility and Resilience Contribution of the identified critical socio-economic systems.

Rate or grade the socio-economic system on each element (Relevance, Opportunity, Feasibility and Resilience) as *[low –medium –high]*. A Traffic Light Scheme similar to the one utilized in the M4P Guide may be used. Make sure a robust selection criterion is formulated (refer to ***Table 2***).

> "When women have more influence over economic decisions, their families allocate more income to food, health, education, children's clothing and children's nutrition."
>
> (FAO, 2011)

Due to the increasing evidence of the importance of women's economic empowerment (WEE) in strengthening the resilience of households and communities, a clear differentiation of how women will be reached through programme interventions must be present in the selection criteria of the critical socio-economic system.

Specifically, the elements that make up the basis for the system's selection, should answer the following:

Relevance – How significant is the socio-economic system to the Target Groups inclusion and well-being? Will large numbers of socially excluded and vulnerable persons be benefitted? Will a long-term effect be produced?

Opportunity – Does the system change present the opportunity to achieve sustainable impact at scale for the Target Group?

Feasibility – Is it feasible to achieve change given the time, resources, capacity of the intervention effort? Is real change (socially, politically, geographically and economically) possible? Are there players with influential positions with the skill/will to foster and lead change? Is there sufficient funding, timeframe and capability of the implementing development agency? Are there new upcoming events that would give momentum to change (innovations, policy reforms, change of power)?

Resilience – How does the system contribute to the Target Groups strategy to build resilience to the identified risk scenarios? What are the potential positive and negative consequences on the Target Group's resilience by strengthening this system? How critical is the system in times of crisis? By working on this system, would the *absorptive, adaptive or transformative* capacity of the Target Group be strengthened? Would vulnerabilities of the Target Group be reduced?

Example Summary of Steps 1.2 - 1.4

Step 1.2

Target Group: Low income women and men in informal urban settlement.

Step 1.3

Identify the critical risk scenario impacting the Target Group: Multi-hazard risk scenario of major storm triggering Flooding and Landslides.

Strategy to build resilience?

Transformative options are limited due to lack of access to alternative land, increasing adaptive capacity is limited due to high costs, therefore preferred strategy is to increase absorptive capacity through operation of landslide early warning system and improve surface water management.

Step 1.4

Type of system on Resilience Wheel: "Emergency & Security Systems" (includes Disaster Risk Management)

List of critical socio-economic systems:

Landslide Early Warning and Response System

System for Provision and Maintenance of Surface Water Drainage

Figure 13. Example Summary of Steps 1.2 – 1.4, Component 1

1.4.3 Select Critical Socio-Economic System for Application of R4S Approach

The socio-economic system(s) with the highest overall score considering *Relevance, Opportunity, Feasibility* and *Resilience* should be the selected system(s). This analysis is centred on guidance provided in the *M4P Operational Guide* with additional emphasis on resilience from the outset in selecting target systems.

		Traffic Light			
Description of socio-economic system under consideration:		**Low**	**Medium**	**High**	
Note: The questions below are illustrative: the R4S User should formulate key questions to investigate Relevance, Opportunity, Feasibility and Resilience in order to score these for each critical socio economic system.		*1 Point*	*2 points*	*3 points*	Comments
Relevance	Are marginalized and vulnerable populations dependent on this goods or services provided by this system?				
	To what degree would the improved functioning of this system reduce vulnerability and wellbeing of the Target Group?				
	Are the target group engaged in this system currently or would they be in the future if they had access to it?				
	Does the system have a significant role to play in empowering women within the Target Group?				
	What portion of the Target Group are currently engaged in this system?				
Opportunity	What portion of the target group could potentially benefit from an intervention to improve the functioning of this system?				
	Potential for attracting the participation of the private sector in the improvement of the system?				
	Potential for obtaining the government's active engagement?				
	Potential for creating a "crowding" effect?				
	Degree of poverty reduction of Target Group due to improved resilience?				
	Opportunity to reach large numbers of women?				
Feasibility	Can the system be changed in a significant way during the available timeframe?				
	Are there barriors to change that can not be influenced by the proposed intervention?				
	Is the scale of resources (funding, technical assistance, etc) sufficient to achieve significant change?				
	Are there other interventions in the same area or with the same population that could have a distortionary influence and hence prevent systemic change?				
	Possibility of getting key players on board?				
	Is there sufficient level of stability to effectively engage permanent stakeholders on working towards longerterm system change?				
	In the case of displaced persons, is the current settlement a temporary arrangement and if so is there the motivation to work towards longerterm systemic improvements? This question can also apply to relevance?				
Resilience (past)	Does the system development contribute to the Target Groups Strategy to become more resilient to risk scenarios?				
	Does proposed system's intervention have any negative consequences on Target Group's resilience? If so, to what degree?				
	Degree of criticality of the system in times of crisis?				
	Degree of impact of the system in reducing the Target Group's vulnerability to shocks and stresses?				
	Total Score				

Table 2. Traffic Light Matrix example for selecting critical socio-economic system

STEP 1.5 –Determine 'Key Performance Indicators' (KPIs) of Selected Critical Socio-Economic System

The performance of the selected socio-economic system before, during and after programme interventions is central to the aim of the intervention. To apply *R4S* it is essential to have a clear vision at the outset of how the Target Group is to benefit from the intervention and this will obviously inform the relevance of the selected socio-economic system in the analysis above. A baseline of performance indicators revealing the current state of the system must be established at the beginning of the system analysis in order to monitor the progress or lack of it. The number of times the performance of the system is monitored depends on users of the *R4S Approach*, however 3 times is the recommended minimum (baseline, interim and end line) for an intervention. The ideal way of doing this is by determining a list of key performance indicators (KPIs) of the system which can then be tracked on the *R4S System Maps* described in Components 2 and 4. KPIs to measure benefit for the Target Group will vary depending on whether the Target Group is a producer, intermediary, consumer, receptor, etc. It is recommended that a KPI be stablished using the ARC-D toolkit to monitor the level of resilience of the Target Group. Further guidance on measuring the impact of the intervention is given in **Component 5 Participatory Monitoring, Evaluation, Accountability and Learning** of this Guide. *Refer to **Annex 5: Key Questions Component 1*** for additional guidance on identifying KPIs for the selected socio-economic system.

COMPONENT 2 Mapping of the Current Status of Selected Socio-Economic System(s)

In this section the selected critical socio-economic system will be mapped using an innovative system mapping technique. Key data will be collated and analysed using the Stakeholder Assessment Matrix (SAM). The objective of this Component is to be able to visualize the system as a whole in order to better understand its current state and understand the roles of the system actors and the status of the relationships between them and relative to the Target Group.

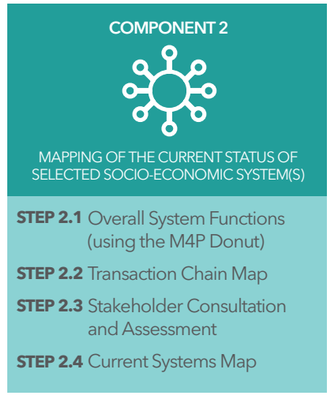
A system's map is a powerful visualization tool; it is an effective way to inspire 'systems thinking'.

(Gopal & Clarke, 2015)

System Mapping for Improved Systems Thinking

Being able to clearly understand and visualize how critical socio economic systems function is especially important for agencies who aim to address complex social, economic and environmental challenges. Solutions to these problems cannot be produced with an individualistic mentality, but rather can only be achieved through collaboration with different stakeholders. Systems mapping allows greater insight into which stakeholders are most relevant to form partnerships and collaborate with in order to bring about a desired change.

A system's map is a powerful visualization tool, it is an effective way to inspire systems thinking.[14] System maps show who the actors of a particular system are and the quality and quantity of their relationships. The system architecture used in *R4S* is for transactional based, Input/output socio-economic systems which is essentially about human beings collaborating as individuals or as part of organizations to deliver goods and/or services. In the R4S Systems Map, the role and interaction of each actor relating to essential supporting and regulatory functions, and the exchange of goods and services along a transaction chain are represented; special emphasis is placed on the Target Group which can be either at the Input end (e.g., producers) or the Output end (e.g., consumers) of the transaction chain or at some point in between.



Getting Started

What is needed to get started

**Secondary and Primary Information*

The primary stakeholder consultation process of the R4S Approach (or the Stakeholder Consultation Process of Step 2.3) takes place under Component 2. This process can be divided into two phases, a preliminary phase and a validation phase.

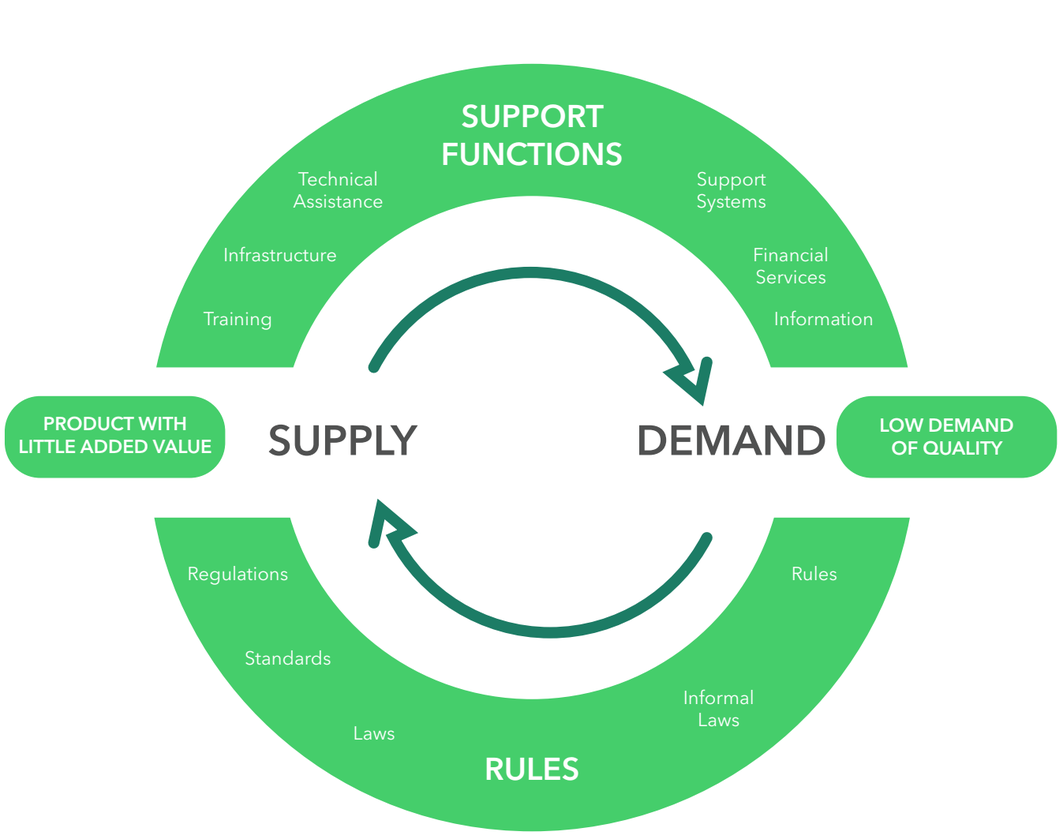
The preliminary phase entails the use of all the information gathered in Component 1 (which was mainly secondary information) to have a initial understanding of how the system functions in general and to be able to make a preliminary schematic of the system. Thus, at this stage, a preliminary map of the overall enabling environment (supporting and regulatory functions) and of the transaction chain of the system (Step 2.1 and Step 2.2) will be elaborated.[15] It is necessary to prepare a preliminary list of who are the system's key stakeholders and informants who will later be approached for the system investigation. It is crucial to have this preliminary information before beginning field work as it will give the team clarity over who they will be targeting for the consultation process and field investigation.

The validation phase requires field work that will verify, correct and validate preliminary schematics of the Overall System Functions (M4P Donut) including the Transaction Chain and collect all the other information necessary to complete the Current System Map (Step 2.3).

*The collected information must ensure a clear understanding of the system's components, relations among actors and overall transactional functionality in order to be able to thoroughly assess the system in its current state and map it out in the most accurate way possible (Step 2.4). As stated previously, the development of the system map is an iterative process as understanding of the system deepens and additional information on the system functions becomes available based on an adaptive management process as described in more detail in Component 5. (Refer to **Annex 6: Key Questions Component 2**)*

14 FSG Reimagining Social Change: 'System Mapping: A Guide to Developing Actor Maps', S. Gopal, T. Clarke (2015) http://www.fsg.org/tools-and-resources/system-mapping

15 If insufficient or poor quality information which is not adequate to develop the above mentioned preliminary schematics it may be necessary to make 'ad-hoc' consultations with key informants.



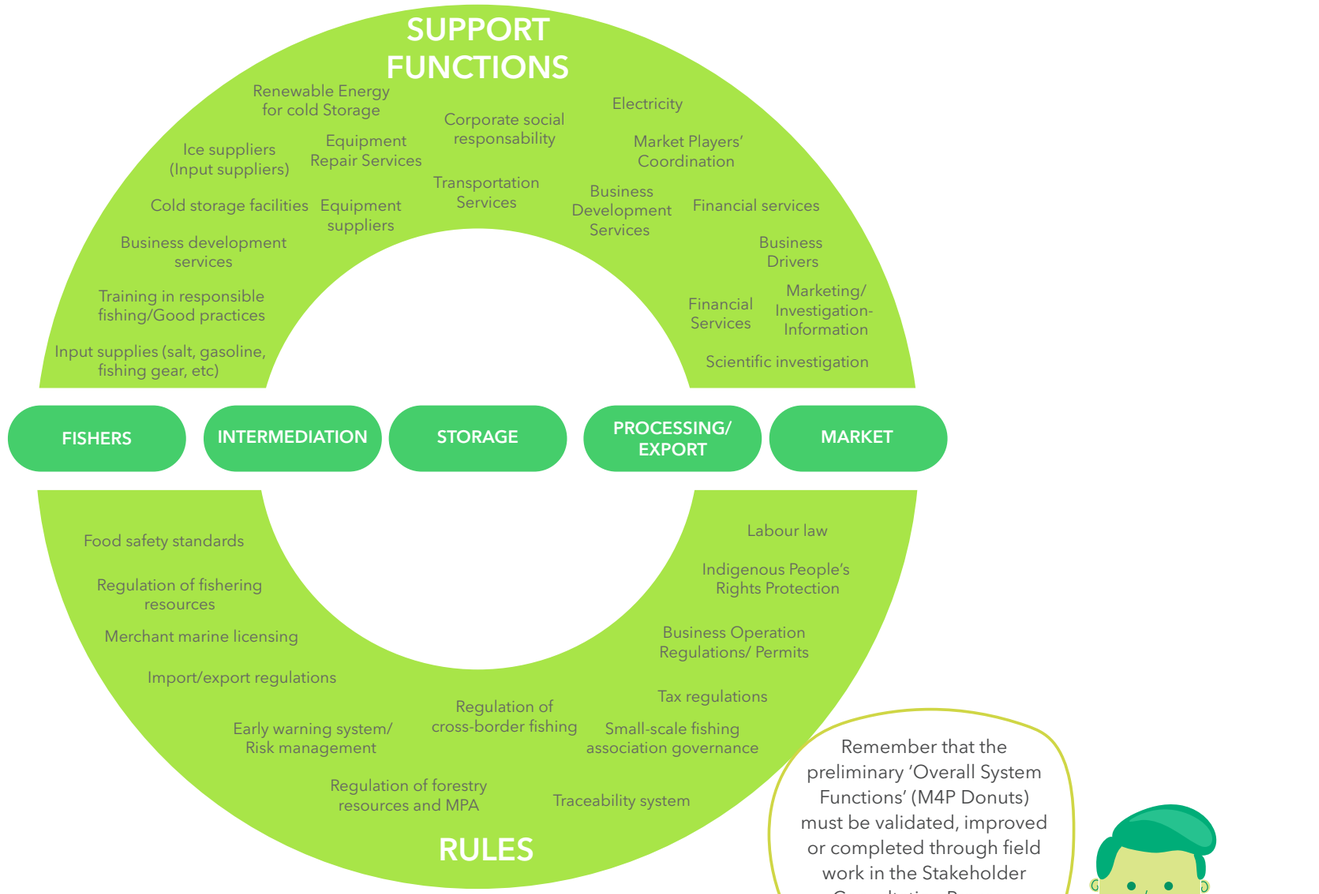


Figure 14. Top left. Schematic of System Functions (Credit: M4P Guidance Manual)

Figure 15. Top right. Example of Market System.

Step 2.1 – Overall System Functions (using the M4P Donut)

The overall system functions of the selected critical socio-economic system are first mapped out using the M4P Donut (***Figure 14***). It should include: (1) Core Function *(Input and Output transactional chain),* (2) Supporting Functions *and* (3) Regulatory Functions. It is recommended to refer to the M4P Operational Guide for further guidance on this process.

Figure 15 shows an example of a system schematic using the M4P Approach for the small scale fisheries market system in the North coast of Honduras. This case study will be continued through this R4S Guidance Manual. At this point it is important to start to identify how well the system functions are functioning and in this way identify which are critical for further analysis.

In the diagnostic of the system further investigation may be required on the selected critical functions. Each of these system functions can, in turn, be analysed as a socio-economic system in its own right, using the same mapping and analysis tools as the overall system. This will bring the assessment to a second level of iteration. Further diagnostic assessment can be carried out through different levels of iteration in order to get to the root causes. This process is fully described in the M4P Operational Guide and not

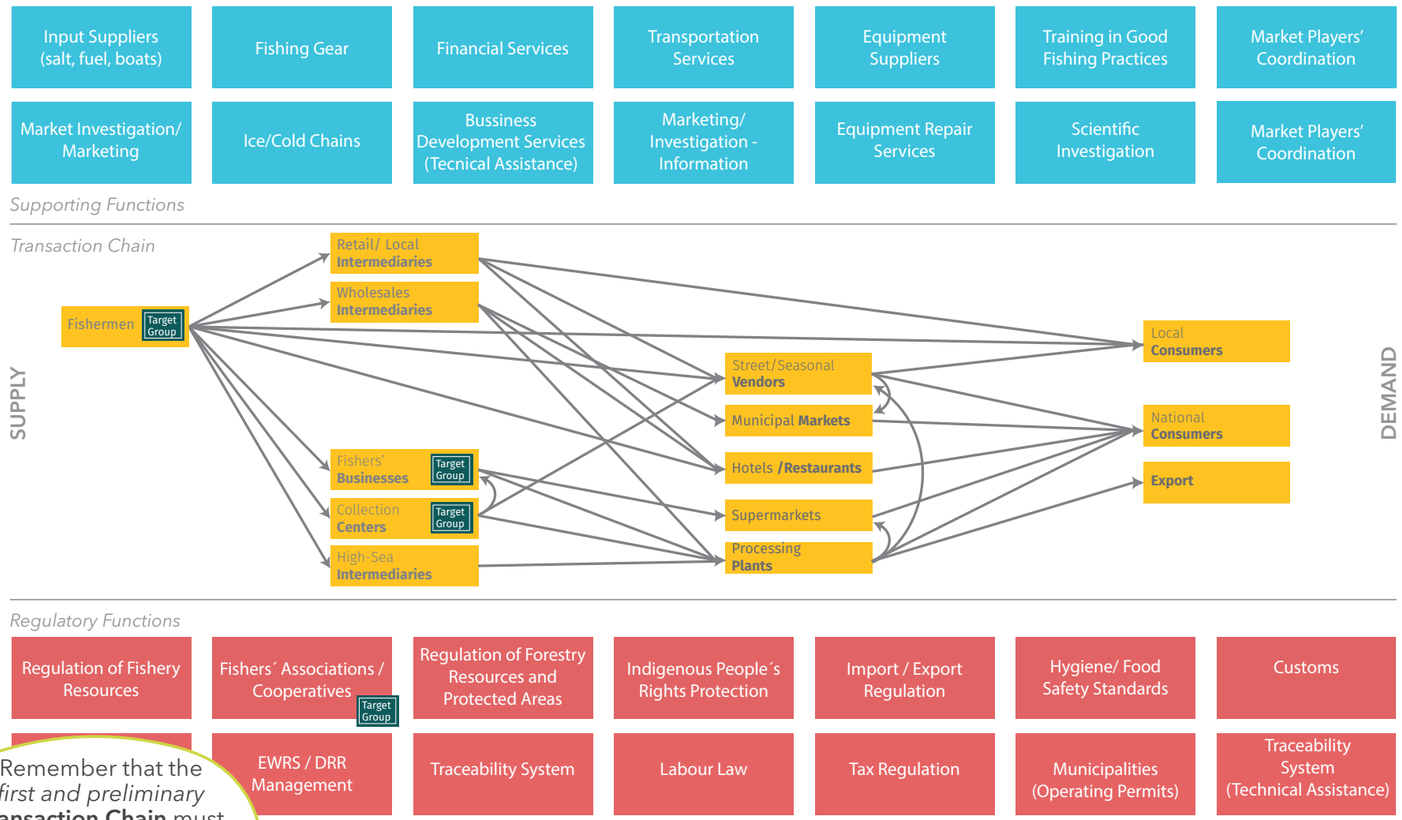


Figure 16. Transaction chain map for Artisanal Fishery.

repeated here. The R4S Approach can be applied in the same way through different levels of iteration, however, the level of detail presented in the system maps and assessment tools provides a significant amount of information thus reducing the need for different levels of iterations to get to the root causes of dysfunction in a system. (Refer to ***Annex 6: Key Questions Component 2***).

Step 2.2 –Transaction Chain Map

Map the system Input-Output process (or the Transaction Function) of the selected socio-economic system as a Transaction Chain, depicting the commercial or non-commercial transactions that take place, starting with 'Input' on the left and ending with 'Output' on the right. Label and place the system's actor groups in their correct position according to Stages of the Transaction Chain e.g. Production, Processing, Transport, Transformation, Retail, etc of the system. This will be done in general or specific terms, depending on the level of information that has been attained so far. Remember that more detail and/ or validation of information will be gathered through the *Stakeholder Consultation Process* of the next step of this Component.

The Transaction Chain particular to the selected socio-economic system is represented with a clear start and end point (left to right) e.g. from producer to intermediary to end consumer, of the good or service being transacted. The Target Group will be either at the beginning or the end of the Transaction Chain, or somewhere in between, depending of the role they have in the system. If the Target Group is a producer, it will be at the beginning or input side, and if it is a consumer of a service, it will be at the end or output side. In the example depicted in (***Figure 16***) the Target Group is at the beginning of the Transaction Chain, since it is located in the Capture stage in the small-scale fisheries market system, and at the intermediary position, since they are also 'intermediaries'. (Refer to ***Annex 6: Key Questions Component 2***).

Step 2.3 –Stakeholder Consultation and Assessment

The *Stakeholder Assessment Matrix (SAM)* is a tool that collates the critical information on the selected socio-economic system; it is utilized to assess the current state of the selected socio-economic system. It must be filled out with the information obtained mainly through primary sources, specifically through the *Stakeholder Consultation Process*. However, existing secondary information (obtained through Component 1, for example, or at a later stage) may also feed the information for the *'SAM'*. A set of instructions (on the Instructions Tab of 'SAM') will guide the data input process in the matrix. (Refer to ***Annex 6*** for these instructions).

It is important to emphasize that the Target Group including their immediate family and dependents are stakeholders.

2.3.1 Stakeholder Consultation Process

After mapping the system's basic functions (through the M4P Donut and the Transaction Chain Map from the two previous steps) the necessary background information

should now be available to start designing the *Stakeholder Consultation Process*. A well designed and implemented data gathering process is crucial to successfully complete Step 2.3; all the necessary information to fill out the sections 1,2 and 3 of the 'SAM' must be gathered at this point.

The *Stakeholder Consultation Process* entails the following:

1. Draw up a preliminary list of the system's stakeholders: The M4P Donut and Transaction Chain Map exercises will enable the completion of a preliminary list of all the system's stakeholders; it will also serve as a guide as to who must be part of the Consultation Process.

2. Select data gathering methods: To determine the methods and techniques for data gathering, the team should revise the key questions and information needs in relation to time and resources available for the investigation, and plan accordingly. The recommended methods for data gathering are as follows: Structured interviews, focal group discussions (FGDs), surveys, mapping, and others.

3. Prepare Survey instruments: The design of the Survey instruments should be based on the type of data gathering methods that will be applied and the suggested Key Guiding Questions[16] (refer to ***Annex 6: Key Questions Component 2***), particularly in regards to the 6 Determinant Factors of Resilience pivotal for the system´s resilience analysis proposed by R4S (refer to the 6 DFRs described in more detail in Component 4). It is important for the team to adapt the Key Guiding Questions to the context and to take into consideration the language/dialect, education and cultural background of the persons that will be consulted during the field investigation. The Survey instruments should give careful consideration to addressing levels of inclusion of the Target Group in the socio economic system and include an age and gender sensitive lens, to identify how children or women are impacted by the system. This will enable additional depth to the understanding of specific vulnerabilities or marginalization in relation to the system and inform programme designs that can help to enhance inclusion. Once the methods and instruments are well defined, take into consideration digital data gathering (DDG) techniques when relevant; this is generally recommended for gathering quantitative data.

4. Define the sample size: Given that the investigation is primarily qualitative it is not necessary to establish statistically representative values of the system's Target Group. Nonetheless, the following considerations are recommended:

a. ***Of Target Group:*** It is recommended to utilize the Lot Quality Assurance Sampling (LQAs) methodology, which uses small sample sizes, typically of 19 actors per Supervision Areas (SAs). This gives statistically representative results for informed decision making. Larger samples are seldom needed. At least 5 (SAs) are recommended – this gives a total sample size of 95 actors which results in confidence intervals of above 90%. This method is highly recommended for questions with dichotomous responses (yes/no). For further information consult the LQAs methodology.[17] Nonetheless, R4S users are at liberty to consider a statistically representative sample if the resources allow.

b. ***Of the rest of the system's stakeholders:*** Making use of the preliminary list of the system's stakeholders, define the minimum number of surveys that can be applied according to the available time, human resources and logistics. A key recommendation here is to use the Overall Systems Function (M4P Donut) and Transactional Chain Map as an aid to identify the system actor groups. For each function the relevant actors should be identified even if some of the functions and system actors are not currently engaged in the system. The stakeholder identification should therefore include actors under each of the system functions whether active in the system or not. Once in the field, it is recommended to consult key informants in the area, those who can locate the actors identified, or identify actors that have not been considered in the preliminary list and that could be the key stakeholders for the investigation. Furthermore, during the field exercise, the team should check if the minimum number of consulted actors satisfy the information needs or not; and if necessary add more stakeholders to the consultation process. This should occur until all the necessary information has been obtained satisfactorily from the field.

5. Prepare field work activities: This refers to the development of the whole program for field work activities, which includes time, transportation, human resources, mobile devices (if applying DDG), among others. At this time, it is very important to take into consideration a training process for the survey team that will be in charge of gathering information in the field with the designed instruments with regards to data gathering methods and techniques, security standards, code of conduct of the organization, among other elements considered pertinent.

6. Consultation and instrument validation process: A process of validating the survey instruments must be executed before moving into the pre-determined field investigation areas. It must be designed in the manner to ensure the methodology is appropriate for the target location and with actors relevant to the selected socio-economic system. The purpose of this validation process is to verify the feasibility, duration and effectiveness of the designed instruments and techniques, as well as to identify necessary improvement or adjustment prior to implementing the instruments in the field.

7. Field work: This is the moment when, according to the survey plan, the system stakeholders and key informants are consulted through the selected and validated instruments, methods and techniques. During the survey it is recommended to:

a. Keep the Overall System Function and Transaction Chain Maps to hand; update and/or improve them according to obtained findings through the field consultation process.

16 R4S proposes a set of Key Guiding Questions for each section of the Stakeholder Assessment Matrix (SAM) and to accurately analyse the 6 Determinant Factors of Resilience of the selected socio-economic system (Component 4).

17 GOAL Lot Quality Assurance Sampling (LQAS) Guidelines for Routine Monitoring and/or Surveys (3rd Ed.) (2012).

b. Have the Survey Team check the programming daily; adjustments and discussions about the main findings and/or identified information gaps throughout the process may be necessary.

c. Have a Supervision and Quality Control Team to oversee field work activities, ensuring the quality of the instruments' application and data gathering process.

d. Data analysis and report: After gathering all the required information, this should be uploaded into the corresponding sections of the Stakeholder Assessment Matrix (SAM).

2.3.2 Stakeholder Assessment Matrix (SAM)

The Stakeholder Assessment Matrix assesses the system in 5 parts (Actor Assessment, Relationships, System Assessment, Vulnerability Assessment and Stakeholder Engagement). It is completed in stages in the different components of the R4S Approach and subsequently updated and refined in an iterative process as understanding of the system deepens through the adaptive management process. Likewise, the process to build the different R4S Maps will be developed through the Components of the R4S and subsequent iterations. (Refer to ***Figure 18 and Table 3: Stakeholder Assessment Matrix (SAM)*** *and to the further explanation provided in the description of each of SAM's areas).*

During the completion of the Stakeholder Assessment Matrix, behaviours that influence relationships should be investigated e.g household financial behaviours that define the relationship between husband and wife on financial decisions, or a farmer's behaviour that defines his/her relationship with suppliers or a woman's behaviour that defines her relationship with family planning or vaccination for her children (Refer to ***Figure 17)***. This makes the SAM sensitive to Social and Behaviour Change and sets the basis to identify specific behaviours that need to change and that can be studied under the scope of Social and Behaviour Change. Specific recommendations for the strengthening of relationships within the system by changing certain behaviours of the stakeholders can be tailored within the context of the selected socio economic system. The field Surveys for the completion of the SAM is a key opportunity to collect relevant information of behaviours and this will be analysed further during the development of the Systemic Theory of Change and Results Chain described in Component 4.

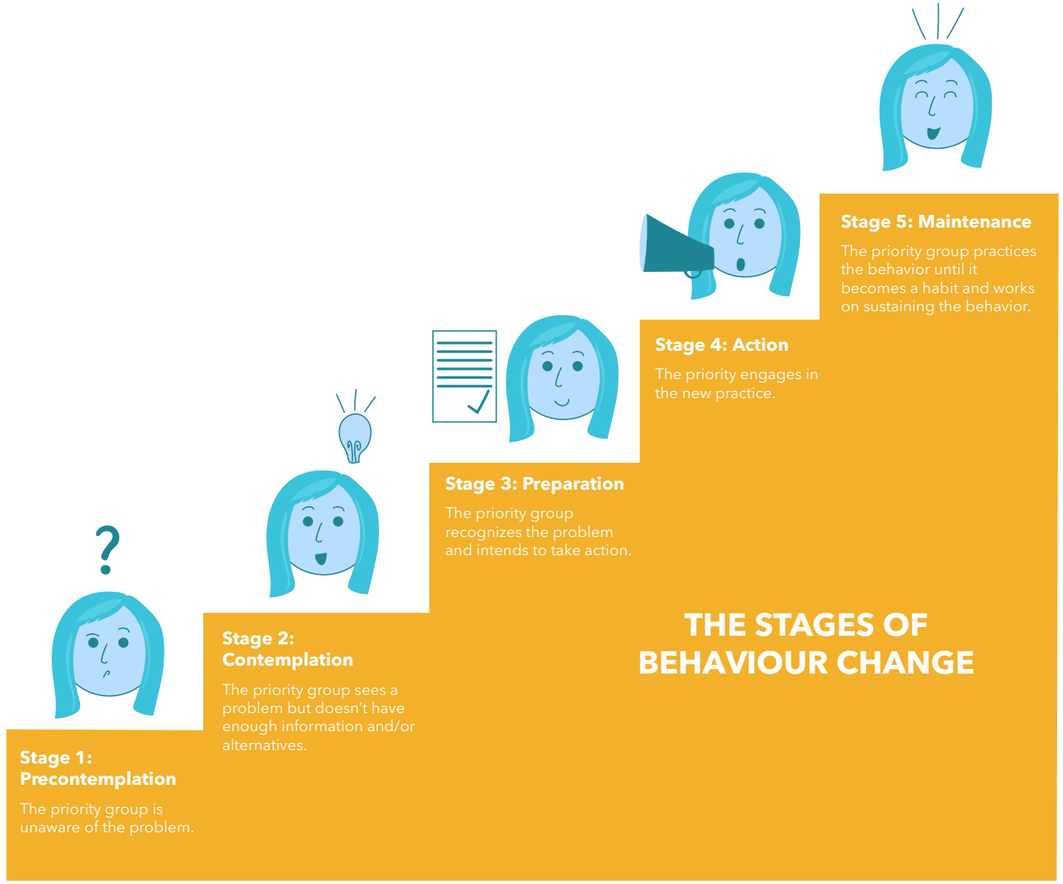


Figure 17. The behavioural ladder includes five stages of change

An examination of the behaviours can be broadened through a formative research process such as barrier analysis or social investigation -which investigates the barriers preventing the Target Group from adopting the positive behaviours that would strengthen relationships between the system actors. The process also identifies the doers or enablers within a Target Group, these are people who are already practicing the behaviour in order to carry out a comparative analysis.

A descriptive explanation of the Target Group must be included in the SAM and most of the information can be gathered through formative research. As part of the Stakeholder Assessment, describe the Target Group through:

1. Socio-demographics,
2. Their daily routine,
3. Something most people in the Target Group wants (desires, aspirations),
4. Possible barriers that are keeping the Target Group from practicing the behaviour,
5. Knowledge and practices regarding the behaviour.
6. Stage of change in which the Target Group is in.
7. Influencing group: People who approve or disapprove of their behaviours

Sections of the Stakeholder Assessment Matrix (SAM) for System Mapping:

The sections of the Stakeholder Assessment Matrix (SAM) gathers the following information obtained previously through the Consultation Process described above. The SAM is the central repository to collate the detailed information collected on the parts of the system. It is completed through an iterative process over the implementation of the R4S. This information is later synthesized from a holistic persective of the system and presented through System Maps.

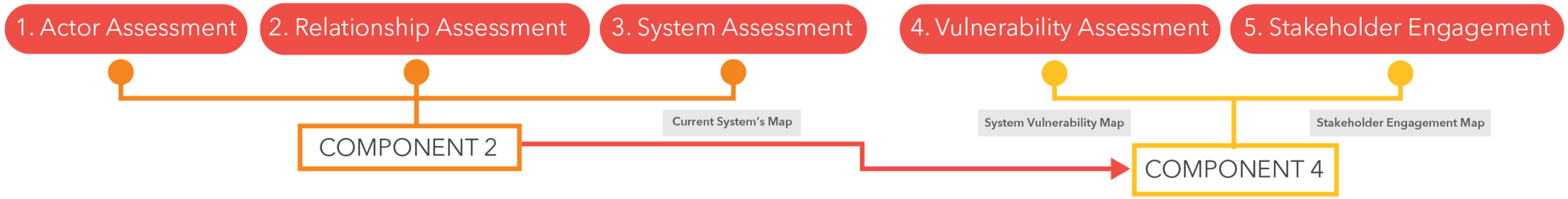


Figure 18. Description of the Structure of the Stakeholder Assessment Matrix

1. Actor Assessment (In Component 2)

1. All the actors in the system (all actors from Transaction Chain and Supporting and Regulatory Functions need to be identified).
2. Quantity of actors (specific or estimated).
3. Geographic location of each actor.
4. Category of each actor (from Transaction Chain, Supporting or Regulatory Function).
5. Needs/Wants of each actor.
6. Worries/Negative Impacts of each actor.

2. Relationship Assessment (In Component 2)

1. All the Input and Output Relationships for each actor.
2. A description of the type of relationships between the Input/output actors.
3. Summary of Input/output relationship between actors (Good/Stressed/Bad).

3. System Assessment (In Component 2)

1. Estimate the throughput or production volume that is generated or is influenced by each actor in the form of a percentage of the total throughput of the system.
2. An evaluation of the throughput of each actor based on a scale of 1-5 (1-20%=1; 21-40%=2; 41-60%=3; 61-80%=4; 81-100%=5).
3. An assessment of the critical role (or how easily the actor can be replaced) played by each actor (1=Feasible to replace; 5=Not replaceable). The Relevance of each actor is defined by the product of the level throughput and replaceability.

*After completing all the sections of **Component 2**, proceed to elaborate the **Current System Map** (refer to Table 3 and Figure 19, 20 and 21).*

4. Vulnerability Assessment* (!) (In Component 4)**

1. Sensitivity analysis of each actor based on a scale of 1-5 (1=lowest degree; 5=highest degree).
2. Exposure analysis of each actor based on a scale of 1-5 (1=lowest degree; 5=highest degree).
3. Capacity analysis of each actor based on a scale of 1-5 (1=lowest degree; 5=highest degree).
4. Vulnerability analysis of each actor = [(Sensitivity x Exposure)/Capacity].

**** (!) This assessment is possible only after **Component 3** (Identification of Principal Risk Scenarios) has been completed. R4S users will come back to the Stakeholder Assessment Matrix after identifying the main risk scenarios and will use them to analyse the system's (actors') vulnerability. (Refer to **Component 4** for further description on completing the vulnerability assessment.).*

Note: For illustrative purposes only two Risk Scenarios are shown in the *Stakeholder Assessment Matrix*, however more could be evaluated depending on the system being assessed. Three would typically be the limit of the principal Risk Scenarios which a selected socio economic system would be exposed to.

*After completing the Vulnerability Assessment, proceed to elaborate the **Systems Vulnerability Map**.*

5. Stakeholder Engagement** (!!) (In Component 4)**

1. The influence of each actor over the system based on a scale of 1-5 (1= lowest degree; 5=highest degree).
2. The interest/motivation of each actor to change the system based on a scale of 1-5 (1= lowest degree; 5=highest degree).
3. Stakeholder Engagement is assessed based on the two previous items. Each actor receives one of four possible engagement approaches: 'Minimal Effort/Monitor', 'Keep Informed', 'Keep Satisfied' or 'Key Player'.

**** (!!) This assessment is possible only after the completion of the Systemic Theory of Change in Component 4 has been completed. R4S users will come back to the Stakeholder Assessment Matrix after completing the **Systemic Theory of Change**. (Refer to *Figure 26*)

*After completing the Vulnerability Assessment and Theory of Change, proceed to elaborate the **System Change Map.***

Table 3. Stakeholder Assessment Matrix (SAM)

Resilience for Social Systems (R4S) - STAKEHOLDER ASSESSMENT MATRIX (SAM) for SYSTEM MAPPING					
1. Name of the Selected Socio Economic System					
2. Description of the Selected Socio Economic System					
3. Description of the Target Group	1 . Socio-demographics;2. Their daily routine; 3. Something most people in the Target Group wants (desires, aspirations); 4. Possible barriers that are keeping the Target Group from practicing the positive behaviour; 5. Knowledge and practices regarding the positive behaviour; 6. Stage of change in which the Target Group is in;7. Influencing group: People who approve or disapprove of their behaviours.				
Completed by:		**Recieved by:**			
Approved by:		**Date:**		**Revision Number:**	

ABBREVIATIONS

TBD - To Be Determined
NA - Not Applicable

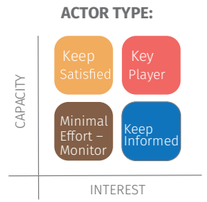
1. ACTOR ASSESSMENT							**2. RELATIONSHIP ASSESSMENT**				**3. SYSTEM ASSESSMENT**				
Reference Number	Stakeholder Description (general and/or specific)	Quantity of actors per actor node (exact or approximate)	Geographic Location	Transaction Chain, Supporting or Regulatory Function	Needs/Wants	Worries/ Negative Impacts	INPUT relationships to actor node	OUTPUT relationships from actor node	Detailed Assessment of Relationship	Summary Assessment of Relationship Quality (Good, Stressed, Bad, Absent)	What percentage of goods/ services produced by the system are dependent on this actor?	Assessment of level of production/ throughput of actor with scale 1-5 (A)	How easily can actor be replaced? Scale 1-5 (1= highly replaceable; 5= not replaceable) (B)	Relevance of actors based on current status of system = (A) X (B)	Key Performance Indicator (KPI)

LEGEND

Level of Vulnerability color code:

- No/minimal vulnerability
- Low level vulnerability
- Medium level vulnerability
- High level vulnerability

Proposed intervention per actor:



4.VULNERABILITY ASSESSMENT										5. STAKEHOLDER ENGAGEMENT			
RISK SCENARIO* 1 (STRESSORS ONLY)					RISK SCENARIO 2 (HAZARD OR MULTI-HAZARD)								
SENSITIVITY (Scale 1-5) 1=very low sensitivity; 5=very high sensitivity	**EXPOSURE** (Scale 1-5) 1=very low exposure; 5=very high exposure	**CAPACITY (Scale 1-5)** 1= very low capacity; 5=very high capacity	**VULNERABILITY** (Sensitivity x Exposure)/Capacity	**LEVEL OF VULNERABILITY**	**SENSITIVITY** (Scale 1-5) 1=very low sensitivity; 5=very high sensitivity	**EXPOSURE** (Scale 1-5) 1=very low exposure; 5=very high exposure	**CAPACITY** (Scale 1-5) 1= very low capacity; 5=very high capacity	**VULNERABILITY** (Sensitivity x Exposure)/Capacity	**LEVEL OF VULNERABILITY**	Influence capacity over the system, Scale 1-5 (A)	Interests and incentives to improve the system, Scale 1-5 (B)	Minimal Effort, Keep Informed, Keep Satisfied, Key Players	Proposed intervention strategy per actor

Table 4. Stakeholder Assessment Matrix (SAM) - Case Study Small Scale Fisheries in North Coast of Honduras (The following Table includes aSample of the Data from the Completed SAM)

Resilience for Social Systems (R4S) - STAKEHOLDER ASSESSMENT MATRIX (SAM) for SYSTEM MAPPING					
1. Name of the Selected Socio Economic System	Small Scale Fisheries in North Coast of Honduras				
2. Description of the Selected Socio Economic System					
3. Description of the Target Group	1. Men/boys around the age of 14 and 50 years old; 2. Low educational level, have attended some school, some can read and write; 3. They all want security for their families and better income; 4. The are unaware their fishing practices are inadequate, they do not see a problem: Pre contemplation stage; 5. Most live in rural villages				
Completed by:	Melissa López, Oscar Portillo, Mario Argeñal, Darwin Castillo	**Recieved by:**	Luigi Loddo, Sayri Molina		
Approved by:	Bernard McCaul	**Date:**	Mar-2018	**Revision Number:**	A16

1. ACTOR ASSESSMENT							2. RELATIONSHIP ASSESSMENT				3. SYSTEM ASSESSMENT				
Ref. #	Stakeholder Description (general and/or specific)	Quantity of actors per actor node (exact or approximate)	Geographic Location	Transaction Chain, Supporting or Regulatory Function	Needs/Wants	Worries/Negative Impacts	INPUT relationships to actor node	OUTPUT relationships from actor node	Detailed Assessment of Relationship	Summary Assessment of Relationship Quality (Good, Stressed, Bad, Absent)	What percentage of goods/ services produced by the system are dependent on this actor?	Assessment of level of production/ throughput of actor with scale 1-5 (A)	How easily can actor be replaced? Scale 1-5 (1= highly replaceable; 5= not replaceable) (B)	Relevance of actors based on current status of system = (A) X (B)	Key Performance Indicator (KPI)
1	Fishers	15,000-20,000	1. Puerto Cortés 2. Bahia de Tela 3. Cuero y Salado 4. Bahía de Trujillo 5. Bacalar-Iriona 6.Sistema-Ibans-Brus-Patuca 7.Sistema Karataska	Transaction Chain	Increase sales price of fish (as it is and by adding value to fish), higher income through fish sales, income during banned fishing periods (4 months), food security, improved fishing practices, acesss to market information, improve quality of life.	Capture quotas, climate change, storms, hurricanes, no fish to capture, water contamination, overexploitation of fisheries.	1. Salt (Input suppliers) 2. Ice (Input suppliers) 3. Fishing Gear (Input suppliers) 4. Boats (Input suppliers) 5. Fuel (Input suppliers) 6. Shipping (Equipment suppliers) 7. Motors (Equipment suppliers) 8. Equipment Repair Services suppliers 9. Financial Services providers 10. Regulators of Fishery Resources 11. Regulators of Forestry Resources and Protected Areas 12. Implementers of Hygiene/Food Safety Standards 13. Implementers of EWS/DRR Management 14. Implementers of Indigenous People's Rights Protection	1. Local Consumers 2. Street/Seasonal Vendors 3. Intermediaries 4. Fisher's Businesses 5. Collection Centers 6. Hotels/Restaurants 7. High-Sea Intermediaries 8. Fishers' Associations/Cooperatives	TBD	GOOD STRESSED GOOD GOOD GOOD (EXCELLENT) GOOD STRESSED STRESSED GOOD STRESSED STRESSED STRESSED STRESSED GOOD (EXCELLENT) GOOD (EXCELLENT) STRESSED GOOD GOOD STRESSED STRESSED GOOD	100%	5	5	25	FISHERS' INCOME From Sales to 1. Local Consumers 2. Street/Seasonal V. 3. Fishers' Busine. 4. Hotels/Restaurants 5. Collection Centers $1.00/Lb. From Sales to 1. Intermediaries $0.65-$0.70/Lb. 2. High-Sea Intermed. $0.50-$6.70/Lb.
2	Intermediaries: Retail Wholesales	Aprox. 100	TBD	Transaction Chain	High or good quality fish at low prices.	Low quality fish, not enough volume to sell, not high enough sales turnover causing an accumulation of unsold fish, lowered sales price from supermarkets, municipal markets, hotels and restaurants.	1. Fishermen	1. Street/Seasonal Vendors 2. Supermarkets 3. Municipal Markets 4. Hotels/Restaurants 5. Processing Plants	TBD	STRESSED GOOD GOOD GOOD GOOD STRESSED	In total: 20% 10% 10%	1 1	3 4	3 4	INTERM. INCOME $1.20-$1.30/Lb. $0.90/Lb. $0.90-$1.10/Lb.

ABBREVIATIONS

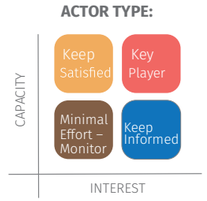
TBD - To Be Determined
NA - Not Applicable

LEGEND

Level of Vulnerability color code:

- No/minimal vulnerability
- Low level vulnerability
- Medium level vulnerability
- High level vulnerability

Proposed intervention per actor:



4.VULNERABILITY ASSESSMENT										5. STAKEHOLDER ENGAGEMENT			
RISK SCENARIO* 1: STRESSOR ONLY RISK ESCENARIO					RISK SCENARIO 2: MULTI HAZARD RISK SCENARIO OF WATERSURGE AND HIGH WINDS TRIGGERED BY MAJOR STORM EVENT					Influence capacity over the system, Scale 1-5 (A)	Interests and incentives to improve the system, Scale 1-5 (B)	Minimal Effort, Keep Informed, Keep Satisfied, Key Players	Proposed intervention strategy per actor
SENSITIVITY (Scale 1-5) 1=very low sensitivity; 5=very high sensitivity	**EXPOSURE** (Scale 1-5) 1=very low exposure; 5=very high exposure	**CAPACITY (Scale 1-5)** 1= very low capacity; 5=very high capacity	**VULNERABILITY** (Sensitivity x Exposure)/ Capacity	**LEVEL OF VULNERABILITY**	**SENSITIVITY** (Scale 1-5) 1=very low sensitivity; 5=very high sensitivity	**EXPOSURE** (Scale 1-5) 1=very low exposure; 5=very high exposure	**CAPACITY** (Scale 1-5) 1= very low capacity; 5=very high capacity	**VULNERABILITY** (Sensitivity x Exposure)/ Capacity	**LEVEL OF VULNERABILITY**				
5	5	2	12.5	Medium Level Vulnerability	5	5	2	12.5	Medium Level Vulnerability	2	5	Keep Informed	(1) Develop business skills of fishermen through business development training. (2) Create/build entrepreneurial skills and train them in good/responsible fishing practices. (3) Catalys increase of financial services availability for fishermen to have more working capital, be able to invest in equipment, ships, cold chains, gear, etc.
4	4	3	5.33	Low Level Vulnerability	2	2	4	1	Low Level Vulnerability	1	2	Minimal Effort - Monitor	Facilitate a higher price of purchase of fish in benefit of small-scale fishers, correlated to quality and diversity of fish captured.
4	3	4	3.00	Low Level Vulnerability	3	1	5	0.6	No/Minimal Vulnerability				

*Risk Scenarios are defined in Component 3. Follow guidance in Components 3 and 4 to complete this section of the SAM. Also, refer to Glossary of Terms for description of the terms referred to in this section.

As described in Component 4, it is strongly recommended that the first risk scenario is a stressor only scenario.

Step 2.4 –Current System Map

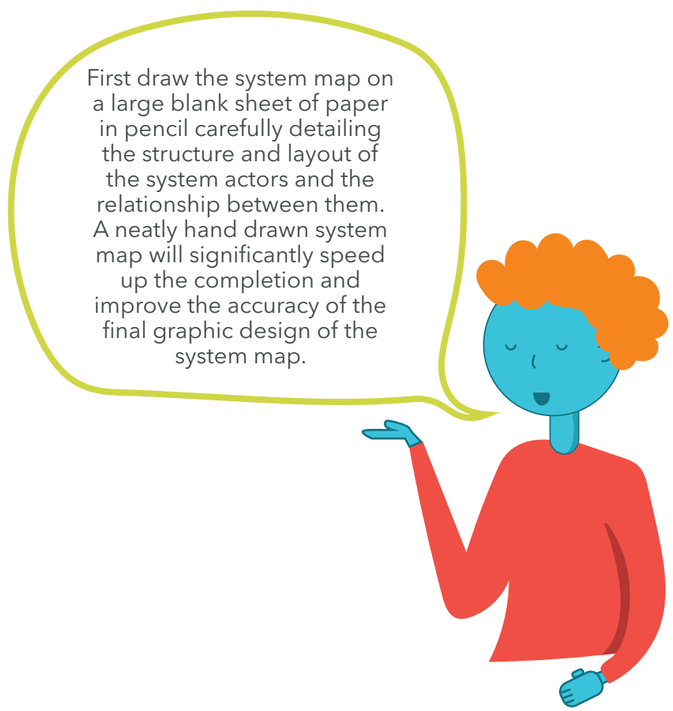
With Sections 1, 2 and 3 of the Stakeholder Assessment Matrix (SAM) are completed, the first draft of the **Current System Map** can be elaborated. The R4S **Current System Map** is a visual representation of the selected socio-economic system.

The **Current System Map** is an integration of the Supporting and Regulatory Functions identified in Step 2.1 and of the **Transaction Chain Map** developed in Step 2.2. Building a **Current System Map** is somewhat of putting a puzzle together; putting together all the data collected through previous stages and filling in any gaps through further investigation and consultation as necessary.

The following are the steps to be followed to build the first R4S Map (most of the rest of the maps that will be generated are essentially the first R4S Map but with additional analysis represented). Note that the creation of an accurate map of the socio-economic system is an iterative process which will constantly be updated as understanding of the system deepens and new data is collected in consultation with system actors over the course of an intervention.

Generation of the map to fully present the socio-economic system should include visual aids, images, graphics etc to help communicate the system more effectively. For example, a system map of a coffee market system should be drawn with visual aids characteristic of a coffee system. Important to recognize in each system map representing a transactional socio-economic system some particular service or good is flowing across the system from input to output. The flow of this throughput has a significant bearing on the characteristic of the system. For example, in a fisheries market system map it is fisheries produce that is the throughput of this system. This characteristic throughput should be readily identifiable in the presentation of the system map.

To represent a transactional socio-economic system, it is necessary to have input from an expert in graphic design that can support the development of the map in a way that effectively communicates to the reader and particularly to the system stakeholders. The system maps included in this guidance manual will serve as useful references to aid the completion of the particular system map being developed.



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Department of Foreign Affairs and Trade

RESILIENCE FOR SOCIAL SYSTEMS 'R4S' APPROACH
MAP NAME

System:

Date: Revision
Number:
Prepared by:
Reviewed by:

Users of the R4S Approach must employ an iterative process between the Stakeholder Assessment Matrix 'SAM' (Component 2, Step 2.3) and the Transaction Chain (Component 2, Step 2.2) in order to construct the R4S Maps. The guidelines herein reveal an illustrative step by step roadmap.

- To develop the 'Current System Map', Sections 1, 2 and 3 of the Stakeholder Assessment Matrix (SAM) must be completed.
- To develop the 'System Vulnerability Map(s)', Component 3 and 4 of the R4S Approach must be completed. Based on the analysis of the impact of the principle risk scenarios (Component 3) each of the actor nodes can be assessed for their vulnerability to these risk events. Using the Current System Map as a base map, the actor nodes should be coloured either white, green, yellow or red, according their vulnerability level (obtained in section 4 of the Stakeholder Assessment Matrix (SAM)). Note that a separate map should be developed for each selected risk scenario.
- To develop the 'System Change Map', Steps 4.2 and 4.3 of Component 4 must be completed. Using the Current System Map as a base map, and the Resilience System Matrix (RSM) and the Systems Theory of Change Diagram, highlight the proposed system changes. Note that this might consist in moving/creating/eliminating/modifying key actors attributes/relations.
- To develop the 'Stakeholder Engagement Map', Section 5 of the Stakeholder Assessment Matrix (SAM) and the Systems Theory of Change must be completed. Using the Current System Map as a base map, actors nodes will be coloured according their level of engagement in the system (this is generated through Section 5 of the SAM).

LEGEND

RELATIONSHIP Quality
GOOD
STRESSED
BAD

Step 1: Map out the Transaction Chain (identified in Step 2.2)

1.1 In the middle of the work area map out the system's transaction chain. Visually divide your work area into the transaction chain stages and label the corresponding categories of the map (i.e., Production, Transport, Retail, Consumption, etc.)

CAPTURE/ PRODUCERS | COLLECTION/ INTERMEDIARIES | RETAIL/ PROCESSING | CONSUMPTION

1.2 Place actors nodes under their correct category (e.g., producers should all be found in the same 'vertical' area, intermediaries should all be in the same 'vertical' area, etc).

NOTE: *The size of actor node is determined by their Relevance in the system (calculated by the Throughput and Replaceability of each in the Stakeholder Assessment Matrix). The higher the Relevance score of the actor, the larger the circle, the lower the relevance score the small the actor node circle.*

Transaction Chain **INPUT**

FISHERS (<15K) Target Group
+/-9-10 K MT of fish

Retail/ Local **Intermediaries** (+/-100)
Wholesales **Intermediaries** (+/-80)
Fishers' **Businesses** (5) Target Group
EMPROMARSA* COOPESPCOL* APAIB* LAREINI - LAWAN KAUMA
*Fishers' Associations
Collection **Centers** (+/- 29) Target Group
YAHURABILA CAPIRO JERICÓ CASTILLA APROCUS DELFINES DEL CARIBE TONINA BLANCA MARIÓN KRUTA - RÓBALO BRIT-PUT-TANGNI BUKARIMAT
High-Sea **Intermediaries** (+/53)

Street/Seasonal **Vendors** (+200)
Municipal **Markets** (9)
TOCOA TRUJILLO SAN PEDRO SULA PUERTO CORTÉS CHOLOMA LA CEIBA PROGRESO TELA TEGUCIGALPA
Hotels /**Restaurants** (+/-150)
Supermarkets (3)
LA COLONIA WALMART LA ANTORCHA
Processing **Plants** (+/-19)
KAUMA /GEOVANNY LEE ALDASA FINCOR GRUPO MOON MARINOS PESCADERÍA MARISCOS DEL ATLÁNTICO MARUCO other FROZEN

1.3 Connect actors with arrowed lines showing the flow of the throughput of the main product or service. The size of the line is determined by the volume of the throughput being channelled between those actor relations.

NOTE: *The lines can either connect specific actors or actor groups depending on the level of detail desired for the system map.*

1.4 Place the corresponding symbol depicting the type of relationship that exists between actors on top of the connecting line: A lightning bolt represents a Stressed relationship, an (X) represents a Bad relationship, and a Good relationship has no symbol, just the connecting line.

NOTE: *The 'Relationship Quality' Legend can be found on the upper right-hand corner of the R4S Maps. *The Relationship Assessment carried out in the Stakeholder Assessment Matrix provides this information.*

1.5 Place the percentage (%) that represents the throughput/production volume that flows from actor node to actor node on top of the connecting lines; this percentage is of the total production volume of the system. *The System Assessment carried out in the Stakeholder Assessment Matrix provides this information.

1.6 Place the KPIs (Key Performance Indicators) on top of the connecting lines between actors. The example used in the case study for this Guidance Manual is the price ($) per pound (Lb.) of scaled whole fish ($/Lb.) small-scale fishers receive for the sale of their catch.

LOCAL **Consumer**
NATIONAL **Consumer**
EXPORT

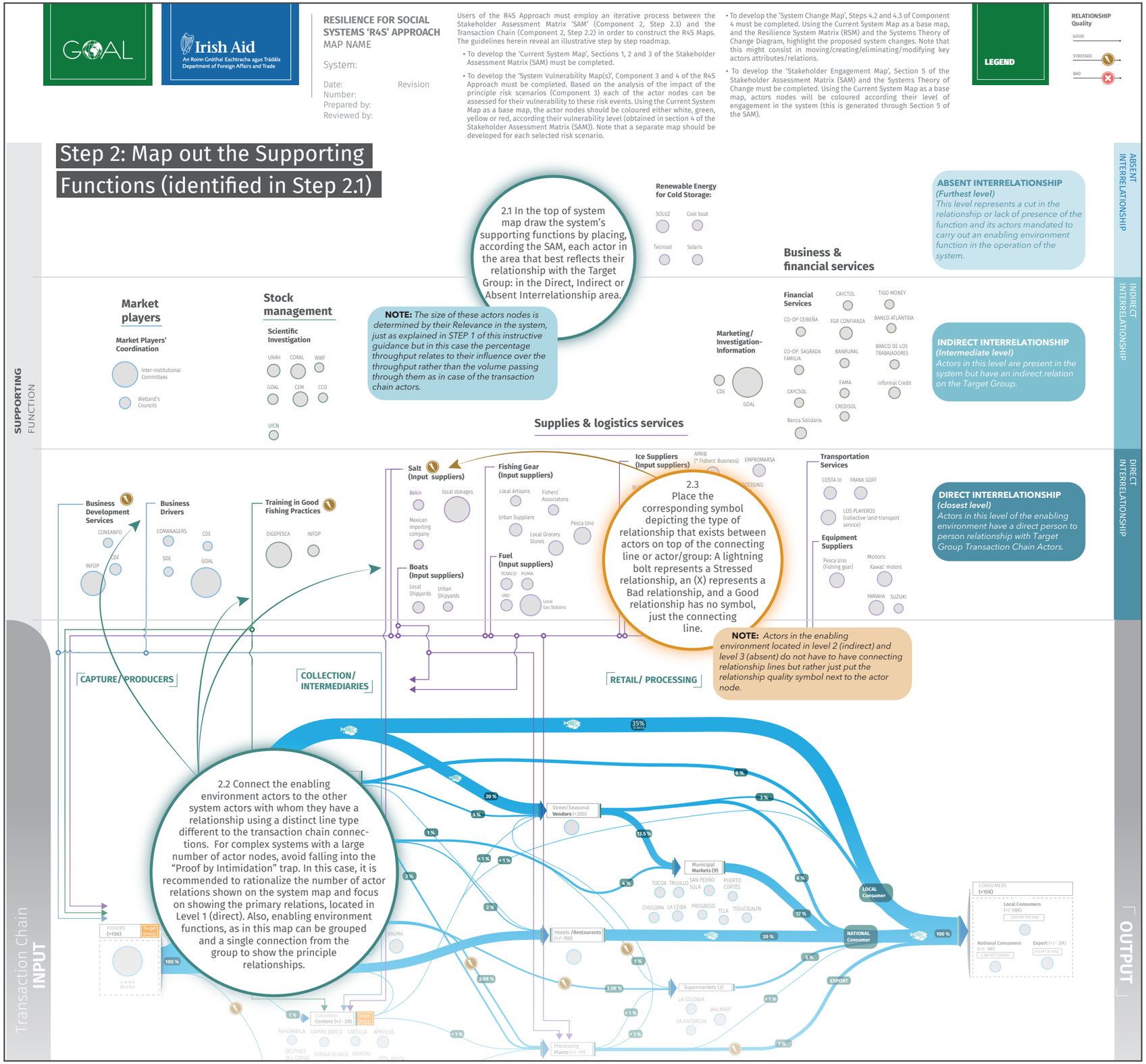
CONSUMERS (+15K)
Local Consumers (+/-50K) 7,010 MT (10.10%)
National Consumers (+/- 1M) 2,380 MT (3.80%)
Export (+/- 2M) 610 MT (6.10%)

NOTE: *Apart from the percentage of throughput of the system, other KPIs can be included onto the system map so that the performance of different aspects of the system can be more easily understood. In the case of small-scale fisheries, an important KPI is the income received by small-scale fishers. This can be shown on the different branches of the system, showing that different routes for the throughput of the system offer better returns for the fishers.*

OUTPUT

Figure 19. Instructive Guidance to build an R4S Map (Step 1)

Figure 20. Instructive Guidance to build an R4S Map (Step 2)



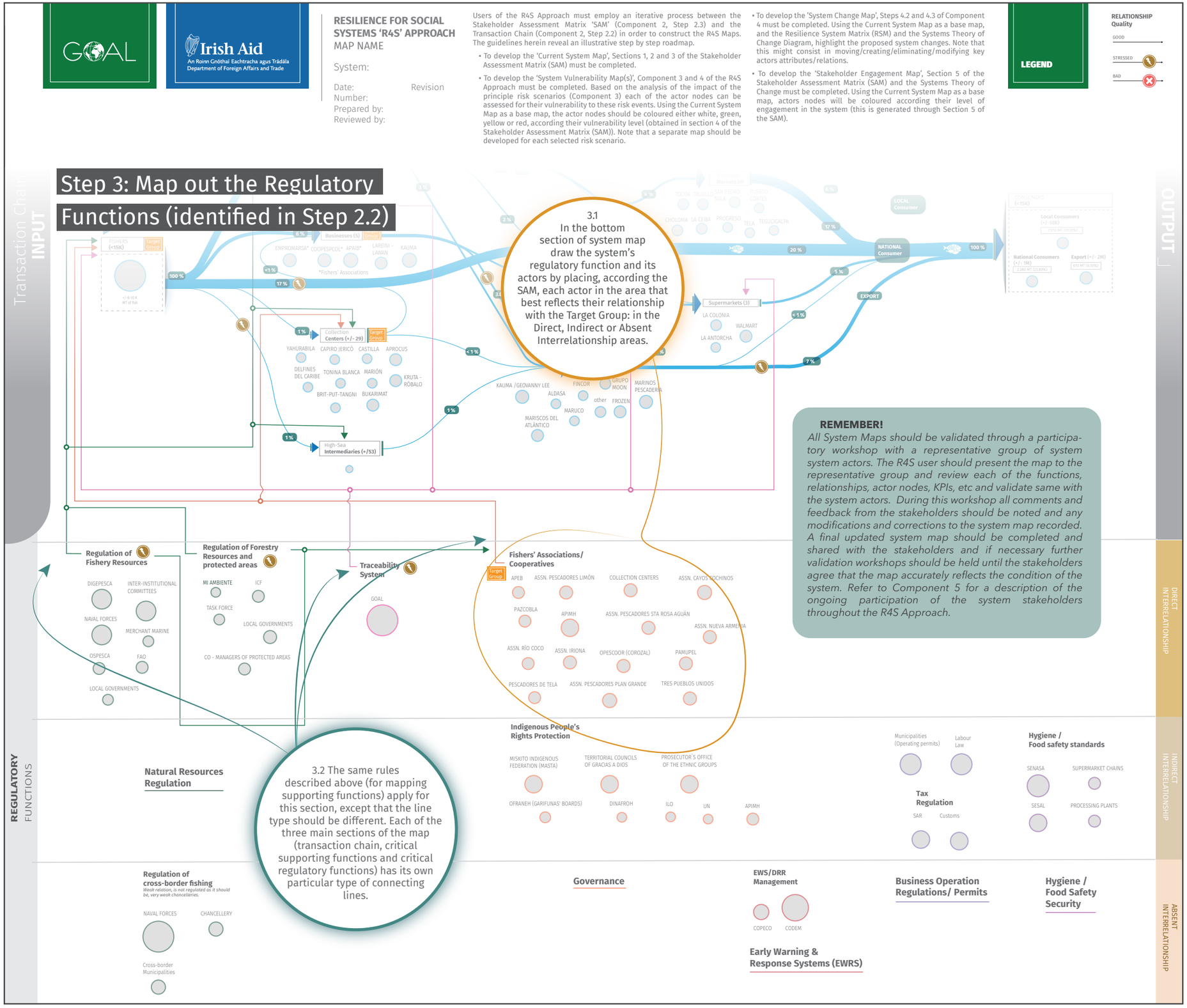


Figure 21. Instructive Guidance to build an R4S Map (Step 3)

Case Study: Small-Scale Fisheries System from the North Coast of Honduras

Refer to **Current System Map**

The Transaction Chain structure is the small-scale fisheries value chain and is shown in the middle of the map, in the top part of the map are actors who carry out the Supporting Functions of the system and in the bottom part of the map the actors for the Regulatory Functions. The supporting and regulatory functions are depicted with 3 different levels of relationship/connectivity to the Target Group: *Direct, Indirect or Absent relationship*.

> *For example*, the Small-Scale Fisheries Market System is missing some important *Supporting Functions,* and this significantly limits the performance of the system. The Target Group's enabling environment does not provide the necessary technical assistance in Good Fishing Practices which has been qualified as a Stressed Relationship and appears as a lightning bolt sign next to the name. There is a stressed relationship between the salt suppliers and transaction chain actors. Other important system functions not linked to the system are the Marketing/Investigation services, scientific investigation, financial services, market players coordination and renewable energy for cold storage.
>
> With regards to the *Regulatory Functions,* Traceability System and Hygiene/Food Safety Standards actors have an *Indirect Interrelationship* with the Target Group, making this a significant limitation for the Target Group to increase their market share in the national and international markets and/or monitor the status of the fish stocks, etc. The relationship between the artisanal fishers and various regulatory functions are stressed. The Early Warning and Response Systems functions, along with the Regulation of cross-border fishing are absent, which significantly increase the risk from a disaster event.
>
> The *Transaction Chain* shows the transactional structure of the system and the volume of goods/services dependent on each actor node (flowing from actor to actor), which is represented on top of each connecting line shown by the percentage of the total volume of production of the system. The thicker connecting lines in the Transaction Chain represent the highest volume of goods or services flowing between actor nodes. This can be viewed on the Current System Map, where 55% of the total fish captured by small-scale fishermen is sold to 'Local Consumers' either directly by the fishers (35%) or through 'Street/Seasonal Vendors' (20%). The Key Performance Indicators (KPIs) are shown on top of each line all along the Transaction Chain. As previously mentioned, apart from the percentage of throughput of the system, other Key Performance Indicators can be included onto the system map so that the performance of different parts of the system can be fully understood. In the case of small-scale fisheries, an important KPI is the income received by small scale fishers (price per pound of fish). This is shown on the different branches of the transaction chain, showing that different system relations offer better returns for the fishers.

The level of *Relevance* or criticality of actors (measured through the 'SAM') is represented via the circle size of each actor; the circle size responds to two variables (1) the production volume, of goods/services (throughput) of the entire system, dependent on the actor and (2) the degree of replaceability of the actor. The more critical or irreplaceable the actor, the bigger the circle. *In the Current System Map, for example, it can be seen that 'Street/Seasonal Vendors' and 'Fishers' have one of the biggest circle sizes; this responds to the fact that 70% of the product is commercialized through these informal markets.*

RESILIENCE FOR SOCIAL SYSTEMS 'R4S' APPROACH
CURRENT SYSTEM MAP

System: Small-Scale Fisheries Market System in the Honduran North Atlantic Coast

Date: May/2019 · Revision Number: 03
Prepared by: Mario Argeñal/ Gabriela Cáceres/ Ana Córdova/ Carlos Villatoro/ Darwin Castillo/ Sayri Molina
Reviewed by: Luigi Loddo/ Bernard McCaul

The 'R4S' Current System Map represents from 15-20,000 small-scale fishermen who fish around 8-10,000 metric tonnes of fish per year off the North Atlantic coast of Honduras and whose System operates with the involvement of around 35 different types of actors. The data collected corresponds to the period: December 2015 – March 2019.

The Transaction Chain, in the middle of the map, demonstrates the volume of production that goes through the different distribution channels (or actors), from the producers all the way to the end consumers (It has been assumed nothing goes to waste). The Supporting Functions are in the top section of the map and the Regulatory Functions are in the bottom section; each containing 3 different levels of connectedness to the Target Group: Direct, Indirect or Absent Interrelationship.

LEGEND

RELATIONSHIP Quality
GOOD
STRESSED
BAD

ABSENT INTERRELATIONSHIP
INDIRECT INTERRELATIONSHIP
DIRECT INTERRELATIONSHIP

SUPPORTING FUNCTIONS

Market players

Stock management

Renewable Energy for Cold Storage:
SOLUZ
Cool boat
Tecnisol
Solaris

Business & financial services

Market Players' Coordination
Inter-institutional Committees
Wetland's Councils

Scientific Investigation
UNAH
CORAL
WWF
GOAL
CEM
CCO
UICN

Supplies & logistics services

Marketing/ Investigation- Information
CDE
GOAL

Financial Services
CAYCTOL
TIGO MONEY
CO-OP CEIBEÑA
FGR CONFIANZA
BANCO ATLÁNTIDA
CO-OP. SAGRADA FAMILIA
BANRURAL
BANCO DE LOS TRABAJADORES
CAYCSOL
FAMA
Informal Credit
Banca Solidaria
CREDISOL

Business Development Services
CONEANFO
CDE
INFOP

Business Drivers
COMANAGERS
CDE
SDE
GOAL

Training in Good Fishing Practices
DIGEPESCA
INFOP

Salt (Input suppliers)
Bekin
local storages
Mexican importing company

Boats (Input suppliers)
Local Shipyards
Urban Shipyards

Fishing Gear (Input suppliers)
Local Artisans
Fishers' Associatons
Urban Suppliers
Pesca Uno
Local Grocery Stores

Fuel (Input suppliers)
TEXACO
PUMA
UNO
Local Gas Stations

Ice Suppliers (Input suppliers)
APAIB (* Fishers' Business)
EMPROMARSA
BUKARIMAT
KAUMA
Urban Markets
PROCESSING PLANTS
BRIT - PUT - TANGNI
COOPESPCOL

Equipment Repair Services
Local repair workshop
Fishermen
Yamaha Repair Workshop

Transportation Services
COSTA III
FRANK GOFF
LOS PLAYEROS (collective land-transport service)

Equipment Suppliers
Pesca Uno (Fishing gear)
Motors:
Kawas' motors
YAMAHA
SUZUKI

Transaction Chain **INPUT**

CAPTURE/ PRODUCERS
COLLECTION/ INTERMEDIARIES
RETAIL/ PROCESSING
CONSUMPTION

FISHERS (<15K) — Target Group
+/-8-10 K MT of fish
100 %
75 %
35% (10.66 K)
55 %
10 %
20 %
3 %
6 %
1 %
< 1 %
2 %
4 %
13.5 %
17 %
20 %
3.08 %
5 %
7 %
EXPORT
LOCAL Consumer
NATIONAL Consumer

Retail/ Local **Intermediaries** (+/-100)
Wholesales **Intermediaries** (+/-80)
Fishers' **Businesses** (5) — Target Group
EMPROMARSA* COOPESPCOL* APAIB* LAREINI - LAWAN KAUMA
*Fishers' Associations
Collection **Centers** (+/- 29) — Target Group
YAHURABILA CAPIRO JERICÓ CASTILLA APROCUS DELFINES DEL CARIBE TONINA BLANCA MARIÓN KRUTA - RÓBALO BRIT-PUT-TANGNI BUKARIMAT
High-Sea **Intermediaries** (+/53)

Street/Seasonal **Vendors** (+200)
Municipal **Markets** (9)
TOCOA TRUJILLO SAN PEDRO SULA PUERTO CORTÉS CHOLOMA LA CEIBA PROGRESO TELA TEGUCIGALPA
Hotels /**Restaurants** (+/-150)
Supermarkets (3)
LA COLONIA WALMART LA ANTORCHA
Processing **Plants** (+/-19)
KAUMA /GEOVANNY LEE ALDASA FINCOR GRUPO MOON other FROZEN MARUCO MARISCOS DEL ATLÁNTICO MARINOS PESCADERÍA

CONSUMERS (<15K)
Local Consumers (+/-50K) 7,010 MT (70.10%)
National Consumers (+/- 1M) 2,380 MT (23.80%)
Export (+/- 2M) 610 MT (6.10%)

REGULATORY FUNCTIONS

Regulation of Fishery Resources
DIGEPESCA
INTER-INSTITUTIONAL COMMITTEES
NAVAL FORCES
MERCHANT MARINE
OSPESCA
FAO
LOCAL GOVERNMENTS

Regulation of Forestry Resources and protected areas
MI AMBIENTE
ICF
TASK FORCE
LOCAL GOVERNMENTS
CO - MANAGERS OF PROTECTED AREAS

Traceability System
GOAL

Fishers' Associations/ Cooperatives — Target Group
APEB
ASSN. PESCADORES LIMÓN
COLLECTION CENTERS
ASSN. CAYOS COCHINOS
PAZCOBLA
APIMH
ASSN. PESCADORES STA ROSA AGUÁN
ASSN. NUEVA ARMENIA
ASSN. RÍO COCO
ASSN. IRIONA
OPESCOOR (COROZAL)
PAMUPEL
PESCADORES DE TELA
ASSN. PESCADORES PLAN GRANDE
TRES PUEBLOS UNIDOS

Natural Resources Regulation

PROCESSING PLANTS

Indigenous People's Rights Protection
MISKITO INDIGENOUS FEDERATION (MASTA)
TERRITORIAL COUNCILS OF GRACIAS A DIOS
PROSECUTOR'S OFFICE OF THE ETHNIC GROUPS
OFRANEH (GARIFUNAS' BOARDS)
DINAFROH
ILO
UN
APIMH

Municipalities (Operating permits)
Labour Law

Tax Regulation
SAR
Customs

Hygiene / Food safety standards
SENASA
SUPERMARKET CHAINS
SESAL
PROCESSING PLANTS

Regulation of cross-border fishing
Weak relation, is not regulated as it should be, very weak chancelleries.
NAVAL FORCES
CHANCELLERY
Cross-border Municipalities

SENASA
DIGEPESCA
OIRSA
SUPERMARKET CHAINS
Marine Stewardship Council

Traceability

Governance

EWS/DRR Management
COPECO
CODEM

Early Warning & Response Systems (EWRS)

Business Operation Regulations/ Permits

Hygiene / Food Safety Security

OUTPUT

Current Systems' Map - Case Study Small Scale Fisheries in North Coast of Honduras

COMPONENT 3 Identification and Selection of Risk Scenarios with Potential to Affect the Selected Critical Socio-Economic System(s)

In Component 1 a preliminary analysis of the general risk landscape was carried out to inform the selection of the target socio-economic system(s). In this section, a more in-depth risk assessment will be developed in order to identify the principle risk scenarios (typically two or three) that could potentially affect the selected socio-economic system(s). These Risk Scenarios are utilized in Component 4 to assess the vulnerability of the system.

COMPONENT 3

IDENTIFICATION OF RISK SCENARIOS

STEP 3.1 Determine Scope of Risk Analysis

STEP 3.2 Determine Primary Risks and Secondary Risks (Cause and Effect)

STEP 3.3 Prioritize Risk Scenarios according the probability of Occurrence and level of Impact on System Function

This risk analysis will provide a clear picture of what the system must be resilient to and will be a key input to analyse which are the main vulnerabilities of the system in component 4. Preparing a socio-economic system for potential crises (whose occurrence and impact is uncertain) and being able to mitigate the effects of those crises, is one of the key differentiating aspects between 'traditional' systems development[18] and resilient systems programming.

The steps described here for risk assessment were constructed based on GOAL's *ARC-D Toolkit* and the *'Guidelines for Resilience Systems Analysis'* (OECD 2014).

STEP 3.1 –Determine Scope of Risk Analysis

It is important to accurately delimit the risk analysis pertaining to the selected socio-economic system. The selection of the socio-economic system being analysed was made under Component 1 and this selection was, at least in part, due to the systems relevance to reducing the impact of a risk scenario(s) on the Target Group. Under this component the focus is different in that the scope of the risk analysis is to understand what risk scenarios could impact on the target system and not just the Target Group although there will be significant overlap. It is recommended to review the risk analysis previously identified under Component 1 to ensure the most relevant risk scenarios are being identified for the selected system. The scope of the risk analysis must be realistic, relevant[19] and not unnecessarily vast. The following four key questions help guide the risk analysis scope[20]:

Scope of Risk Analysis:

The risk analysis will be of who and where?

Of previously selected Target Group in specific geographic location (identified in Component 1). E.g. Small-scale fishers in the North Atlantic Coast of Honduras.

The risk analysis will be of what system?

Of the previously selected socio-economic system (identified in Component 1). E.g. Small-scale fisheries market system.

Which specific risks, shocks and stresses will be analysed?

To previous shocks and stresses experienced by the system in the past and to other new potential risk scenarios identified through a rigorous risk landscape analysis (to be conducted in Step 3.2). (Note: this may vary from the risk scenarios considered for the Target Group identified in Component 1)

The risk analysis will be over which timeframe?

Users of the R4S Guide may decide the timeframe that best suits their programme intervention but should typically be selected to address the development horizon of the Target Group.

According to the OECD a shock is a "sudden event with an important and often negative impact on the vulnerability of a system and its parts." Shocks can be negative or positive and they affect people's means of living. A stress is a "long-term trend weakening the potential of a given system and deepening the vulnerability of its actors."

A complete understanding of the overall risk landscape the system is exposed to is required. A preliminary analysis of the risk landscape was carried out in Component 1. However, in Component 3 a more rigorous analysis is necessary in order to determine new potential system specific risks that were not identified in Component 1. The geographic position, country and regional characteristics (culture, economy, etc.) where the system is located must also be analysed. The five main risk categories are the following:

1. *Environmental (includes Infrastructural)*
2. *Economic*
3. *Social (includes Cultural, Technological)*
4. *Political (includes Geopolitical)*
5. *Health*

The overall risk landscape describing each of the 5 main risk categories of the critical socio-economic system should be summarised in the final R4S report. The Risk Assessment Matrix (RAM) in ***Table 5*** is provided to complete the risk analysis for the selected socio-economic system(s) and is described in Step 3.2 and 3.3.

STEP 3.2 –Determine Primary Risks and Secondary Risks (Cause and Effect)

In dealing with complex and dynamic socio-economic systems, where an important degree of uncertainty and lack of control exists, identifying all the interactions (and effects) between variables may not be possible. However, as a minimum, the cause and effect relationship between variables –how primary risks (shocks and/or stresses) can trigger secondary risks (other shocks and stresses)– must be analysed and understood.[21]

18 Or 'Market Systems Development'

19 'OECD: Guidelines for Resilience Systems Analysis'

20 Adopted from the 'OECD: Guidelines for Resilient Systems Analysis' https://www.oecd.org/dac/Resilience%20Systems%20Analysis%20FINAL.pdf

21 The possibility of modeling the dynamic nature of complex socio-economic systems through more sophisticated software (i.e., Vensim, Stella, iThink, etc.) has been envisioned for a future version of the R4S Approach.

The primary risks the system is exposed to come from: (1) previous shocks and stresses which have impacted the system and (2) from *new* potential shocks and stresses the system is exposed to. Users of the *R4S Guide* may or may not identify new potential shocks or stresses; this depends on the socio-economic system being diagnosed and its context. A shock can produce others shocks and/stresses, and a stress can produce other stresses. An important risk scenario to consider is the risk of system collapse due to the levels of stress affecting the system. That is to say, that at present there could exist stressors affecting the system in such a way, which without the necessity of the occurrence of a shock, could lead to a point of the collapse in the system. To better understand this, see ***Figure 22*** where Scenario A shows a simplified interpretation of development progress over time and, Scenario B shows the typical reality of the development of socio economic systems affected by shocks and stressors (past or future).

Scenario C on the other hand, shows that there could be stressors that have long affected the system with the resultant reduction in development and system performance over time. Therefore, instead of advancing towards development, under this scenario the system is moving towards collapse without the occurrence of a shock. Clearly, if a shock occurs it would accelerate the collapse of it, but this should be considered in a separate risk scenario. Therefore, R4S recommends that at least one risk scenario should be solely based on the identified stressors without a shock and other risk scenarios are triggered by a shock.

After identifying all the possible shocks and stresses (old and new) and their relationships it is necessary to understand how these combine to create realistic risk scenarios and then to determine the effect of these. For example, does "Shock 1" (e.g., a flood) cause another shock (i.e., a landslide) or multiple shocks and stresses (e.g., landslide, bridge collapse, interruption in economic activity, food insecurity, etc.). This cause and effect relationship is captured through the matrix provided in the RAM Part A of ***Table 5,***Selection of Risk Scenarios.

GOAL recommends users of the R4S to consider the potential collapse of the socio-economic system solely due to the levels of stress in the system to be a principle risk scenario in the RAM. If the current scenario without the impact of shocks is critically dysfunctional and likely to result in system collapse then it will be a critically important risk scenario to address in step 3.3 below. For the case study of small-scale fisheries market system, stressors such as environmental degradation and climate change combined with unsustainable fishing practices have undermined the stock of fish to the point of potential collapse of the system and represents a primary risk scenario and hence the urgency of a systems change intervention. The stressor only risk scenario is also relevant to inform the analysis of the likelihood and impact of other risk scenarios triggered by shocks such as major storms etc.

The completion of the cause and effect relationship to determine the primary and secondary shocks and stresses and the identification of risk scenarios should be completed through a participatory workshop with the system stakeholders and by completing Part A of the Risk Assessment Matrix (RAM). This workshop could potentially be organized to be held at the same time as the workshop to validate the Current System Map.

STEP 3.3 –Prioritize Risk Scenarios according the probability of Occurrence and level of Impact on System Function

Risk scenarios should be prioritized based on the probability of occurrence of the identified shocks and stresses and the potential impact. The Probability Scale *R4S* proposes to estimate the likelihood of occurrence of the root risks is the following[22]:

Possibility Scale

1	Very Unlikely	<1% probability in determined timeframe
2	Unlikely	Between 1-10% probability in determined timeframe
3	Possible	Between 10-50% probability in determined timeframe
4	Likely	Between 50-75% probability in determined timeframe
5	Very Likely	Between 75-100% probability in determined timeframe

22 Users of R4S may come up with their own probability metrics.

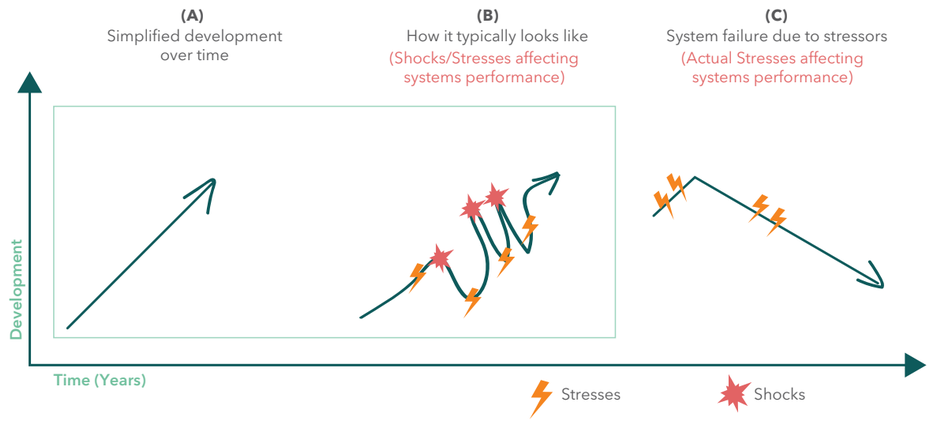


Figure 22. Image at the top. Development Versus Time diagram

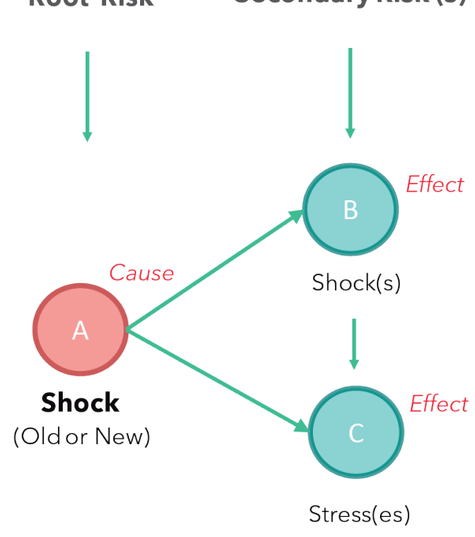


Figure 23. Image at the bottom. Root Risks and Secondary Risks

The preliminary assessment of level of impact is determined by considering to what degree the risk scenario will impact on the delivery of goods and / or services provided by the system to the Target Group. If the impact results in the system discontinuing to provide goods and / or services to the Target Group for an extended period then the impact is more severe. On the other hand, if the impact of the risk scenario is short term and only results in minor disruptions then the level of impact is considered to be minor. The following table provides a guide for determining the level of impact of a risk scenario on the performance of a socio-economic system.

The R4S user may choose to prioritize all risk scenarios which obtain a risk score (Probability X Impact) over a certain threshold value, however, this will depend on the context and the scope of the risk assessment and R4S study. Alternatively, it is suggested that typically 2 to 3 principle risk scenarios should be sufficient to inform measures to build resilience of the system. Part B of the Risk Assessment Matrix (in ***Table. 5***) should also be completed through a participatory workshop with the system stakeholders and should be used to further develop the understanding of the selected risk scenarios by first describing in more detail the potential risk event, providing a description of the likely impact and to begin to develop understanding of the potential coping strategies and the capacities of the system to respond to these risks. Through this process of consultation with system actors the R4S user should collate as much as possible of the local knowledge and experience on potential risk scenarios and this will be used to inform the assessment of system resilience in component 4.

Systemic Impact Scale

Level 1	Level of impact is not significant and the system can continue to function delivering close to the desired level of service and/or products to the Target Group. (Most of the Target Group unaffected).
Level 2	Level of impact is demonstrably affecting the function of the system limiting capacity to deliver services and/or goods to the Target Groups although impact is short term and the system has capacity to recover without outside intervention. (Majority of Target Group experiencing minor level of impact.)
Level 3	Level of impact is limiting the capacity of the system to deliver goods and services for an extended period to the majority of the Target Group. System has capacity to recover with only small-scale interventions from external assistance. There is no significant permanent damage to the system. (Majority of Target Group experiencing medium level of impact over short period).
Level 4	Level of impact severely limits the capacity of the system to deliver goods and services for an extended period to the majority of the Target Group. There is permanent damage to the system function which can be restored with large scale interventions from external assistance. (Majority of Target Group experiencing significant level of impact for extended period).
Level 5	The impact on the system results in complete collapse of the system for an extended period of time affecting most or all of the Target Group. There is permanent damage to the system which can only be restored through significant large-scale interventions from external assistance. (All or most of the Target Group cut off from services and / or products provided by the system).

Figure 24. Level of impact of a risk scenario on the performance of a socio-economic system

Part A: Selection of Risk Scenarios

Root Risks and Secondary Risks from Past and New Potential Shocks/Probability of Occurrence of Root Risks

Type of Shock/ Stress		Root Risks	Secondary Risks	Rate: 1-2-3-4-5	Rate: 1-2-3-4-5	Total Risk Score	Root Risks (New)	Secondary Risks	Rate: 1-2-3-4-5	Rate: 1-2-3-4-5	Total Risk Score
		Past Shocks/ Stresses	Effect of Past Shocks/Stresses (i.e., flood produced landslide) <Can be shock or stress>	Probability of Root Risk from Past Shocks/Stresses	Impact on System		New Potential Shocks/Stresses	Effect of New Shock/Stress (i.e. storm surge may produce infrastructural damage) <Can be shock or stress>	Probability of Root Risk (from New Shocks/Stresses)	Impact on System	
Environmental											
	1	*Flood (shock)*		*4*	*3*	*12*					
			1. Landslide <shock>								
			2. Bridge collapse <shock>								
			3. Cease in economic activity <stress>								
			4. Food insecurity <stress>								
			5…								
	2	*Water pollution (stress)*		*5*	*3*	*15*					
			1. Poor sanitation and hygiene <stress>								
			2. Infectious disease <stress>								
			3. Immigration <stress>								
			4…								
Natural/Health											
	3	**…**									
Economic											
	4	**…**									
Social/political											
	5	**…**									

Table 5. Part A & B of the Risk Assessment Matrix (RAM)

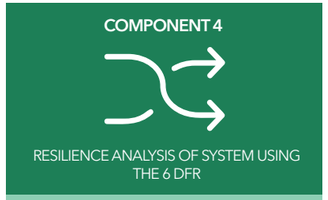
Part B. Analysis of Risk Scenarios on the Selected Socio-Economic System

Based on the information collected in Part A, analyse the principal risk scenarios with potential to affect the selected socio-economic system.

Risk Scenarios	Description
RISK SCENARIO 1	Shock/Stress and Effects
	Which event (shock/stress) is the most probable and devastating, and if applicable, how does it lead to other shocks/stresses?
	Impact on the Performance of the Socio-Economic System
	What is the extent of impact (damage, loss, etc.) from this Risk Scenario (identified above)?
	Coping Mechanisms
	What coping mechanisms (both positive and negative) and/or capacities does the system use (or can use) to deal with this Risk Scenario?
RISK SCENARIO 2	Shock/Stress and Effects
	Which event (shock/stress) is the second most probable and devastating, and if applicable, how does it lead to other shocks/stresses?
	Impact on the Performance of the Socio-Economic System
	What is the extent of impact (damage, loss, etc.) from this Risk Scenario (identified above)?
	Coping Mechanisms
	What coping mechanisms (both positive and negative) and/or capacities does the system use (or can use) to deal with this Risk Scenario?

COMPONENT 4 – Resilience Analysis of Critical Socio-Economic System(s) against the 6 Determinant Factors of Resilience (DFRs)

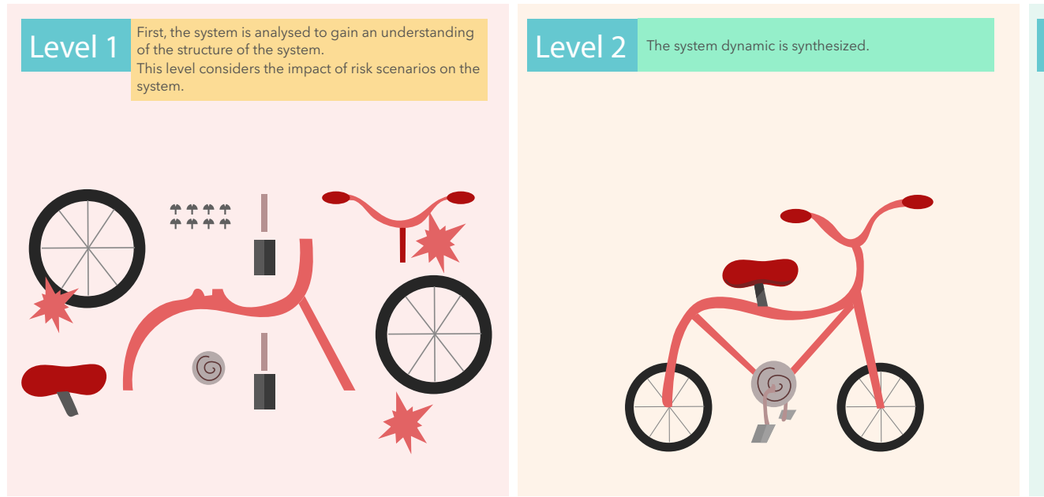
In this component an analysis of the resilience of the selected socio-economic system(s) is carried out. This is done utilizing the data collected on the system to date and participatory reviews with the system stakeholders. This analysis will guide interventions to strengthen the resilience of the selected socio-economic system(s).



A well-designed intervention will be based on two clear perspectives – one which is sets a vision for the system and how it should ideally function in the future and the other is a clear understanding of what is the current status of the system. Both are likely to change over time as the vision for how the system should function in the future becomes more realistic and also as understanding of the actual status of the system improves and the system changes and moves towards the idea vision.

The R4S Approach for analysis of the status of a socio-economic systems has three levels.

Level 1: First, the system is analysed to gain an understanding of the structure of the system as defined by the actor nodes and their relationships. This level considers the impact of risk scenarios on the system and identifies what actor nodes and relationships are impacted and how. This reductionist approach provides an important understanding of the resilience of the system in a static way by studying the parts that make up the system.



Level 2: The system dynamic is synthesized for each risk scenario, starting with the stressor only scenario identified in Component 3, to understand the stock and flow in the system, what are the critical reinforcing and balancing feedback loops and their related time delays.

Level 3: Finally, the overall system is assessed to understand the system characteristic based on six Determinant Factors of Resilience (DFRs): **Connectivity, Diversity, Redundancy, Governance, Participation and Learning.** Refer to the ***Resilient System Matrix in Table 6*** for a description of the six Determinant Factors of a Resilient System.

The R4S approach will inform understanding of how well the system is functioning in terms of delivering goods and services to the Target Group and contributing to their wellbeing. While R4S focuses on risk scenarios there is direct overlap between resilience of the system and its contribution to the wellbeing of the Target Group. The assessment of the system function under the stressor only risk scenario is key to understanding the normal function of the system. Therefore, it is recommended that the stressor only risk scenario is always the first consideration unless it is clear that the system is not currently critical to the wellbeing of the Target Group and is functioning well and the analysis is limited to future risk scenarios triggered by shocks. It is recommended to refer to the M4P Guidance Manual for additional guidance on assessing the function of socio-economic systems.

To develop a vision for the system in the future the process is reversed. Based on the assessment of the system characteristic a set of overall recommendation are made to improve resilience and inclusiveness of the system. This vision is developed further through a model of the system dynamic and finally an **System Change Map** is developed.

As described in Component 5, complex socio-economic systems by their nature have high degrees of uncertainty in terms how they respond to change and hence an adaptive management approach is critical to achieving long-term sustainable change.

Figure 25. The R4S Approach for analysis of actual resilience status of socio-economic systems

STEP 4.1 –Analysis of the impact of the selected Risk Scenarios on the System.

4.1.1. Develop System Vulnerability Map(s) for each selected risk scenarios

The identification of the risk scenarios which could potentially impact the system and the information gathered through the stakeholder consultation and mapping process completed up to this point provides sufficient information and understanding of the system to complete the "Vulnerability Assessment" in section 4 of the *Stakeholder Assessment Matrix (SAM)*. For each risk scenario prioritized through Component 3, the SAM will guide the assessment of each system actor and their relationships to assess their level of vulnerability defined by Sensitivity, exposure and capacity. The SAM utilizes a scale from 1 to 5, where 1 = very low sensitivity/exposure/capacity and 5 = very high sensitivity/exposure/capacity. The vulnerability of each actor is presented using a traffic light colour scheme to represent the System Vulnerability: No/minimal (White), Low level (Green), Medium Level (Yellow) & High level (Red).

Based on the selected risk scenarios and Section 4 of the *Stakeholder Assessment Matrix (SAM),* a **System Vulnerability Map** is then elaborated for each risk scenario. The *R4S System Vulnerability Map* is a visual representation of system actors' vulnerability and the potential effects that the risk scenarios have on the selected socio-economic system. A separate map should be developed for each selected risk scenario and this informs the analysis of the potential impacts of these risks on the system and their negative effect on the Target Group as described above. The first risk scenario to be analysed in this way should be the stressor only risk scenario. Each map should be validated through participatory workshops with the principle system actors. The System Vulnerability Map is completed as follows:

a) Include a description of the risk scenario being assessed in the System Vulnerability Map and include visual aids, images or graphics to clearly represent the risk scenario under analysis.

b) Using the Current System Map as a base map, the actor nodes should be coloured in white, green, yellow or red, according their vulnerability level obtained in section 4 of the Stakeholder Assessment Matrix (SAM).

c) The status of the relationship between the system actors is described in the SAM and presented on the Current Systems Map. At this point, for the development of the System Vulnerability Map it is necessary to assess the impact of the Risk Scenario on the level of connectivity or the relationships between the actors in the System. An exclamation mark "!" represents a Relationship Partially Disrupted and an "X" represents a Relationship Totally Disrupted.

No Impact: In this case no additional marker is required because the relationship is not impacted by the risk scenario.

Partially Disrupted (!): The relationship is still in place and functioning but the throughput has been significantly disrupted due to the impact of the risk scenario. There is capacity for the actors to re-establish their connection in the short term without the need for external intervention.

Totally Disrupted (X): The relationship is fully disrupted and the connectivity between the actors has been broken due to the impact of the risk scenario. This could be temporary or permanent and can not be re-established without external intervention.

These symbols should be put in a different colour (preferably Red) to the symbols used to indicate the status of the relationships in the **Current System Map**[23]. The 'X' and the exclamation mark can be increased in size to represent a higher level of negative impact. The following maps provide examples of two System Vulnerably Maps using the case study of small-scale fisheries and two risk scenarios, the **System Vulnerability Map- Stressor Only Risk Scenario** and the **System Vulnerability Map- Risk Scenario Triggered by a Major Storm Event.**

23 Under the Stressor only risk scenario the R4S user will further develop the analysis of relationships in the Current System Maps to project out the impact on relationships and actor nodes due to the ongoing and future impact of stressors on the system.

GOAL

Irish Aid
An Roinn Gnóthaí Eachtracha agus Trádála
Department of Foreign Affairs and Trade

RESILIENCE FOR SOCIAL SYSTEMS 'R4S' APPROACH
SYSTEM VULNERABILITY MAP
Stressor Only Risk Scenario - Climate change, environmental degradation and unsustainable fishing practices

System: Small-Scale Fisheries Market System in the Honduran North Atlantic Coast

Date: May/2019 - Revision Number: 01
Prepared by: Mario Argeñal/ Carlos Villatoro/ Darwin Castillo/ Sayri Molina/ Daniela Torrez
Reviewed by: Bernard McCaul/ Gabriela Cáceres

The 'R4S' System Vulnerability Map is a visual representation of system actors' vulnerability and the potential effects that the risk scenarios have on the selected socio-economic system. This map uses the Current System Map as a base map and each actor is colored according their vulnerability level obtained in section 4 of the Stakeholder Assessment Matrix (SAM).

As the Legend on the upper right hand corner illustrates, the System Vulnerability Map identifies four levels of vulnerability by each system actor: Actors with no/minimal vulnerability are colored white, low level of vulnerability will be green, medium vulnerability will be yellow and those with the highest level of vulnerability will be colored in red.

Also, the System Vulnerability Map also defines the corresponding symbol depicting the effects of the identified risk scenarios in the transaction chain and also on the links to the actors in the supporting and regulatory functions. An exclamation mark (!) represents a Partially Disrupted relationship, and an (X) represents a Totally Disrupted relationship. These symbols are colored in red to indicate the status of the relationships in the Current System Map. If necessary, the exclamation mark can be doubled and/or increased in size to represent a higher negative impact.

LEGEND

- No/minimal vulnerability
- Low level of vulnerability
- Medium level of vulnerability
- High level of vulnerability
- Relation totally disrupted
- Relation partially disrupted

SUPPORTING FUNCTIONS

ABSENT INTERRELATIONSHIP

Market players

Stock management

Renewable Energy for Cold Storage:
SOLUZ, Cool boat, Tecnisol, Solaris

Business & financial services

INDIRECT INTERRELATIONSHIP

Market Players' Coordination
Inter-institutional Committees
Wetland's Councils

Scientific Investigation
UNAH, CORAL, WWF, GOAL, CEM, CCO, UICN

Supplies & logistics services

Marketing/ Investigation- Information
CDE, GOAL

Financial Services
CAYCTOL, TIGO MONEY, CO-OP CEIBEÑA, FGR CONFIANZA, BANCO ATLÁNTIDA, CO-OP. SAGRADA FAMILIA, BANRURAL, BANCO DE LOS TRABAJADORES, CAYCSOL, FAMA, Informal Credit, Banca Solidaria, CREDISOL

DIRECT INTERRELATIONSHIP

Business Development Services
CONEANFO, CDE, INFOP

Business Drivers
COMANAGERS, CDE, SDE, GOAL

Training in Good Fishing Practices
DIGEPESCA, INFOP

Salt (Input suppliers)
Bekin, local storages, Mexican importing company

Boats (Input suppliers)
Local Shipyards, Urban Shipyards

Fishing Gear (Input suppliers)
Local Artisans, Fishers' Associations, Urban Suppliers, Local Grocery Stores, Pesca Uno

Fuel (Input suppliers)
TEXACO, PUMA, UNO, Local Gas Stations

Ice Suppliers (Input suppliers)
APAIB (* Fishers' Business), EMPROMARSA, BUKARIMAT, KAUMA, Urban Markets, PROCESSING PLANTS, BRIT - PUT - TANGNI, COOPESPCOL

Equipment Repair Services
Local repair workshop, Fishermen, Yamaha Repair Workshop

Transportation Services
COSTA III, FRANK GOFF, LOS PLAYEROS (collective land-transport service)

Equipment Suppliers
Pesca Uno (Fishing gear), Motors: Kawas' motors, YAMAHA, SUZUKI

CAPTURE/ PRODUCERS | **COLLECTION/ INTERMEDIARIES** | **RETAIL/ PROCESSING** | **CONSUMPTION**

Transaction Chain **INPUT**

OUTPUT

FISHERS (<15K) Target Group — +/-8-10 K MT of fish — 100 %

75 %

55 % Retail/ Local Intermediaries (+/-100)

10 % Wholesales Intermediaries (+/-80)

10 %

6 % Fishers' Businesses (5) Target Group — EMPROMARSA*, COOPESPCOL*, APAIB*, LAREINI - LAWAN, KAUMA — *Fishers' Associations

<1 %

17 %

1 % Collectors' Centers (+/- 29) Target Group — YAHURABILA, CAPIRO JERICÓ, CASTILLA, APROCUS, DELFINES DEL CARIBE, TONINA BLANCA, MARIÓN, KRUTA - RÓBALO, BRIT-PUT-TANGNI, BUKARIMAT

1 %

High-Sea Intermediaries (+/53)

3 %

20 %

3 %

1 %

< 1 %

< 1 %

2 %

3.08 %

< 1 %

1 %

Street/ Seasonal Vendors (+200)

13.5 %

Municipal Markets (9) — TOCOA, TRUJILLO, SAN PEDRO SULA, PUERTO CORTÉS, CHOLOMA, LA CEIBA, PROGRESO, TELA, TEGUCIGALPA

4 %

Hotels /Restaurants (+/-150)

20 %

Supermarkets (3) — LA COLONIA, WALMART, LA ANTORCHA

5 %

EXPORT

< 1 %

< 1 %

Processing Plants (+/-19) — KAUMA /GEOVANNY LEE, ALDASA, FINCOR, GRUPO MOON, other, FROZEN, MARUCO, MARINOS PESCADERÍA, MARISCOS DEL ATLÁNTICO

7 %

35%

6 %

3 %

6 %

17 %

LOCAL Consumer

NATIONAL Consumer

100 %

CONSUMERS (<15K)
Local Consumers (+/-50K) — 7,010 MT (10.10%)
National Consumers (+/- 1M) — 2,380 MT (23.80%)
Export (+/- 2M) — 610 MT (6.10%)

Regulation of Fishery Resources
DIGEPESCA, INTER-INSTITUTIONAL COMMITTEES, NAVAL FORCES, MERCHANT MARINE, OSPESCA, FAO, LOCAL GOVERNMENTS

Regulation of Forestry Resources and protected areas
MI AMBIENTE, ICF, TASK FORCE, LOCAL GOVERNMENTS, CO - MANAGERS OF PROTECTED AREAS

Traceability System
GOAL

Fishers' Associations/ Cooperatives Target Group
APEB, ASSN. PESCADORES LIMÓN, COLLECTION CENTERS, ASSN. CAYOS COCHINOS, PAZCOBLA, APIMH, ASSN. PESCADORES STA ROSA AGUÁN, ASSN. NUEVA ARMENIA, ASSN. RÍO COCO, ASSN. IRIONA, OPESCOOR (COROZAL), PAMUPEL, PESCADORES DE TELA, ASSN. PESCADORES PLAN GRANDE, TRES PUEBLOS UNIDOS

INDIRECT INTERRELATIONSHIP

Natural Resources Regulation

PROCESSING PLANTS

Indigenous People's Rights Protection
MISKITO INDIGENOUS FEDERATION (MASTA), TERRITORIAL COUNCILS OF GRACIAS A DIOS, PROSECUTOR´S OFFICE OF THE ETHNIC GROUPS, OFRANEH (GARIFUNAS' BOARDS), DINAFROH, ILO, UN, APIMH

Municipalities (Operating permits), Labour Law

Tax Regulation
SAR, Customs

Hygiene / Food safety standards
SENASA, SUPERMARKET CHAINS, SESAL, PROCESSING PLANTS

REGULATORY FUNCTIONS

ABSENT INTERRELATIONSHIP

Regulation of cross-border fishing
Weak relation, is not regulated as it should be, very weak chancelleries.
NAVAL FORCES, CHANCELLERY, Cross-border Municipalities

SENASA, DIGEPESCA, OIRSA, SUPERMARKET CHAINS, Marine Stewardship Council

Traceability

Governance

EWS/DRR Management
COPECO, CODEM

Early Warning & Response Systems (EWRS)

Business Operation Regulations/ Permits

Hygiene / Food Safety Security

System Vulnerability Map - Stressor Only Risk Scenario - Case Study Small Scale Fisheries in North Coast of Honduras

GOAL

Irish Aid
An Roinn Gnóthaí Eachtracha agus Trádála
Department of Foreign Affairs and Trade

RESILIENCE FOR SOCIAL SYSTEMS 'R4S' APPROACH
SYSTEM VULNERABILITY MAP
Multi Hazard Risk Scenario Triggered by Major Storm Event (Watersurge and strong winds)

System: Small-Scale Fisheries Market System in the Honduran North Atlantic Coast

Date: May/2019 - Revision Number: 03
Prepared by: Gabriela Cáceres/ Mario Argeñal/ Carlos Villatoro/ Darwin Castillo/ Ana Córdova
Reviewed by: Luigi Loddo/ Bernard McCaul

The 'R4S' System Vulnerability Map is a visual representation of system actors' vulnerability and the potential effects that the risk scenarios have on the selected socio-economic system. This map uses the Current System Map as a base map and each actor is colored according their vulnerability level obtained in section 4 of the Stakeholder Assessment Matrix (SAM).

As the Legend on the upper right hand corner illustrates, the System Vulnerability Map identifies four levels of vulnerability by each system actor: Actors with no/minimal vulnerability are colored white, low level of vulnerability will be green, medium vulnerability will be yellow and those with the highest level of vulnerability will be colored in red.

Also, the System Vulnerability Map also defines the corresponding symbol depicting the effects of the identified risk scenarios in the transaction chain and also on the links to the actors in the supporting and regulatory functions. An exclamation mark (!) represents a Partially Disrupted relationship, and an (X) represents a Totally Disrupted relationship. These symbols are colored in red to indicate the status of the relationships in the Current System Map. If necessary, the exclamation mark can be doubled and/or increased in size to represent a higher negative impact.

LEGEND

- No/minimal vulnerability
- Low level of vulnerability
- Medium level of vulnerability
- High level of vulnerability
- Relation totally disrupted
- Relation partially disrupted

SUPPORTING FUNCTIONS

ABSENT INTERRELATIONSHIP

Market players

Stock management

Renewable Energy for Cold Storage:
SOLUZ, Cool boat, Tecnisol, Solaris

Business & financial services

INDIRECT INTERRELATIONSHIP

Market Players' Coordination
Inter-institutional Committees
Wetland's Councils

Scientific Investigation
UNAH, CORAL, WWF, GOAL, CEM, CCO, UICN

Supplies & logistics services

Marketing / Investigation-Information
CDE, GOAL

Financial Services
CAYCTOL, TIGO MONEY, CO-OP CEIBEÑA, FGR CONFIANZA, BANCO ATLÁNTIDA, CO-OP. SAGRADA FAMILIA, BANRURAL, BANCO DE LOS TRABAJADORES, CAYCSOL, FAMA, Informal Credit, CREDISOL, Banca Solidaria

DIRECT INTERRELATIONSHIP

Business Development Services
CONEANFO, INFOP, CDE

Business Drivers
COMANAGERS, CDE, SDE, GOAL

Training in Good Fishing Practices
DIGEPESCA, INFOP

Salt (Input suppliers)
Bekin, local storages, Mexican importing company

Boats (Input suppliers)
Local Shipyards, Urban Shipyards

Fishing Gear (Input suppliers)
Local Artisans, Fishers' Associations, Urban Suppliers, Local Grocery Stores, Pesca Uno

Fuel (Input suppliers)
TEXACO, PUMA, UNO, Local Gas Stations

Ice Suppliers (Input suppliers)
APAIB (* Fishers' Business), EMPROMARSA, BUKARIMAT, KAUMA, Urban Markets, PROCESSING PLANTS, BRIT - PUT - TANGNI, COOPESPCOL

Equipment Repair Services
Local repair workshop, Fishermen, Yamaha Repair Workshop

Transportation Services
COSTA III, FRANK GOFF, LOS PLAYEROS (collective land-transport service)

Equipment Suppliers
Pesca Uno (Fishing gear), Motors:, Kawas' motors, YAMAHA, SUZUKI

SUPPORTING FUNCTIONS

Transaction Chain **INPUT**

CAPTURE/ PRODUCERS | **COLLECTION/ INTERMEDIARIES** | **RETAIL/ PROCESSING** | **CONSUMPTION**

Watersurge and strong winds

FISHERS (<15K) — Target Group — +/-8-10 K MT of fish — 100 %

Stresses
Enviromental degradation (solid waste, sewage, etc)
Shrimp Farms
Alien species introduction

75 %

Retail/ Local Intermediaries (+/-100) — 55 %, 10 %
Wholesales Intermediaries (+/-80) — 10 %
Fishers' Businesses (5) — Target Group — 6 %
EMPROMARSA*, COOPESPCOL*, APAIB*, LAREINI - LAWAN, KAUMA
*Fishers' Associations — <1 %
17 %
Collectors' Centers (+/- 29) — Target Group — 1 %
YAHURABILA, CAPIRO JERICÓ, CASTILLA, APROCUS, DELFINES DEL CARIBE, TONINA BLANCA, MARIÓN, KRUTA - RÓBALO, BRIT-PUT-TANGNI, BUKARIMAT
High-Sea Intermediaries (+/53) — 1 %

35% (7,000 MT)

Street/Seasonal Vendors (+200) — 20 %, 3 %, 13.5 %
Municipal Markets (9) — 4 %, 6 %, 17 %
TOCOA, TRUJILLO, SAN PEDRO SULA, PUERTO CORTÉS, CHOLOMA, LA CEIBA, PROGRESO, TELA, TEGUCIGALPA
Hotels /Restaurants (+/-150) — 2 %, 20 %
Supermarkets (3) — 3.08 %, 5 %
LA COLONIA, WALMART, LA ANTORCHA
Processing Plants (+/-19) — < 1 %, 7 %
KAUMA /GEOVANNY LEE, ALDASA, FINCOR, GRUPO MOON, other, FROZEN, MARUCO, MARINOS PESCADERÍA, MARISCOS DEL ATLÁNTICO

LOCAL Consumer — 6 %
NATIONAL Consumer — 100 %
EXPORT

CONSUMERS (<15K)
Local Consumers (+/-50K) — 7,010 MT (70.10%)
National Consumers (+/- 1M) — 2,380 MT (23.80%)
Export (+/- 2M) — 610 MT (6.10%)

OUTPUT

Regulation of Fishery Resources
DIGEPESCA, INTER-INSTITUTIONAL COMMITTEES, NAVAL FORCES, MERCHANT MARINE, OSPESCA, FAO, LOCAL GOVERNMENTS

Regulation of Forestry Resources and protected areas
MI AMBIENTE, ICF, TASK FORCE, LOCAL GOVERNMENTS, CO - MANAGERS OF PROTECTED AREAS

Traceability System
GOAL

Fishers' Associations/ Cooperatives — Target Group
APEB, ASSN. PESCADORES LIMÓN, COLLECTION CENTERS, ASSN. CAYOS COCHINOS, PAZCOBLA, APIMH, ASSN. PESCADORES STA ROSA AGUÁN, ASSN. NUEVA ARMENIA, ASSN. RÍO COCO, ASSN. IRIONA, OPESCOOR (COROZAL), PAMUPEL, PESCADORES DE TELA, ASSN. PESCADORES PLAN GRANDE, TRES PUEBLOS UNIDOS

DIRECT INTERRELATIONSHIP

REGULATORY FUNCTIONS

Natural Resources Regulation

PROCESSING PLANTS

Indigenous People's Rights Protection
MISKITO INDIGENOUS FEDERATION (MASTA), TERRITORIAL COUNCILS OF GRACIAS A DIOS, PROSECUTOR´S OFFICE OF THE ETHNIC GROUPS, OFRANEH (GARIFUNAS' BOARDS), DINAFROH, ILO, UN, APIMH

Tax Regulation
Municipalities (Operating permits), Labour Law, SAR, Customs

Hygiene / Food safety standards
SENASA, SUPERMARKET CHAINS, SESAL, PROCESSING PLANTS

INDIRECT INTERRELATIONSHIP

Regulation of cross-border fishing
Weak relation, is not regulated as it should be, very weak chancelleries.
NAVAL FORCES, CHANCELLERY, Cross-border Municipalities

SENASA, DIGEPESCA, OIRSA, SUPERMARKET CHAINS, Marine Stewardship Council

Traceability

Governance

EWS/DRR Management
COPECO, CODEM

Early Warning & Response Systems (EWRS)

Business Operation Regulations/ Permits

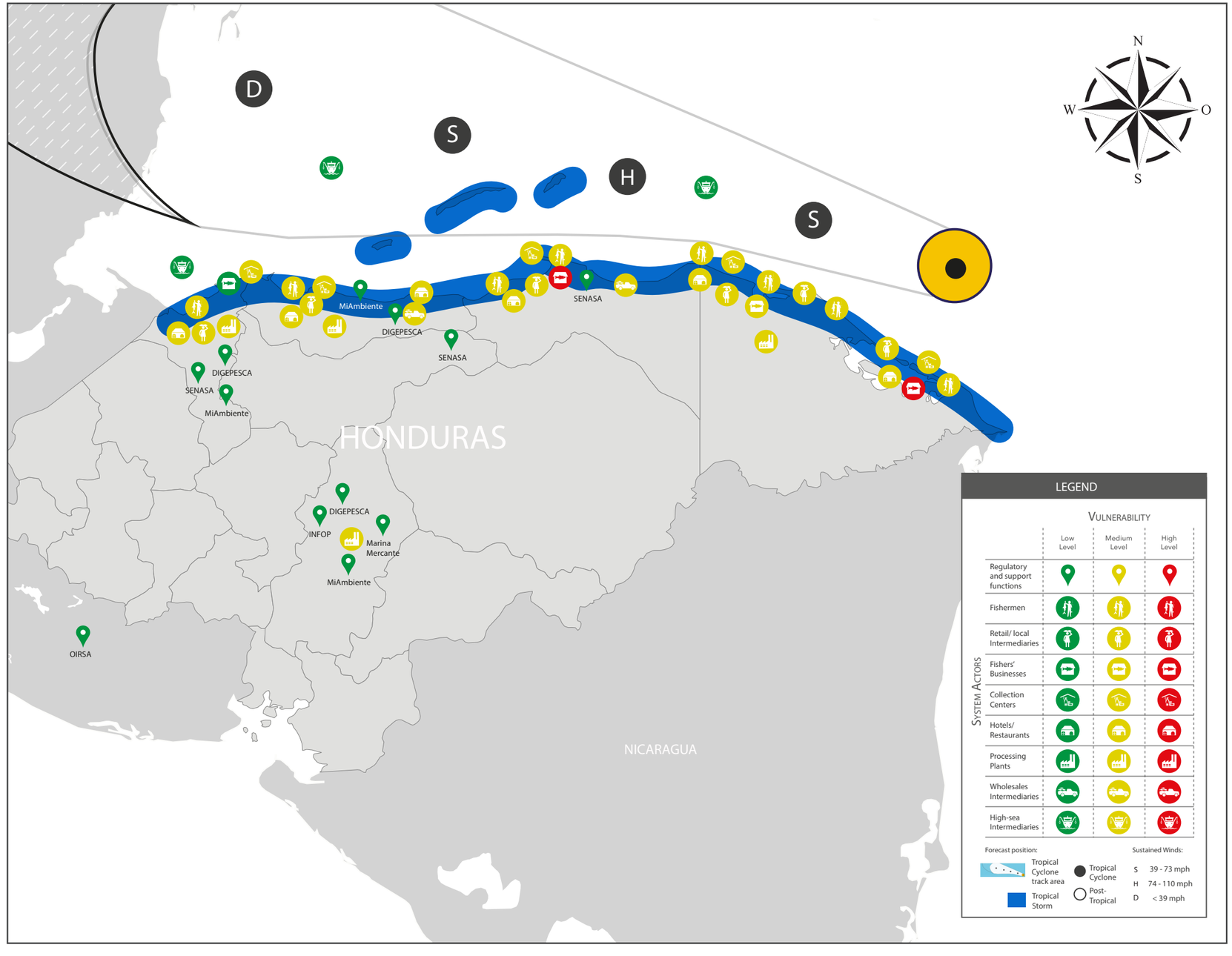
Hygiene / Food Safety Security

ABSENT INTERRELATIONSHIP

System Vulnerability Map - Multi Hazard Risk Scenario Triggered by Major Storm Event (Watersurge and strong winds) - Case StudySmall Scale Fisheries in North Coast of Honduras

It is also recommended to develop a geographic hazard map that helps visualize where the socio-economic system actors and the potential hazards are physically located. Note this type of map may not be relevant for all types of systems and risk scenarios but where it is relevant it is recommended to be completed. The vulnerability of each actor is again depicted through a traffic light colour: *Green (Low Vulnerability), Amber (Medium Vulnerability) and Red (High Vulnerability) as provided in the Stakeholder Assessment Matrix (SAM).*

As can be seen, the **Geographic Hazard Map** helps depict important aspects of the socio-economic system which helps deepen the understanding of how the system functions and how it would be impacted by the identified risk scenarios. For example, in the map shown, the Target Group (small-scale fishers) is spread across 7 different sub-regions along the North Atlantic Coast of Honduras.



Geographic Hazard Map - Case Study Small Scale Fisheries in North Coast of Honduras

4.1.2 Synthesis of the selected system dynamic for each selected risk scenario

The R4S user must understand how the system operates in a dynamic integrated way rather than only considering a set of static connected actors with linear interactions. Socio-economic systems rarely only have linear relations and they generally operate with embedded balancing and positive reinforcing feedback loops. In this step the key reinforcing and balancing loops and the stock and flow relationships of the system are assessed by developing causal loop diagrams for the system. The R4S User should investigate the system under each risk scenario to determine if is operating within reasonable and acceptable parameters in order to develop a sustainable balanced condition which is not at risk of collapse and supports the wellbeing of the Target Group. For the purposes of this manual an illustrated example is provided of the synthesis of the small scale fisheries market system in Central America as shown in the causal loop diagram and maps in ***Figure 26*** and ***27***. This synthesis of the market system shows that there are a number of the key functions that are absent from the system and as a result the system is at the point of collapse due to the impact of the identified shocks and stresses. Under the current system dynamic relating to the stressor only risk scenario fishers are caught in a reinforcing loop of ever-increasing use of unsustainable fishing practices and increasing fishing effort, poor governance of marine coastal resources and depleting fish stocks resulting in increasing vulnerability for fishers and their families. Market engagement is limited to local markets with reducing returns for fishers. There is a lack of access to formal markets, financial services and investment and little or no risk management measures. Under this current situation not only is the fisheries market system at the point of collapse but it is also clear that fishing communities are becoming more marginalized and vulnerable.[24]

At the end of this step, it is expected that R4S User will have gained a deeper understanding of the system structure and dynamic under the principal risk scenarios to which is exposed.

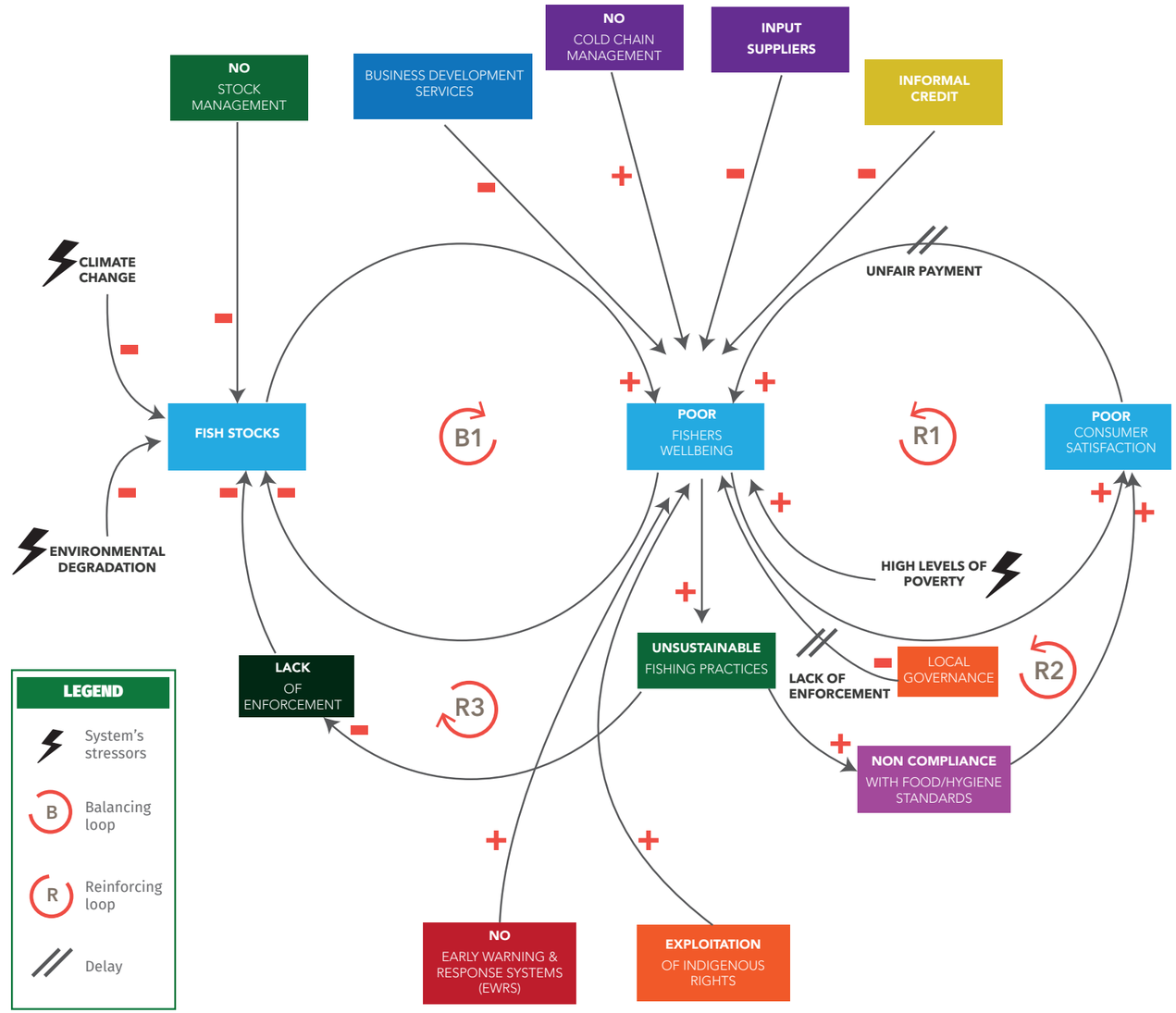


Figure 26. Causal Loop Diagram - Case Study Small Scale Fisheries in North Coast of Honduras

24 Suggested further guidance: Systems Thinking for Social Change, Peter David Stroh, A practical guide to solving complex problems, avoiding unintended consequences and achieving lasting results, 2015

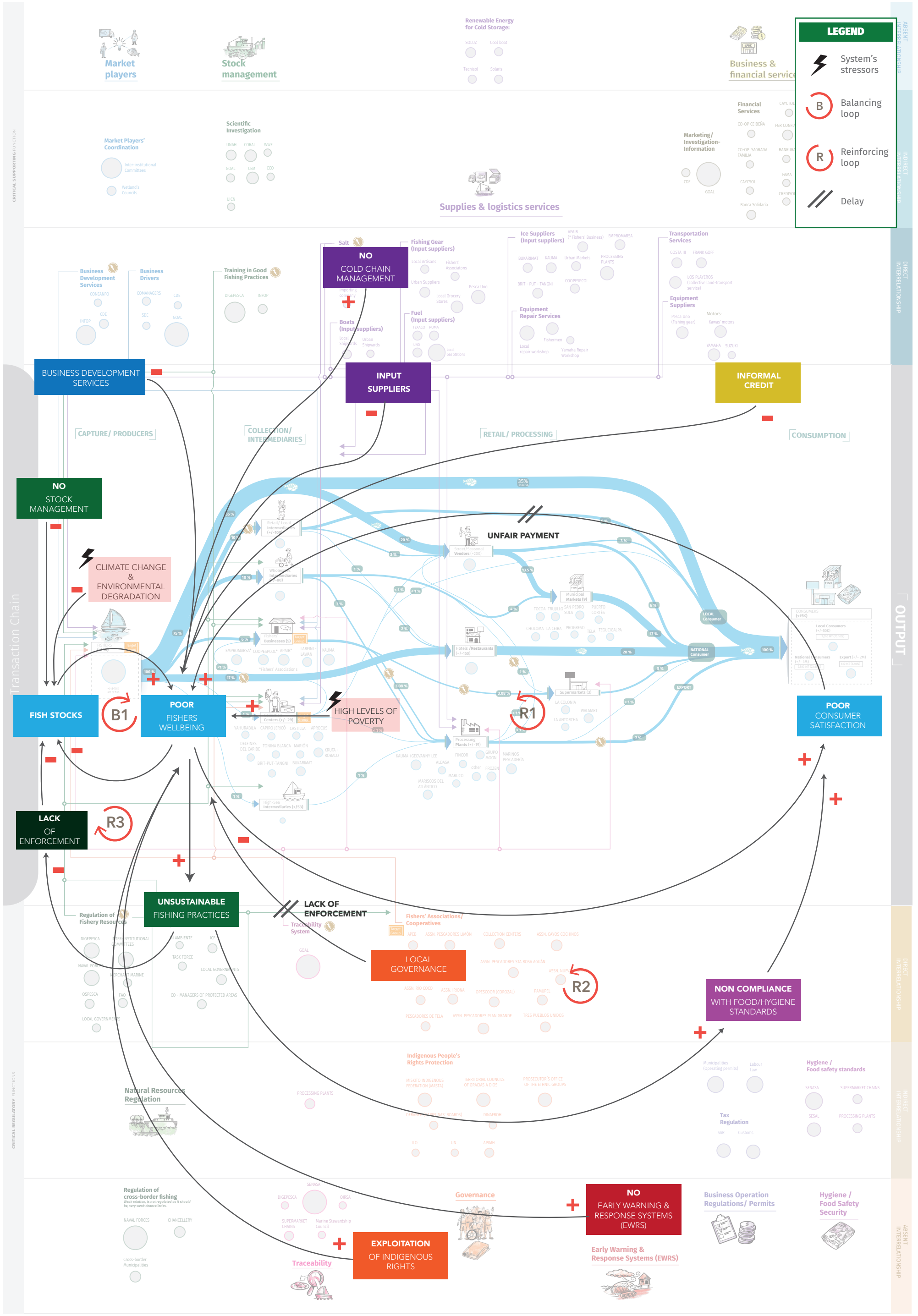


Figure 27. Causal Loop Diagram developed over Current System Map - Case Study Small Scale Fisheries in North Coast of Honduras

STEP 4.2 -Resilience Assessment against the 6 Determinant Factors of Resilience

In this step an overall assessment of the system is carried out against the 6 DFRs through the ***Resilient Systems Matrix (RSM).*** This assessment considers what are the main characteristics that make the system more resilient. The analysis will be developed for each selected risk scenario in order to then make overall conclusions on the system resilience and make recommendations for the future vision of the system. The RSM is a key tool at the heart of the R4S where the assessment of the system up to this point is consolidated and reviewed against the 6 DFRs in order to translate this assessment into overall recommendations to improve the system resilience.

The Resilience Systems Matrix (RSM) is divided in two parts, Part A & Part B. The first part (Part A) assesses the system's resilience to the selected risk scenarios considering the 6 DFRs (Refer to ***Table 6***). In Part A, each of the DFRs is described and graded into 5 levels as explained below:

- ***Level 1*** – *Minimal or* No Degree of Resilience
- ***Level 2*** – Low Degree of Resilience
- ***Level 3*** – Medium Degree of Resilience
- ***Level 4*** – *Approaching* Optimal Degree of Resilience
- ***Level 5*** – Optimal Degree of Resilience

Part A provides a characteristic description of the 5 resilience levels for each of the 6 DFRs. The R4S User can make an initial judgement of the levels against each DFR based on the assessment completed up to this point. However, a key part of the R4S approach is combining technical analysis with local knowledge in order to make the best judgement on resilience. Therefore, it is recommended that the RSM is completed through participatory workshops in a collaborative manner between the R4S User and the system stakeholders. The RSM guides this collaborative process to thoroughly explore and discuss the resilience assessment with the key system stakeholders.[25]

The assessment of system resilience against each Determinant Factor of Resilience (DFR) should be completed for each risk scenario in Part B of the Resilient Systems Matrix given in **Table 7**. It is important for the R4S User to properly prepare for the focus group discussion with the system stakeholders. Guiding questions are provided in the RSM to help facilitate the discussion with the system stakeholders. These guiding questions are indicative only and the R4S User should develop a context specific list of guiding questions based on the assessment of the system up to this point. The aim here is that sufficient informed discussion is undertaken between the R4S User and the system actors in order to make an evidence based assessment of the resilience characteristic for each DFR. Also the RSM includes a suggested list of means of verification, again this list is indicative and a context specific list should be developed during the preparation phase fo the focus group discussion.

The R4S User, considering the technical assessment and consultation with the stakeholder group, must select from the five levels of each DFR which best describes the socio-economic system. Note it is more important to capture the qualitative assessment in the discussion with the stakeholder group than simply recording the resilience level. Once completed, the R4S user should proceed to a holistic analysis of the system (Part B of Resilient System Matrix, ***Table 7***) by drawing a conclusion of the system's current state of resilience and problem areas to build/strengthen the resilience of the system through future interventions. This is a crucial section of the R4S in which the research findings are consolidated in order to begin to develop a strategy to build the resilience of the selected socio-economic system. The Resilient System Matrix aims to identify the root causes of problems within the system and helps to determine how to strengthen the resilience of the selected socio economic system and ultimately the Target Group.

25 Refer to GOALs ARC-D Toolkit for further description on facilitating focus groups to assess resilience characteristics.

Part A - 6 Determinate Factors of Systemic Resilience

Connectivity

Connectivity refers to the degree to which a system transfers the impact of shocks and stresses across a system, Connectivity can be both a good and a bad thing. A well-connected system reduces the degree of impact on a single or small group of actor nodes (e.g., the target group) and increases the capacity of the system to recover or bounce back following an impact. However, an overly connected system can lead to contagion or rapid spread of disturbance across the system. The degree of connectivity should be considered from the perspective of the system's functionality, and the degree of protection afforded to the target group.

Category and Level	Description of Levels
1 No or Minimal Connectivity Little awareness of issues and no action	System Actors are not connected in any way that transfers risk across the system. Most of the connections between the target group and other actors are bad, stressed or absent.
2 Low Connectivity Some awareness and motivation, some action, but action is piecemeal and short-term	System Actors have some connections in place which transfer risk to other actors in the system, actors are motivated to act on improving risk transfer and some action has been taken but these are piecemeal and not based on a long-term strategy. Most of the connections between target group and other actors are bad, stressed or absent.
3 Medium Connectivity Awareness and long-term actions, but these are not linked to a long-term strategy and/or not all aspects of the problem are addressed	System actors are becoming more connected in a way that transfers risk, long-term actions to dissipate shocks and stresses throughout the system are being taken but these are not based on a long-term strategy and some significant gaps exist. There is an equal balance of good and stressed/bad connections between target group and other actors. Target group is more successful at building or maintaining relations with other actors, but still faces some obstacles.
4 Approaching Optimal Connectivity Actions are long-term, linked to strategy and address main aspects of the issue, but there are still deficiencies (especially systemic) in imple-mentation	System actors are connected in a way that transfers risk although there still are some gaps. Long-term actions to dissipate the impact of shocks and stresses are being taken and are linked to a long-term strategy with some gaps which do not prevent the system from functioning in times of crisis. Most of the connections between target group and other actors are good (some stressed/bad). Target group is able to build or maintain relations with other actors.
5 Optimal Connectivity Actions are long-term, linked to strategy, addressing all aspects of the issue, embedded in society and sustainable	Target group is extremely well connected to other actors in the system, the impact of shocks and stresses gets diluted throughout the system (proper risk mitigation) and therefore the system continues to function properly, in benefit of the target group. A tightness of feedback exists (information flows fast and effectively). Actors/connections are sparsely distributed. All connections between target group and other actors are good. Target group can easily build or maintain relations with other actors (little or no obstacles and/or resources that must be employed to make the connections are not costly).

Guiding Questions	Verification Means
• What means of access and connectivity are used (ie. access routes, transport, telecommunication, etc.) to create or keep existent linkages between target population and system actors? • Are these means enough for the target group to create new or maintain/improve existent linkages among actors, especially when facing a shock or stress? Why not and what else is needed? • How are these relationships formed? Are these relationships built on trust? • In general, how is the quality of relationships between the target group and system actors? (ie. Good or bad, stressed, absent, etc.) • Does any part of the system or actor nodes seem to be overly connected? • What sorts of positive and/or negative impacts do these relationships have over the system? • Does the target population and its multiple levels feel they have secure and safe relationships to rely on when facing a shock or stress? • How does communication flow among system actors' relationships? How effective is the communication between them? Is it a one-way or two-way communication between system actors? • How do impacts from the previously identified shocks and stresses transfer across the system? If so, through what particular group or groups? • What happens in terms of system actor's functionality after an impact? How do they recover or bounce back in a way that the system continues to function properly? • What sort of obstacles are preventing relationships from improving their quality (better feedback loops, distribution of shocks and stresses, etc.)? • What measures are put in place to dissipate the impact of shocks and stresses over the system?	• Vulnerability Maps • Current System Map • Social network map • Interviews and/or group discussions notes • Available Reports • Physical works to protect transport and communications infrastructure necessary • PCMMA and/or EMMA studies

Table 6. Resilience Systems Matrix (RSM Part A)

Part A - 6 Determinate Factors of Systemic Resilience

Diversity

Diversity refers to the different forms through which a system can function which are sufficiently different such that a single risk scenario will not disable the entire system's functionality. A system with good level of diversity has the capacity to continue to function in different or adapted ways when impacted by a risk scenario. A system which has a small number of actors or is dependent on a small number of actors that are critical (i.e., cannot easily be replaced) has less diversity and is more vulnerable to shocks and stresses. Diversity allows some components to compensate for the lost or failure of others.

Category and Level	Description of Levels
1 No or Minimal Diversity Little awareness of issues and no action	The system is limited in the form it functions and as a result is vulnerable to shocks and stresses. Target group is particularly vulnerable to shocks and stresses under the current form the system is functioning. The system actors are unaware of need to modify the role they undertake in response to different threats and no action is being taken.
2 Low Diversity Some awareness and motivation, some action, but action is piecemeal and short-term	Alternative and varied forms for the system to function are emerging due to awareness and motivation to increase capacity to confront different shocks and stresses. System actors are more aware of need to modify the role they undertake in response to different threats although actions to achieve this are piecemeal and short term.
3 Medium Diversity Awareness and long-term actions, but these are not linked to a long-term strategy and/or not all aspects of the problem are addressed	Alternative and varied forms for the system to function are in place and increase capacity to confront some of the different shocks and stresses the system is exposed to. Long-term actions are being undertaken to increase capacity to confront different shocks and stresses although these are not linked to a long-term strategy. System actors are capable of modifying the role they undertake in response to different threats although significant gaps remain in this capacity.
4 Approaching Optimal Diversity Actions are long-term, linked to strategy and address main aspects of the issue, but there are still deficiencies (especially systemic) in imple-mentation	Alternative and varied forms for the system to function are in place and increase capacity to confront the principle shocks and stresses the system is exposed to. Actions are being undertaken to diversify functionality linked to a long-term strategy. System actors are capable of modifying the role they undertake to adjust to different threats although some deficiencies remain.
5 Optimal Diversity Actions are long-term, linked to strategy, addressing all aspects of the issue, embedded in society and sustainable	Alternative and varied forms for the system to function are in place and system has strong capacity to confront all the different shocks and stresses the system is exposed to and this is embedded into a long-term strategy. System actors are capable of modifying the role they undertake to adjust to different threats.

Guiding Questions	Verification Means
• How diverse are the products and services of the selected socioeconomic system? • Are there various types of system actors in the different levels of the transaction chain to ensure that the service or product flow will continue despite the impact of shocks and stresses over the system? • Supporting and regulatory functions, are sufficiently diverse to ensure the functionality of the transaction chain despite the impact of shocks and stresses? Are they responsive to the Target Group when facing shocks or stresses? • Are there back-up systems for critical infrastructure and public services during emergencies (e.g. WASH, food, shelter, health, energy, and protection/safety)? • Are there system actors playing more than on single role within the system? (e.g. Fishers' associations are also supplying fishing gear). • Are there new actors or relationships in the system that can alternate functions between other actors or relationships? • Are there system actors modifying or adapting the role they undertake in response to shocks and stresses? • When facing shocks or stresses, how does the system actors respond to? Trough what actions (individual or collective) they have secured or restored systems' functionality? Are these complementary and coordinated with each other? • Are these actions enough diverse and effective? Why not and what else is needed?	• Historical studies • Perception surveys • Available Reports • PCMMA and/or EMMA studies

Part A - 6 Determinate Factors of Systemic Resilience

Redundancy

Redundancy refers to having a sufficient number and capacity of actors which can carry out system functions should system actors become disabled due to the impact of shocks and stresses. It means having a back-up plan through which the system continues to function, should some actors become unavailable.
Certain systems can be said to function in a polycentric or modular way which increases their overall resilience. This means that if modules of the system fail, the system as a whole can continue to function; although with reduced capacity.

Category and Level	Description of Levels
1 No or Minimal Redundancy Little awareness of issues and no action	The system is highly dependent on a small number of critical actors who cannot be easily replaced, and these actors are vulnerable to shocks and stresses. This is little awareness of this risk to the system and no action is being taken to put backup measures for key functions in place should critical actors become disabled.
2 Some awareness and motivation, some action, but action is piecemeal and short-term	There is some awareness among the system actors of the dependence of the system function on a small number of critical actors who cannot be easily replaced and who are vulnerable to shocks and stresses. Actions to put backup measures in place for key system functions should critical actors become disabled are piecemeal and short-term.
3 Medium Redundancy Awareness and long-term actions, but these are not linked to a long-term strategy and/or not all aspects of the problem are addressed	The system has some dependency on a small number of critical actors who cannot be easily replaced and who are vulnerable to shocks and stresses. Some long-term actions have been taken to put backup measures in place for key system functions although these are not linked to a long-term strategy and gaps exist.
4 Approaching Optimal Redundancy Actions are long-term, linked to strategy and address main aspects of the issue, but there are still deficiencies (especially systemic) in implementation	The system has low dependency on critical actors who cannot be easily replaced, and these actors have measures in place to reduce their vulnerability. Long-term actions have been taken to put backup measures in place for key system functions based on an overall strategy although some deficiencies exist.
5 Optimal Redundancy Actions are long-term, linked to strategy, addressing all aspects of the issue, embedded in society and sustainable	The system has low minimal dependency on critical actors who cannot be easily replaced, and these actors have measures in place to protect them from threats. Long-term actions have been taken to put backup measures in place for most/all system functions based on an overall strategy which is embedded in the operation of the system.

Guiding Questions	Verification Means
• Are there multiple actors within the different functions that can compensate the loss or failure of others when shocks or stresses impact over the system? • Are there key functions within the system depending only in one or few actors? Are there other actors able to replace them when facing a shock or stress? • To what extent the system depends on critical actors that cannot be easily replaced? (e.g. highly dependent, low or minimal dependent). Are these critical actors highly vulnerable to shocks or stresses? • What sorts of common failures or challenges can be seen across the system when facing any shock or stress? • When shocks or stresses impact over the system, do system actors anticipate losses and/or failures? What kind of backup measures do system actors undertake (e.g. fix failures, replace other actors' roles, elaborate backup plans) to reduce the probability of collapse over a shock or stress? • Are these backup measures adequate to effectively prepare for and/or recover from any shock or stress? If not, why and what else is needed? • Are supporting and regulatory functions sufficiently large and protected to ensure and/or restore the functionality of the transaction chain despite the impact of shocks and stresses?	• Venn Diagrams and other participatory tools • Network, process and other types of mapping • Interviews/group discussions notes

Part A - 6 Determinate Factors of Systemic Resilience

Governance

Governance revolves around three dimensions: power (authority)/leadership, decision-making and accountability. It is contextually driven; thus, it will vary from social system to social system.
From a system's resilience perspective governance relates to whether the system has the capacity to take decisions and act as a whole using complex adaptive thinking. This is reflected in how actors throughout the system become aware of potential risks, how they organize themselves (naturally or intentionally) to make decisions to face those risks and if through these decisions the leaders are able to guide the system to a position of an acceptable level of impact ensuring that the system continues to function. If this governance function exists in the system, a key consideration is how it may be impacted by shocks and stresses, before, during and after emergency. The quality of this governance function should be assessed to understand how effective it will be as a coordination mechanism during shocks and stresses –is it led by a single actor or a consensus group of actors, are the voices of the actors that do not have the power/authority heard, and which actors are held accountable for their decisions?

Category and Level	Description of Levels
1 No or Minimal Governance Little awareness of issues and no action	System actors have little or no awareness of how the system functions and the risks to which the system is exposed. The decision-making structure is greatly impacted by shocks/stresses in a negative way. Actors with leadership positions have a very difficult time organizing the system to reduce the impact of threats and their influence over the system is extremely low.
2 Low Governance Some awareness and motivation, some action, but action is piecemeal and short-term	There is an informal governance mechanism for the system which has some understanding of how the system functions and the risks to which the system is exposed. Some decision-making is being made in benefit of the whole system's functionality, but these are piecemeal and with a short-term perspective. The decision-making structure is impacted by shocks/stresses in a negative way and struggles to function in crisis. Leadership are becoming better at organizing the system to reduce the impact of perturbations and their influence over the system functionality is increasing although there still are a number of weaknesses.
3 Medium Governance Awareness and long-term actions, but these are not linked to a long-term strategy and/or not all aspects of the problem are addressed	There is a more structured governance mechanism which understands how the system functions and most of the risks to which the system is exposed. Decision making is being made in benefit of the whole system functionality and to reduce impact on the system from shocks/stresses with a short to medium perspective. Some resources are not being used effectively/efficiently and are going to waste. The decision-making structure is impacted (less) by shocks/stresses and has some limited capacity during crisis. More times than not leaders are able to organize the system to reduce the impact of perturbations and their influence over other the system functionality is increasing.
4 Approaching Optimal Governance Actions are long-term, linked to strategy and address main aspects of the issue, but there are still deficiencies (especially systemic) in implementation	There is an effective formal governance mechanism for the system with a good understanding how the system functions and the risks to which the system is exposed. Decision making is being made in benefit of the whole system functionality and to reduce impact on the system from shocks/stresses with a long-term perspective. Most of resources are being used effectively/efficiently and are not going to waste. The decision-making structure does get impacted negatively by shocks/stresses but remains functional. Leaders are able to organize and influence the system to reduce the impact of threats. Most of the actors are rendered accountable for their decisions.
5 Optimal Governance Actions are long-term, linked to strategy, addressing all aspects of the issue, embedded in society and sustainable	The system is managed in a transparent way (actors have access to information, other actors and processes); thus, its functionality is understood by all and can be easily monitored. System actors become aware of risks in a timely manner. The use of resources is effective and efficient. Rule of law works, and informal social rules reinforce positive feedback loops in the system. Decisions are made in benefit of the whole system's functionality (especially in the face of shocks/stresses) and with a long-term (sustainable) perspective in mind. The decision-making structure is not impacted negatively by shocks/stresses. Accountability is rendered by all equally. Leadership is consensus driven or 'democratically' chosen. Actors with leadership positions can easily organize system in the face of perturbations and their influence capacity is high among other actors.

Guiding Questions	Verification Means

• Who are the main leaders and decision makers of the system?
  o How do they relate to the target population?
  o Are these actors from the transaction chain?
  o How are women, minorities or vulnerable groups participating/ represented within them?
• What is their performance in terms of decision making, efficacy, efficiency and transparency? How is their performance impacted by shocks or stresses?
• Have decision makers established transparent and effective accountability mechanisms? Have they been participatory?
• How much are system actors (especially the main leaders and decision makers) aware of how the system functions and the risks to which the system is exposed? (e.g. no or little awareness, some awareness and/or understanding, good understanding, etc).
• Through what processes are decisions made within the system? (e.g. consensus driven, led by a single actor, etc). Are these processes different in the face of shocks and stresses?
 	
In the face of shocks and stresses:
• In what ways women, minorities and vulnerable groups participate or are represented in this decision-making process? Can you give examples of how their opinions and/or needs are considered?
• Are decisions made in benefit of the whole system's functionality? If not, what limitations are identified (e.g. are piecemeal, short -term and not sustainable)?
• Do the system and its main leaders have the capacity to take effective and timely decisions/actions to ensure that the system continues to function? (e.g. able to organize and/or coordinate the system quickly, influence capacity to reduce impact of shocks and stresses over the system, collaboration and articulation with other decision makers in the regulatory and supporting functions, etc). If not, why? What else is needed?
• Do system actors trust that decisions and coordination actions taken by the main system leaders or decision makers would be effective? If not, why?
	• Narratives/descriptions
	• Interviews
	• Documentation of meeting and assemblies (minutes, attendance lists, photos)
	• Completed projects/works based on system actors decision
	• Evidence of accountability (e.g. public announcements on how funds have been managed).
	• Triangulation consultations to verify commitment

Part A - 6 Determinate Factors of Systemic Resilience

Participation

Participation refers to how inclusive the system is in taking into account the needs of vulnerable or disadvantaged actors. If the system is operating in a way that benefits only a small group of the overall system actors then the system is less functional and less resilient. The system should make the provision to protect vulnerable groups and ensure zero exploitation, particularly of children. It also reflects the degree of freedom to associate, participate and speak (skill and will to do so) and the obstacles that impede an effective participation from all possible actors (especially women; women's economic empowerment or leading role in the transactions of the system are especially important, since evidence shows that households and communities who are led by women are inherently more resilient to perturbations in the system).

Category and Level	Description of Levels
1 No or Minimal Participation Little awareness of issues and no action	The system functions in a way that benefits only a small group of powerful actors with minimal or no benefit or influence by vulnerable actors who are exploited by the system. There is no awareness or recognition of the need to be more inclusive of vulnerable groups or for gender equality. There is no accountability in the system.
2 Low Participation Some awareness and motivation, some action, but action is piecemeal and short-term	Many system actors including the target group receive minimal benefit from the system and some actors are exploited by more dominate and powerful actors in the system. There is some awareness of the need to more fairly distribute benefits of the system and that all actors should participate in the system's decision-making process and in the control of assets. Women and other vulnerable groups are less afraid to associate or speak freely (more freedom to associate, participate or speak is becoming a reality). The obstacles to participate are decreasing. The importance of accountability in the system is starting to be accepted by the system's actors.
3 Medium Participation Awareness and long-term actions, but these are not linked to a long-term strategy and/or not all aspects of the problem are addressed	The benefits of the system are being distributed more fairly across the system although more some powerful actors still dominate. Women and vulnerable groups do not feel completely confident participating and therefore often decide not to, however they can and do participate (obstacles to participate are few). Spaces for freedom of association and speech, regarding the decision-making processes and influence over the system function are starting to open up. The importance of accountability in the system is starting to be accepted by the system's actors. The system is being managed with more transparency, equity and inclusiveness. Leadership is now shared between men, women and other vulnerable groups.
4 Approaching Optimal Participation Actions are long-term, linked to strategy and address main aspects of the issue, but there are still deficiencies (especially systemic) in imple-mentation	The benefits of the system are distributed more fairly across the system with some exceptions. Participation level from men, women and other vulnerable groups is increasingly more equitable and inclusive, meaning that women and other vulnerable groups are more active in participating in the decision-making processes and control of assets. The system is open to freedom of association and speech and the majority of actors feel free to participate constructively in benefit of the system's functionality although there are still some obstacles. Accountability mechanisms for the operation of the system are in place but not fully operational. The system is being managed with more transparency, equity and inclusiveness. Leadership is now shared between men, women and other vulnerable groups.
5 Optimal Participation Actions are long-term, linked to strategy, addressing all aspects of the issue, embedded in society and sustainable	The benefits of the system are distributed fairly across the system actors and this is linked to a long-term strategy for the system with effective mechanisms embedded to ensure equity. Participation level from men, women and other vulnerable groups is at optimal level meaning that all who could possibly participate in the decision-making process and control of assets are participating or are represented. There is a high degree of freedom of association and speech (no obstacles) and all actors feel free to participate constructively in benefit of the system's functionality. The importance of accountability in the system is accepted by the system's actors. The system is being managed with transparency, equity and inclusiveness. Leadership is now shared between men, women and other vulnerable groups. Women and other vulnerable groups face no obstacles to holding positions of 'Key Players' (or decision makers).

Guiding Questions	Verification Means

• What benefits do the system actors perceive from the system? In their opinion, are these benefits distributed fairly? (e.g. benefits all or the majority of actor not only a small group, distribution is equitable, transparent and inclusive) If not, why?
• From system actor's perspective, who is responsible for the occurrence of shocks/stresses and its negative effects over the system? Can people do something to reduce the impact of these? If yes, in what ways? If not, why not?
• Are there spaces in which system actors feel free to participate, have open discussions and take decisions in benefit of the system's functionality despite the impact of shocks and stresses?
  o If no, why not? (e.g. lack of trust among actors, conflicts, there aren't shared understanding/objectives, limited skills or willingness to do so).
  o If yes, what collective actions have been undertaken to reduce the impact of shocks and stresses over the system? Have these been effective?
• Are there active and productive spaces benefitting the systems functionality? To what extent do systems actors participate and feel free to do so?
• In what ways women, minorities and vulnerable groups participate or are represented in decision-making processes? Can you give examples of how their opinions and/or needs are considered, especially when shocks and stresses impact over the system?
• What obstacles impede an effective participation from all possible actors in the system (men, women, minorities, vulnerable groups) regarding decision making processes, control of assets and holding positions of key players within the system? (e.g. leadership is centralized in a few people, no transparency process, lack of accountability, non-inclusive and unequal management of the system, etc).
	• Barrier analysis
	• KAPB surveys
	• Interviews
	• Observations and focal group discussions notes.
	• Agreements, works, photos or other evidence of collective actions in benefit of the system.
	• Triangulation consultations to verify commitment

Part A - 6 Determinate Factors of Systemic Resilience

Learning

Learning refers to how the system as a whole learns through feedback loops in response to past experiences or proactively from learning exchanges. For system learning to be effective there must be a change in understanding (first) at the individual level and (second) at the group level and this change must be demonstrated through practices, interactions and processes between actors in the system. Learning also refers to the quality of learning and to the barriers for learning. Learning is directly correlated to Participation, learning in a social system cannot take place if there is no participation at the individual, household, community and organizational level.

Category and Level	Description of Levels
1 No or Minimal Connectivity Little awareness of issues and no action	The system's function does not improve due to learning from past experiences or proactively because it does not possess the structures or capacities to do so and it faces an abundance of obstacles. Social change or social learning is not evident in the system. The system has been able to surpass difficulties temporarily because it has received external help; no coping mechanisms have been developed by system (system is not autonomous). There is little to no participation from the system's actors in learning processes to improve system and reduce impact from shocks and stresses.
2 Low Learning Some awareness and motivation, some action, but action is piecemeal and short-term	System actors have some awareness of measures to reduce impact of shocks and stresses based on past experiences and in a proactive manner and are motivated to put structure and capacities in place to improve the system based on this learning. Some action has been taken to build capacities and coping mechanisms to reach an autonomous state of response to shocks and stresses, but these are piecemeal and short-term. Social learning occurs at individual actor level. The system is still dependent on external help and is not autonomous. Participation in learning processes to improve system performance and reduce impact from shocks and stresses is taking place at the individual level and not at a systemic level.
3 Medium Learning Awareness and long-term actions, but these are not linked to a long-term strategy and/or not all aspects of the problem are addressed	The system has begun to learn from past experiences (it has limited capacity to learn proactively from other agencies). The system is starting to demonstrate social change at the individual and partially (with some difficulties) at the systemic level. The system is currently working on building capacities and coping mechanisms to face shocks and stresses (these cannot be yet translated into practices, interactions and processes) although a long-term strategy is not in place. The system is becoming autonomous although it still relies on external help in times of crisis. Participation in learning processes is increasing and is taking place at the individual and systemic level, focused on improving the system's performance through better practices, interactions and processes.
4 Approaching Optimal Connectivity Actions are long-term, linked to strategy and address main aspects of the issue, but there are still deficiencies (especially systemic) in imple-mentation	The system can learn effectively from past experiences, but it is still working on how to learn proactively from others' lessons. The system demonstrates social change at the individual and systemic level, there are still deficiencies in putting this learning into practice. Long-term actions linked to an overall strategy have been taken to increase capacities and coping mechanisms for the system (however, there is still room for improvement). Most of the time the system is capable of functioning autonomously in crisis, but it still needs some external help. Individual actors and system representatives actively participate in learning processes to improve system performance and reduce the impact from shocks and stresses.
5 Optimal Connectivity Actions are long-term, linked to strategy, addressing all aspects of the issue, embedded in society and sustainable	The system can effectively learn from past experiences, proactively and through feedback loops; and strong capacities are in place to continue this learning process. Social change or social learning is evident in the system, at the individual level and systemic level and is effectively translated into practice supported by long-term strategy. Coping mechanisms have been developed by the system and it is autonomously capable of managing difficulties produced by shocks and stresses. A high level of Participation in learning processes to improve system performance and reduce impact from shocks and stresses from all system actors and a cohesive network has been developed. The system receives only guidance from external actors, and little to no external help.

Guiding Questions	Verification Means
• What do system actors know about the shocks and stresses to which the system is exposed to? How likely is it that these shocks and stresses will happen? From system actors experience and knowledge, which actors/functions and relations will be the most impacted by shocks and stresses across the system? • What coping mechanisms (both positive and negative) does the system undertake to face the shocks and stresses it is exposed to? What else can be done against future risk scenarios? • How do system actors and the entire system learn to cope and adapt from shocks and stresses? (e.g. reflecting on past experiences, local knowledge, learning exchanges, experimenting with new solutions, feedback loops). • Apart from local knowledge and experiences, what scientific and technical knowledge or studies have the system actors had access to? Does the system combine local knowledge and experiences with technical and scientific knowledge, data and assessment methods? • How is this knowledge shared and used by system actors? Can you give examples of how it has been put in practice to improve system performance and reduce impact from shocks and stresses? (e.g. has influence decision making, social and behaviour changes have occurred at individual and systemic level, autonomy at handling difficulties, ect). • What obstacles or barriers impede the system to learn effectively and put it into practice? • Is there any long term strategy, policies or system (s) supporting or guiding a participative and effective system learning process?	• Barrier analysis • ARC-D assessment reports • Copies of scientific studies/reports • Hazard monitoring equipment • Triangulation consultations with relevant technical/ scientific institutions • Disaster risk Management plans • Contingency Plans

To complete Part B, it is necessary to have determined the main conclusions from the analysis of the six DFRs. Summarize the problem of the selected socio-economic system resulting from the resilience analysis to provide key recommendations to build/strengthen the resilience of the system. Note that areas of higher levels of resilience may provide additional insight regarding positive pathways for resilience. In making these conclusions and recommendations it is important to take into account the influence of social and behaviour change within the system as described elsewhere in the R4S and if necessary further assessment of SBC may be required to ensure this is properly addressed in the conclusions and recommendations from the RSM.

Part B. Actual Status/Problem/Recommendation Analysis

After assessing the Determinant Factors of Resilience that best describes the socio-economic system (in Part A), proceed to summarize the status of each DFR for each of the Risk Scenarios selected in Component 3. Finalize your analysis by drawing up a conclusion of the system's current state and overall capacity to face those risk scenarios, define the system's problem in a concrete way and make your recommendations for future programme designs and interventions to build/strengthen the resilience of the system.

	Connectivity	**Diversity**	**Redundancy**	**Governance**	**Participation**	**Learning**
	1- No/Minimal	1- No/Minimal	1- No/Minimal	1- No/Minimal	1- No/Minimal	1- No/Minimal
	2- Low	2- Low	2- Low	2- Low	2- Low	2- Low
	3- Medium	3- Medium	3- Medium	3- Medium	3- Medium	3- Medium
	4- Approaching Optimal	4- Approaching Optimal	4- Approaching Optimal	4- Approaching Optimal	4- Approaching Optimal	4- Approaching Optimal
	5- Optimal	5- Optimal	5- Optimal	5- Optimal	5- Optimal	5- Optimal
Risk Scenarios	Current Level = 2	Current Level = 3	Current Level = 1	Current Level = 4	Current Level = 3	Current Level = 3
Risk Scenario 1:						
Risk Scenario 2:						
Conclusion from Current Status						
Synthesize what is the Problem with the Current System Status						
Recommendations to Build and/or Strengthen System Resilience						

Table 7. Resilience Systems Matrix (RSM Part B)

Part B. Actual Status/Problem/Recommendation Analysis (*Example*)

Selected Socio-Economic System: Small-Scale Fisheries System from the North Coast of Honduras

	Connectivity	Diversity	Redundancy	Governance	Participation	Learning
	1- No/Minimal	1- No/Minimal	1- No/Minimal	1- No/Minimal	1- No/Minimal	1- No/Minimal
	2- Low	2- Low	2- Low	2- Low	2- Low	2- Low
	3- Medium	3- Medium	3- Medium	3- Medium	3- Medium	3- Medium
	4- Approaching Optimal	4- Approaching Optimal	4- Approaching Optimal	4- Approaching Optimal	4- Approaching Optimal	4- Approaching Optimal
	5- Optimal	5- Optimal	5- Optimal	5- Optimal	5- Optimal	5- Optimal
Risk Scenarios	Current Level = 2	Current Level = 3	Current Level = 1	Current Level = 4	Current Level = 3	Current Level = 3
Risk Scenario 1: Stressor Only Risk Scenario	The system has Low Connectivity, when facing current stresses, it is not able to mitigate risk through different connections, as many of these are bad, stressed or absent. Some actors are motivated to take action on improving risk transfer, but these are piecemeal and short-term. System's functionality falters.	The system has low Diversity, when facing current stresses, some alternatives for the system to function are emerging due to awareness to increase capacity to confront these stresses. However, the system struggles to function as replaceability and rerouting is not fluid. System has little experience in modifying their role in response to threats.	The system has Low Redundancy, when facing current stresses, there is some awareness among actors about the dependence of the system on few critical actors who cannot be easily replaced and are also vulnerable to these stresses and/or future shocks. There are some back-up measures in place in benefit of System's functionality, but these are piecemeal and short-term.	The system has low Governance, when facing current stresses, the existent governance mechanism has some understanding of how the system functions and the risk to which is exposed to. Some actions are in place in benefit of the System's functionality, however these are piecemeal and short-term. Decision Making structure and leadership is becoming better although there are a number of weaknesses.	The system has low Participation, when facing current stresses, minimal benefits are received by the main system actors (including Target Group). The majority of participants will be men, women and other vulnerable groups do not have the skill/will to participate in the decision-making process.	The system has medium Learning, when facing current stresses, it's starting to apply lessons learnt from the past, more so at the individual level and in some degree in the group level. System is becoming autonomous although it stills relies on external help.
Risk Scenario 2: Risk Scenario Triggered by Major Storm Event (Tropical storm, water surge with strong winds)	The system has Low Connectivity, when facing a tropical storm and/ or watersurge with strong winds. The risk scenario can limit how the system functions from the fishing activity up to the intermediaries.	The system has low Diversity, when facing a tropical storm and/or watersurge with strong winds it will come to a halt and start functioning with difficulty. Replaceability and re-routing is not fluid, specially for certain system actors. The system has little experience re-routing.	The system has low Redundancy, when facing a tropical storm and/ or watersurge with strong winds it will come to a complete halt since it does not have a back-up plan. The system cannot be re-started. No replaceability can take place.	The system has low Governance, when facing a tropical storm and/ or watersurge with strong winds actors become aware of the risk in an individual manner and get organized by affinity , the system is controlled by a small group of actors with low or non existent accountability and arbitrary decision making.	The system has low Participation, when facing a tropical storm and/ or watersurge with strong winds. The majority of system actors do not have the skill/will to particiate in the decision-making process.	The system has medium Learning, when facing a tropical storm and/or watersurge with strong winds it will be able to apply lessons and knowledge learnt from the past specially regarding hydrometereological information and EWS, more so at the individual level and in some degree in the group level.
Conclusion from Current Status	This synthesis of the market system shows that there are a number of the key functions that are absent from the system and as a result the system is at the point of collapse due to the impact of the identified shocks and stresses. Under the current system dynamic relating to the stressor only risk scenario fishers are caught in a reinforcing loop of ever-increasing use of unsustainable fishing practices and increasing fishing effort, poor governance of marine coastal resources and depleting fish stocks resulting in increasing vulnerability for fishers and their families. Market engagement is limited to local markets with reducing returns for fishers. There is a lack of access to formal markets, financial services and investment and little or no risk management measures. Under this current situation not only is the fisheries market system at the point of collapse but it is also clear that fishing communities are becoming more marginalized and vulnerable.					
Synthesize what is the Problem with the Current System Status						
Recommendations to Build and/or Strengthen System Resilience						

Table 8. Resilience Systems Matrix (RSM Part B) - Case Study Small Scale Fisheries in North Coast of Honduras

STEP 4.3 –Develop Vision for System Change

4.3.1. Develop dynamic model for Systemic Change

Based on the recommendations of the RSM a Systemic Theory of Change must now be developed in order to specify the interventions required to increase the resilience of the system. Systemic theories of change must be designed to evolve over time as more information becomes available, actions take effects and conditions shift. Refining the Theory of Change means incorporating the theories of other stakeholders, tracking how key elements change over time, and modifying the theory by comparing what is expected to happen to what actually occurs.

In order to develop a Theory of Change to increase the resilience of the selected socio-economic system it is necessary to model the system dynamics setting out the future vison for the system. As mentioned above, the R4S User must understand how the system operates in a dynamic integrated way when changed rather than considering a set of static connected actors with linear interactions. The R4S approach uses system synthesis to develop the systemic theory of change. In this step the R4S User should complete a master causal loop diagram that addresses all of the issues identified in the analysis of risk scenarios and the recommendations of recommendation of the RSM. This causal loop diagram will represent the core Systemic Theory of Change. Further description of the process of updating the systemic theory of change through adaptive management is described in Component 5.

The R4S Approach recognizes the key relationship between systems change and behaviour change and that they are essentially two sides of the same coin. It is not possible to achieve one in a meaningful way that achieves scale without the other. A key consideration is what level of systemic change is feasible within the potential shift in social and behaviour change of the system actors and vice versa. R4S Approach recommends taking this key dynamic of the interplay between systems and behaviour change into consideration when developing the Theory of Change to achieve targeted changes in the selected socio-economic system. This is done by understanding the behaviour changes necessary to achieve the proposed systemic ToC and refining both until a feasible balanced combination of systems change and SBC are determined.

The graphic shown in ***Figure 28*** describes an overall theory of change for the system where the relevant market functions are present and operational and connected within the system. In the small scale fisheries case study under this scenario fish stocks are sustainably re-established, and fishers are receiving much stronger returns for their livelihood efforts, with improved management of marine coastal resources. This synthesis provides a high-level strategy to improve the system functionality and improve its resilience incorporating the recommendations of the analysis of the 6 determinant factors of resilience. The full detailed theory of change is developed through the **System Change Map** described in following Step 4.3.2.

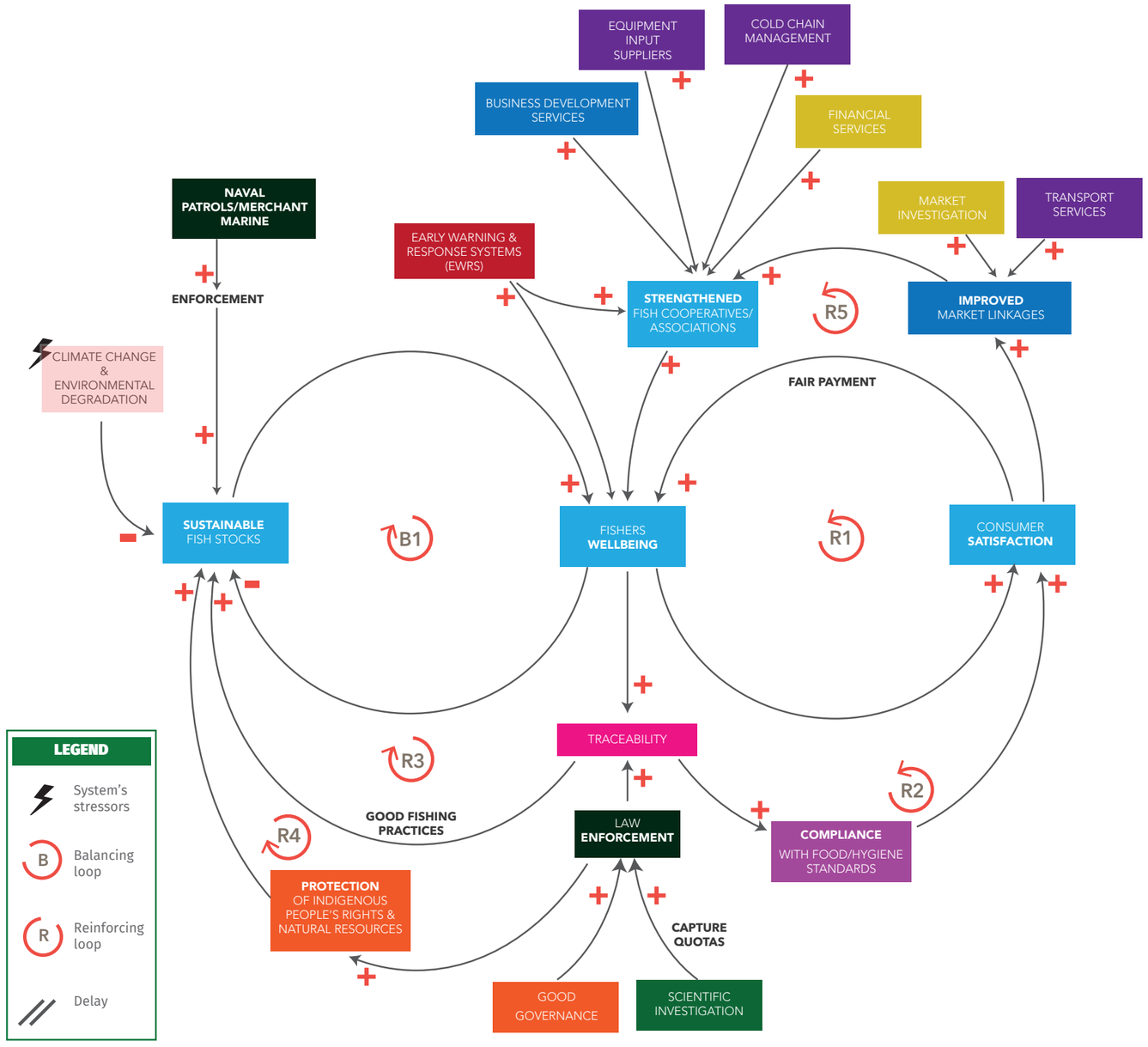


Figure 28. Overall Theory of Change of the System - Causal Loop Diagram

4.3.2. Develop System Change Map

A key step in the R4S Approach is the development of a **System Change Map** based on the analysis completed in Steps 4.1 and 4.2. This map represents the proposed systemic changes based on the Theory of Change and sets out the desired state of the socio-economic system in benefit of the Target Group and incorporating measures to strengthen the system's resilience. ***Figure 28*** shows the analysis of an improved system dynamic for the Small Scale Fishers Case Study with key measures in place to enhance stock and flow and positive balacing and reinforcing loops established in the system. This causal look diagram sets out the basis of a systemic Thoery pf Change from which a more detailed Systems Change Map can be developed. The System Change Map highlights which key relations and which actors' attributes are to be developed through the programme intervention. The different symbols shown on the map represent the map changes, such as: increase of actors' capacities & interests, new actors or relations appear, improved quality of relationships between actors or reduction of actor's relevance & level of replaceability, and finally increase or reduction of throughput & influence. If changes are being achieved, then this will be seen in the reduced number of stressed, broken and absent relationships, improving KPIs producing better returns for the Target Group, reduced impact of risk scenarios, etc. However, in this example as a result of governance of natural resources improvement, some actors will keep or increase their stressed relations. When necessary, this map can also include visual aids, images, graphics or notes that better explain proposed changes.

It is essential that the resilience analysis of the system(s) is a participatory process involving the key actors of the selected socio-economic system. The system maps are designed to be used as a tool to aid the engagement with system actors so that there is a consensus regarding the status of the existing system, what are its limitations and what are the measures to improve the system. At least one workshop is recommended to validate each revision of the **System Change Map** to ensure participation and consensus among the system stakeholders.

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Department of Foreign Affairs and Trade

RESILIENCE FOR SOCIAL SYSTEMS 'R4S' APPROACH
SYSTEM CHANGE MAP

System: Small-Scale Fisheries Market System in the Honduran North Atlantic Coast

Date: May/2019 - Revision Number: 03
Prepared by: Mario Argeñal/ Gabriela Cáceres/ Ana Córdova/ Carlos Villatoro/ Darwin Castillo
Reviewed by: Luigi Loddo/ Bernard McCaul

The 'R4S' System Change Map represents the proposed systemic changes based on the Theory of Change and sets out the desired state of the socio-economic system in benefit of the Target Group and incorporating measures to strengthen the system's resilience.

The System Change Map highlights which key relations and which actors' attributes are to be developed through the programme intervention. As the Legend on the upper right hand corner illustrates, the different symbols represent changes such as: increase or reduction of actors' capacities & interests, new actors or relations appear, improved quality of relation between actors (absent or minimal stressed relations), increased or reduction of actor's relevance & level of replaceability, finally increased or reduction of throughput. If changes are being accomplished actors should be getting close to the transaction chain, stressed relations should be reduced. However, in this example as a result of governance of natural resources improvement, some actors will keep or increase their stressed relations. When necessary, this map can also include visual aids, images, graphics or notes that better explain proposed changes.

LEGEND

- Reduced capacities & interests
- Increased capacities & interests
- Reduced dependency on service or production and becomes more replaceable.
- Increased dependency on service or production and becomes less replaceable.
- Reduced Throughput
- Increased Throughput
- New Actor

Relationship Quality:
- Reduced stress relation
- Previous stress relation
- Stress relation increases
- New or increased relation intensity between actors.

ABSENT INTERRELATIONSHIP

INDIRECT INTERRELATIONSHIP

DIRECT INTERRELATIONSHIP

SUPPORTING FUNCTIONS

Market players

Market Players' Coordination
- Inter-institutional Committees
- Wetland's Councils

Stock management

Scientific Investigation
UNAH, CORAL, WWF, GOAL, CEM, CCO, UICN

Business & financial services

Marketing/ Investigation- Information
CDE, GOAL

Supplies & logistics services

Business Development Services
CONEANFO, CDE, INFOP

Business Drivers
*Improved commercial links and bussiness benefits
CDE, COMANAGERS, GOAL, SDE, Second floor fishers' businesses

Training in Good Fishing Practices
DIGEPESCA, INFOP, Certified Private Consultants

Salt (Input suppliers)
Bekin, local storages, Mexican importing company, National suppliers (South of Honduras)

Boats (Input suppliers)
Local Shipyards, Urban Shipyards

Fishing Gear (Input suppliers)
Local Artisans, Fishers' Associations, Urban Suppliers, Pesca Uno, Local Grocery Stores

Fuel (Input suppliers)
TEXACO, PUMA, UNO, Local Gas Stations, Fishers' Associations /Cooperatives

Ice Suppliers (Input suppliers)
APAIB (* Fishers' Business), EMPROMARSA, BUKARIMAT, KAUMA, Urban Markets, PROCESSING PLANTS, CAPIRO-JARICO, LAREINI LAWAN, BRIT - PUT - TANGNI, COOPESPCOL, IRIONA

Equipment Repair Services
Fishermen *INFOP providing trainings to fishers, Local repair workshop, Yamaha Repair Workshop

Renewable Energy for Cold Storage:
SOLUZ, Cool boat, Tecnisol, Solaris

Transportation Services
COSTA III, FRANK GOFF, New supplier, LOS PLAYEROS (collective land-transport service)

Equipment Suppliers
Pesca Uno (Fishing gear), Motors:, Kawas' motors, New supliers of new technology, YAMAHA, SUZUKI

Financial Services
*Access to formal credit and other financial services will be improved
CAYCTOL, TIGO MONEY, CO-OP CEIBEÑA, FGR CONFIANZA, BANCO ATLÁNTIDA, CO-OP. SAGRADA FAMILIA, BANRURAL, BANCO DE LOS TRABAJADORES, CAYCSOL, FAMA, Informal Credit, Banca Solidaria, CREDISOL

SUPPORTING FUNCTIONS

Transaction Chain **INPUT**

CAPTURE/ PRODUCERS | **COLLECTION/ INTERMEDIARIES** | **RETAIL/ PROCESSING** | **CONSUMPTION**

*Creation of Small-Fishers Platform
*Promotion of good fishing practices and compliance with high quality products

FISHERS (<15K) Target Group

Fishers' Businesses (5) Target Group
EMPROMARSA*, COOPESPCOL*, APAIB*, LAREINI - LAWAN, KAUMA, CAPIRO-JARICO
*Fishers' Associations

Retail/ Local Intermediaries (+/-100)
Wholesales Intermediaries (+/-80)
Collection Centers (+/- 29) Target Group
PAZCOBLA, YAHURABILA, CASTILLA, APROCUS, AS. PESCADORES LIMON, DELFINES DEL CARIBE, TONINA BLANCA, MARIÓN, KRUTA - RÓBALO, BRIT-PUT-TANGNI, BUKARIMAT, ASOC. NUEVA ARMENIA, ASOC. BATALLA, ASOC. IRIONA
High-Sea Intermediaries (+/53)

Street/Seasonal Vendors (+200)
Municipal Markets (9)
TOCOA, TRUJILLO, SAN PEDRO SULA, PUERTO CORTÉS, CHOLOMA, LA CEIBA, PROGRESO, TELA, TEGUCIGALPA
Hotels /Restaurants (+/-150)
Supermarkets (3)
New supermarkets, LA COLONIA, WALMART, LA ANTORCHA
Processing Plants (+/-19)
KAUMA /GEOVANNY LEE, ALDASA, FINCOR, GRUPO MOON, MARINOS PESCADERÍA, MARISCOS DEL ATLÁNTICO, MARUCO, other, FROZEN, Azul Import-Export
*Potentiates traceable artisanal fish trade

LOCAL Consumer
NATIONAL Consumer
EXPORT

CONSUMERS (<15K)
Local Consumers (+/-50K)
National Consumers (+/- 1M)
Export (+/- 2M)

Transaction Chain **OUTPUT**

Regulation of Fishery Resources
*Impoved governance of marine coastal resources
DIGEPESCA, INTER-INSTITUTIONAL COMMITTEES, NAVAL FORCES, MERCHANT MARINE, OSPESCA, FAO, LOCAL GOVERNMENTS

Regulation of Forestry Resources and protected areas
MI AMBIENTE, ICF, *Capacities and protocols for Blue Carbon Capture and measurement are stablished, TASK FORCE, LOCAL GOVERNMENTS, CO - MANAGERS OF PROTECTED AREAS, INTER-INSTITUTIONAL COMMITTEES, *Standarization of regulatory framework

Traceability System
PROCESSING PLANTS, *Compliance with food/hygiene standards, GOAL, SENASA, IMPORTERS, DIGEPESCA, OIRSA, SUPERMARKET CHAINS, Marine Stewardship Council

Fishers' Associations/ Cooperatives
Target Group
APEB, ASSN. PESCADORES LIMÓN, COLLECTION CENTERS, ASSN. CAYOS COCHINOS, PAZCOBLA, APIMH, ASSN. PESCADORES STA ROSA AGUÁN, ASSN. NUEVA ARMENIA, ASSN. RÍO COCO, ASSN. IRIONA, OPESCOOR (COROZAL), PAMUPEL, Fishers' Association of the Atlantic Cost, PESCADORES DE TELA, ASSN. PESCADORES PLAN GRANDE, TRES PUEBLOS UNIDOS
*Creation of Small- Fishers Platform to enhance commercial and governance capacities.

EWS/DRR Management
COPECO, CODEM, CODED, INTER-INSTITUTIONAL COMMITTEES

Business Operation Regulation/Permits
Municipalities (Operating permits), Labour Law

Tax Regulation
SAR, Customs
*Fishers' Businesses comply to Operation and Tax Regulations

Hygiene / Food safety standards
*Compliance with food/hygiene standards
SENASA, SUPERMARKET CHAINS, SESAL, PROCESSING PLANTS

REGULATORY FUNCTIONS

Regulation of cross-border fishing
Weak relation, is not regulated as it should be, very weak chancelleries.
NAVAL FORCES, CHANCELLERY, Cross-border Municipalities

Natural Resources Regulation

* increased roll out of Territorial use rights for fisheries (TURF) model

Traceability

Indigenous People's Rights Protection
MISKITO INDIGENOUS FEDERATION (MASTA), TERRITORIAL COUNCILS OF GRACIAS A DIOS, PROSECUTOR'S OFFICE OF THE ETHNIC GROUPS, OFRANEH (GARIFUNAS' BOARDS), DINAFROH, Fishers' Association of the Atlantic Cost, ILO, UN, APIMH
*Creation of Small- Fishers Platform to enhance governance capacities.

Governance

Early Warning & Response Systems (EWRS)

Business Operation Regulations/ Permits

Hygiene / Food Safety Security

DIRECT INTERRELATIONSHIP

INDIRECT INTERRELATIONSHIP

ABSENT INTERRELATIONSHIP

System Change Map - Case Study Small Scale Fisheries in North Coast of Honduras

STEP 4.4 -Stakeholder Engagement Strategy and Results Chain

This Stakeholder Engagement Strategy will be developed by completing Section 5 of the Stakeholder Assessment Matrix (SAM) which analyses all actors according two key elements: their influence capacity and interest & incentives to improve the system based on the Systemic Theory of Change and System Change Map developed in Step 4.3. The stakeholder analysis uses a scale from 1 to 5 for capacity and also a 1 to 5 scale for interest and incentive, where 1 is the lowest score and 5 the highest score possible. The highest capacity and interest score is represented with the colour red identifying a 'Key Player' to engage for achieving the proposed systemic change, the lowest capacity and interest is represented with a brown colour and are identified as less critical actors and engagement should be 'Minimal Effort" and continue to monitor the level of influence and interest of these actors; actors who have low capacity to influence change but have high interest are identified with Blue and should be 'Keep Informed' and finally actors who are less interested but have high capacity to influence are identified in orange and should be 'Keep Satisfied'. (Refer to ***Figure 29***). This preliminary Stakeholder Engagement Strategy is represented on the **Stakeholder Engagement Map**.

The completed Stakeholder Assessment Matrix (SAM) and a detailed Social & Behaviour Change Assessment should be used to develop a more detailed Stakeholder Engagement Strategy to achieve the outcomes described in the **Systemic Theory of Change** and the **System Change Map**. The purpose of the Stakeholder Engagement strategy is to identify the actors to partner with and how to engage with them to facilitate changes in the selected socio-economic system. The process of facilitation is described in detail in the Markets for the Poor Guidance Manual and is not repeated here. Also, a full detailed Results Chain should be developed for each intervention setting out all the activities based on the Systemic Theory of Change. The process for developing a Results Chain is also described in detail in the M4P Guidance manual and it is recommended to refer to this and other relevant good practice for developing a comprehensive Results Chain.

Figure 29. Stakeholder Engagement Strategy

Colour Code	Strategy	Description
	Minimal Effort	Actors with low capacity & interest.
	Keep Informed	Actors with low capacity & high interest.
	Keep Satisfied	Actors with high capacity & low interest.
	Key Players	Actors with high capacity & interest.

TAKE AWAY

The R4S Approach uses systems change and behaviour change techniques to support the improved functioning of inclusive and resilient socio-economic systems. The R4S Approach is designed as a participatory diagnostic tool which integrates technical assistance with stakeholder knowledge and experience. The R4S should be considered as a tool to accompany a temporary process of facilitation of change which will ultimately be delivered and sustained by the system actors. This process of change is likely to be a long-term process with intermediate stages or milestones of progress towards the desired change. R4S Approach aims to generate understanding of the complex dynamics of socio-economic systems and the positive and negative feedback loops that influence a system performance. With this increased understanding targeted interventions can be developed to improve the system and progress can be monitored towards increased inclusiveness and resilience of the system. What is described throughout the manual up to this point is the selection of the target system and synthesis of the performance and resilience of that system. Typically, the first synthesis or iteration of a complex system will take between 3 to 6 months. In a humanitarian crisis it is envisaged that the R4S tools can also be applied to complete a rapid assessment in 2 to 4 weeks through a number of participatory workshops with key informants to give an initial high-level overview of a system with the detailed analysis continuing as conditions permit. However, it must be remembered that achieving systems change is an adaptive management process and therefore the R4S diagnostic should be repeated as required throughout the facilitation process to understand how the system is changing, what actors remain vulnerable to impact from risk scenarios and to update the vision for change.

The Theory of Change and System Change Map aim to reflect as realistically as possible the future performance of the target system(s). This is clearly based on a number of assumptions and risk factors which will have been identified. It is therefore essential to continuously review the ToC, Results Chain and the System Maps as described in Component 2, 3 and 4 and update these tools in participation with the socio-economic system actors ensuring participation of vulnerable groups and gender equality through a Participatory Monitoring and Evaluation, Accountability and Learning approach (Described in Component 5).

Figure 30. Perspectives on R4S Approach

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Department of Foreign Affairs and Trade

RESILIENCE FOR SOCIAL SYSTEMS 'R4S' APPROACH
STAKEHOLDER ENGAGEMENT MAP
Current System

System: Small-Scale Fisheries Market System in the Honduran North Atlantic Coast

Date: May/2019 - Revision Number: 03
Prepared by: Mario Argeñal/ Gabriela Cáceres/ Ana Córdova/ Carlos Villatoro/ Darwin Castillo/ Sayri Molina/
Reviewed by: Luigi Loddo/ Bernard McCaul

The 'R4S' Stakeholder Engagement Map is based in the Current System Map. It represents all the different type of players that exist in the small-scale fisheries system according to two key elements: their influence capacity over the system & Interest and incentives to improve the system based on the Systemic Theory of Change and System Change Map developed in Step 4.3. The stakeholder analysis uses a scale from 1 to 5 for capacity and also a 1 to 5 scale for interest and incentive, where 1 is the lowest score and 5 the highest score possible. As the Legend on the upper right hand corner illustrates, the Stakeholder Engagement Map reflects four (4) types of actors.

'Key Players' are represented as red circles, and they could be considered the most important type of actor in the system since they reflect the highest scores on two critical variables: (1) capacity to influence the system and (2) interest to improve the system. Thus, being the ideal system players (change agents) to work with.

The **'Minimal Effort – Monitor'** type of actors (brown circles) are those whose capacity and interest to change the system are the lowest, hence trying to effect systemic change with these type of actors would not be fruitful at this stage. However, these type of actors could change their status in the future and become potential change agents and thus must be monitored.

The **'Keep Informed'** type of actors (blue circles) are those who possess a high interest to improve the system but their capacity to do so is low. Thus, the capacity of these system players could be enhanced since their interest for systemic change is high (resistance for change would be low). They represent potential change agents at this stage and they must be kept informed.

Finally, the **'Keep Satisfied'** type of actors (orange circles) are those whose capacity to influence change in the system is high but whose interest to do so is low. As the Legend reflects, these type of players are a few steps from becoming 'Key Players' and thus should be motivated and persuaded to become key change agents. They must be kept satisfied for them (intentionally or unintentionally) not to use their influence to obstruct change to the system.

LEGEND

RELATIONSHIP Quality
GOOD
STRESSED
BAD

ACTOR TYPE:
CAPACITY
INTEREST
Keep Satisfied
Key Player
Minimal Effort – Monitor
Keep Informed

ABSENT INTERRELATIONSHIP
INDIRECT INTERRELATIONSHIP
DIRECT INTERRELATIONSHIP

SUPPORTING FUNCTIONS

Renewable Energy for Cold Storage:
SOLUZ
Cool boat
Tecnisol
Solaris

Market Players' Coordination
Inter-institutional Committees
Wetland's Councils

Market players

Scientific Investigation
UNAH
CORAL
WWF
GOAL
CEM
CCO
UICN

Stock management

Supplies & logistics services

Business & financial services

Marketing/ Investigation-Information
CDE
GOAL

Financial Services
CAYCTOL
TIGO MONEY
CO-OP CEIBEÑA
FGR CONFIANZA
BANCO ATLÁNTIDA
CO-OP. SAGRADA FAMILIA
BANRURAL
BANCO DE LOS TRABAJADORES
CAYCSOL
FAMA
Informal Credit
Banca Solidaria
CREDISOL

Business Development Services
CONEANFO
CDE
INFOP

Business Drivers
COMANAGERS
CDE
SDE
GOAL

Training in Good Fishing Practices
DIGEPESCA
INFOP

Salt (Input suppliers)
Bekin
local storages
Mexican importing company

Boats (Input suppliers)
Local Shipyards
Urban Shipyards

Fishing Gear (Input suppliers)
Local Artisans
Fishers' Associations
Urban Suppliers
Pesca Uno
Local Grocery Stores

Fuel (Input suppliers)
TEXACO
PUMA
UNO
Local Gas Stations

Ice Suppliers (Input suppliers)
APAIB (* Fishers' Business)
EMPROMARSA
BUKARIMAT
KAUMA
Urban Markets
PROCESSING PLANTS
BRIT - PUT - TANGNI
COOPESPCOL

Equipment Repair Services
Local repair workshop
Fishermen
Yamaha Repair Workshop

Transportation Services
COSTA III
FRANK GOFF
LOS PLAYEROS (collective land-transport service)

Equipment Suppliers
Motors:
Kawas' motors
Pesca Uno (Fishing gear)
YAMAHA
SUZUKI

Transaction Chain **INPUT**

CAPTURE/ PRODUCERS
COLLECTION/ INTERMEDIARIES
RETAIL/ PROCESSING
CONSUMPTION

FISHERMEN (<15K) — Target Group
+/-9-10 K MT of fish
100 %
75 %
55 %
10 %
10 %
6 %
17 %
<1 %
1 %
1 %
1 %
3 %
2 %
3.08 %
< 1 %
< 1 %
< 1 %
< 1 %
20 %
3 %
1 %
4 %
13.5 %
6 %
17 %
20 %
35%
6 %
3 %
5 %
7 %
EXPORT
100 %

Retail/ Local **Intermediaries** (+/-100)
Wholesales **Intermediaries** (+/-80)
Fishers' **Businesses** (5) — Target Group
EMPROMARSA* COOPESPCOL* APAIB* LAREINI - LAWAN KAUMA
*Fishers' Associations
Collection **Centers** (+/- 29) — Target Group
YAHURABILA CAPIRO JERICÓ CASTILLA APROCUS DELFINES DEL CARIBE TONINA BLANCA MARIÓN KRUTA - RÓBALO BRIT-PUT-TANGNI BUKARIMAT
High-Sea **Intermediaries** (+/53)

Street/Seasonal **Vendors** (+200)
Municipal **Markets** (9)
TOCOA TRUJILLO SAN PEDRO SULA PUERTO CORTÉS CHOLOMA LA CEIBA PROGRESO TELA TEGUCIGALPA
Hotels /**Restaurants** (+/-150)
Supermarkets (3)
LA COLONIA WALMART LA ANTORCHA
Processing **Plants** (+/-19)
KAUMA /GEOVANNY LEE ALDASA FINCOR GRUPO MOON other FROZEN MARISCOS DEL ATLÁNTICO MARUCO MARINOS PESCADERÍA

LOCAL Consumer
NATIONAL Consumer

CONSUMERS (<15K)
Local Consumers (+/-50K) 7,010 MT (70.10%)
National Consumers (+/- 1M) 2,380 MT (23.80%)
Export (+/- 2M) 610 MT (6.10%)

Regulation of Fishery Resources
DIGEPESCA
INTER-INSTITUTIONAL COMMITTEES
NAVAL FORCES
MERCHANT MARINE
OSPESCA
FAO
LOCAL GOVERNMENTS

Regulation of Forestry Resources and protected areas
MI AMBIENTE
INTER-INSTITUTIONAL COMMITTEES
TASK FORCE
ICF
LOCAL GOVERNMENTS
CO - MANAGERS OF PROTECTED AREAS

Traceability System
GOAL

Fishers' Associations/ Cooperatives — Target Group
APEB
ASSN. PESCADORES LIMÓN
COLLECTION CENTERS
ASSN. CAYOS COCHINOS
PAZCOBLA
APIMH
ASSN. PESCADORES STA ROSA AGUÁN
ASSN. NUEVA ARMENIA
ASSN. RÍO COCO
ASSN. IRIONA
OPESCOOR (COROZAL)
PAMUPEL
PESCADORES DE TELA
ASSN. PESCADORES PLAN GRANDE
TRES PUEBLOS UNIDOS

Business Operation Regulations/ Permits

Hygiene / Food Safety Security

DIRECT INTERRELATIONSHIP

REGULATORY FUNCTIONS

Natural Resources Regulation

Traceability
PROCESSING PLANTS

Indigenous People's Rights Protection
MISKITO INDIGENOUS FEDERATION (MASTA)
TERRITORIAL COUNCILS OF GRACIAS A DIOS
PROSECUTOR'S OFFICE OF THE ETHNIC GROUPS
OFRANEH (GARIFUNAS' BOARDS)
DINAFROH
ILO
UN
APIMH

Municipalities (Operating permits)
Labour Law
Tax Regulation
SAR
Customs

Hygiene / Food safety standards
SENASA
SUPERMARKET CHAINS
SESAL
PROCESSING PLANTS

INDIRECT INTERRELATIONSHIP

Regulation of cross-border fishing
Weak relation, is not regulated as it should be, very weak chancelleries.
NAVAL FORCES
CHANCELLERY
Cross-border Municipalities

SENASA
DIGEPESCA
OIRSA
SUPERMARKET CHAINS
Marine Stewardship Council

Governance

EWS/DRR Management
COPECO
CODEM

Early Warning & Response Systems (EWRS)

ABSENT INTERRELATIONSHIP

OUTPUT

Stakeholder Engagement Map - Case Study Small Scale Fisheries in North Coast of Honduras

COMPONENT 5. Participatory Monitoring, Evaluation, Accountability and Learning (PMEAL)

The R4S Approach places significant importance on achieving resilience outcomes, however, in fact resilience is a secondary outcome, the primary outcome that R4S is striving for is more inclusive societies. Clearly if socio economic systems are more resilient then they are more inclusive and provide greater protection to vulnerable populations exposed to shocks and stresses. Hence, the core aim is about building more inclusive societies and the Target Group must be at the centre of the R4S. *R4S* Approach recognizes that performance measurement tools are often developed with minimal or no participation of the stakeholders impacted by a proposed intervention within a social system. As a result, system actors including the Target Group are regularly unaware or unclear of the proposed impact of an intervention and do not have ownership of systemic changes that are being promoted. Therefore, R4S Approach utilizes a *Participatory Monitoring, Evaluation, Accountability and Learning* as the recommended approach to measure the impact of a systemic intervention and is developed in coordination with system actors and with particular emphasis on ensuring gender equality and effective participation of vulnerable groups.

According to the World Bank, participation is *"a process through which stakeholders including the poor and marginalized influence and share control over development initiatives and the resources and decisions that affect them"*[26]. Effectively applying PMEAL enhances accountability for all stakeholders and ensures a more effective systemic intervention.

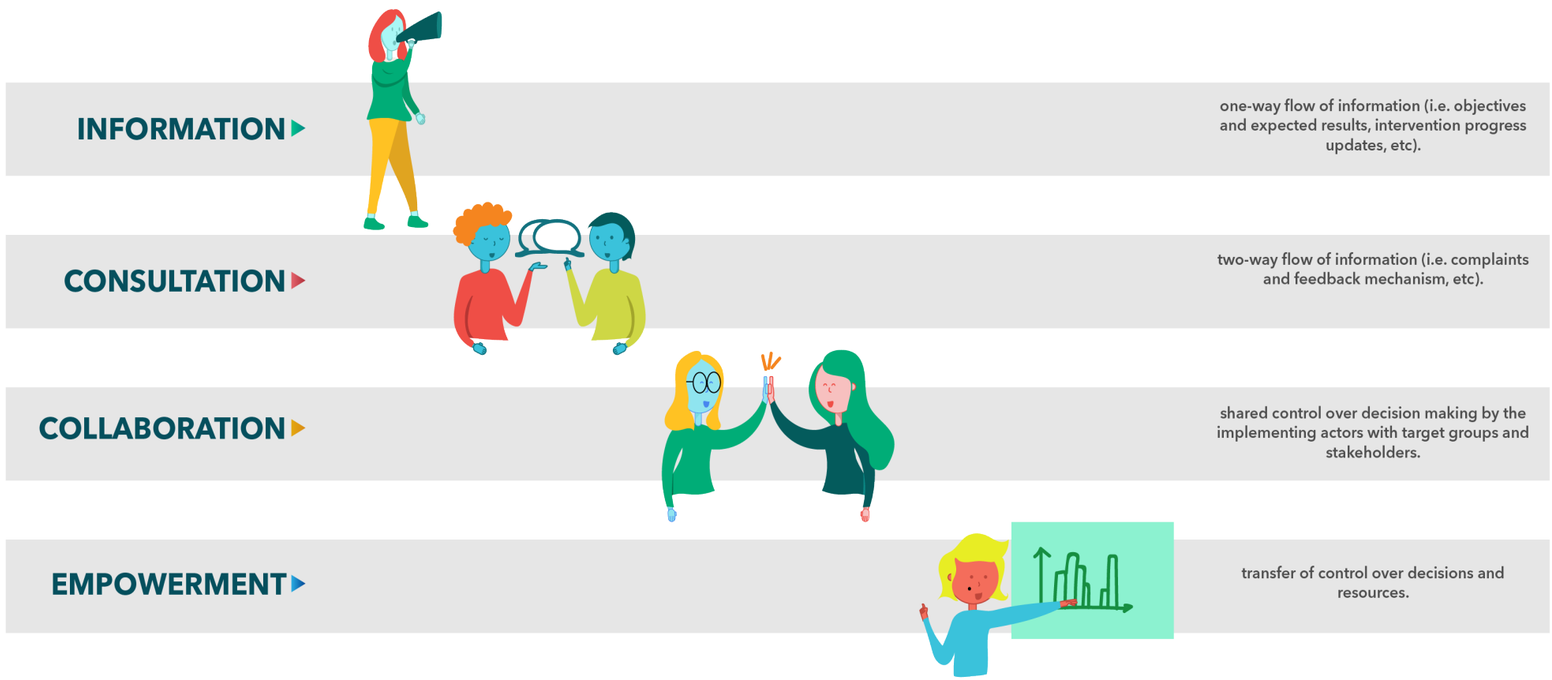

Figure 31. Levels of participation

PMEAL is a process through which stakeholders at various levels a) engage in monitoring and evaluating a project, program or policy, b) share control over the content, the process and the results of the M&E activity and c) engage in taking or identifying corrective actions.[27]

PMEAL acknowledges that there are multiple stakeholders who are or should be participants in monitoring, evaluation, accountability and learning. Stakeholders are those who directly or indirectly become involved in deciding what a project or programme should achieve and how it should be achieved. The essential feature of the *PMEAL* is *"partnership in development"* whereby people are involved in deciding when and how to monitor and evaluate, analyse, communicate and use information collected on the projects' impact.[28]

In addition, *PMEAL* efforts are recognized by the level of involvement of:

- Major stakeholders, including those who may be directly or indirectly affected by or involved in the project or programme interventions.
- Target Group of the project or programme interventions.
- Marginalized groups, including women, the very poor, children, people with disabilities.

This approach shifts the role of the intervention's M&E staff; instead of conducting monitoring and evaluation

26 Sirker, K. & Ezemenario, K. (2016). Participatory Monitoring and Evaluation. Principles, Action Steps, Challenges. World Bank & PREM. Retrieved February 1, 2017 from <http://siteresources.worldbank.org/INTPAME/Resources/Training-Materials/Training_2002-06-19_Sirker-Ezemenari_PovMon_pres.pdf>

27 Sirker, K. & Ezemenario, K. (2016). World Bank & PREM. http://siteresources.worldbank.org/INTPAME/Resources/Training-Materials/Training_2002-06-19_Sirker-Ezemenari_PovMon_pres.pdf

28 Estrella, M., & Gaventa, J. (1997). Who Counts Reality? Participatory Monitoring and Evaluation: A Literature Review. Philippines: Institute for Development Studies. Retrieved from http://www.ids.ac.uk/files/Wp70.pdf

actions or collecting information from Target Group, M&E staff become facilitators of these processes. This role as facilitator demands not just technical skills, but also interpersonal skills such as negotiating and handling conflicts.[29]

Why Participatory Monitoring, Evaluation, Accountability and Learning (PMEAL)?

It increases ownership, autonomy and self-organization (institutionalization of participation/ empowerment).

Information quality is improved and less distorted by project staff bias.

Joint learning improves performance and outcomes.

Increases accountability and transparency.

Strengthens commitment to implement corrective actions.

PMEAL Principles

The first principle of *PMEAL* is *Participation*. This refers to creating structures and processes that include those most directly affected by the program and often those most frequently powerless and/or voiceless in program design and implementation.

The second is *Negotiation*. It refers to the commitment that must be present in order to work through different points of view (with the potential for conflict and disagreement) about what the evaluation should focus on, how it should be conducted and used, and what actions should result.

The third is *Learning*. Participatory processes lead to learning among all participants which, when shared, leads to corrective action and program improvement.

Finally, the fourth is *Flexibility*. Given the changing circumstances, people and skills available for the process, flexibility is required. As circumstances change, those involved in and affected by the evaluation should be committed to modifying their strategies to achieve desired *'results knowledge'* that will shape effective and sustainable programs.[30]

COMPONENT 5

PARTICIPATORY MONITORING EVALUATION ACCOUNTABILITY AND LEARNING

STEP 5.1 Set the basis for a Participatory Monitoring, Evaluation, Accountability & Learning (PMEAL) for socio-economic system development.

STEP 5.2 Monitoring & Evaluation

STEP 5.3 Resilience Measurement and Adaptive Management

STEP 5.4 Accountability & Learning

STEP 5.1 -Set the basis for a Participatory Monitoring, Evaluation, and Accountability & Learning (PMEAL) for socio-economic system development

5.1.1. Define the Target Group (Of Whom and Where? – must be defined at the outset of Component 1)

The Target Group may include people who receive a direct benefit and those who receive an indirect benefit. R4S users should define their Target Group, considering "direct Target Group" those receiving goods and/or services from an intervention through a direct interaction or as a result of facilitation strategies. People receiving indirect benefit will be those amplifying demonstration (e.g. crowding-in actors that imitate the model or copying actors imitating the first Target Group). Also, during the adaptation phase, people receiving indirect benefit could include actors innovating or adapting the original model or new actors entering as a result of new opportunities[31]. For clear and consistent assessment of impact, it is critical to agree upon the definition of Target Group before starting the intervention.

5.1.2. Continuous Updating of ToC, System Change Map and Results Chain

In component 4 the Systemic Theory of Change and System Change Map are described and these are the key overall framework for achieving the proposed systemic change. The ToC and System Change Map are an "essential framework to guide all monitoring and evaluation activities" and a key tool for learning and adapting[32]. For these reasons, it is highly recommended to revise the ToC and the System Change Map during key stages of an intervention such as: project/activity inception phase, impact evaluation design at midline, end line evaluations, etc. It is important to properly document changes to the Systemic Theory of Change and System Change Map throughout the life of the intervention and also make sure that clear version control are in place, so all stakeholders are working off of the correct version.

A Results Chain is a subset of the Theory of Change/ System Change Map and describes more specifically the outcomes to be achieved by a specific project intervention considering the available resources, time, skills, experience, etc. Results Chains are a critical tool for **adaptive management** and facilitation of systemic change. Updating of the results chain has been hailed as a key process to deal with the uncertainty of working in complex systems where it is difficult to anticipate or predict the precise pathways to achieve systemic change[33]. Adaptive Management can be understood as a *"real-time sensing of the system changes to manage facilitation-based interventions in a complex environment"*[34]. In this regard, it is critical to frequently review and update the results chain to facilitate real-time learning and adaptation. An ideal frequency would be on a quarterly basis or at least annually, according to the Donor Committee for Enterprise

29 Rossman, G. B. (2015). Participatory Monitoring & Evaluation. Amherst: The Center for International Education.

30 Idem

31 Adapted from USAID. (2016). Guidelines for Monitoring, Evaluation and Learning in Market Systems Development: MarketLinks. MarketLinks Web site: https://www.marketlinks.org/library/guidelines-monitoring-evaluation-and-learning-market-systems-development

32 Idem

33 Ripley, M., & Jaccard, S. (2016). The Science in Adaptive Management. ILO. Obtenido de https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---ifp_seed/documents/briefingnote/wcms_537422.pdf

34 USAID. (2016). Guidelines for Monitoring, Evaluation and Learning in Market Systems Development: MarketLinks. Obtenido de MarketLinks Web site: https://www.marketlinks.org/library/guidelines-monitoring-evaluation-and-learning-market-systems-development

Development (DCED) Results Measurement Standard[35]. Additionally, the DCED Standard recommends that mid and senior level project staff familiarize themselves with the Results chain and use it to guide their activities[36]. For further guidance on measuring systemic changes, refer to the Guidelines for Monitoring, Evaluation and Learning in Market Systems Development from USAID.[37]

Project interventions for system development, should be evaluated in multiple dimensions to avoid overemphasizing some while ignoring others. Five dimensions are recommended to evaluate intervention results: **Outcomes** refers to the beneficial changes that an intervention seeks to facilitate (e.g. changes in technology adoption at intermediate outcomes or reducing poverty at development outcomes level). **Outreach** is linked to outputs and is a measure of the number of people, households receiving benefits (e.g. number of farmers that are trained), but also is related to early behaviour changes (e.g. number of farmers using improved production technologies). **Inclusiveness** is measured regarding the Target Groups' characteristics, how benefits are distributed and how the intervention promotes inclusive growth for marginalized groups. **Sustainability** refers to the continuity or persistence of outcomes, outreach and inclusiveness beyond the life of the program. **Systemic changes** relate to changes in the structure or dynamics within systems that influence its performance and its potential to positively affect development outcomes.[38]

STEP 5.2 -Monitoring & Evaluation

5.2.1 Participatory Monitoring & Evaluation through Social Auditing

According to the FAO, 'social auditing' is "*a way of measuring, understanding, reporting and ultimately improving social and ethical performance. A social audit helps to narrow gaps between vision/goal and reality, between efficiency and effectiveness. It is a technique to understand, measure, verify, report on and to improve social performance.*"[39]

For the R4S Approach 'Social auditing' is defined as the participation of the system stakeholders in the monitoring and supervision of an intervention to improve resilience of that system. Through this mechanism, the system stakeholders are empowered to influence the decisions made by the intervention.

The steps to carry out a *Participatory Monitoring & Evaluation Process* through *Social Auditing* are described below:

a) Assign Indicators of Change According to the Results Chain with Key Stakeholders

1. Define the selection criteria of key stakeholders ensuring the Target Group are fully represented.
2. Invite key stakeholders and present the draft System Change Map and the results chain prepared under Component 4.
3. The DCED Standard recommends assigning at least one indicator for each change described in the results chain. This should be done by asking stakeholders how they could measure the changes produced. The indicators should include the measurement of the Key Performance Indicators (KPIs) agreed with the system stakeholders as described in Step 1.5.
4. Make sure all indicators are SMART (specific, measurable, achievable, realistic and time-bound) and agree targets with stakeholders.
5. Review all assumptions in the results chain with the system stakeholders.

b) Select Key Stakeholders to form the Social Auditing Committee (SAC)

The members of the Social Auditing Committee should be selected through the following steps:

1. Define the purpose and scope of the SAC.
2. Define the member's selection criteria ensuring full representation of the Target Group including the following suggested criteria:
    - Availability of time to meet their role.
    - Knowledge about the cultural context.
    - Be recognized for their honesty, commitment and involvement with the selected system.
    - Concern and/or experience on advocating for the protection of vulnerable groups and the environment.
    - Balance in participation between women and men within the SAC.[40]
3. Together with key stakeholders, select the SAC and get their commitment to develop their role. The SAC should represent the critical system functions as identified in the System Change Map.

c) Create a Monitoring & Evaluation Plan

The objective here is to build the *Monitoring & Evaluation (M&E) Plan* with the SAC. See below the recommended steps:

1. List all the indicators and classify them according to their level (process, output, outcome or impact). Indicators should include Key Performance Indicators (KPIs) which describe the overall system's performance. *(Refer to Component 1)*.
2. List the assumptions of each indicator, so that these are tracked during the monitoring process.
3. Clearly define how indicators will be calculated, particularly in the case where the indicator is measured as a percentage (i.e. what is the numerator and denominator and how are those calculated).
4. Select the data collection method that best measures or describes the indicators' status and that can give evidence of progress (e.g. Focus Group Discussions (FGD), interviews, surveys, etc.).

35 For further information on the DCED standard refer to https://www.enterprise-development.org/wp-content/uploads/DCED_Standard_VersionVIII_Apr17.pdf

36 DCED. (2017). The DCED Standrad for Measruing Results in Private Sector Development. Obtenido de https://www.enterprise-development.org/wp-content/uploads/DCED_Standard_VersionVIII_Apr17.pdf

37 USAID. (2016). Guidelines for Monitoring, Evaluation and Learning in Market Systems Development: MarketLinks. Obtenido de MarketLinks Web site: https://www.marketlinks.org/library/guidelines-monitoring-evaluation-and-learning-market-systems-development

38 Idem

39 FAO. (2016). FAO Corporate Document Repository. Retrieved from FAO Corporate Document Repository website: http://www.fao.org/docrep/006/ad346e/ad346e09.htm

40 FHIS. (2006). Contraloría Social PEC. (Social Auditing PEC). Tegucigalpa.

5. Establish the frequency of data collection for each indicator with stakeholders.
6. Agree on who will be the person responsible for data gathering.
7. List the targets and/or projections that were previously agreed on with the key stakeholders.
8. Identify baseline conditions and decide how to collect baseline data.

The M&E Plan should establish the data to be collected and the necessary steps to complete the data analysis to inform decision making. To make sure that stakeholders are empowered and support the plan and that it remains relevant to the interventions' objectives, it is recommended to:

- Circulate the plan amongst stakeholders –prior to rollout– for their review.
- Incorporate review and updating mechanisms of the plan, to be carried out on a regular basis.

It is recommended to use *Digital Data Gathering (DDG)* tools where possible throughout the R4S Approach. *DDG* techniques can help improve the efficiency, transparency and accuracy of data collected through surveys, routine monitoring and evaluation, actors tracking, among others.[41]

The main advantages of using *DDG* are:

- More data accessibility in real time as this data can be stored online
- Data reliability, because mobile apps have controls to avoid undesired data and reduce data entry errors.
- Ability to monitor data collection including GPS location, time of submission by user, so it is possible to track field survey performance and the quality of incoming data.[42]

41 Pact, Inc. (2014). Mobile Technology Hanbook. Washington, D.C.

42 Idem

STEP 5.3 -Resilience Measurement and Adaptive Management

5.3.1 Measuring Changes in Resilience of the Target Group and Selected System

In addition to the indicators based on the Results Chain it is also recommended to measure changes in resilience both of the Target Group and the selected system. GOAL recommends the use of the Analysis of Resilience of Communities to Disaster (ARC-D) toolkit[43] as part of the Monitoring and Evaluation Plan to measure the changing level of resilience of the Target Group.

The ARC-D Toolkit has been developed by GOAL as a concise and user-friendly tool to assess the level of disaster resilience at community level through a discussion-based survey of 30 disaster resilience components. The application of the ARC-D Toolkit serves as a valuable entry point into systems analysis. Each of its 30 components correspond to one of eight sector systems for community resilience, as shown in GOAL's Resilience Wheel.

It is recommended that users of the R4S Guide apply the ARC-D Toolkit as a complementary tool to the intervention's baseline and end-line, thus revealing what is the effect of strengthening the selected system in terms of target communities' resilience. This tool is comprised of three sections: (1) a two-part mobile-based questionnaire; (2) a digital data collection platform for the ARC-D surveys, and (3) a user guidance manual. The field assessment team should be comprised of at least two facilitators, preferably one male and one female. One will be leading the discussion and inputting the selected resilience levels in the DDG device, while the other takes detailed notes and supports the lead facilitator wherever necessary. Download the ARC-D Toolkit at: https://www.goalglobal.org/disaster-resilience.

Also, the Resilient System Matrix and the related 6 Determinant Factors of System Resilience can be applied to give both a qualitative and quantitative measurement of system resilience based on the resilience building strategy.

43 GOAL. (2014). Analysis of the Resilience of Communities to Disasters (ARC-D) Toolkit User Guidance Manual. Dublin. Accessed from <https://www.goalglobal.org/disaster-resilience> and <https://www.goalglobal.org/files/ARC-D-Toolkit-User-Manual-2016.pdf>

> "Holling – the so-called father of adaptive management – formally defined it as "a structured, iterative process of robust decision-making in the face of uncertainty, with an aim to reduce uncertainty over time via system monitoring."
>
> (Holling, 1978 cited by Ripley & Jaccard, 2016)

This is described in more detail in Step 4.1 and should be updated throughout the performance of an intervention.

5.3.2 Adaptive Management

Adaptive management requires strong linkages between learning and implementation and the most effective way is through feedback loops. A double loop learning is required not just correcting deviations but also continuously questioning the fundamental assumptions that underpin the very problem being addressed[44].

Using the data gathered on a regular basis, as established in the M&E Plan, the SAC jointly with programme staff should analyse the data and key findings to guide the decision-making processes (mainly pertaining to adaptative actions needed to achieve the intervention results). For adaptive management, feedback can be developed on a quarterly basis, considering monthly reviews in highly dynamic and complex systems[45]. The DCED standard promotes results management systems updated on a regular basis according to new information and learnings[46]. Learnings could be registered and adequately documented by using a "Recommendations Tracker" to keep a record of changes and decisions taken or recommendations for future strategies. (Refer to ***Table 9***)

This step also includes documentation, reporting and sharing information to the rest of the key stakeholders. Information sharing is considered further in Step 5.4

44 Ripley, M., & Jaccard, S. (2016). The Science in Adaptive Management. ILO. Obtenido de https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---ifp_seed/documents/briefingnote/wcms_537422.pdf

45 USAID. (2016). Guidelines for Monitoring, Evaluation and Learning in Market Systems Development: MarketLinks. Obtenido de MarketLinks Web site: https://www.marketlinks.org/library/guidelines-monitoring-evaluation-and-learning-market-systems-development

46 DCED. (2017). The DCED Standrad for Measruing Results in Private Sector Development. Obtenido de https://www.enterprise-development.org/wp-content/uploads/DCED_Standard_VersionVIII_Apr17.pdf

Project Recommendation Tracker	
Project Name:	<optional>
Project Description:	<required>

ID	Status	Priority	Recommendation	Recommendation Made By	Start Date	Emerging From	Action Steps	Assigned to	Expected Due Date	Final resolution	Resolution date
001											
002											
003											
004											
005											
006											
007											
008											
009											
010											
011											
012											

Table 9. Example of a Recommendation Tracker

STEP 5.4 -Accountability & Learning

For the purposes of *R4S Approach,* accountability is defined as the *"means through which power is used responsibly. It is a process of taking account of, and being held accountable by, different stakeholders, and primarily those who are affected by the exercise of power."*[47]

To make sure that the intervention remains accountable, in this section a number of tools and/or activities are proposed which can be led by the SAC.

5.4.1. Protection Risk Assessment Toolkit

Once *Component 4* is completed and the SAC is formed, it is recommended to develop a risk assessment for protection of vulnerable groups within the Target Group.

According to the *Core Humanitarian Standard,* protection is defined as: *"all activities aimed at ensuring the full and equal respect for the rights of all individuals, regardless of age, gender, ethnic, social, religious or other background, going beyond immediate life-saving activities."*[48]

The *Protection Risk Assessment Tool* was developed by GOAL and is comprised of 4 steps. It identifies all the risks that can be produced by an intervention and that could potentially affect vulnerable groups: *elderly, children, people with disabilities, women, and indigenous groups, among others considered by the SAC.* At the end of the analysis a rating of the level of risk to which each group is exposed to is gathered; mitigation measures for each identified risk are also established. (Refer to ***Table 10***).

The SAC will assign those responsible for the application of the mitigation measures and follow up on these measures as part of its monitoring activities, updating the level of risk periodically. Risk will decrease or increase if measures are in place or if there is no progress in its implementation, respectively. A summary of the steps to complete the Protection Risk Assessment Tool is provided in ***Figure 32***.

47 HAP International. (2010). The 2010 HAP Standard in Accountability and Quality Management. Geneva.

48 CHS Alliance, Groupe URD & the Sphere Project. (2014). Core Humanitarian Standard on Quality and Accountability. Copenhagen.

Protection Risk Assessment Toolkit							
Project/Programme Title:						**Date of Elaboration:**	
Risks	Likelihood 1 to 5 (1=lowest; 5= Highest)	Impact 1 to 5 (1=lowest; 5= Highest)	Level of Risk	Short term mitigation measures during implemention stage	Responsible	Long term mitigation measures post project implemention stage	Responsible
General risks							
1.1 Vulnerable groups to not have access to the benefits/services provided by the project.	2	4	8	For selecting the beneficiaries/groups (risk reduction measures and family relocation, microenterprises) different vulnerable groups/homes are prioritized in places where vulnerable groups are located.	Project technical team		
1.2 Vulnerable groups are unaware about the functioning Complaint and Response Mechanism (CRM).	4	4	16	Socialize the CRM functioning in all bimonthly meetings. Develop a socialization session of the CRM along with prevention advocates aimed at homes of vulnerable groups already mapped out.	M&E	Amplify the CRM to community level (placing mailboxes in 5 family stores and 1 curch) The project team references the CRM in various reunions/activities with the community.	Project technical team
Gender-based risks							
Dissabilities and elderly people associated risks							
...Other particular risks							

Low Risk (1-9)
Medium Risk (10- 15)
High Risk (15-20)
Very High Risk (20-25)

Table 10. Protection Risk Assessment Tool including sample of data to be completed

The relevant protection measures must be included into the overall System Change Map and the relevant activities, assumptions, results of the results chain. In other words, protection must be mainstreamed across the intervention and this is a core part of the strategy of R4S Approach to contribute to more Inclusive and Resilient Societies.

Figure 32. Social Auditing Steps using the Protection Risk Assessment Tool

	Protection Risk Assessment Toolkit						
	Project/Programme Title:					**Date of Elaboration:**	
Risks	Likelihood 1 to 5 (1=lowest; 5= Highest)	Impact 1 to 5 (1=lowest; 5= Highest)	Level of Risk	Short term mitigation measures during implemention stage	Responsible	Long term mitigation measures post project implemention stage	Responsible
General risks							
Gender Based Risks							
Dissabilities and elderly people associated risks							
Child Protection Risks							

Table 11. Protection Risk Assessment Tool

- **Low Risk** (1-9)
- **Medium Risk** (10- 15)
- **High Risk** (15-20)
- **Very High Risk** (20-25)

5.4.2. Stakeholder Information Provision

'Information sharing' is one of the *6 elements of accountability*. It is an important nexus through which other elements are achieved. For example, if stakeholders are not aware about program objectives it is difficult for them to feel motivated to participate in activities or feel ownership for an intervention. To increase transparency, an information sharing strategy needs to be developed and set out all the measures to share details of funding sources, progress updates, evaluation findings, etc.

The SAC, jointly with the key stakeholders selected according the *Stakeholder Engagement Map* should prepare an '*Information Provision Strategy'*, to inform when, where and how to best to share information. A Focus Groups Discussion (FGD) is the most recommended way for conducting an accountability assessment. Key questions to clarify through the assessment on information sharing include:[49]

- What is the current level of information sharing?
- What knowledge do the stakeholders have of intervention activities?
- What information do the stakeholder want to receive in the future?
- What language do the stakeholder want to receive information in?
- What methods would the stakeholders prefer to use to share information?
- What should the timing of the information be?
- What special needs are there for vulnerable groups/ Target Group?

It is expected that the *Intervention Team* and the SAC provide at least the following information:[50]

- *Intervention information* (i.e., objectives, key activities, who partners are, when did an intervention start or will start, when will it end and the sustainability/exit strategy.) Target Group selection criteria and Target Group lists should be made public. Sharing of financial summaries will need to be at discretion of program coordinators.
- *Achievements/limits/adjustments* (i.e., KPIs, what the periodic achieved outputs were, level of outcome achievement relative to targets/indicators, if program is behind schedule and why, limitations or specific areas of underachievement, any adjustments that need to be made to the program.)
- *Learnings and innovation* based on the evaluation process or routine monitoring activities.
- *Organizational obligations* (i.e., standards of integrity.)
- *Complaints and feedback* (i.e., what are the entry points, how does the process work, contact person, response time, etc.)

There are a number of ways of sharing information that the SAC can consider according to the assessment findings, but also in terms of available resources and budget. Some suggested options for sharing of information are given below:[51]

Verbal Forms of Information Sharing

- Open meetings
- House to house visits
- Training of local community groups or focal points who become the information providers to others

Written Forms of Information Sharing

- Community notice boards
- Office notice boards
- Posters
- Flyers/ Leaflets
- Monthly or Quarterly newsletters

Some alternative ways of providing information to the community (less often used):

- Mass mobile phone text messaging
- Radio campaigns
- Presentations on a screen using power point, projector and laptop computer
- Video
- Picture cards

Finally, it is important to make sure that all the material for sharing information is easy to understand, respectful and appropriate to stakeholders and to the Target Group's culture and language.[52]

DESCRIPTION OF INFORMATION	WAYS OF SHARING	FREQUENCY	WHO IS RESPONSIBLE
Program Progress (Based on monitoring data)	Report sharing by email and meeting	Monthly	SAC
Evaluation	Summary presentation of findings shared by email, meeting also if the evaluation directly related to the partner	As arises	Program Manager supported by the SAC
Complaints or Feedback	By meeting. Be careful to avoid jeopardising the investigation process of sensitive complaints.	As arises	SAC supported by Program Manager

Table 12. Example of a Stakeholder Information Provision Plan

49 CHS Alliance, Groupe URD & the Sphere Project. (2014). Core Humanitarian Standard on Quality and Accountability. Copenhagen.

50 Idem

51 Idem

52 CHS Alliance, Groupe URD & the Sphere Project. (2014). Core Humanitarian Standard on Quality and Accountability. Copenhagen.

5.4.3. Complaints and Feedback

The word 'complaining' typically summons up negative associations. However, complaining is a normal and fundamentally important human process that enables identification and rectification of problems in programmes for the people which they serve. *Complaints and feedback* are opportunities to improve the quality of work and maintain or build on existing stakeholders' and Target Group's trust.[53]

The *Core Humanitarian Standards (CHS)* establishes that *"complaints are welcome and addressed",* it means that it is essential to have a complaints and feedback mechanism established in consultation with stakeholders including the Target Group to identify the best ways of reporting any complaint or feedback.[54] 'Complaints and response' are formal mechanisms to help interventions understand the Target Groups' and other system stakeholders perspective, giving the necessary information to make adjustments that best meet stakeholder and Target Group needs. The SAC supported by the *Intervention Team* should assess the best ways for entry points (i.e., suggestion boxes, open sessions, log books, phone hotlines, etc.), the most suitable process to follow up and give response, and also select the most appropriate entry point or processes according to the complaints' nature (sensitive or non-sensitive).[55] The CHS suggest to refer complaints to a relevant party when they do not fall within the scope of the organization.

The effectiveness of any 'complaints and response mechanism' relies heavily on the extent to which stakeholders and Target Group have been made aware of their right to complain and the process by which they can make a complaint. For this reason, the information provision strategy should incorporate all data related to the complaints and feedback mechanism.[56]

The R4S Approach recommends that a Complaints and Response mechanism is established in order to ensure that incidents of abuse, fraud, dissatisfaction, suggestions etc can be communicated by the system stakeholders in a structured and transparent way. In order for the complaints and feedback mechanisms to work, clear and accessible information must have been provided on the process of making a complaint and a process for promptly and transparently responding to and satisfactorily addressing complaints.

53 GOAL. (2014). GOAL Programme Complaints and Response Mechanism (CRM). Dublin.

54 CHS Alliance, Groupe URD & the Sphere Project. (2014). Core Humanitarian Standard on Quality and Accountability. Copenhagen.

55 GOAL. (2014). GOAL Programme Complaints and Response Mechanism (CRM). Dublin.

56 Idem

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D ANNEXES

ANNEX 1. Glossary of Key Terms

Accountability: The process of using power responsibly, taking account of, and being held accountable by, different stakeholders, and primarily those who are affected by the exercise of such power (CHS, 2014). Downward accountability involves making accounts and plans transparent to the primary stakeholders, which can include partners and poor and marginalised groups. Unfortunately, aid projects often focus more on upward accountability to funding agencies than downward accountability (IFAD).

Assessment: A process of gathering information, analysing it, then making a judgement on the basis of the information (IFAD).

Build Back Better: Coined in the aftermath of the 2004 Indian Ocean Tsunami, "Build back better" is an approach to post-disaster recovery that aims to reduce vulnerability and improve living conditions; it seeks to not only restore what existed previously, but to go beyond, seizing the moral, political, managerial, and financial opportunities the crisis has offered governments to set communities on a better and safer development path (Office of the UN Secretary-General's Special Envoy for Tsunami Recovery, 2006).

Capacity: The ability of people, institutions and societies to perform functions, solve problems, and set and achieve objectives (UNDP, 2002). According to UNISDR, it is the combination of all the strengths, attributes and resources available within a community, society or organisation that can be used to achieve agreed goals. Capacity may include infrastructure and physical means, institutions, societal coping abilities, as well as human knowledge, skills and collective attributes such as social relationships, leadership and management. A capacity assessment is a term for the process by which the capacity of a group is reviewed against desired goals, and the capacity gaps are identified for further action (UNISDR, 2009).

Chemical Accidents: Accidental release occurring during the production, transportation or handling of hazardous chemical substances (UNISDR, 1992).

Climate: Climate, in a narrow sense, is usually defined as the average weather, or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time, ranging from months to thousands or millions of years. The classical period for averaging these variables is 30 years and the relevant quantities are most often surface variables such as temperature, precipitation, and wind (IPCC, 2012).

Climate change: The United Nations Framework Convention on Climate Change (UNFCCC) defines climate change as "A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is, in addition to natural climate variability, observed over comparable time periods" (1994). On the other hand, the Intergovernmental Panel on Climate Change (IPCC) defines climate change as "a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forces, or to persistent anthropogenic changes in the composition of the atmosphere or in land use." Both definitions are widely accepted, though the UNFCCC definition is the more restricted one as it excludes climate changes attributable to natural causes. The IPCC definition can be paraphrased for popular communications as "A change in the climate that persists for decades or longer, arising from either natural causes or human activity." (UNISDR, 2009).

Climate change adaptation: The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate harm or exploit beneficial opportunities. In natural systems, human intervention may facilitate adjustment to expected climate and its effects. (IPCC, 2013).

Community: "In conventional emergency management, communities are seen in spatial terms: groups of people who live in the same area or close to the same risks (i.e. a village or an urban neighbourhood). This overlooks other significant dimensions of the "community" which are to do with common interests, values, activities and structures. From a hazard's perspective, the spatial dimension is essential in identifying communities at risk. However, this must be linked to an understanding of the socio-economic differentiations, linkages and dynamics within the area at risk, not only to identify vulnerable groups but also to understand the diverse factors that contribute to vulnerability. It was noted during field testing in Malawi in 2014, that the smallest administrative level facilitates the most consensus in terms of resilience measurement. For the purpose of this toolkit the definition of community can be determined in tune with that context in so far as a spatial element is also included.

Conflict: A state of open, often prolonged fighting; a battle or war. Conflict can apply both to open fighting between hostile groups and to a struggle between opposing forces (Turnbull et al., 2013).

Conflict (**latent):** Latent conflict exists whenever individuals, groups, organizations, or nations have differences that bother one or the other, but those differences are not great enough to cause one side to act to alter the situation (Wehr, 1975). Note: Latent conflict is often rooted in longstanding economic inequality, or in groups' unequal access to political power. The government may be unresponsive to the needs of a minority or lower-power group. Strong value or status differences may exist. Any of these issues could emerge as an open conflict after a triggering event (Turnbull et al., 2013).

Contingency planning: A management process that analyses specific potential events or emerging situations that might threaten society or the environment and establishes arrangements in advance to enable timely, effective and appropriate responses. Contingency planning results in organized and coordinated courses of action with clearly-identified institutional roles and resources, information processes, and operational arrangements for specific actors at times of need. Based on scenarios of possible emergency conditions or disaster events, it allows key actors to envision, anticipate and solve problems that can arise during crises. Contingency planning is an important part of overall preparedness. Contingency plans need to be regularly updated and exercised (UNISDR, 2009).

Cyclone: Cyclones are severe weather systems characterized by high winds and heavy rains. In the North Atlantic and East Pacific, they are usually called hurricanes; in the West Pacific they are called typhoons. They have the ability to cause widespread damage to house, roads, crops,

and livelihoods related to wind damage, storm surge, flooding and flash flooding, and landslides, all depending on an area's geography and topography. Without proper sanitation in affected areas, disease outbreaks are possible (USAID, 2014).

Desertification: The United Nations Convention to Combat Desertification (UNCCD) defines desertification as 'land degradation in arid, semi-arid and sub-humid areas resulting from various factors including climatic variations and human activities' (UNCCD Art.1.a). Desertification is a dynamic process that is observed in dry and fragile ecosystems. It affects terrestrial areas (topsoil, earth, groundwater reserves, surface run-off), animal and plant populations, as well as human settlements and their amenities (for instance, terraces and dams) (http://www.unesco.org/mab/doc/ekocd/chapter1.html).

Disaster: A serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources. Disasters are often described as a result of the combination of: the exposure to a hazard; the conditions of vulnerability that are present; and insufficient capacity or measures to reduce or cope with the potential negative consequences. Disaster impacts may include loss of life, injury, disease and other negative effects on human physical, mental and social well-being, together with damage to property, destruction of assets, loss of services, social and economic disruption and environmental degradation (UNISDR, 2009).

Disaster Risk Reduction: The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events (UNISDR, 2009). Specifically, the purpose of disaster risk reduction is to minimise vulnerabilities and disaster risks throughout a society in order to avoid (prevent) or to limit (mitigate and prepare for) the adverse impacts of natural hazards, and facilitate sustainable development (UNICEF, 2012).

Drought: Drought originates from a deficiency of precipitation over an extended period of time, usually a season or more. This deficiency results in a water shortage for some activity, group, or environmental sector. Different from other hazards in that it develops slowly, sometimes over years, and its onset can be masked by a number of factors. Drought can be devastating: water supplies dry up, crops fail to grow, animals die, and malnutrition and ill health become widespread (Prevention web). Drought can be classified into four different definitions: meteorological (deviation from normal rainfall), agricultural (abnormal soil humidity conditions); hydrological (related to abnormal hydric resources) and socio-economic (when the lack of water affects the life and livelihoods of persons).

Early recovery: After a disaster, early recovery is about shifting the focus from saving lives to restoring livelihoods. Early recovery interventions seek to stabilize the economic, governance, human security and social equity situation. Early recovery interventions also seek to integrate risk reduction at the very early stages of the response to a specific crisis; and to lay the foundations for longer-term reconstruction (UNISDR, 2009)

Early Warning System (EWS): The set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organizations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss. This definition encompasses the range of factors necessary to achieve effective responses to warnings.

A people-centred early warning system necessarily comprises four key elements: a) knowledge of the risks; b) monitoring, analysis and forecasting of the hazards; c) communication or dissemination of alerts and warnings; and d) local capabilities to respond to the warnings received. The expression "end-to-end warning system" is also used to emphasize that warning systems need to span all steps from hazard detection through to community response (UNISDR, 2009).

Earthquakes: A sudden motion or trembling in the earth crust caused by the abrupt release of accumulated stress along a fault (NHRP).This energy is released through seismic waves that travel to the source area, causing the earth to tremble. The level of earthquake damage depends upon various factors, including earthquake intensity, depth, the vulnerability of structures and the distance from the earthquake source.

Ecosystem: An ecosystem is a functional unit consisting of living organisms, their non-living environment, and the interactions within and between them (IPCC, 2012). Ecosystems are nested within other ecosystems and often have no fixed boundaries. Depending upon the scientific, management, or policy question being examined, a single lake, a watershed, or an entire region could be considered an ecosystem (US EPA, 2005). In the current era, most ecosystems either contain people as key organisms, or are influenced by the effects of human activities in their environment. Ecosystems are critical in supporting human well-being, and the importance of their preservation under anthropogenic climate change is explicitly highlighted in Article 2 of the United Nations Framework Convention on Climate Change, or UNFCCC (IPCC, 2012).

Emergency Market Mapping Assessment/Analysis (EMMA): EMMA is a rapid market analysis designed to be used in the first two to three weeks of a sudden onset crisis. Its rationale is that a better understanding of the most critical markets in an emergency situation enables decision makers (i.e. donors, NGOs, government, other humanitarian actors) to consider a broader range of responses. It is not intended to replace existing emergency assessments, or more thorough household and economic analyses such as the Household Economy Approach, but instead should add to the body of knowledge after a crisis (Turnbull et al, 2013).

Environmental Degradation: The reduction of the capacity of the environment to meet social and ecological objectives and needs. Environmental degradation can alter the frequency and intensity of natural hazards and increase the vulnerability of communities. The types of human-induced degradation are varied and include land misuse, soil erosion and loss, desertification, wildland fires, loss of biodiversity, deforestation, mangrove destruction, land, water and air pollution, climate change, sea level rise and ozone depletion (UNISDR, 2009).

Epidemics: The occurrence of more cases of disease than expected in a given area or among a specific group of people, affecting or tending to affect a disproportionately large number of individuals, over a particular period of time, usually short-term (days, weeks, months maximum),

such as cholera, typhoid, bubonic plague, etc. (CDC and Reliefweb, 2008).

Erosion of river banks and soil: Soil erosion is the process of soil removal and displacement caused naturally (wind, water) and/or by man. Erosion is one of the key issues that mines soils and contributes to desertification; it results in a redistribution of nutrients and a depreciation of land and soil quality (UNEP, 2011).

Exposure: People, property, systems, or other elements present in hazard zones that are thereby subject to potential losses (UNISDR, 2009). While UNISDR defines exposure only in relation to placement, the resilience discourse develops this term further to include magnitude, frequency and duration of the event. According to the GOAL 2016 guidance on programming for resilience, "exposure relates to the likelihood of a community experiencing a disturbance and includes issues of placement (location and types of houses, land use, etc.), as well as the magnitude, frequency, and duration of an event (e.g., a family that has a home on steeply sloped land will generally be more exposed to the hazard of landslides than a family living on a flatter surface). Exposure is a component of vulnerability, not only to the extent to which a system is subjected to disturbance, but also the degree and duration of these disturbances." Exposure generally means physically being in, or depending on, assets, systems, institutions or other people that are in the area affected by the hazard or climatic phenomenon (Turnbull et al, 2013).

Fire spread (wildfire): Wildfires are a growing hazard in many countries. Hotter, prolonged droughts in many parts of the world may increase the risk of wildfires in the future. Wildfires cause disaster when they pose a threat to life, property, and forage. Fire is also a natural process; often fire suppression can lead to more severe fires due to the build-up of vegetation that serves as fuel. Secondary effects of wildfires, including floods, erosion, landslides, debris flows, and changes in water quality, can be more disastrous than the fire itself (USAID, 2014).

Flooding: The overflowing of the normal confines of a stream or other body of water, or the accumulation of water over areas that are not normally submerged. Floods include river (fluvial) floods, flash floods, urban floods, pluvial floods, sewer floods, coastal floods, and glacial lake outburst floods (IPCC, 2012).

Food Insecurity: A situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life. It may be caused by the unavailability of food, insufficient purchasing power, inappropriate distribution, or inadequate use of food at the household level. Food insecurity may be chronic, seasonal, or transitory (Turnbull et al., 2013).

Food Security: There is food security when all persons have, at all times, physical and economic access to sufficient safe and nutritious food to satisfy their food needs and preferences in order to lead an active and healthy life (World Food Summit, 1996). This widely accepted definition points to the following dimensions of food security: food availability; food access; utilization, and stability (FAO, 2006).

Gender-based Violence: Violence that is directed against a person on the basis of gender or sex. It includes acts that inflict physical, mental, or sexual harm or suffering, threats of such acts, coercion, or other deprivations of liberty. While women, men, boys and girls can be victims of gender-based violence, because of their subordinate status in many places of the world, women and girls are the primary victims (Reliefweb, 2008).

Governance: Governance is the process of decision-making and the subsequent implementation (or non-implementation) of those decisions (IRP, 2010). It is the exercise of political, economic and administrative authority in the management of a country's affairs at all levels. It comprises mechanisms, processes and institutions through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and mediate their differences. Governance encompasses, but also transcends, the state. It encompasses all relevant groups, including the private sector and civil society organizations (UNDP, 1997).

Hazard: A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

The hazards of concern to disaster risk reduction as stated in footnote 3 of the Hyogo Framework are "… hazards of natural origin and related environmental and technological hazards and risks." Such hazards arise from a variety of geological, meteorological, hydrological, oceanic, biological, and technological sources, sometimes acting in combination. In technical settings, hazards are described quantitatively by the likely frequency of occurrence of different intensities for different areas, as determined from historical data or scientific analysis (UNISDR, 2009). For the purposes of this toolkit, "hazards" and "shocks" are synonymous terms.

Hazard mapping: The process of establishing geographically where and to what extent particular hazards are likely to pose a threat to people, property, or the environment (Jha et al, 2010).

Heat wave: Marked warming of the air, or the invasion of very warm air, over a large area; it usually lasts from a few days to a few weeks. This is a rise of atmospheric average temperature well above the averages of a region, with effects on human populations, crops, properties and services (UNISDR, 2009).

Hurricane: See Cyclone.

Inclusion: Actions taken to reverse social exclusion. An inclusive society should firstly rise above differences of race, gender, skin colour, religion, age, wealth, knowledge, etc., and also offer to all its groups an equitable access to opportunities, resources, goods and services, accompanied by changes in economic and political power exercise.

Land use planning: The process undertaken by public authorities to identify, evaluate and decide on different options for the use of land, including consideration of long-term economic, social and environmental objectives and the implications for different communities and interest groups, and the subsequent formulation and promulgation of plans that describe the permitted or acceptable uses. Land-use planning is an important contributor to sustainable development. It involves studies and mapping; analysis of economic, environmental and hazard data; formulation of alternative land-use decisions; and design of long-range plans for different geographical and administrative scales. Land-use planning can help to mitigate disasters and reduce risks by discouraging settlements and construction of key installations in hazard-prone areas, including consideration of service routes for transport, power, water, sewage and other critical facilities (UNISDR, 2009).

Landslides: Landslide is defined as "the movement of a mass of rock, debris, or earth down a slope." The term encompasses events such as rock falls, topples, slides, spreads, and flows, such as debris flows commonly referred to as mudflows or mudslides. Landslides can be initiated by rainfall, earthquakes, volcanic activity, changes in groundwater, disturbance and change of a slope by man-made construction activities, or any combination of these factors (PreventionWeb).

Livelihoods: The resources used, and the activities undertaken in order to live. Livelihoods comprise the capabilities, assets (including both material and social resources) and activities required for a means of living linked to survival and future well-being. Assets include financial, natural, physical, social and human resources - for example, stores, land and access to markets or transport systems. A household's livelihood is sustainable or secure when it can cope with and recover from shocks and maintain or enhance its capabilities and productive assets (Sphere, 2011).

Mitigation: The lessening or limitation of the adverse impacts of hazards and related disasters. The adverse impacts of hazards often cannot be prevented fully, but their scale or severity can be substantially lessened by various strategies and actions. Mitigation measures encompass engineering techniques and hazard-resistant construction as well as improved environmental policies and public awareness. It should be noted that in climate change policy, "mitigation" is defined differently, being the term used for the reduction of greenhouse gas emissions that are the source of climate change (UNISDR, 2009).

Natural Hazard: Natural process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage (UNISDR, 2009).

Natural disaster: Natural disasters are events brought about by natural hazards that seriously affect the society, economy and/or infrastructure of a region. Depending on population vulnerability and local response capacity, natural disasters will pose challenges and problems of a humanitarian nature.

Please note: The term "natural disaster" is used for ease. In reality, the magnitude of the consequences of sudden natural hazards is a direct result of the way individuals and societies relate to threats originating from natural hazards. The magnitude of the consequences is, thus, determined by human action, or the lack thereof (Reliefweb, 2008).

Network Theory: Network theory focuses on the connections between actors and how these connections (their structure) affect the actors and the system as a whole; it is a formal way of modelling 'power' and 'influence' in social systems, it studies the interaction of complex systems.[57]

Nuclear Accidents: Accidental release of radiation occurring in civil nuclear facilities, exceeding the internationally established safety levels (UNISDR, 1992).

Participation: One or more processes in which an individual (or group) takes part in specific decision-making and action, and over which s/he may exercise specific controls. It is often used to refer specifically to processes in which primary stakeholders take an active part in planning and decision-making, implementation, learning and evaluation. This often has the intention of sharing control over the resources generated and responsibility for their future use (IFAD). Participation involves enabling crisis-affected people to play an active role in the decision-making processes that affect them. It is achieved through the establishment of clear guidelines and practices to engage them appropriately and ensure that the most marginalised and worst affected are represented and have influence (CHS, 2014).

Pastoralism: A livelihood strategy based on moving livestock to seasonal pastures primarily in order to convert grasses, forbs, tree-leaves, or crop residues into human food. The search for feed is however not the only reason for mobility; people and livestock may move to avoid various natural and/or social hazards, to avoid competition with others, or to seek more favourable conditions. Pastoralism can also be thought of as a strategy that is shaped by both social and ecological factors concerning uncertainty and variability of precipitation, and low and unpredictable productivity of terrestrial ecosystems (IPCC, 2013).

57 'Network Theory' (Baez, John) http://math.ucr.edu/home/baez/econ.pdf

Preparedness: The knowledge and capacities […] to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions. Preparedness aims to build the capacities needed to efficiently manage all types of emergencies and achieve orderly transitions from response through to sustained recovery. Preparedness is based on a sound analysis of disaster risks and good linkages with early warning systems, and includes such activities as contingency planning, stockpiling of equipment and supplies, the development of arrangements for coordination, evacuation and public information, and associated training and field exercises. These must be supported by formal institutional, legal and budgetary capacities. The related term "readiness" describes the ability to quickly and appropriately respond when required (UNISDR, 2009).

Prevention: The outright avoidance of adverse impacts of hazards and related disasters.

Prevention expresses the concept and intention to completely avoid potential adverse impacts through action taken in advance. Examples include dams or embankments that eliminate flood risks, land-use regulations that do not permit any settlement in high risk zones, and seismic engineering designs that ensure the survival and function of a critical building in any likely earthquake. Very often the complete avoidance of losses is not feasible, and the task transforms to that of mitigation. Partly for this reason, the terms prevention and mitigation are sometimes used interchangeably in casual use (UNISDR, 2009).

Protection: All activities aimed at ensuring the full and equal respect for the rights of all individuals, regardless of age, gender or ethnic, social, religious or other background. It goes beyond the immediate life-saving activities that are often the focus during an emergency (CHS, 2014). It is a concept that encompasses all activities aimed at obtaining full respect for the rights of the individual in accordance with the letter and spirit of human rights, refugee and international humanitarian law. Protection involves creating an environment conducive to respect for human beings, preventing and/or alleviating the immediate effects of a specific pattern of abuse, and restoring dignified conditions of life through reparation, restitution and rehabilitation (Reliefweb, 2008).

Recovery: The restoration, and improvement where appropriate, of facilities, livelihoods and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors. The recovery task of rehabilitation and reconstruction begins soon after the emergency phase has ended and should be based on pre-existing strategies and policies that facilitate clear institutional responsibilities for recovery action and enable public participation. Recovery programmes, coupled with the heightened public awareness and engagement after a disaster, afford a valuable opportunity to develop and implement disaster risk reduction measures and to apply the "build back better" principle (UNISDR, 2009).

Resilience: The ability to recover quickly from illness, change, or misfortune; buoyancy. // The property of a material that enables it to resume its original shape or position after being bent, stretched, or compressed; elasticity.[58] // The ability of communities and households living within complex systems to anticipate and adapt to risks, and to absorb, respond and recover from shocks and stresses in a timely and effective manner without compromising their long-term prospects, ultimately improving their well-being.[59]

Response: The provision of emergency services and public assistance during or immediately after a disaster in order to save lives, reduce health impacts, ensure public safety and meet the basic subsistence needs of the people affected. Disaster response is predominantly focused on immediate and short-term needs and is sometimes called "disaster relief". The division between this response stage and the subsequent recovery stage is not clear-cut. Some response actions, such as the supply of temporary housing and water supplies, may extend well into the recovery stage (UNISDR, 2009).

Retrofitting: Reinforcement or upgrading of existing structures to become more resistant and resilient to the damaging effects of hazards. Retrofitting requires consideration of the design and function of the structure, the stresses that the structure may be subject to from particular hazards or hazard scenarios, and the practicality and costs of different retrofitting options. Examples of retrofitting include adding bracing to stiffen walls, reinforcing pillars, adding steel ties between walls and roofs, installing shutters on windows, and improving the protection of important facilities and equipment (UNISDR, 2009).

Risk: The potential for consequences where something of human value (including humans themselves) is at stake and where the outcome is uncertain. Risk is often represented as probability of occurrence of a hazardous event multiplied by the consequences if these events occur (IPCC, 2012). The word "risk" has two distinctive connotations: in popular usage the emphasis is usually placed on the concept of chance or possibility, such as in "the risk of an accident"; whereas in technical settings the emphasis is usually placed on the consequences, in terms of "potential losses" for some particular cause, place and period. It can be noted that people do not necessarily share the same perceptions of the significance and underlying causes of different risks (UNISDR, 2009). Both are used for the purposes of this toolkit.

Risk assessment: A methodology to determine the nature and extent of risk by analysing potential hazards and evaluating existing conditions of vulnerability that together could potentially harm exposed people, property, services, livelihoods and the environment on which they depend. Risk assessments (and associated risk mapping) include:

- Review of the technical characteristics of hazards such as their location, intensity, frequency and probability;
- Analysis of exposure and vulnerability including the physical social, health, economic and environmental dimensions;
- Evaluation of the effectiveness of prevailing and alternative coping capacities in respect to likely risk scenarios (UNISDR, 2009).
- Analysis of loss/impact to estimate potential losses of exposed population, property, services, livelihoods and environment, and assess their potential impacts on society (UNDP, 2010).

Scenario Thinking: Scenario thinking is a form of preparing for the future through story-telling, each scenario being a story in itself made up of the different possibilities of how the future could unfold. Even though the roots of this form of strategic planning, used in the formulation of long-term flexible plans, lie in military strategy, its application has spread into other fields, like business management and non-for-profit development programming. Scenario thinking shares some common ground with ´systems thinking´ since both recognize that many variables interact in a diversity of forms –through feedback loops– to create final results in complex systems.[60] It basically claims that the best way to analyse the occurrence of risk is through the playing out of different scenarios.

Shocks: Shocks are sudden events that impact the vulnerability of the system and its components. There are many different types of disaster-related shocks that can strike at different levels. These include disease outbreaks, weather-related and geophysical events including floods, high winds, landslides, droughts or earthquakes. There can also be conflict-related shocks, such as outbreaks of fighting or violence, or shocks related to economic volatility (DFID, 2013). Note that drought is not a sudden event, as the definition would suggest, however, once a drought surpasses the tipping point into an extreme event, it is classified as a shock. See comprehensive list in Part A.

Social Protection: In development aid and climate policy, social protection usually describes public and private initiatives that provide income or consumption transfers to the poor, protect the vulnerable against livelihood risks, and enhance the social status and rights of the marginalized, with the overall objective of reducing their economic and social vulnerability. Social protection policies safeguard the poor and vulnerable against livelihood risks and enhance the social status and rights of the marginalized, as well as prevent vulnerable people from falling into poverty (IPCC, 2013).

The publication on which this toolkit is based presents social protection as "mutual assistance systems, social networks and support mechanisms, both formal (i.e. from government) and informal (between individuals or groups) that help reduce risk directly (through DRR activities) or vulnerability (through socio-economic activities) or by being capable of extending their activities to manage emergencies when these occur" (Twigg, 2009). Examples of formal social protection include: conditional or unconditional cash transfer schemes, in-kind transfers (food, tools, and technology), school feeding programmes,

58 The Free Dictionary by Farlex http://www.thefreedictionary.com/resilience

59 ARC-D Toolkit (GOAL, 2016)

60 'Scenario Planning' https://en.wikipedia.org/wiki/Scenario_planning

social security, pensions of handicap or elderly people and insurance schemes for loss of production or accidents. Examples of informal social protection include: tilling the land for a sick farmer, helping to build or rebuild a house, childcare, paying school fees or funeral fees, giving food or money. Please note, social protection relates to transfers of resources and support, not loans to be repaid.

Social Systems: systems where individuals or organizations come together, in an interacting, interrelated and interdependent way, coordinating[61] their actions and connections intentionally or unintentionally, producing their own patterns of behaviour,[62] to affect a specific outcome.

Socio-economic: Of, pertaining to, or signifying the interaction of social and economic factors.[63]

Storm Surge: The temporary increase, at a particular locality, in the height of the sea due to extreme meteorological conditions (low atmospheric pressure and/or strong winds). The storm surge is defined as being the excess above the level expected from the tidal variation alone at that time and place (IPCC, 2012). According to NOAA, storm surge is water that is pushed toward the shore by the force of the winds swirling around the storm. A storm surge can come from a hurricane or an extra-tropical cyclone.

Stress: Stresses are long-term trends that undermine the potential of a given system or process and increase the vulnerability of actors within it. These can include natural resource degradation, loss of agricultural production, urbanisation, demographic changes, climate change, political instability and economic decline (DFID, 2013). See comprehensive list in Part A.

Systems: a group of elements or components which continually interact (are interrelated and interdependent) for a specific purpose or objective, and which form a complex and unified whole.[64]

61 'System Dynamics' (Dinámica de Sistemas), Javier Aracil, http://www.simposio.palmira.unal.edu.co/documentos/Dinamica_Aracil.pdf

62 Meadows, 2008

63 The Free Dictionary by Farlex http://www.thefreedictionary.com/socioeconomic

64 FSG Reimagining Social Change: 'System Mapping: A Guide to Developing Actor Maps', S. Gopal and T. Clarke (2015) http://www.fsg.org/tools-and-resources/system-mapping

System dynamics: the interaction/interdependence, cause and effect links and power structures at different levels in the same system

Systems thinking: applying a 'systems thinking' approach comes from the comprehension that when dealing with human beings and the social systems they interact in daily and are dependent upon (for the attainment of their resources), the latter should not be broken down into its constituent parts in order to understand them and improve them. A system must be analysed as a whole because the way it is structured, and the way it operates, is the result of all the multiplying effects of its interacting, interrelated and interdependent parts, functions and relations.

Tornado: A violently rotating storm of small diameter and the most violent weather phenomenon. It is produced in a very severe thunderstorm and appears as a funnel cloud extending from the base of a cumulonimbus to the ground (Reliefweb, 2008).

Tropical Storm/Depression: See Cyclone.

Tsunamis: Seismic sea waves (mistakenly called "tidal waves"), which are a series of enormous waves created by an underwater disturbance such as an earthquake, landslide, volcanic eruption, meteorite or underwater explosion. A tsunami can move hundreds of miles per hour in the open ocean and smash into land with waves as high as 100 feet or more. Tsunamis can have devastating effects on coastal regions (https://www.ready.gov/tsunamis).

Typhoon: See Cyclone.

Volcanic eruptions: Volcanoes are vents in the surface of the Earth through which magma and associated gases erupt (Preventionweb). Volcanic eruptions are often regarded as rare and mysterious events that impact few people. In reality, there are more than 1,500 potentially active volcanoes, many of which are located in developing countries. The relatively long recurrence interval for volcanic hazards, where the last eruption can pre-date societal memory, can lead to a false sense of security and complacency among at-risk communities. Since 1980, volcanic activity has killed more than 29,000 people and displaced more than 1 million others. On average, approximately 10 eruptions a year cause significant damage and casualties, while major disasters occur several times a decade. Eruptions can devastate agriculture systems and livestock, contaminate water sources, impact health, cripple economies, and destroy infrastructure and property. Effective end-to-end warning systems for volcanic eruptions can significantly reduce risk (USAID, 2014).

Vulnerability: The characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard (UNISDR, 2009). Vulnerability can be determined by the interplay between exposure and sensitivity to a range of interrelated social, economic, political, governance and environmental factors (Oxfam GB, 2010). There are many aspects of vulnerability, arising from various physical, social, economic, and environmental factors. Examples may include poor design and construction of buildings, inadequate protection of assets, lack of public information and awareness, limited official recognition of risks and preparedness measures, and disregard for wise environmental management. Vulnerability varies significantly within a community and over time (Turnbull et al., 2013).

Vulnerability Capacity Analysis (VCA): An analytical and planning process (and associated tool of the same name), originally developed by IFRC and used to facilitate community-led assessment of local disaster risk. The process uses participatory techniques (mapping, seasonal calendars, transect walks, FGDs, interviews, etc.) to develop a comprehensive picture of exposure, vulnerability and capacities and to prioritize actions to reduce disaster risk. VCA and its variations are increasingly used for broader analysis and development planning processes, including for climate change adaptation (Turnbull et al, 2013). For more information on VCA and associated tools please refer to the GOAL DRR sectoral strategy.

Vulnerable groups: Groups or members of groups particularly exposed to the impact of hazards, such displaced people, women, the elderly, the disabled, orphans, and any group subject to discrimination (Jha et al. 2010). "Vulnerable groups" are not a single social group, because they are comprised of many groups and are vulnerable to shocks in different ways and to different extents. Good programming will disaggregate the different groups and their vulnerabilities (Twigg, 2009).

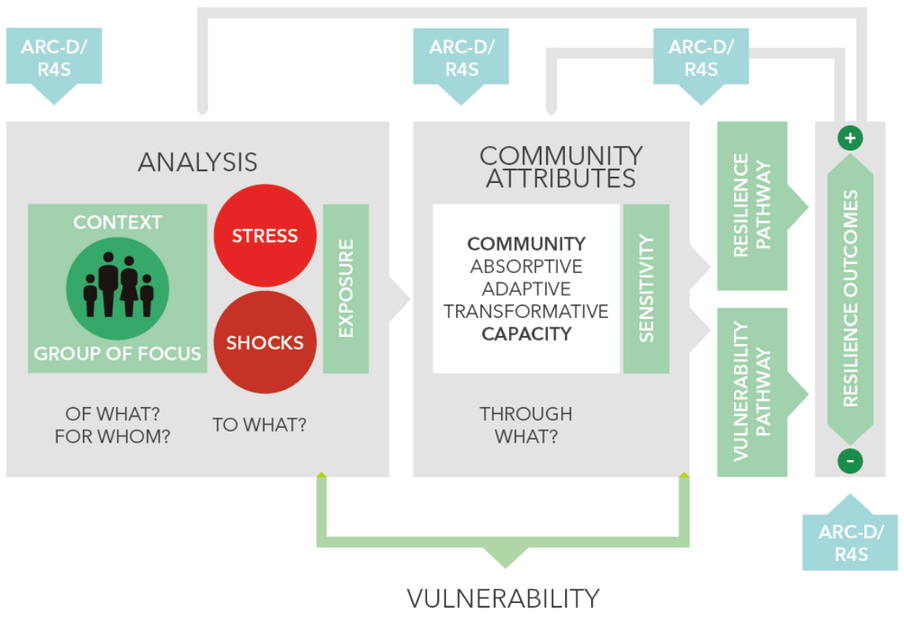
ANNEX 2. Conceptual Framework

Resilience

Since becoming such a prominent concept in the humanitarian and development discourse, resilience has been defined in various ways[65], from the *"capacity of a system to absorb disturbance and reorganize while undergoing change […]"* (Walker et al. 2004), to the *ability to bounce back and return to a fixed stable state of equilibrium following a shock* (Holling 1973 in Béné et al. 2012)[66], to *"learning how to change in order not to be changed"* (Walker 2012)."

For the purposes of the R4S Approach, GOAL defines resilience as "the ability of communities and households living within complex systems to anticipate and adapt to risks, and to absorb, respond and recover from shocks and stresses in a timely and effective manner without compromising their long term prospects, ultimately improving their well-being."

Figure 33. Resilience Framework



GOAL, like many of its peers in the humanitarian and development arenas, does not view resilience as a separate sector or as an issue to mainstream in existing programming. Instead, it is seen as a strategic approach to better programming, based on a strong contextual analysis, a dynamic understanding of community attributes and capacities, and an adaptive management of interventions. Through a resilience lens, the aim is to ensure the preservation of gains in the well-being and development of communities in the face of disturbances and an independence from outside humanitarian assistance over the long term.

To guide its resilience thinking, GOAL adopted and adapted the widely accepted conceptual framework by Frankenberger et al. (2012), updated by IFPRI in 2014.

This conceptual framework for resilience is divided into ***3 main components***:

1. Analysis *(which includes):*

An identification of the group that a proposed intervention will benefit (Resilience for whom?).

An evaluation of the context within which that group or system resides.

An assessment of the shocks and stresses that the group of focus faces (Resilience to what?).

A determination of the level of exposure the group faces to these disturbances.

The determination of the systems and levels at which it is planned to intervene (Resilience of what?).

2. Community or System Attributes

Refer to the capacities that enable the Target Groups to absorb, adapt and transform in the face of the identified shocks and stresses (Resilience through what?).

3. Pathways and Outcomes

Refer to the measureable outputs, results and outcomes it is aimed to achieve from programme interventions that strengthen resilience. The feedback loops give the framework an iterative nature, enabling a continuous examination of how to effect change and learn, by monitoring critical points (e.g. strengthened attributes and expected outcomes) in order to address shortcomings, adjust programme strategies and generate learning.

The *R4S Approach* builds upon the *ARC-D Toolkit* providing a more detailed guidance on designing interventions to build resilient systems and communities. Both the *ARC-D Toolkit* and *R4S* are aimed at strengthening the resilience capacities of the Target Group, immersed in a community or in a much broader system (i.e., health care system or the coffee market system), in order to achieve more positive resilience outcomes. *(Refer to* ***Figure 31****).*

Systems

In general terms, a system can be defined as being a group of elements or components which continually interact (are interrelated and interdependent) for a specific purpose or objective, and which form a complex and unified whole.[67]

There are different systems all around us, they can be human (e.g. digestive or nervous system), mechanical or technological (e.g. a computer or cellphone), or made up of the interactions of both human and non-human components (e.g. a food processing plant where workers and machines interact). Systems can also be found in different units of society where people live and interact on a daily basis (e.g. a household, organization or community) or in much wider contexts, like a country's

65 More information on various definitions of resilience across disciplines can be found in the CARRI 2013 Report (see Bibliography).

66 Market Systems for Resilience, LEO Report #6 (USAID, 2015)

67 FSG Reimagining Social Change: 'System Mapping: A Guide to Developing Actor Maps', S. Gopal and T. Clarke (2015) http://www.fsg.org/tools-and-resources/system-mapping.

general economic system or in nature (e.g. ecosystems). All of these in turn are part (or subsystems) of a much broader whole or system –the overall encompassing environment containing all the social, cultural, political, physical and environmental contexts.[68] Systems structure vary depending on their nature and components; they can also be complicated or highly complex. As soon as the human element is a component of the system it is likely to be highly dynamic and complex.

Social Systems

The type of systems *R4S* is focused on are 'social' (socio-economic) systems where individuals or organizations come together, in an interacting, interrelated and interdependent way, coordinating[69] their actions and connections intentionally or unintentionally, producing their own patterns of behavior, to effect a specific outcome.

The structure of the socio-economic system defines how all the actors (individuals or organizations) and their relations are arranged, each with their own set of roles and functions. Individual actors or social agents of the 'social system' have what is called 'agency', which is the capacity to make choices and take actions independently and autonomously,[70] based on their own cost/ benefit analysis, preference, identity, set of values, agenda, and/ or 'schema' (their own representation/understanding of the environment or world). Since the actors' choices and actions affect the state of the system, these come with a degree of responsibility to each actor. Prior to making choices the social actors must be clear on the set of rules that govern the system; the result of the latter may be simple linear cause and effect outcomes or much more complex ones due to various interacting factors. If the state of one of the actors changes, the state of the other actors is affected; change is felt throughout the entire system.

Groups of people can have agency as well; agency that was given to them by individuals through the 'principal' – 'agent' mechanism where the first gives authority (or the ability to take independent actions and choices) to the second to act on his behalf. Principals and agents can be individuals

68 Represented by the two outer rings of GOAL's Resilience Wheel.

69 'System Dynamics' (Dinámica de Sistemas), Javier Aracil, http://www.simposio.palmira.unal.edu.co/documentos/Dinamica_Aracil.pdf

70 Definition adapted from "Social Complexity 2: Social Systems" https://www.youtube.com/watch?v=JYLh2iYEKvo

"Systems thinking allows people to make their understanding about social systems explicit and improve them" (Aronson, 1998)

or organizations of people. The interactions between social actors produces a dynamic of interdependence between them. According to the *Social Interdependence Theory*, interdependence can be positive, negative or take the form of an exchange. If the interdependence is *positive* it means there is a positive correlation between the decisions/actions of actors and an environment of cooperation prevails. Social actors in this type of interdependence are interested in the accomplishment of their own goals as well as the goals of other actors. Usually having different capabilities, actors align and coordinate their differing agendas towards a common one creating the right synergy; a win-win scenario takes place and the pie gets bigger for all (zero or positive-sum game). *Negative* interdependence or negative correlation, on the other hand, takes place in an environment of competition and/or conflict, where actors perceive that for them to be able to achieve their goals other actors in the system cannot achieve theirs, since everyone is pitted against each other fighting over the same exclusive and limited resource. Thus, a win-lose scenario forms and the whole pie gets smaller and smaller through the interactions (zero or negative-sum game). Finally, *exchange* occurs when social actors trade or swap goods/services in a linear fashion based on simple economics or their acceptance of a mutually rewarding transaction based on their cost-benefit analysis, comparison of alternatives, self-interest and rationality (being a zero – sum game, the size of the whole pie does not change in size, goods/services are only changing hands)[71].

Systems Thinking

The basis for applying a 'systems thinking' approach in *R4S* comes from the comprehension that when dealing with human beings and the social systems they interact in daily and are dependent upon (for the attainment of their resources), the latter should not be broken down into its constituent parts in order to understand them and improve them. Moreover, the opposite is the route that must be taken. A system must be analysed as a whole because the way it is structured, and the way it operates, is the result of all the multiplying effects of its interacting, interrelated and interdependent parts, functions and relations. By breaking it down into individual parts you will be missing the big picture: the complex and dynamic whole, product of multiple non-linear interconnections and (positive and negative) feedback loops, producing particular behaviors and patterns. A social system is not the result of simple, linear, one-directional relations between 'point A' and 'point B'. Traditional forms of analysis, or 'reductionism'[72], cannot be applied if social systems are to be effectively understood and improved for the long-term[73].

'Systems thinking' stems from 'system dynamics' –a field of study founded by MIT professor, Jay Forrester in 1956. Professor Forrester identified a void in the comprehension process of social systems. He believed that the same principles applied to mechanical systems –to understand and improve them– could also be applied to social systems.[74]

'Systems thinking' thinks in terms of the behavior, patterns and effects that emerge from the system as a whole –as a product of all the feedback loops– and not in a linear, cause and effect fashion. The 'root causes' of situations do not emerge from an individual actor or node, they are the result of various dynamic forces. (Refer to 'Systems Thinking' section of ***Figure 34***)[75]. Thus, 'applying solutions' to a system must be done through a 'systems thinking' approach in order to avoid unintended consequences or effects over the system. These unintended effects surface after using a linear cause and effect method. Implementers of solutions erroneously think that to solve a problem 'C' (refer to node 'C' at the right hand section of ***Figure 34***) they just need to apply solutions 'A' and 'B', but they are oblivious to the fact that those solutions probably will affect other variables they are not taking into consideration, and that these will affect problem 'C' in another hidden way.

The application of a 'systems thinking' approach is especially useful when analyzing and improving complex

71 Idem

72 'Social Complexity 1: Overview' https://www.youtube.com/watch?v=KkcGr3y70bk

73 'Overview of Systems Thinking', Daniel Aronson http://www.thinking.net/Systems_Thinking/OverviewSTarticle.pdf

74 Idem

75 'Systems Thinking and the Illusion of Cause and Effect' http://www.personalityhacker.com/podcast-episode-0039-systems-thinking/

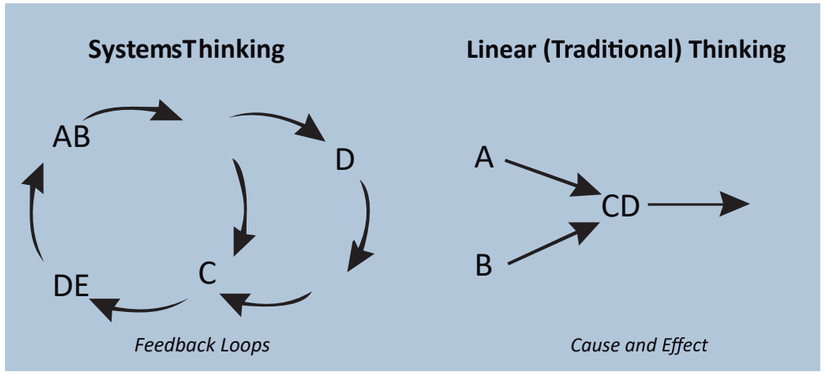


Figure 34. System´s Thinking vs. Linear Thinking

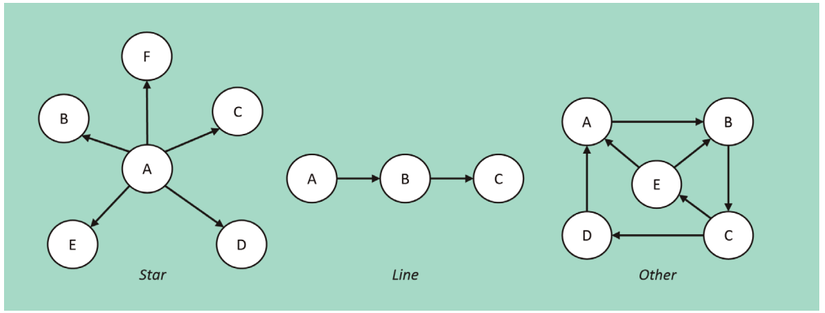


Figure 35. Network Topologies

problems with a high dependence on the past, on actors, their individual actions and the coordination of all. Thinking holistically helps actors that are part of complex issues (systems) see the whole panorama and not just their individual part, solve recurring problems or those which have worsened by previous actions and finally, understand or solve issues which affect the environment (natural or competitive) they are in, or are affected by[76].

Network Theory

A network is a pattern of relationships between actors in a social space; they can be informal (i.e., social networks among individuals –friendships, acquaintanceship) or formal (i.e., contractual relations between organizations).[77] It is represented as a 'graph' or diagram made up of a set of nodes and lines/ arrows joining those nodes which can take any diverse form or topology (tree, line, ring, star, etc.) –Refer to ***Figure 35.*** Using this form of visual representation brings a different perspective to the table making it easier to solve an issue at hand.[78]

R4S applies elements from 'network theory', which just like 'systems theory', is a modeling framework that emerges from 'complexity theory', which in turn comes from complexity science. Complexity science deals with the modeling and understanding of complex human or natural systems (i.e., social, economic, political, ecological, etc.). Network theory focuses on the connections between actors and how these connections (their structure) affect the actors and the system as a whole; it is a formal way of modeling 'power' and 'influence' in social systems, it studies the interaction of complex systems[79]. Its applicability is diverse, ranging from fields in biology to business. Just like 'systems thinking', network theory believes social systems are complex non-linear systems.[80] Network theory provides a "graph-theoretic representation" of the system and techniques to analyse it.[81]

Scenario Thinking

Scenario thinking is a form of preparing for the future through story-telling, each scenario being a story in itself made up of the different possibilities of how the future could unfold. Even though the roots of this form of strategic planning, used in the formulation of long-term flexible plans, lie in military strategy, its application has spread into other fields, like business management and non-for-profit development programming. Scenario thinking shares some common ground with ´systems thinking´ since both recognize that many variables interact in a diversity of forms –through feedback loops– to create final results in complex systems[82]. It basically claims that the best way to analyse the occurrence of risk is through the playing out of different scenarios.

Scenario thinking is different from other types of analysis due to three main reasons according to an MIT Sloan 1995 publication.[83] First, applying a scenario thinking mode allows you to inspect the global impact of several uncertainties in a specific moment in time, each uncertainty being of equal importance. Second, formulating scenarios helps analyse the new states that would potentially develop in key variables after shocks or stresses occur. Third, scenario thinking makes the leap from pure objective analyses (where things can be easily mathematically modeled) to a position where objectivity and subjective interpretations (of trends, rules, uncertainties and stakeholders) meet.

R4S applies dynamic scenario thinking to be able to grasp the range of possibilities that could present themselves in the socio-economic system due to future shocks and stresses, with the objective to better equip the system with the adequate resilience to face them.

Inclusion

The various approaches to resilience this toolkit offers cannot be complete without the full consideration of the Target Group's humanitarian, social and psychological condition within the system. Social and psychological sciences are now being incorporated into multi-sectorial analysis of more objective systems and structures. This results from awareness that social systems play a crucial role in determining resilience from many dimensions.

In terms of what this toolkit aims for, which is a systemic analysis of resilience, concepts relating to social systems will be introduced here. This is especially important in places where the context demands in-depth knowledge on the kinds of interactions and relationships that unfold between actors. Vulnerable social groups face an especially hard time because their physical, social, psychological, cognitive and spiritual needs are not met nor respected. In many cases they function at the

76 Idem

77 'Network Theory: The Basics' https://www.oecd.org/sti/inno/41858618.pdf

78 'Introduction to Network Theory' https://www.cl.cam.ac.uk/teaching/1011/PrincComm/slides/graph_theory_1-11.pdf

79 'Network Theory' (Baez, John) http://math.ucr.edu/home/baez/econ.pdf

80 'Social Complexity 1: Overview' https://www.youtube.com/watch?v=KkcGr3y70bk

81 'Introduction to Network Theory' https://www.cl.cam.ac.uk/teaching/1011/PrincComm/slides/graph_theory_1-11.pdf

82 'Scenario Planning' https://en.wikipedia.org/wiki/Scenario_planning

83 'Scenario Planning: A Tool for Strategic Thinking' http://sloanreview.mit.edu/article/scenario-planning-a-tool-for-strategic-thinking/

margins, not being able to actively use their capacities for their wellbeing and development.

The concept of social exclusion recognizes that individuals or groups marginalize others due to their race, ethnicity, gender, skin tone, nationality, weight, wealth, knowledge, etc., in turn creating for these marginalized groups a feeling of social disadvantage. Norms, models and ideals created and followed by society determine whether the identity of the group is accepted or not by those who display the most power. As such, social exclusion is defined *[by Levitas et al.] as "a complex and multi-dimensional process that involves the lack or denial of resources, rights, goods and services, and the inability to participate in the normal relationships and activities, available to the majority of people in a society, whether in economic, social, cultural or political arenas."* [84].

According to the *Bristol Social Exclusion Matrix (B-SEM)*[85] there are 10 dimensions or domains in social exclusion that are encompassed through four stages of life (childhood, youth, working-age adulthood and later life):

Resources	Participation	Quality of life
Material/ economic resources	Economic participation	Health and well-being
Access to public and private services	Social participation	Living environment
Social resources	Culture, education and skills	Crime, harm and criminalization
	Political and civic participation	

These criteria are highly dependent on cultural and social values which vary in space, time and locality. Interconnected relationships arise the more complex the analysis. Indeed, the factor of political influence (national and local) has a definitive impact on social exclusion processes. This framework of understanding power dynamics and social mechanisms encompasses also the meanings of stress and coping strategies that vulnerable and excluded groups undertake to withstand their condition, and ideally, surface above it.

Social systems, individuals and groups in fact show positive responses when under these circumstances; one of these responses is social inclusion, which are actions taken to reverse social exclusion. An inclusive society should firstly rise above differences of race, gender, skin colour, religion, age, wealth, knowledge, etc., and also offer to all its groups an equitable access to opportunities, resources, goods and services. This shift must be accompanied by changes in economic and political power exercise.

How do we bring about social inclusion? What must be done? According to United Nations "Analyzing and Measuring Social Inclusion in a Global Context", the indicators that will define the social inclusion goals for any organization must start with support and advocacy beyond public authorities and partnerships must be cultivated with key actors through a participatory approach[86]. At a more atomic level (households, communities, social groups), social inclusion can be promoted through access to social networks, building links with community projects, centers and schools between people of different generation, race, class or ethnicity, giving people opportunities to participate in the wider community, identify, respect and use people's skills, among others[87].

At the heart of this, *R4S* will use an approach that builds on understanding and supporting participation and behavior change in order to generate a change within the excluded communities, groups or individuals. Facilitators must have good background knowledge on power dynamics, empowerment, resilience factors and capacities in order to exercise change through group discussions, power maps, change design, and other techniques. The framework for these activities includes Theory of Change (ToC), which enables the implementers to identify, acknowledge and focus on the groups, individuals or communities' desired vision of change. They must be seen as actors and motors of change. This builds on most, if not all, the 3 Capacities and the 6 Determinant Factors of Resilience.

84 The Multidimensional Analysis of Social Exclusion, Levitas et al., 2007. http://webarchive.nationalarchives.gov.uk/+/http:/www.cabinetoffice.gov.uk/media/cabinetoffice/social_exclusion_task_force/assets/research/multidimensional.pdf

85 Idem

86 Analyzing and Measuring Social Inclusion in a Global Context, United Nations, 2010

87 Dignity factors – social inclusion, Social Care Institute for Excellence, 2014 http://www.scie.org.uk/publications/guides/guide15/factors/socialinclusion/

ANNEX 3. Introduction to SBC

What is SBC?

Behavior change is a research-based consultative process for addressing knowledge, attitudes and practices. Social and behavior change enables groups of individuals to engage in participatory processes to define their needs, difficulties and perceptions. SBC focuses on the community as a change unit and aims to change and eliminate harmful behavior and promote positive actions. [1]

Therefore, systematic efforts are necessary to apply successful, evidence-backed practices from the field of SBC in order to achieve better and more sustained change in communities and individuals for improved impact, quality and efficiency. A successful approach for SBC programming is Designing for Behavior Change (DBC) which investigates barriers, doers and non-doers of the behavior, at the individual, interpersonal, community and institutional and policy levels to gather context-specific information necessary to facilitate the development of an enabling environment for SBC adoption and maintenance.[2]

DBC was originally designed by Food for the Hungry for agriculture and nutrition Behaviors, and then revised and expanded by the Food Security and Nutrition Network Task Force. The methodology has since been integrated into the USAID-funded CORE Group knowledge and learning collaboration's Social and Behavioral Change strategy.[3] DBC, and other methods (e.g. anthropological methods, focus group discussions, positive deviance inquiries) are used to add formative research rigor to refine the messaging and activities used in programming, then these models will be more successful at changing behavior and sustaining the change over the long term.[4]

Social and Behavior change programming can increase knowledge and awareness of an issue, influence perceptions, beliefs and attitudes, encourage an action, demonstrate and provide an opportunity to practice skills, reinforce self-efficacy, build individual and community capacity creating and enabling and environment necessary for this change to occur.

A behavior must be understood as a specific physical action that can be measured and observed. Behaviors should be written in present time, taking place in a specific place with duration and frequency, bearing in mind that the action is what counts, unlike knowledge and beliefs.

What is a Barrier Analysis? (BA)

Behavior statement: priority group + action verb in present tense + details. E.g. *Targeted Farmers prepare their own organic compost at home during every planting season.*

A behavior is: an action that can be observed and measured. E.g. *Farmers prepare organic compost.*

A behavior is not: a perception, an intention or a thought. E.g. *Farmers improve their agricultural practices.*

Barrier Analysis is a research tool part of the formative research for DBC, where a behavior is analyzed through the Target Group's perspective, highlighting significant differences between Doers and Non-Doers (people within the Target Group who practice the behavior are referred to as "doers"). The BA identifies the influence group, universal motivators and determinants, which highlight significant barriers and facilitators that prevent or enable the Target Group from doing the behavior promoted. Responses to the BA questionnaire, from Doers and Non-Doers are compared and analyzed in order to focus resources on reducing those differences categorized by determinants[5], supporting Non-Doers to become Doers and Doers to maintain the positive behavior.

By using the BA, the analysis of the 12 determinants that influence behavior provides information about the Stage of Change[6] that the Target Group is in, and also provides information about the influences and possible barriers that occur at higher level.[7] Based on the responses given by the priority group during the formative research, a DBC Framework tool is constructed to address barriers through Bridges to Activities. These are specific descriptions what should be done to address the issue revealed by the research and link to an activity. A Bridge to Activity usually begins with a directional verb (increase, decrease, improve, reinforce) and often proposes to change the perception of the priority group. Finally, through the implementation of the SBC process, contexed based, culturally relevant, action oriented tailored strategies for planning interventions can be suggested through a Designing for Behavior Change approach.

Monitoring for SBC

- Consult the following resources for information on how to monitor social and behavior change:
- Training manual on basic monitoring and evaluation of social and behavior change communication health programs https://www.popcouncil.org/uploads/pdfs/2014RH_BCCTrainingManual.pdf
- Designing an SBCC Intervention for FBP Behavior Change https://sbccimplementationkits.org/provider-behavior-change/lessons/step-9-monitor-and-evaluate-2/
- Social and Behavior Change (SBC) Program Monitoring
- https://www.globalhealthlearning.org/course/social-and-behavior-change-sbc-program-monitoring

Additional Resources:

- A Practical Guide to Conducting a Barrier Analysis https://pdf.usaid.gov/pdf_docs/PA00JMZW.pdf
- Designing for Behavior Change: A Practical Field Guide http://fsnnetwork.org/sites/default/files/designing_for_behavior_change_a_practical_field_guide.pdf
- The CORE Group website http://www.coregroup.org/index.php

1 'Communication for development (C4D): Behaviour and Social Change' https://www.unicef.org/cbsc/index_65736.html

2 Capacity Statement – GOAL's Social and Behavior Change (2017)

3 `The CORE Group website´ http://www.coregroup.org/index.php

4 Capacity Statement – GOAL's Social and Behavior Change (2017)

5 Determinants are categories of elements (perceptions, barriers, motivators) that enable or prevent people from doing a behavior.

6 'Transtheoretical model' https://www.youtube.com/watch?v=oO80XyBDrl0

7 CASCADe: Challenging and Addressing the Structural, Cultural and Attitudinal Determinants for sustained behaviour change. GOAL. (2014).

ANNEX 4. Synthesis Table of Data Gathering Process

COMPONENT	STEPS	INFORMATION NEEDS	KEY RESOURCES	KEY QUESTIONS
1 **Identification and Selection of Critical Socio-Economic System(s) for Resilience Building**	STEP 1.1 Context analysis	Organizational mandate, governance model, ongoing projects, links and economies of scale, culture and organizational culture, actors and key contacts, ongoing or historical conflicts, political priorities or processes, relevant social trends, environmental factors.	• Secondary information • -E.g. Historical studies • -E.g. Technical reports • Observation • Key informants • Screening • Surveys • Questionnaire • Interviews • Digital storytelling • Seasonal calendars • Focus Groups Discussions (FGD) • Participatory group exercises • Venn Diagrams • Network mapping • Village mapping • Household economy map • ER89 (Ego Resiliency Scale)	See Annex 5
	STEP 1.2 Determine Target Group	Demography, basic social and economic profile, poverty status of men/women, gender and cultural composition, capacities, geographic location, occupations and educational status, security/mobility, labor market, economic situation/food security, assistance, infrastructure, coping strategies, health, children, women, politics/peace managing, security, religion.		See Annex 5
	STEP 1.3 Identify the Shocks and Stresses to which the Target Group are exposed	Historical analysis of Target Group, historical and current accounts on shocks and stresses, characteristics and relationships of Target Group and other actors from multiple levels (household, social groups, individuals, communities, etc.), social dynamics of actors, power relations between actors.	• GOALs Resilience Wheel • ARC-D Toolkit • Primary and secondary information from previous steps • Macro-level data • E.g. FEWSNET • E.g. FAO's GIEWS • Risk landscape analysis (Mercy Corp's STRESS) • National early warning systems • Hazard profile mapping/hazard index • Q-sort Methodology • Concept mapping • Network mapping • Risk map/Power map • Focus Groups Discussions (FGD) • Key informant interviews • PCMMA/EMMA • Gap analysis • Statistical analysis • Household surveys • Analysis of drivers of well-being • Problem trees • News and seasonal reports, monitoring rep • Import./export data • Statistical data of socio-economic system • Interviews • M4P • Venn Diagrams • SWOT • Key informants • Six box model • Force-field analysis • Drivers of Change • Traffic Light Scheme	See Annex 5
	STEP 1.4 Identify and Analyse the Socio-Economic Systems Associated with the Chosen Form of Resilience Building	1.4.1 Thoroughly list the critical socio-economic systems using GOAL's Resilience Wheel and the socio economic system categories as a guide. 1.4.2 Analyse the Relevance, Opportunity, Feasibility and Resilience Contribution of the identified critical socio-economic systems. 1.4.3 Select Critical Socio-Economic System for Application of R4S Approach		See Annex 5
	STEP 1.5 Determine 'Key Performance Indicators' (KPIs) of Selected Critical Socio-Economic System	Baseline of the system, KPI categories, goals of actor organizations, communities, households, etc., key drivers of business value, performance thresholds, targets and benchmarks.	• Sub-system with highest marks on ROF evaluations • Sub-system with lowest marks on resilience evaluations • Balanced scorecard • SMART goal setting framework • Survey	See Annex 5
2 **Mapping of the Current Status of Selected Socio-Economic System(s)**	Step 2.1 Overall System Functions (using the M4P Donut)	Actors, rules and functions: market system performance, market system capacities, volumes of production and trade, market integration, competition, conduct, market support options, historical analysis of the selected system, functioning of market system during emergencies or stresses (review M4P)	• Results from component 1 • Interviews • Maps and diagrams • Expert panels • Focal groups • EMMA Toolkit • Market Analysis • Actor maps • Market maps • Data collection sheets • Stakeholder Assessment Matrix (SAM) • Instructive Guidance to build an R4S Map	See Annex 6
	Step 2.2 Transaction Chain Map			See Annex 6
	Step 2.3 Stakeholder Consultation and Assessment	2.3.1 Stakeholder Consultation Process 2.3.2 Stakeholder Assessment Matrix (SAM)		See Annex 6
	Step 2.4 Current System Map	See steps 1, 1.5, 2.1, 2.2: Actor Assessment, Relationship Assessment, System Assessment, Vulnerability Assessment, Stakeholder Engagement		See R4S Approach Guidance Manual

COMPONENT	STEPS	INFORMATION NEEDS	KEY RESOURCES	KEY QUESTIONS
Identification and Selection of Risk Scenarios with Potential to Affect the Selected Critical Socio-Economic System(s)	STEP 3.1 Determine Scope of Risk Analysis	Results from Component 1 and 2	• See the Risk Assessment Matrix (RAM) of the R4S Approach Guidance Manual • ARC-D Toolkit • SAM • R4S Probability Scale and System Impact Scale of the Risk Assessment Matrix (RAM) • R4S Network Vulnerability Map	See R4S Approach Guidance Manual See Table 5
	STEP 3.2 Determine Primary Risks and Secondary Risks (Cause and Effect)	Results from Step 1.4		
	STEP 3.3 Prioritize Risk Scenarios according the probability of Occurrence and level of Impact on System Function	Baseline of the system, KPI categories, goals of actor organizations, communities, households, etc., key drivers of business value, performance thresholds, targets and benchmarks.		
Resilience Analysis of Critical Socio-Economic System(s) against the 6 Determinant Factors of Resilience (DFRs)	STEP 4.1 –Analysis of the impact of the selected Risk Scenarios on the System	4.1.1Develop System Vulnerability Map(s) for each selected risk scenarios 4.1.2 Synthesis of the selected system dynamic for each selected risk scenario	• Resilience Systems Matrix	See R4S Approach Guidance Manual
	STEP 4.2 - Resilience Assessment against the 6 Determinant Factors of Resilience			
	STEP 4.3 – Develop Vision for System Change	Results from Step 4.1 & 4.2 4.3.1.Develop dynamic model for Systemic Change 4.3.2. Develop System Change Map		
	STEP 4.4 Stakeholder Engagement Strategy and Results Chain	Results from Step 4.3	• Current System's Map • Risk Assessment Matrix (RAM) • Focus Group Discussion (FDG) with System Actors • Workshops with System Actors and Key Stakeholders	

ANNEX 5. Key Questions Component 1

STEP 1.1 Context Analysis (Basic or Comprehensive)

- Types of populations existing within chosen geographical area
- Average rainfall, rainfall variability, seasonal temperature variations, local geomorphology, climax vegetation and forest cover
- Types of ecosystems found within geographical area
- Current environmental and economic status, policies and programs, in relation to global issues
- Significant political, historical and cultural background
- Current political and administrative structures of the country, departments and municipalities
- Most pressing issues at the national and local level, in relation to environmental pressures and trends of human activities and its by-products
- What sorts of services are available? Who uses them?
- Who provides health and education services and how are they paid for?
- Infrastructure, roads, rail and waterway connections, land use and quality?
- Quality of power and telecommunications network and fuel sources
- Current status of waste management systems
- Proportion of households with water and sanitation access and services, common WASH practices or lack thereof
- Key risks in the area (health, environmental, political, economic)
- Literacy, mortality and morbidity rates, disease, physical and mental health, fertility rates
- Average educational levels, research and development statistics
- State of knowledge about relationship between people and the ecosystem
- How have people and the economy changed in recent years? How is the health of people changed over the years?
- Existing development interventions (national and international)
- List of main activities (consider their relation to food security, protecting households from vulnerability, generating employment, income, exports). Include non-monetized activities.
- Functioning of markets for agricultural inputs and outputs, main markets that drive national economy
- Functioning of system for other significant local industries/ enterprises/livelihood activities
- What are important determinants of poverty in the area?
- Distribution of benefits and burdens between males and females and among households, ethnic groups and other social divisions
- System of beliefs and expressions of Target Group
- Current status on rights and freedoms, governance, institutions, peace, crime, civil order.
- Relevant organizational mandates
- What information relating to consumer trends can be identified within the system?
- What economic growth trends does the Target Group seem to follow?

For further analysis of context and initial transaction chain map

Supply & demand (Transaction Chain) and System Actor Groups

- Who are the transaction chain actors of the selected socio-economic system? How are they linked?
- What are their roles and functions within the system?
- What sort of relationships develop around the most critical functions (strength, length, history, power, trust)?
- Are the transaction chain actors involved in more than one function/ system?
- How and when are these relationships affected? Key constraints each actor faces, particularly the Target Group?
- What are all the end markets of the selected socio-economic system? Is there a variety of end-products offered? Substitutes?
- What kinds of issues are having an impact on the linkages and functions of the transaction chain actors? How does this affect their relationships?
- Can the market channels be clearly identified within the system? Can any bottlenecks be identified?
- Quantify system services and/or productsinformation such as:
    - Volumes/quantities that are normally produced and traded (at different times of year) of each actor
    - What are the prices along the market channels of the system (import, wholesale, retail, export)?
    - How much stock is there of the supply and how much is available in the system?
    - Are the system actors consuming or producing at the total capacity?
    - Average land size
    - Number of employees of large actors
    - Input costs
    - Others deemed relevant
- When do prices and quantity decrease and/or increase? What seasonal factors affect these variations?
- How do prices vary according to the locality of system actors? In response to this, how to system actors purchase goods/services in the local area?
- How does the market channel and prices vary between key system players, for example between producers and purchasers?
- How are neighboring systems integrated with local system actors?
- What is the trend in relation to import/exports of selected products or services of the system?
- What actor players control the setting of prices? What functions are they controlling within the system?
- How are dominant system players competing with each other?
- How to local actors obtain products/services from the socio-economic system?
- What sort of risks, shocks and stresses are identified within the socio-economic system and actor relationships?

Supporting and Regulatory Functions

- Are there supporting systems and infrastructure that provide critical services to transaction chain actors (inputs, capital, knowledge/ training, transport, storage, financial services, technical assistance)?
- What actors demand these supporting services? Which ones have access to the service and which ones don't?
- Identify categories or specific supporting service providers within the system.
- What various governance patterns can be identified with respect to each market channel?
- What futures price trends have been identified?
- Relate the way in which trading changes according to seasonal or social patterns (holidays, road conditions, academic seasons, crop calendars, rainfall, election years, etc.)
- Analyse the legal context of the selected socio-economic system, starting from international agreements to national polities and regulations.
- What institutions are related to the legal context and with the supporting services of the selected system? How do they interact with the market players?
- What rules and norms influence and shape the selected socio-economic system environment? How do they relate to the positive and negative trends of the system?
- How do norms and regulations change in the face of shocks and stresses?

Sources:

(CPRC)

(IUCN)

(Committee, OXFAM, InterAction, & Action, 2010)

(Microlinks)

(World Economic Forum, 2013)

STEP 1.2 Determine Target Group

- General demographic information: ages, locations, gender, income, education, occupation, ethnicities.
- General psychographic information: personalities, attitudes, values, interests, lifestyles, behaviours
- Outline the socio-economic categories (most important and alternative) of the Target Group.
- Identify age groups and genders, minorities and ethnic groups
- Out of the total population how many are at risk or belong to vulnerable groups or minorities? Are there any groups that are at greater risk than others?
- What is their geographic location? Are there geographical areas more at risk than others?
- What are their main sources of employment, income, and/or other livelihood activities?
- What significant responses in relation to pressing national issues can be identified from the Target Group?
- What are the current rates of service access with respect to social and ethnic groups of Target Group?
- How do the members of the household or Target Group spend their days?
- What sort of lands do they live in? What is their land tenure situation? Does their livelihood depend upon direct use of natural resources?
- Identify the main conflicting demands that the Target Group is facing.
- What is the basic seasonality of livelihood activities followed by the Target Groups?
- What major risks to people's livelihoods can be identified?
- How are gender roles distributed within the Target Group in the access and use of markets, natural resources, land and other assets?

For further analysis of Target Group

- Identify the institutions, organizations, groups and important individuals found within the Target Group and its geographical area.
- List the different economic activities that predominate in the households of the Target Group (earning and spending)
- What sort of roles and interdependence exist between household members?
- Identify the possible (alternative) and main sources of cash within the geographical area
- Identify the possible uses for cash (paying rent or tax, saving, repaying loans or lending money, giving gifts, etc.)
- What key constraints (barriers to entry, capitalization needed, required skill level, social or political capital) can be identified for the main livelihood activities?
- What are the primary sources of cash income (wage labor, sale of crops, livestock, microenterprise, activities, remittances) or how are the sources of income distributed? How are they distributed between genders?
- What sort of gaps do the groups face to obtain the goods and services in quantity and quality?
- What sort of impact do they have on the normal consumption of items (food and non-food) and services?
- What factors seem to be affecting the sources of income/ employment, if any?
- How is the household or Target Group coping? Have any changes been adopted to adjust or face new hardships?
- Within households, who generally decides what the money should be used for? Where is money stored when it is not in use?
- When do unexpected cash needs arise? What kinds of needs are they?
- What coping strategies have been adopted by households after shocks?
- From the information is it possible to map the households within the communities they belong to?
- What sort of wealth differences and inequalities can be found within the Target Group?
- What local groups are working on environmental issues (water, land, forest)? Economic (savings, credit, agriculture,

livestock), social (health, literacy, religion, traditional education, sport), and/or political issues (famer's associations, women's groups)?

- How important do these organizations seem to be for the Target Group? Why?
- What is the degree of contact and cooperation among the identified actors and the Target Group? Which organizations work together?
- What are services provided by certain organizations from which the poorer people are usually excluded from?
- Are there institutions and/or groups working with savings and credits issues with the Target Group? In what ways? Are they benefitting the Target Group?
- What kind of parenting style does the Target Group present? Did they secure early attachments, influencing the community with trust and self-esteem?
- Are parenting styles influenced by cultural and social norms and values? What results can be observed from this?
- Within the system what are community and extracurricular activities available to the Target Group?
- Personal attributes that influence resilience: temperament, intelligence, health, self-awareness, social skills, optimism, sense of humor, recreation, productivity, approachable.

Sources:

(Rim & Rouse, 2002)

(Committee, OXFAM, InterAction, & Action, 2010)

Step 1.3 Identify the shocks and Stresses to which the target group are exposed

3 CAPACITIES FOR BUILDING RESILIENCE

Absorptive

- If existent, what is the quality of the bonds within and between the target populations and communities? What kind of bond exists between families?
- What levels of familiarity are present between the target populations? To what degree do they forego their privacy if necessary (or due to culture)?
- Examine the quality of the horizontal ties between similar individuals or groups and that live in close proximity within the Target Group and/or geographical area.
- Within groups of the Target Group are there any experiencing indifference or hostility between nonmembers?
- How closely do Target Group work together to address multiple problems in the wake of a disaster?
- Community-based early warning
- Community-based dissemination/diffusion of critical information, community-based risk sharing
- Sharing resources
- Close relationships within Target Group facilitate adoption of new practices for such things as income generation, health and nutrition, climate change, etc.
- Does the Target Group and its multiple levels have the capacity to self-regulate their behaviour and control (and attention, emotion, thought) when facing a shock or stress? Or to comply with norms and rules?
- How are behaviours externalized when facing shocks or stresses?
- What actions do individuals take to influence when, how and what positive and negative emotions are experienced? Is there a collective emotional (negative and/or positive) response when facing shocks or stresses?
- Can they persist through difficulties, tolerate distress, display rule-governed conduct, and display the appropriate behaviour when in negative contexts?
- Savings and loan associations led by women (such that promotes empowerment of women, livelihood diversification and climate adaptation).
- Does the Target Group have access to informal community safety nets?
- Are cash savings common among the Target Group?
- Is there available a disaster preparedness and mitigation program, at any level?
- Determine the state of basic infrastructure (transportation, shelter, energy, communications and water systems, health facilities and markets).
- Is there enough production equipment? Is it being used to its full capacity?
- Can the current infrastructure operate at an individual and group level? After natural and man-made disasters?
- From the physical assets available, are there same-type alternatives if a break-down of one of them occurs?
- Determine key services and critical infrastructure.
- What sorts of impacts can occur on critical infrastructure, and do any of these support key services in the given geographical area?
- How many members of the Target Group can truly access the critical infrastructure?
- Gaps in productive infrastructure?
- Community-based mechanisms for maintenance?

Adaptive

- What is the level of flexibility of identified critical variables or groups? For example, levels of trust, capacity to self-organize?
- What innovations or positive trends can be found within the actors, critical infrastructure and relationships?
- How rigid are the boundaries between social groups of the Target Group and other involved actors?
- Has the risk been appraised (where the probability of an adverse event is assessed along with potential extent of the damage)
- Have possible options for and costs of adaptation been considered before the risks?
- What characteristics can be found within the Target Group and/or geographical area that influence their propensity or ability to adapt?
- What available technological options can be found for the Target Group and within the geographical area?
- What resources does the Target Group count with to address needs and risks? How to they manage if they count with spare resources?
- What sort of structures make up the critical institutions and decision making authorities of the country?
- What stock of human capital is the Target Group made of?
- What is their stock of social capital including the definition of property rights?
- Does the system have access to risk-spreading processes?
- What sort of information management systems to they operate and what is the credibility of information supplied by decision makers?
- What is the Target Group's perception of risks and exposure?
- What sort of aspirations can be found among household members? Do they show confidence they can adapt?
- What is the extent and quality of each form of capital?
- Which populations have access to the capital? Access to financial resources?
- Which institutions control access to the capital?
- How does the current status of the capital contribute to or constrain livelihood security and resilience?
- Level of access to skills, labor, knowledge and physical and mental wellbeing or health.
- Any ongoing epidemics, armed conflict, underinvestment in education and health infrastructure?
- What does the demographic data say about the Target Group?
- What sort of conditions are found amongst the socio-economic profiles that indicate the state of human capital?
- What is the quality and level of access to social services?
- At community and household level, what is the level of cash and liquid resources (savings, credits, remittances, pensions, etc.)
- How easily accessible, reliable and inclusive are formal and community-based savings and credit institutions?
- Any signs of post-disaster investments, such as roads, bridges, dams, through financial capital?
- Any signs of human capital development, such as funding of healthcare and education?
- What about financial services, such as microfinancing or sustenance of small and medium enterprises?
- Can any patterns and trends be identified in formal employment, petty trade, entitlements, remittances, and external financial assistance from government or civil society?
- What is the Target Group's or community's environmental stocks? Land, water, forest, fisheries, wildlife, biodiversity, environmental services, clean energy potential, etc.)
- What is the condition of the natural environment in the selected

geographic locations of the Target Group?

- What is the relationship between the livelihood activities and the management of natural resources and ecosystem services of the Target Group in the given geographical area?
- What sort of collective norms and valuations of the environment as a public good are found within the geographical area?
- What is the current quality of the natural assets such as soil, forest cover, pasture, fishery stocks, riverine/costal habitats, groundwater supplies, etc.?
- What natural disasters have occurred historically, recently and/or chronically?
- Is there a sense of competition for and dispute over access to scarce natural resources, such as conflicts, price increases or disempowerment?
- Can the Target Group and its multiple levels adapt well to changing circumstances? How flexible are their coping responses?

Transformative

- How exposed to information is the household or Target Group populations?
- What are the perceived trusted social networks amongst the Target Group?
- Community-based organizations formed in response to disasters can provide community members with voice and leverage in decision-making in externally-supported rebuilding efforts.
- Linking social capital facilitates a feedback loop between grassroots and policy/ formal governance regarding covariate risks, e.g., collaboration over climate information gathering and dissemination: government agencies, research institutions, media
- Collective action can compel formalization or strengthening of structures that can have an impact at higher levels, e.g., people resettled into new areas as a protection measure or in the aftermath of a disaster form new networks and institutions (farmers' unions, women's associations) beyond the immediate community.
- Vertical linkages are essential to realizing transformative capacities. These are evidenced in a variety of areas: - - - - - - infrastructure investment land reform pro-poor policies government accountability mechanisms equitable allocation of entitlements policies informed by representative participation of different community sectors (sociocultural groups; women/men; elderly/ youth; disabled).
- Are there members of the Target Group with social ties outside their immediate community?
- Are these social ties reliable to call upon when local resources are insufficient or unavailable?
- Are there members of the Target Group bringing in new perspectives and resources to the rest of their members?
- Unaffected communities share resources with disaster-affected ones
- Unaffected communities share knowledge, expertise, and networks based on their own experiences of similar shocks
- Social capital facilitates dissemination and multiplier effects of proven good practices
- Formal and/or informal ties between communities in different agro-ecological zones can contribute to livelihood diversification and protection from adverse seasonal trends
- Exposure to models and experiences from other countries can inform and broaden aspirations, create new ideas and new practices
- Increased exposure to other groups in markets may help in mitigating conflicts as different groups become more familiar with each other and discover their common interests
- How easily can the Target Group influence and participate in governmental processes at local and higher levels?
- To what level does the Target Group participate in the process of policy formulation and implementation? What type of policies are being formulated currently?
- How effective is the local government in addressing the needs and priorities of the communities, voter participation and involvement of women and minorities in political leadership and decision-making?
- Identify the power relationships occurring between Target Group and the rest of the actors of the system.
- What are the power dynamics between these spaces of decision-making, in relation to the selected system and geographical area?
- Inter-community communication/sharing of technologies, innovations
- What type and quality of interaction exists between formal government and traditional authorities?
- What is the level of transparency and accountability found among government officials?
- Has the system evolved when dealing with a new or changed circumstance after the manifestation of a risk?
- What level of psychological flexibility (capacity to transform in different situations) does the Target Group and its multiple levels (household, community, district, national and social systems)?
- Do they deploy coping strategies to match the demands of their environment?
- What positive responses or emotions have they experienced during moments of shocks or stresses?
- Do they engage in recognizing and shifting to new perspectives that helps them cope with the situation?
- Can they persist through difficulties, tolerate distress, display rule-governed conduct, and display the appropriate behaviour when in negative contexts?

Sources:

(Frankenberger, M., T., & S., 2013)

(Alberini, Chiabai, & Muehlenbachs, 2006)

(Waugh, Thompson, & Gotlib, 2011)

(Davis, Reich, & Kent, 2014)

(Levine, 2003)

PAST SHOCKS AND STRESSES

- What events or trends have/are causing stress among the Target Group (regularly and intermittently)?
- Historical occurrence of floods, droughts, epidemics, local environmental trends and cycles
- Level of food stores across the year, rainfall, crop planting and harvesting schedules, food prices, changes in health status
- What sort of man-made and natural shocks and to what level have they struck over the Target Group? (disease outbreaks, floods, landslides, hurricanes, droughts, armed conflict, economic volatility, etc.)
- What sort of man-made and natural stresses are found among the Target Group? (natural resource degradation, urbanization, demographic changes, climate change, political instability, economic decline)
- From another perspective, what kind of shocks and stresses can be identified within the following subsystems of country: political, security, economic, social and environmental? Are they preventable risks, strategic risks or external risks?
- Identify to the extent possible que types of economic, environmental, geopolitical, societal and technological risks within the Target Group.

- How likely does the Target Group feel the risks are likely to occur? Technological, economic, governance, infrastructure, social systems? How are these risks perceived differently between women and men?
- According to Target Group populations, what are the unforeseen impacts of new life science technologies and climate change mitigation? Of uncontrolled population growth? The negative consequences of economic regulation? Food shortages? Etc.
- How are political shocks being generated, from top-down, from national institutions to communities, or bottom-up, from grass-root level to state level? What level of political and economic instability if found within the geographical area of the selected Target Group? What long term stressors can be identified (corruption, patronage, clientelism, and marginalization?
- The relative importance of vulnerability factors to different groupso Trends:
  - Rainfall, temperatures • Producer and consumer prices across the year
  - Population density
  - Degradation/renewal of natural resources
  - Morbidity/mortality
- Identify political factors that relate to informal structures at the local levels and their effect over the target populations vulnerability.
- What significant past events have occurred in the designated geographical location that constitute shocks?
- What seasonality and trends can be found within the political, economic, environmental, cultural and various other dimensions within the designated geographical area?
- What sort of impacts have they had on the livelihoods of the Target Group? How as it impacted differently men and women?
- What is the current trend on global food prices? Has it caused shocks or stresses over the selected socio-economic system?
- How much does the Target Group and other actors know about the types of risks present in the system?
- How to organizations comply with regulatory, industry and institutional directives? How does this compliance affect their risk management system? Does this have any influence over preventable and strategic risks?
- Risk factors that influence resilience: poor natal care of mother and child (pre, peri, post), poverty, abuse/neglect, family dysfunction, inadequate/poor schools, lack of nurturing adults, absence of mentors or models.

Sources:

(Choularton, Frankenberger, Kurtz, & Nelson, 2015)

(World Economic Forum, 2013)

(Levine, 2003)

ANNEX 6. Key Questions Component 2

Step 2.1. Overall System Functions (using the M4P Donut) & STEP 2.2. Transaction Chain Map

PAST SHOCKS AND STRESSES

- What is being done in the transaction chain?
- Who are the key players that are doing it?
- How is the product/service reaching end markets?
- What market channels are available to reach those end markets?
- What supporting markets exist within the system?
- How are the power dynamics wielded by different kinds of actors?

Source :

(The Springfield Centre, M4P Approach, 2015)

STEP 2.3 Stakeholder Assessment Matrix (SAM)

SAM- ACTOR Assessment

- System actors: these can be organized according to different categories of participating and latent actors across the system, from individual firms or population groups to institutional, scientific, political, social, environmental and other socio-economic organizations that form part of the whole network, reacting and responding to shocks and stresses in different ways. The implementer can go into as much detail as possible when emptying data into the matrix. For the mapping process later in this component, it is useful to determine here the quantity of actors within each node and their percentage of total production or throughput of the system.
- Actor assessment: these series of columns evaluate each system actor and their location within the transaction chain and qualitative aspects that describe their current situation within the market system.
  - In the next columns indicate where they belong to the Transaction Chain, supporting or regulatory function. Assign them a colour using cell management properties on Excel.
  - Based on information from component 1 (context analysis), define the most critical needs/wants as well as the most pressing worries/negative impacts.

SAM- RELATIONSHIP Assessment

- In this section the columns now begin to link the relationships between the actors; for this it is necessary to bring back all information from component 1 related to the workings of relationships between actors of Transaction Chain, supporting and regulatory function. They should be listed in the columns of input and output (transaction chain) relationships accordingly.
- Next column will include a short description of both input and output (transaction chain) relationships of system actors, starting from the first system actor and continuing until the last one. The description should be a brief paragraph.
- This section of the Assessment Matrix concludes with a Summary Assessment which is a one-word description the relationship, based on the quality of the relationship: excellent or good, stressed, bad, absent).

SAM- SYSTEM Assessment

- This section of the matrix will quantify variables from the transaction chain that evaluate the relevance of system actors. Keep in mind this may include actors from supporting and regulatory functions.
- Once again, make use of the information gathered from component one, particularly:
- How much each actor produces or trades, converted into percentage of goods/services produced by the system that are dependent on each system actor
- Next, from a scale of 1-5 (ranging from 1-100%), determine the level of service/product/Throughput of each system actor. This ought to be based on both quantitative and qualitative information from the data gathering process.
- The continuing column will evaluate how easily the actor could be replaced within the system. This will be evaluated using a scale of 1-5, with 1 being easily replaceable and 5 being not replaceable. Once again the data gathering process should give enough information for the team to make an informed and accurate value.
- Both evaluations above will be multiplied and this will result in the relevance of actors based on current status of system. This number will be needed further on when establishing the size of each system actor during the mapping process.

SAM- VULNERABILITY Assessment

- The focus of this section falls upon the analysis of two risk scenarios, which result from the analysis of shocks and stresses found in component 1.
- Each risk scenario will evaluate the following parameters using a 1-5 scale:
  - Sensitivity
  - Exposure
  - Capacity
  - Vulnerability, which is the result of the product of sensitivity and exposure, divided by its capacity.
- The resulting value in the vulnerability column will determine the vulnerability, ranging from red to white (corresponding to the colours of a risk assessment).

SAM- STAKEHOLDER Engagement

- The final section of the Stakeholder Assessment Matrix will evaluate the system actors to influence over the system, and their level of interests and incentives to improve the system. Both will respond to the scale of 1-5. The comparison between the scales assigned to both criteria will result in 4 possible level of engagement with stakeholder: Minimal Effort, Keep Informed, Keep Satisfied, and Key Players.
- The final column will provide a brief description of proposed intervention strategies per actor.

Source :

GOAL

ANNEX 7. Instructions' Tab of Stakeholder Assessment Matrix (SAM)

INSTRUCTIONS TO FILL IN the STAKEHOLDER ASSESSMENT MATRIX (SAM) for SYSTEM MAPPING

PRIOR STEPS before filling in the STAKEHOLDER ASSESSMENT MATRIX (SAM) for SYSTEM MAPPING

A	Describe the Target Group (i.e.socio-demographics, their daily routine, Knowledge and practices regarding the behaviour, etc) -- *Refer to the second heading details of the Stakeholder Assessment Matrix (SAM) and STEP 2.3.2 and Figure 17 of the R4S Approach Guidance Manual about Social and Behaviour Change (SBC).
B	Map the M4P Donut of the selected socio-economic system (with all its Supporting Functions and Regulatory Functions). ---Step 2.1 (Component 2)
C	Map the Transaction Chain of the selected socio-economic system. - Step 2.2 (Component 2)

STEPS to complete the STAKEHOLDER ASSESSMENT MATRIX (SAM) for SYSTEM MAPPING

1 ACTOR ASSESSMENT

1.1.	(Column 1) With Prior Steps 2.1-2.3 completed, proceed to list all the relevant actors that have a role in the system (these are all the actors that belong in Transaction Chain and in the Supporting and Regulatory functions), by naming the actors in general terms (i.e. 'fishermen', 'intermediaries'); actors will be labeled specifically if the information is available and if the quantity of actors in each category is less than 15 (i.e. Collection Centers are 8 in total = 'Chachahuala', 'Cerritos-Marión', 'Tugapiz/Tonina Blanca', etc).
1.2.	(Column 2) Specify the quantity of each actor; if you have no exact data, estimate.
1.3.	(Column 3) Specify the geograhic location of each actor; if you have no exact data, estimate.
1.4.	(Column 4) Determine if the actor (actor node) is part of the Transaction Chain, Supporting or Regulatory Function of the system by choosing the correct label from the drop down menu.
1.5.	(Column 5) Determine the Needs/Wants of each actor.
1.6.	(Column 6) Determine the Worries/ Negative Impacts of each actor.

2 RELATIONSHIP ASSESSMENT

2.1.	(Column 7) Determine all the INPUT relationships that the actor node receives (or that feed into the actor node).
2.2.	(Column 8) Determine all the OUTPUT relationships that come out of the actor node.
2.3.	(Column 9) Assess the type of relationship between the INPUT and OUTPUT relationships (write small descriptive paragraph).
2.4.	(Column 10) Summarize the Quality of the Relationship between the INPUT and OUTPUT relationships as: Good, Stressed, Bad or Absent.

Good = May also mean very good or excellent.
Stressed = Means inadequate, one of the actors has dominance over the other, not working in ideal terms for both actors.
Bad = Relationship not working for Target Group.
Absent = Non-existent.

3 SYSTEM ASSESSMENT

3.1.	(Column 11) Determine the level of production (throughput) of goods or services in the system that is dependent on each actor node (or that pass through this actor node).
3.2.	(Column 12) Assess the level of production (throughput) of each actor node with a scale of 1-5 (this is done automatically by Matrix).

Scale for Colum 12

1-20% = 1
21-40% = 2
41-60% = 3
61-80% = 4
81-100% = 5

3.3.	(Column 13) Determine how easily each actor node (or individual actors) can be replaced in system, using a scale of 1-5 (1 = Highly Replaceable; 5 = Not Replaceable).
3.4.	(Column 14) Determine the relevance of each actor (or actor node) in the current system's set-up, by multiplying (A) the Level of Production (Throughput) times (B) Replaceability of actor (this is done automatically by Matrix). *The Relevance of each actor determines the size of the actor in the R4S System Maps.
3.5.	(Column 15) Write the Key Performance Indicator (KPI) of each actor; you may have more than one KPI (add more columns to the Matrix if this is the case).

****Proceed to make your first R4S Map: Current System Map

4 VULNERABILITY ASSESSMENT

* This assessment is possible only after Component 3 (Identification of Principal Risk Scenarios) has been completed. R4S users will come back to the Stakeholder Assessment Matrix after identifying the main risk scenarios and will use them to analyse the system's (actors') vulnerability.

4.1.	(Heading of Columns 16 - 25) Name the two (or three) most critical risk scenarios your system faces. *These were identified in Component 3 using the Risk Assessment Matrix (RAM).
4.2.	(Column 16,21) Grade on a scale of 1-5 the Sensitivity of each system actor to the impact of the selected risk scenario (1 = very low sensitivity; 5 = very high sensitivity).
4.3.	(Column 17,22) Grade on a scale of 1-5 the Exposure of each system actor to impact of the selected risk scenario (1 = very low exposure; 5 = very high exposure).
4.4.	(Column 18,23) Grade on a scale of 1-5 the Capacity of each actor to resist (absorb), adapt or transform in the face of the selected risk scenario (1 = very low capacity; 5 = very high capacity).
4.5.	(Column 19,24) Assess the Level of Vulnerability of each system actor by multilying the Sensitivity x Exposure and then dividing it by the Capacity (this is done automatically by Matrix).
4.6.	(Column 20, 25) Depending on the Level of Vulnerability of each system actor, each will be categorized as either: WHITE, GREEN, YELLOW or RED (this is done automatically by Matrix).

Colour Code	Scale for Columns "20" & "25"	
	White	No threat exists. However, atmospheric and seismic conditions (and other natural phenomena or events) are being permanently monitored to avoid the Loss of life and/or of material possessions.
	Green	A threat exists. The threat must be monitored and people must be kept informed.
	Yellow	A threat -with a certain degree of risk- exists, it must be continuously monitored, possible preventive evacuations may be a must.
	Red	This level confirms the impact of a natural phenomenon that could cause catastrophic damages. To avoid the loss of lives, evacuation is obligatory.

****Proceed to make the R4S Map: System's Vulnerability Map (s). *These will be develop for each selected risk scenario identified in Component 3 using the Risk Assessment Matrix (RAM).
****Proceed to make the R4S Map: Geographic Hazard Map (When relevant).
**** Proceed to make the Causal Loop Diagram for current system analysis. *This should be developed based on the Current System Map and after completing Section 1 - 4 of the System Assessment Matrix (SAM).

5 STAKEHOLDER ENGAGEMENT

5.1.	(Column 26) Determine the Influence Capacity over the system of each system actor by using a scale of 1-5 (1 = very low capacity; 5 = very high capacity).
5.2.	(Column 27) Assess the Interests and/or Motivation to change the system of each actor node (or individual actors) by using a scale of 1-5 (1 = very low interest/motivation; 5 = very high interest/motivation).
5.3.	"(Column 28) The Matrix will automatically determine on of four possible engagement approaches: 'Minimal Effort/Monitor', 'Keep Informed', 'Keep Satisfied' or 'Key Player'. * This assessment is possible only after the completion of the Systemic Theory of Change in Component 4 has been completed. R4S users will come back to the Stakeholder Assessment Matrix after completing the Systemic Theory of Change.

Levels of Engagement Approaches (Column 28):

Colour Code	Strategy	Description
	Minimal Effort	Actors with low capacity & interest.
	Keep Informed	Actors with low capacity & high interest.
	Keep Satisfied	Actors with high capacity & low interest.
	Key Players	Actors with high capacity & interest.

5.4.	(Column 29) Specify the proposed strategy intervention per actor.

**** Proceed to make the Causal Loop Diagram for system theory of change.

****Proceed to make your R4S Map: System Change Map. *This map is possible only after completing STEP 1 & 2 of Component 4.

****Proceed to make the R4S Map: Stakeholer Engagement Map. *This map is possible only after completing STEP 3 of Component 4

6 HIGH LEVEL DESCRIPTION OF PROPOSED SYSTEMIC CHANGE

Describe the proposed systemic change of the intervention.

ANNEX 8. Synthesis Summary Literary Review of Systems Development and Resilience

A comparative analysis of the existing research and investigation on resilience and systems programming was carried out by GOAL. A summary of the key findings from of each of the development or humanitarian aid agencies is presented below. You may refer to the cited documents for further reading on each of the agencies' findings and/or proposed frameworks.

It is important to point out that the majority of the work done so far by these agencies in the systems development field has focused on 'market systems' (or commercial systems) and less so on non-commercial systems. Thus, when we mention 'market systems development' or 'markets' we mean 'systems development' or 'systems', respectively.

Markets are everywhere, they are interconnected and important for everyone, especially the poor and the most vulnerable[1]. Making markets work better for the poor, for them to achieve economic growth to ultimately defeat poverty, is the essential theme behind all the different market systems development approaches; even though they (may) propose different means of achieving it– through the local economic development, private sector development (PSD), value chain approaches (supported by GIZ and USAID), participatory market system development (PMSD) approach or *The Making Markets Work* for the Poor (M4P) Approach (supported by DFID and SDC)[2].

Market systems development approaches have mainly focused in the *agriculture* and *finance* sectors so far; the development community is now looking into other sectors, such as: *health, education, water, sanitation, infrastructure, food and nutrition*[3].

Like previously mentioned, **The Making Markets Work for the Poor (M4P)** Approach is the most widely used market systems development approach (Beam Exchange, 2014) to design and implement programmes and interventions, its extensive application and practices can be found in various sources and will not be repeated here (refer to M4P's 2008 and 2015 Operational Guides, M4P's 'Synthesis' (Blue Book) and 'Perspectives' (Green Book)[4] and several other mentioned in BEAM Exchange's *Market systems approaches: Literature review* (Elliott and Gibson 2004; Gibson et al. 2004, The Springfield Centre 2008; Elliott et al. 2008, de Ruyter de Wildt 2007; Gibson 2005))[5]. However, it is worth noting that *M4P* proposed has 'systemic change' in its documents from the start, recognizing that to achieve real and sustainable change, work must be done on the market system (or socio-economic system) as a whole.

The United States Agency of International Development **(USAID)**, through its Office of Microenterprise and Private Enterprise Promotion (MPEP), started a 3 year program called LEO (Leveraging Economic Opportunities), ***LEO Report #6: Market Systems for Resilience*** [6]is the program's first paper on building resilient market systems. Through this paper USAID shows its progress on resilience and market systems development, for example it now incorporates/recognizes many of the elements of *The Making Markets Work for the Poor (M4P)* philosophy (like 'inclusiveness' for example), not focusing solely on the commercial side of the system.[7]

The following is a concise representation of the most outstanding aspects found herein:

> There is *not much evidence on what causes resilience in market systems*, since it is a relatively new area in the development community (Frankenberger and Nelson 2013); and therefore an exact roadmap on how to increment resilience through a market systems development approach is still a work in progress.

It proposes *Diversity, Redundancy, Trusting Relationships and Market Governance and Policy Environment* as the "determinants of market systems resilience" (these were arrived at after analyzing the different proposed variables that increase a system's resilience (not particularly a market system) from various studies and surveys). However, additional quantitative and qualitative evidence must be gathered to robustly determine all the key factors that determine resilience in market systems; the proposed determinants by the LEO Program must be further analyzed.

To gather information on resilience, *shocks and stresses must be documented and measured over time to determine possible correlations*. The big challenge the latter poses is that the contributing factors of resilience vary from system to system, actor to actor and context to context; since, according to Frankenberger and Nelson (2013), shocks and stresses affect people in different ways and degrees (depends on gender, age, economic class, and other demographics).

Resilience must be achieved at all levels: individual, household and market. The last being the most important since it is the common ground where everyone meets and everything takes place. When the market system is not resilient the effects are felt on the livelihoods of all the people who depend on it for the exchange of goods and services (as consumers, producers and workers). When designing resilience strategies market systems must be considered in order to avoid wasting resources, displacing actors and distorting market incentives (SEEP 2007).

It recommends focusing on *two main systems as a starting point* to build resilience of the complete system: *Households and Market Systems*.

It identifies *Women's Economic Empowerment (WEE)* as a key determinant of household resilience (for food security and livelihood diversification) and community resilience (participation in community

1 A Synthesis of The Making Markets Work for the Poor (M4P) Approach (Blue Book) http://www.value-chains.org/dyn/bds/docs/681/Synthesis_2008.pdf

2 Market systems approaches: A literature review (BEAM Exchange, December 2014)

3 Idem

4 Perspectives on The Making Markets Work for the Poor (M4P) Approach (Green Book) http://www.value-chains.org/dyn/bds/docs/681/Perspectives%202008.pdf

5 Market systems approaches: A literature review (BEAM Exchange, December 2014)

6 Market Systems for Resilience, LEO Report #6 (USAID, 2015) https://www.microlinks.org/sites/default/files/resource/files/Market_Systems_for_Resilience__final_508_Compliant.pdf

7 Market systems approaches: A literature review (BEAM Exchange, December 2014)

based collective action groups, for increasing collaboration, solidarity, reciprocity and conflict resolution); thus it must be one of the guiding principles for developing strategies for resilience building.

Risk Diversification must be present in resilient building strategies, but a clear pathway on how to achieve it still does not exist. Income sources must be diversified, but risk over each of those income sources must also be diversified. How households and market systems must diversify and from what must still be determined.

Governance structures that best support resilience building for the poor and most vulnerable must be developed. Further investigation is needed in order to attain an inclusive participatory governance system that will bring forth the necessary transformative capacity. Who has the decision-making power, who benefits, who loses, by how much, who is more resilient?

There is *common ground between the market systems development approach and resilience programming*: (1) Both are complex approaches and require action at systemic level in order to attack the root causes of poverty and underperformance. (2) Both recognize the interdependency between levels in the system or the system dynamics that takes place. (3) Both must interact with other complex systems (economic, ecological, political, etc.).

The "*tensions*" between the two approaches are: (1) The efficiency[8] -resilience tradeoff; building resilience means investing resources in the mitigation of potential risks that may or may not occur and being efficient is quite the opposite – it means not "wasting" resources in order to be competitive/productive. (2) Conflicting programme approaches; apparently programming activities for both are managed separately and not cohesively (market systems development targets value chain development for the most vulnerable and resilience programming targets strengthening resilience of those households most prone to shocks and stresses). Only in theory both approaches can work cohesively, in practice they end up clashing.

It recognizes the 3 Capacities a system (household, community, market system) must develop in order to be resilient: *Absorptive, Adaptive and Transformative Capacities*.

Resilience is at the heart of ***Mercy Corps***, their strong suits in this particular area are in *peacebuilding and conflict management*. They are focusing their resilience programming in countries on the verge of total collapse (in a transitional stage), which are fertile ground for resilience building due to their fragility. *Market systems development* is a new approach Mercy Corps is looking into to build resilience with. For them "resilience" is not just about increasing the income and productivity of the Target Group (even though these factors do contribute to resilience building); resilience building is more a process than just an end result to be achieved. A deliberate effort must be made to achieve resilience through market systems development since the former is not a consequence of the latter (programmes must be developed and analyzed a certain way); an integrated systems approach of humanitarian response and market systems development must be carried out. Mercy Corps' programs focus on building long term sustainability, to help communities rapidly progress to recovery and aid families and communities build resilience so that they are less vulnerable to shocks and stresses[9].

Even though Mercy Corps does not view resilience as being inherent or synonymous to market systems development, it does perceive some "*tangible and intangible" links between market systems development and resilience programming* (or common ground). For example, it views both approaches as complex systems (similar to USAID's LEO Program) that need long-time frames to be developed effectively. Thus, a change in the approaches and expectations must be done. For the effective integration of these two approaches, Mercy Corps states that it is necessary to have a clear understanding of who your Target Group is, of the shocks and stresses that affect the market systems of your Target Group, and how market systems development can increase their resilience (analysis, implementation and assessment is key)[10].

Additionally, Mercy Corps recognizes that *Risk Diversification*, the *3 Capacities* of a resilient system *(Absorptive, Adaptive and Transformative capacities)* and the *3 Components of Sustainability (Community-Led, Market Driven and Good Governance)* should be included in the design of resilient building strategies and interventions.

Mercy Corps has been implementing a "light-touch" approach in two single-sector programmes[11], in the sub-regions of Acholi and Karamoja in northern Uganda (both subject to multiple, recurring, acute and chronic crises), to increase their resilience through market systems development. It has focused on playing the role of 'facilitator' (facilitating relationships between market players) instead of directly providing services. Their focus has been creating market-driven sustainable opportunities in a more cost/effective way by attracting new potential private sector players and leveraging financial partnerships between financial institutions and farmers; honing in more on 'the process' (building capacities, reframing opportunities, shaping incentives) than the outcome (just fulfilling indicators). For Mercy Corps the how is as important as the what. Their objective is to create a system not dependent on the development programme by building a web of sustainable commercial partnerships between public and private players (from small to large; farmers to retailers).

8 Particular to USAID's value chain focus for market systems development.

9 Mercy Corps Web Page: https://www.mercycorps.org/research-resources/resilience

10 Excerpt from video presentation from Mercy Corps' Sasha Muench, Director of Economic and Market Development, and Eliot Levine, Senior Technical Advisor for Environment, Energy and Climate on the connection between Market Systems Development and Resilience: https://www.mercycorps.org/research-resources/market-systems-development-inherently-resilience-approach

11 The RAIN (Revitalizing Agricultural Incomes and New Markets, funded by the U.S. Department of Agriculture to increase food security and economic growth in the agricultural sector) and GHG programs (Growth, Health and Governance, a five year Development Food Assistance Program funded by the USAID Food and Peace Program, focusing on expanding economic opportunity, boosting nutrition through the promotion of maternal and child health, and improving governance).

The ***Case Study: More Than Markets – Building Resilience in Northern Uganda (Uganda 2015)***[12], analyzed for purposes of the present summary, captures the lessons learnt by Mercy Corps in these two programs. The following are the key takeaways:

1. *You may have successes but produce some unintended consequences* (programs must be careful in not "trading one risk for another"). Even though the programs have been successful (in increasing livestock health, creating a centralized local market for produce, increasing income, productivity, yields, and cultivated land and creating a crowd-in effect) they have also produced some unintended consequences or *system disruptions*:

    a. Food security to face lean times was not improved and malnutrition is still evident: farmers decided to focus primarily on the 'cash crop' (sesame) due to its high profitability, causing a significant drop in agriculture for consumption and more (or the same level of) malnutrition; parents (farmers), being away from home all day farming, did not attend their children and did not save or spend money on nutrition (instead spent it on lavish things or more tools/equipment for harvesting).

    b. 'New vulnerabilities' arose: (1) Unsustainable agricultural practices exhausted the soils and produced migration. (2) Theft and money problems in the community due to income increase. (3) Potential land disputes due to poor land management and planting's itinerant nature. (4) No income diversification due to focus on 'cash crop'.

2. *Governance* was found to be a key obstacle in building resilience in Northern Uganda, particularly due to ill-informed or incoherent development programs, poor infrastructure investments and sluggish regulations. For Mercy Corps, good governance is directly linked to resilience building, since it allows for a society to organize and police its resources appropriately. The local community's governance structure must be enhanced, by building their voice and transformative capacity and increasing their involvement, and having more accountability from government through civil society groups.

3. *Education must be increased*. A learning commitment from the poor (on savings, benefits of sustainability, necessity of diversifying incomes through new cash crops) must be ongoing.

4. *Risk diversification of Target Groups is necessary;* market systems development may exacerbate the risks households and communities are exposed to due to new cycles (increase-decrease) of production, prices and income cycles, environmental degradation, social and cultural changes.

5. *Coordination among all assets, from households and communities, is critical for a community to pull through a crisis* (infrastructure, relationships and human capital must be coordinated for there to be "collective action" in response to shocks).

6. *Build relationships/partnerships that work*. More comprehensive/integrated partnerships with local communities, governments, donors, private sector and other stakeholders, must be formed.

7. Development programs for resilience building must have *longer-time frames* (5 years minimum), be *flexible and iterative* (program designs must support adaptive management approaches since systems are complex and in constant change), they must adopt a *multi-sector integrated systems approach* (interventions must be designed across multiple systems: economic, social and ecological), *assess vulnerabilities continuously* (across economic, social and ecological spectrums), and secure resilience programming through government led programmes (agencies bring the 'know-how' and governments put forth the regulation and infrastructure).

The Organization for Economic Co-Operation and Development **(OECD)** started focusing on resilience since the 2008 financial worldwide crisis. Hence, *the Experts Group on Risk and Resilience* of the OECD has elaborated a series of (approximately) 10 papers on resilience to help donors and other stakeholders "support the resilience of states and their institutions, communities and households." For this literary review, the ***Guidelines for Resilience Systems Analysis***[13] was primarily used (plus two working papers);[14] which in the words of the OECD, it is an "initial guidance that can be picked up, added and adapted by each organization."[15]

A 2011 review of UK's humanitarian programme caught the attention of the development and humanitarian aid community. Subsequently, the OECD carried out a major study on why (theoretical) resilience was not being effectively translated into practice (in field action). In summary, the study found a series of obstacles; these being a mix of not everyone understanding what resilience really meant and the value of building it and (some) being "cynical" about it, some were confusing resilience with having more food security, better livelihoods and/or improved disaster risk reduction. As a consequence, the members of the Development Assistance Committee and of the Experts Group on Resilience of the OECD asked for a simple 'how-to' guide to build resilience, the document *Guidelines for Resilience Systems Analysis* is the answer to this petition. Thus, it is essentially a roadmap (5 step methodology) that tells you how to achieve/build resilience in *people, groups and systems*, by analyzing the different types of risks they face every day and the context where they are immersed; to later design future programmes or modify existing efforts on the ground (integrating resilience building into development and humanitarian programming.) It also provides guidance on how to bring key stakeholders together (risk experts, resilience experts and key decision makers) to obtain a shared view on short and long term actions to achieve resilience. This methodology has been

12 More than Markets: Building Resilience in Northern Uganda (Mercy Corps, 2015) https://d2zyf8ayvg1369.cloudfront.net/sites/default/files/MercyCorps_MoreThanMarkets_Uganda2015.pdf

13 OECD (2014) Guidelines for resilience systems analysis, OECD Publishing. https://www.oecd.org/dac/Resilience%20Systems%20Analysis%20FINAL.pdf

14 What does resilience mean for donors? and Joint risk assessment – the first step in resilience programming, http://www.oecd.org/dac/May%2010%202013%20FINAL%20resilience%20PDF.pdf and http://www.oecd.org/dac/Experts%20Group%20working%20paper%20-%20Joint%20risk%20assessment.pdf

15 OECD Working Paper: How should donors communicate about risk and resilience? http://www.oecd.org/dac/howshoulddonorscommunicateaboutriskandresilience.htm

field tested, it was first applied in the eastern Democratic of Congo.

Elements from this 5 step methodology were adopted and adapted into the *R4S Guide*, specifically those having to do with risk assessment (scope definition, probability, root risks and secondary risks).

CARE UK's progress in resilience through market systems development is evidenced by the ***Workshop Report and an Emerging Framework on Resilience in Market Systems in the Middle East and North Africa (MENA) RMU***[16], which gathers the information of a workshop held in Cairo in the month of March 2016. In which they adapted the framework developed by USAID in its LEO Program Report #6, depicting the 3 capacities of a resilient market system, or the '*AAT Tool*' (from Absorptive, Adaptive and Transformative capacities) and developed a matrix analyzing the 3 capacities in the MENA region in 3 stages: *pre-crisis, during and post-crisis*.

The MENA region has experienced *multiple* crises in the last 6 years, specifically in the political, security, humanitarian, climate, demographic and social areas. These have led to wars/turmoil in some countries (Syria, Yemen, Iraq), chronic crises with recurrent spikes of violence (WBG - West Bank and Gaza), and wave of refugees, just to mention the most outstanding. The result of the latter (many crisis at once) has been crippling economies, infrastructures and livelihoods; the destruction of some of the MENA countries goes way beyond the production side of the market system. According to CARE UK, the political turmoil in this region has destroyed two main areas: *(1) critical infrastructure* –energy and water sectors being the most affected –and *(2) productive capacities* –farms and production units, market and selling points where consumers can buy/get products, and processing capacities at the private sector.

For CARE UK, resilience building refers to the following:

1. The *'core' of resilience* lies in *building capacities from the individual to the value chain to the market system*; the private sector is a key market player being the backbone of the economic system. (Absorptive capacities are sometimes not enough).
2. *Market systems are non-static, they are dynamic, complex and highly volatile* (especially in the MENA region). Thus a more holistic approach is needed to understand the entire system; issues must be addressed at multiple levels. Market systems analysis should include value chain analysis and the analysis of the other key market players, institutions and rules and conflict sensitivity analysis, the political or war economy, do no harm analysis, climate change and market governance analysis.
3. *Improving market systems does not equal to improving the entire economic system*. Programs cannot focus only on one aspect of the full market system at a time; this would mean you are ignoring the varied interrelationship between functions and market players. You must work on the key systemic bottlenecks and constraints. Clustering constraints and solutions can be a way to multiply impact on resilience. Interventions can be designed to tackle a group of constraints/issues that will benefit a varied group of other systems.
4. *Context and nature of crisis must be taken into account*. Each type of crisis is plagued with its own set of constraints, trends, attributes and opportunities; crises have soft boundaries between each other. (Particularly in the MENA region, it is rather difficult to exactly pinpoint pre-crisis, during and post-crisis stages due to the continuity and variety of crises). Hence the importance of understanding context and market players.
5. *Women's Economic Empowerment (WEE)* is key in achieving resilient market systems. This must be integrated or better yet, institutionalized, in resilience programming. Women are made especially more vulnerable during crisis than men. "Women often end up with greater economic responsibility for the household, yet they are often less well equipped economically than men. Women are considered economic 'shock absorbers' in conflicts, disasters, climate change and economic crises."[17] Crises can transform gender dynamics and can cause gender norms to be more fluid, which pose a threat and an opportunity at the same time; this could be an entry point for gender transformative programming. CARE recommends the following strategies for an effective WEE implementation (gender transformative programming), but makes the warning that some economic activities may lead to more harm than benefit for women:

    i. *A stronger gender analysis is a must*. Determine how crisis affects gender-based social and economic norms, for example, in crisis men are not the sole bread-winners and destruction of infrastructure causes households to lose access to health, sanitation (water), energy, and education services; as a consequence more burden is put on women (i.e., causing women to walk very long distances to bring water and/or wood for cooking).

    ii. *Men's and boys' roles must be changed to help women*. Engage men/boys to protect women from backlashes, change social norms and culture (for women to be politically and economically empowered).

    iii. *Women's role must be more visible in higher value-added activities*. Women must be incorporated into other areas of the market system and not just in the production side at the household/backyard level or other low-value added (invisible, little or no pay) activities –where they seem to get stuck and where their role is not as visible.

    iv. *Join forces with women's organizations,* coalitions, movements and collectives advancing protection in crisis towards women's empowerment.

    v. *Develop women's life skills* (communication, negotiation, etc.), business and entrepreneurship, and technical/vocational skills.

    vi. *Role modeling* with help of successful women, to challenge existing and traditional perceptions of women's roles (uniquely to household level).

16 Resilient Market Systems: Workshop Report and Emerging Framework of RMS in MENA (CARE UK, March 2016) http://reliefweb.int/report/world/resilient-market-systems-workshop-report-and-emerging-framework

17 Idem

vii. *Advocacy* to change some inherent causes of inequity of women (i.e., inheritance rights in MENA region stop women's access to finance and decision-making over their income).

CARE UK has developed a hypothesis on how to build more resilient market systems based on Women's Economic Empowerment. It states that [Agency x Relations x Structure] equals = More Resilient Women, which in turn equals = More Resilient Market Systems. (Agency = Women's capacities (+ other vulnerable groups) to be resilient; Relations = Relationships (within household, value chain and market system) are working to give women equity in decision-making, share and control over assets, use of time; Structure = Structures that support women's greater visibility and power within households, value chain and market system.

6. *Social norms are 'root causes'* of injustice towards women, governance issues, environmental controls, political systems, others (during conflict/ war or after). Formal/informal rules about conflict governance influence market systems. Women's social informal roles limit their growth capacities.

Finally, CARE recommends that the following factors be included in resilience building strategies in the MENA region: *Advocacy, financial inclusion, risk and income sources diversification, entrepreneurial skills, social cohesion, role in delivering aid (more strengthening than disruptive role), governance (relationships and functions are commonly broken after shocks; they can easily become non-functioning, politicized or monopolized; understand who controls and benefits from what shifts, leading to more inequity), collectives (they have proven to be a strong approach in improving resilience (for vulnerable groups and other systems) because they tend to be more resilient socio-economic entities in the face of shocks), and private sector engagement (according to CARE UK, this is an area that requires more attention from aid organizations in the future).*

The ***City Resilience Index***[18], according to **OVE-ARUP,** is the first comprehensive, technically robust, globally applicable tool. It was developed after 3 years of extensive international research in order to assess (quantitatively and qualitatively) the current state of a city's resilience. It is based on a *4 Dimension resilience analysis*, measured through 156 questions on 52 indicators; it reflects a city's current performance (city resilience profile) on the 12 goals a resilient city should fulfill –it helps determine where the city has to get to in order to be more resilient. ARUP has tested the Index on 5 pilot cities/countries around the world (Chile, China, India, Tanzania, UK) and currently also has research cities. Its intended use is for city governments and their partners.

Rockefeller Foundation defines 'city resilience' by how 5 principal groups in a city (*individuals– communities – institutions – businesses – systems*) prepare, absorb, adapt and transform from the impacts of shocks and stresses, in three main areas: *physical, social and economic*.

Part of ARUP's evaluation is determining the political, demographic and governance context (plus others areas, if applicable).

Each of the *4 Dimensions* is measured on 3 elements:

1. *Dimension 1 – Health & Wellbeing (PEOPLE)*– 1. Minimal human vulnerability; 2. Diverse livelihoods & employment; 3. Effective safeguards to human health & life.
2. *Dimension 2 – Economy & Society (ORGANISATION)*– 1. Collective identity & community support; 2. Comprehensive security & rule of law; 3. Sustainable economy.
3. *Dimension 3 – Infrastructure & Ecosystems (PLACE)*– 1. Reduced exposure & fragility; 2. Effective provision of critical services; 3. Reliable mobility and communication.
4. *Dimension 4 – Leadership & Strategy (KNOWLEDGE)*– 1. Effective leadership & management; 2. Empowered stakeholders; 3. Integrated development planning.

Refer to the City Resilience Index's web page and a publication from Arup[19] *for more information on the Index.*

The ***100 Resilient Cities Challenge***[20] started on September 2013. The $100 million global commitment for action was announced by the Clinton Global Initiative, to be led by *The Rockefeller Foundation* with support by *Swiss Re, American Institute of Architects (AIA), Architecture for Humanity and Palintir*, with the objective of building *urban resilience* to face the future shocks and stresses particularly in the *physical, social and economic realms*. The reason for focusing on urban resilience (infrastructure) is that today's world population lives mostly in cities and by 2050 about 75% will be living in cities. Due to this population density, the shocks and stresses in cities have a greater impact; especially now with globalization being so ubiquitous.

The cities that have become part of the 100RC initiative were selected by a panel of experts based on their applications, which have been measured according to four key elements (having an engaged, committed and innovative mayor; having been hit recently by a catalyst for change; history of building partnerships and an ability to work with a wide range of stakeholders). The 100 cities were chosen in three different rounds, one per year (2013-2015), with groups of 30 plus cities per year. The initiative says they intend to go further than 100 cities in the future. In December 2015 they started the 10% *Resilience Pledge*, through which mayors of the 100RC promise to use 10% of the city's budget in resilience building programs and in exchange 100RC promises to give access to goods and services worth $5 million through the *Platform Partners* (not necessarily direct cash); so far 26 of the 100RC have signed pledge.

Through this platform, they help cities choose a Chief Resilient Officer (CRO), develop the city's resilience-building strategy and give financial and technical support through access to tools, resources for implementation (innovative finance and technology, infrastructure and land use, and community and social resilience). By being part of the 100RC initiative, cities have access to a multidisciplinary network where CROs and other stakeholders can all learn and share information, best practices, strategies, innovations, etc. through workshops and seminars that will help them by guiding their resilience building agendas. Specifically, they have access to practical risk management insight and tools, including CatNet (a state-of-the-art risk assessment tool), offered to the cities free of charge;

18 http://www.arup.com/city_resilience_index

19 publications.arup.com/~/media/.../160518_CRI%20total-Booklet-V3%20Print.ashx

20 http://www.100resilientcities.org/#/-_/

access to planning tools and planning experts through the Regional Resilient Design Studios formed by AIA and Architecture for Humanity. Additionally, the Rockefeller Foundation has made $100 billion in goods and services available for the 100RC.

The *City Resilience Framework* of the *100RC* builds upon OVE-ARUP's City *Resilience Index's 4 Dimensions: Leadership & Strategy, Health & Wellbeing, Economy & Society, and Infrastructure & Environment*.

They measure the elements of each dimension in terms of the following *7 Qualities:*

Flexible– willingness and ability to adopt alternative strategies in response to changing circumstances.

Redundant– spare capacity purposively created to accommodate disruption

Robust– well-conceived, constructed, and managed systems

Resourceful– recognizing alternative ways to use resources

Reflective– using past experience to inform future decisions

Inclusive– prioritize broad consultation to create a sense of shared ownership in decision making

I*ntegrated*– bring together a range of distinct systems and institutions

The ***Participatory Market Systems Development (PMSD)***[21] Approach developed by **Practical Action** is the result of 12 years of experience in the field. Its objective is to make markets more inclusive and reduce poverty on a large scale, while protecting the environment. It bases its work on 3 Core Principles: (1) Systems thinking; (2) Participation; and (3) Facilitation. The novelty of this approach lies in that it produces the solutions from within the system, by bringing together all key players (stakeholders) for them to collectively (visualize) identify the market system's *linkages, blockages and opportunities*, and working to build trust amongst them and a shared vision of change. Through the PMSD Approach, market players jointly create strategies and action plans in which they will coordinate and collaborate to effect market system changes.

21 Practical Action http://policy.practicalaction.org/policy-themes/markets/participatory-market-systems-development

Practical Action recognizes that "markets are complex systems that adapt to new information constantly" whose behavior cannot be predicted by looking at "individual people or parts"; relationships and interactions must be understood. Thus, a systems approach must be applied. Likewise, Practical Action believes in a participatory and collaborative approach for achieving systemic change. The participation of all the system's market actors (stakeholders) is a must, since "no single actor can determine how the system will change." Finally, development and humanitarian aid agencies must stay in their role of 'facilitators' by focusing on creating the right environment for market players to generate the change themselves, avoiding substituting market players in the system and always having an exit strategy. For Practical Action, "good facilitation is at the heart of sustainability". Facilitators are equipped with tools and techniques that aid collective strategic thinking and planning and that help stakeholders overcome any potential conflicts and risks. The PMSD Approach is done in a way that ensures the empowerment of market actors with the process, so that once the intervention comes to end they continue effecting market change without the need of facilitators.

The steps for applying the PMSD Approach are:

1. Market(s) selection based on the potential to reach the most in need, growth potential and opportunities to reduce poverty on a large scale.
2. Analysis of the selected market system by mapping it out; in order to gain a good understanding of the system, by identifying its problems, connections, market actors and how everything "fits together" (connections and market actors are studied in detail).
3. Facilitators start engaging key market players (private and public) –those who can really drive change– in order to incentivize them to attend participatory meetings (workshops) with the rest of the market chain players. At the same time, facilitators start working to empower the "marginalized actors" of the market chain so they are better able (and better prepared) to engage more powerful market players (and be on the same level playing field) during these participatory meetings and actually have influence over the change process. For example, facilitators provide these 'weaker' actors with the adequate knowledge and skills (i.e., improving their business language and market system comprehension).

The *Darfur Efficient Cookstove Project* in Energy, the Urban Wash *Sustainable Faecal Sludge Management System* in Faridpur Bangladesh and the honey sector *Christian Aid* Inclusive Markets Development *projects* are all examples of the effective use of Practical Action's PMSD Approach in effecting systemic change. (Refer to Practical Action's web page for specific details on these projects).

With regards to resilience, **Practical Action** has focused its efforts in the Disaster Risk Reduction (DRR) area. Practical Action believes in the mutually reinforcing relationship between natural disasters and development –"disasters impact development and development affects disasters"[22]– not just in developing countries but also poor communities of developed countries. For them, "resilience is only possible through the integration of disaster risk management and development aspirations" (Practical Action) and the engagement of communities.

The *"From Vulnerability to Resilience (V2R) Framework"* is a widely known tool developed (and pioneered) by Practical Action. It addresses the vulnerabilities of communities in four areas (exposure to hazards and stresses, fragile livelihoods, future uncertainty, and weak governance) in order to build their resilience toward natural and man-made hazards by empowering poor people, communities, private sector and local governments to take action. *(For more on the V2R Framework and its publications refer to Practical Action's web page*[23]*).*

Practical Action has partnered with the Zurich Insurance Group (in the Zurich Flood Resilience Alliance[24]) to build the resilience of communities prone to disasters, specifically towards floods since "foods globally account for more losses than all other natural hazards combined."[25]

22 Practical Action http://policy.practicalaction.org/policy-themes/disaster-risk-reduction/resilience

23 Practical Action http://policy.practicalaction.org/policy-themes/disaster-risk-reduction/resilience/resilience-in-practice

24 The Zurich Alliance is working on a framework for disaster risk reduction in urban areas, which intends to give users a better pre-disaster "situation analysis".

25 Practical Action http://policy.practicalaction.org/policy-themes/disaster-risk-reduction/resilience/measuring-resilience

To measure the resilience to floods Practical Action is in the process of developing a toolkit, which includes a methodology to test and empirically validate their framework and a technological tool to gather data, measure and assess resilience.

Through this *toolkit*, resilience will be measured through the 5 Capitals (human, social, physical, natural and financial) for poverty reduction from the Sustainable Livelihoods Framework (SLF) from the Department for International Development (DFID). Each capital will be measured through a specific "set of sources of resilience or sub-indicators" (totaling 88 indicators in all) by gathering information through surveys, key informants, interest groups, community discussions, and third party sources. Each of the 88 indicators will be graded on a 'A-D' scale (A: best practice, D: very poor practice) by trained assessors. Results will be viewed in different ways: (1) Through the 5 Capitals; (2) Through the "4 R's" (Robustness, Redundancy, Rapidity, Resourcefulness); (3) 10 Themes (Assets & Livelihoods, Education, Energy, Food, Governance, Life & Health, Natural Environment, Transport & Communication, Waste, Water); (4) 5 stages of the DRM Cycle (Coping, Corrective risk reduction, Crisis Preparedness, Prospective risk reduction, Reconstruction); and (5) Context (Enabling environment, community level). This toolkit is currently being piloted in 9 countries by 6 organizations; the pilot phase will continue until 2018.

It is also working in Bangladesh and Peru through an "action-research" method looking at the vulnerability and resilience of market systems in disaster-prone areas. Currently, Practical Action is using a mix of the PMSD approach and disaster risk reduction methodologies to design a new approach for analyzing the vulnerabilities of market systems in rural and urban areas prone to flooding. This new approach is called *Markets For DRR (M4DRR)* and its aim is to increase the resilience of these market systems in order to reduce (or avoid) the impact of natural disasters and climate risk by getting the private sector on board and having them invest in resilience building initiatives (in markets and value chains).

The ***PCMA (Pre-Crisis Market Analysis)***[26] guidance, previously PCMMA (2014), is a practical, step-by-step guide for analyzing markets in a pre-crisis (pre-emergency) state in order to anticipate how markets will respond to shocks.[27] From this analysis, better strategies to design preparedness, DRR programming and future emergency responses can be recommended. It is not a toolkit, rather it uses an adaptation of existing post-crisis market assessment tools and recommends their use to perform the analysis, these being (mainly) EMMA, Rapid Assessments of Markets (RAM), and potentially Market Assessment Guidance (MAG), Oxfam 48-hour tool, and WFP trader survey. PCMA focuses on 'emergency setting' tools, and not on "longer-term approaches such as GEM (Gendered Enterprise and Markets), the M4P (Making Markets Work for the Poor) or the Client First! RMA (Rapid Market Appraisal)." Its use is not appropriate for slow-onset emergencies when the hazard is imminent. [28]

The focus to date in the development and humanitarian aid community has been on the analysis of markets post-crisis (post-emergency), and for PCMA, more effort and guidance is needed in pre-crisis market analysis; it must be present in *pre-emergency contingency planning, preparedness, disaster risk reduction (DRR) and early warning initiatives*. A greater awareness before, during, and after disasters strike is necessary in order to improve response mechanisms.

By analyzing the current state of the market and establishing a reference baseline from which to work on 'post-disaster' (PCMA does not cover post-shock market analysis if there is no baseline), agencies will be able to improve their responses to emergencies (more timely and effectively), protect critical livelihoods (by intervening earlier), and reduce the impact of shocks received by markets; all of which clearly make a contribution to resilience building in markets (even though this may not be PCMA's stated core objective). PCMA aims to address the latter.

PCMA also supports the design of market based programming by covering all types of engagement with the market system, from relief interventions to the strengthening of local market systems. It covers existing market systems, where people get their income from ("income market systems", as named by PCMA) or where they spend their money at ("expenditure market systems") and not new market opportunities.[29]

PCMA identifies which are the critical market systems, what are their capacities and constraints to face future shocks, and determines how to mitigate upcoming crisis in the market system by improving preparedness, contingency planning and better response options (to keep the access to basic services and livelihoods in place when facing crises). According to PCMA: "This can begin to address the long term or 'chronic' nature of vulnerability and poverty in some areas"; which is basically resilience building. (*Refer to www.emma-toolkit.org for further detail on the PCMA guidance*)

The aforementioned guides, frameworks and/or tools were reviewed and analyzed before developing the *R4S Approach*. Certain elements were adopted and/or adapted by *R4S* (especially for the selection and definition of the proposed *6 Determinant Factors of Resilience* used to measure the resilience of a socio-economic system) – these have been referenced in the Guide.

26 http://www.emma-toolkit.org/sites/default/files/bundle/PMCA_FINAL_WEB.pdf

27 http://www.cashlearning.org/news-and-events/news-and-events/post/158-pre-crisis-market-mapping-and-%20analysis-pcmma-guidance-document-now-available

28 http://www.emma-toolkit.org/sites/default/files/bundle/PMCA_FINAL_WEB.pdf

29 http://www.emma-toolkit.org/sites/default/files/bundle/PMCA_FINAL_WEB.pdf