Manual for Application of the

MOTA framework

A tool to analyse

implementation feasibility

Manual for Application of the

MOTA framework

A tool to analyse implementation feasibility

Nguyen Hong Quan[1]

Juan David Patiño Guerra[2]

Dorien Korbee[2]

Pham Dang Manh Hong Luan[1]

Tran Duc Dung[1]

Do Quang Hung[3]

Ho Huu Loc[4]

Leon Hermans[2, 5]

[1] Center of Water management and Climate Change, Institute for Environment and Resources, Vietnam National University – Ho Chi Minh city, Vietnam

[2] Delft University of Technology, the Netherlands

[3] University of Transport Technology, Vietnam

[4] Nanyang Environment and Water Resource Institute, Nanyang Technological University, Singapor

[5] IHE Delft Institute for Water Education, the Netherlands

Foreword

The Manual came to reality from all these actors continuously asking why do some big plans are adopted by society and others not? Why some plans are more "useful" for local people than others? And more concretely, how to identify that? The first hints came from the identification that not everybody has the same concepts of what is - for instance - economic development, a successful project or an adequate solution. The identification of these disparities was a common denominator in many nation-wide projects in these three countries. It was however from the joint effort from researchers from WACC, CEGIS, TU Delft, IHE Delft and Wageningen University from the Netherlands, that a first paper (Phi, Hermans, Douven, Van Halsema, & Khan, 2015) came out explaining the MOTA framework as an assessment tool for policy plan comparisons from a multi-stakeholder perspective.

The team behind this *Manual for Application of the MOTA framework* consists of professionals from different areas of expertise in different countries. The Center of Water Management and Climate Change (WACC) from Vietnam National University, engineers and agricultural scientists from Delft University of Technology, IHE-Delft Institute for Water Education, Wageningen University from the Netherlands and the team of the Center for Environmental and Geographic Information Services (CEGIS) from Bangladesh. Their challenges vary from backgrounds, however these variety helped to create and propose the tool here presented.

After this first MOTA framework exposure, other projects started using the methodology to assess the adoptability and implementability of various policy plans in Vietnam. These results were insightful for decision makers of government and multilateral institutions who wanted to know more about the methodology and how to implement it different projects. Here was where the idea of developing a Manual started. The MOTA Manual developed here aims to offer new perspectives for decision makers on how to measure social variables critical for successful plan implementation. This implied translating from academic terminology useful concepts to measure how could plans be implemented among different stakeholders, and therefore making a manual useful for professionals on the field who want to bring clear information from the ground to decision makers and investors. This document will explain on detail the MOTA framework, practical elements on how to use it, when and how to produce insightful information from stakeholders for plan or policies implementation.

Wim Douven

Project leader "*Strengthening strategic delta planning processes in Bangladesh, the Netherlands, Vietnam and beyond*"

Acknowledgement

Executive Summary

Assessment of plans and projects has usually been carried out with the use of a variety of decision support techniques, where Multi-Criteria Analysis (MCA) and Cost Benefit Analysis (CBA) are two well-known analytical tools that are used to support the evaluation decision (Kompas and Liu, 2013). Recently, Robust Decision Making (RDM) has contributed with the identification of robust strategies, identifying vulnerabilities and trade-offs required. Also, when environmental impacts must be considered, Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) are common tools used.

The dimensions that are usually measured in a project are focused on performance indicators, like MCA or CBA propose, such as number of houses built, number of people benefited, percent of population working or money saved by protecting against floods.

Although these elements are valid and required, they are certainly not enough to define if a project will be actually adopted by local people and implemented by the institutions, especially when such projects required institutional regulations and enforcement at local levels. Here is where MOTA comes in.

The Motivation and Ability (MOTA) framework takes a multi-stakeholder and multilevel approach to assess and compare projects and plans, centering on the integrated relationship between "Trigger-Motivation-Ability". The outcomes are then conveyed through a combination of motivation and ability of multiple stakeholders, at different co-existing levels in the implementation process (Figure I).
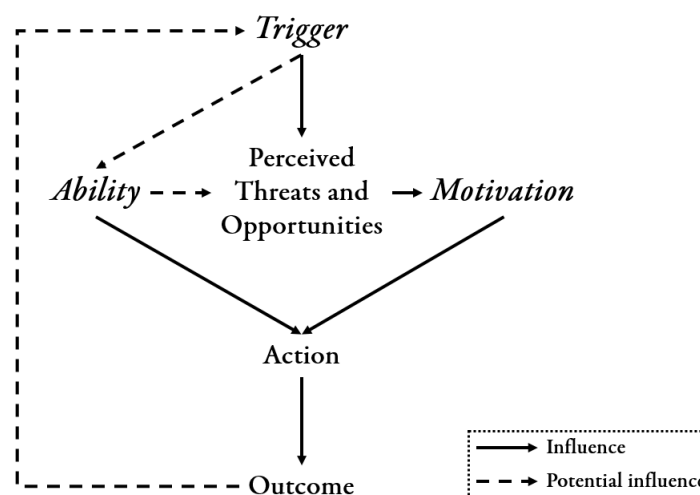

Figure I. MOTA framework: from trigger to action, adapted from (Phi et al., 2015)

This framework recognizes that the influence of a trigger on a motivation is shaped by one's perception of threats and opportunities, or subjective assessment of that trigger, which may be either positive or negative and range in intensity from weak to strong. In other words, a specific

trigger may be perceived as a threat, as neutral, or as an opportunity. And this is where stakeholders get (or not) involved by the execution of a project.

The Manual for Application of the MOTA framework aims to develop a step by step methodology which can be applied by practitioners to evaluate implementation feasibility of plans, projects, alternative strategies from the perspectives of different actors. One of the relevant aspects of the MOTA tool is that, through surveys, can offer quantitative indicators to the motivations and abilities of different actors. This quantification is useful to visualize whether a stakeholder is lacking behind in motivations and/or abilities towards a specific plan (see the following Figure II). Based on this, suitable capacity and consent building strategies can be developed for various stakeholders.
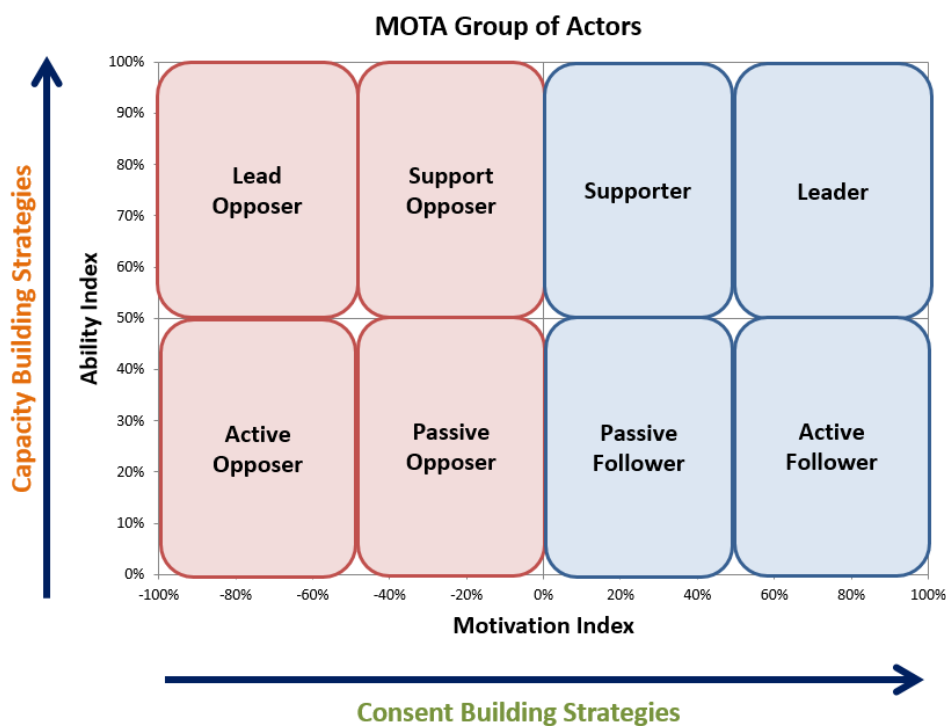
Figure II. MOTA scores mapping

Identifying the degree in which specific motivations and abilities associate the stakeholders as – for example – leaders or opposers, is useful to identify then the strategies to follow in order to make such change in behaviour happen. More specifically, as capacity and consent building strategies.

Depending on the type of actors, the MOTA can be operationalised as Social Adoptability MOTA or Governmental Implementability MOTA.

The following are the steps for implementing the MOTA framework:

1. ***Problem definition of when to use MOTA***. Why use MOTA? In which situations? An adequate preliminary research should be done here to identify the key elements where MOTA can contribute i.e. evaluate implementation feasibility of plans, projects, alternative strategies.

2. ***Specifying the relevant MOTA elements***. Here we will translate the challenges found in the previous step into specific relations with *Motivations*, *Abilities* and *Triggers*.

3. ***Survey preparation***. How will be the MOTA components measured? By surveys (namely Questionnaires and Interviews). Here we will see how to translate the MOTA attributes into questions.

4. ***Survey implementation***. This step presents the fundamental advices for an adequate survey implementation.

5. ***Data processing and analysis***. Once data is gathered, what to do with it? How to process it? This step presents the main tools used: MOTA scoring and (multi-variable) statistical analyses.

6. ***Synthesis and recommendations***. How to translate the findings into useful information for planners and decision makers? Here are some tips on how to translate this information.

To finalize, the MOTA Manual presents 2 cases which used the MOTA framework, and followed the explanation step by step. They are respectively "Farmers adoptability in agriculture transformation" (Social Adoptability MOTA) and "Implementation (strategic) delta plan at local government level" (Governmental Implementability MOTA).

Table of Content

Introduction, Origins and Novelty of MOTA

6

I.   Introduction

A crucial challenge in resource and environmental planning, where multiple stakeholders are involved, is the successful implementation of plans and policies. Plan implementation is a complex task since it is influenced by multiple interests of various stakeholders, such as residents, experts (individuals, universities/institute…), managers (ministry, municipality/councilors) or NGOs. Each one of these stakeholders is a group of people who share a common interest and perspective in a particular issue. A disparity gap between plan objectives and its outcomes will arise when planners and policy makers do not understand the difficulty of coordinating the large number of competing interests and diverse stakeholders involved during plan implementation.

To address this challenge, collaborative approaches have been used to help implementation of environmental plans and policies. There are two 'usual' approaches to address this issue, which are top-down and bottom-up. The top-down approach assumes experts (or elites) to provide directives for implementation, sometimes omitting the important details on the ground required for implementation. On the other hand, the bottom-up approach aims to include the modifications and mediations to address interests of the stakeholders on the ground. In this perspective, the MOTA framework (Phi et al., 2015) is developed as a tool that helps revealing and assessing potential bottom-up plan implementation, as well as to identify key criteria for implementation success. It helps to identify differences between an expected outcome of a plan and the potential outcome resulted from the collective actions of stakeholders. The framework focuses on the relationship between three key components: Motivation, Ability and Trigger, and goes beyond by considering the influences of triggers on motivations through perceptions.

The MOTA framework has successfully been applied to assess plan implementation maturity of flood management in Ho Chi Minh City, Vietnam (Phi et al., 2015), as tool to assess transformation potential of farming practices in Mekong delta, as well as in other cases that will be presented throughout this document. It is expected that the MOTA framework can be applied throughout different levels of decision-making situations, e.g. ranging from farmers and citizens' preferences about livelihood adaptation, to local and national authorities' choices in the delivery of (strategic) plans.

Though its success as a tool for assessment, the knowledge on theoretical foundations and practical guidelines to apply the MOTA framework in evaluating plan implementation is not condensed in one document. We developed a manual that to assist researchers, planners and implementing agencies interested in applying the MOTA framework. In providing this manual, we cater to a request expressed by participants of the MOTA framework training workshop in Ho Chi Minh City (May 2018).

This manual aims also to disseminate the MOTA framework as an efficient tool across the academic and practitioner communities in Vietnam and other countries, intended to become a tool for various audiences to apply in both scientific study and real case application (e.g. agriculture development projects, nationwide projects implementation, etc.).

The objectives of the manual are;

1. To provide a practical guideline for using the MOTA framework in comparing and assessing plans, as well as to consolidate the theoretical background of MOTA;

2. To contribute to the development of novel methods to inform communities and decision makers in better understanding the purposes of a plan;

3. To propagate the MOTA framework, and lastly, to provide a tool for education and training purpose (e.g. short course or part of master subjects such as water governance)

The structure of this Manual is as follows. In the chapters II and III, we present the origins an novelty of MOTA. Hereafter, in chapter IV, the MOTA framework is explained in detail. Chapter V presents the steps for applying MOTA as a plan comparison's tool. Finally, chapter VI presents some real cases explaining the full method.

II.   Origins of MOTA and relevant concepts

Where did MOTA come from, you may ask yourself? It started with the always challenging question of: *why are plans partially implemented or not implemented at all?* It turned out that project plans and technical aspects were well developed. The problem of non-implementation was rather a matter of non-adoptability by the local community/farmers/citizens. To understand this better, social science insight were brought in that could explain what happened..

The definition of public plans or policy implementation is naturally shaped by the interplay between efforts of several actors with different goals, interests and resources, such as residents, experts (individuals, corporations, universities, institutes), managers (ministries, municipalities, councilors), implementing agencies, NGOs, etc. Including the correct actors in the decision making process is a crucial element in the successful implementation of any measure. If the interests of the different stakeholders are not taken into account, the plan has a high chance of being attacked by them (Walker, 2001). Thus, it is of great importance that plan comparisons provide insights about the range of actors involved, power and networks. This insight can support assessment of plan implementation in various ways.

The application of behavioral and social science theory has gained great attention recently from academics and practitioners to enhance the quality of decision making, and to provide better understanding of involved actors in plan implementation. Several models have been developed and empirically tested in an extensive way to explain and predict actors' intentions and behaviors, including Ajzen's theory of planned behaviors (Ajzen, 2002), Fogg's model (Fogg, 2009), and the Motivation-Opportunity-Abilities (MOA) model (Rothschild, 1999).

According to the theory of planned behavior (TPB) from Ajzen, a behavioral intention is guided by three kinds of considerations: the attitude (beliefs about the consequences of the behavior), subjective norm or social pressure (beliefs about the normative expectations of others), and perception of behavioral control (beliefs about the presence of factors that may facilitate performance of the behavior). The combination of these three factors lead to the formation of a behavioral intention.

Fogg's model, in a similar way, looks at three elements including motivation, ability and trigger for understanding behavior change. These elements control whether a behavior or action is performed. Each of the three elements have their own subcomponents. Motivation estimates the general desire or willingness of an actor to perform an action, which can be internal or external. The three core motivators are pleasure/pain, hope/fear and social acceptance/rejection. Ability (i.e., simplicity or ease of use) means how difficult it is for the actor to take action. Fogg's model indicates six subcomponents including time, money, physical effort, brain cycles (cognitive effort), social deviance (opposing norms and rules of society), and non-routine (novelty). If a behavior requires more abilities, it will be more difficult for the actor to change it. A trigger relates to the spark required change a behavior, and what should happen when a person has both enough ability and motivation to change the behavior. A trigger can be any type of reminder, call to action, or cue that prompts an actor to perform the action. These three elements must occur simultaneously for any action to happen.

9

The MOA from Rothschild proposes that motivation, opportunity, and ability are fundamental determinants in the performance of an individual or an organization. The MOA can be used as a tool to analyze community engagement in a plan. Motivation is an integral element of the MOA framework. However, the motivation may not lead to an action if there are inconvenient factor such as low opportunity. Opportunity can restrict the behavior/action of stakeholders. Insufficient ability, including the knowledge and skills needed to perform a specific task, can also have a negative influence on action.

From the previous elements, a multi-actor approach has been proposed as an analytical Motivations and Abilities (MOTA) framework by (Phi et al., 2015) to better understand the collaborative structure and complex interaction among planners, managers and users. Consequently, the MOTA tool helps to identify in more detail the differences between an expected outcome of a plan and a potential outcome resulted from the collective actions of stakeholders. In principle, the framework focuses on the integrated relationship between three key factors (Motivation, Ability, and Trigger) of multiple stakeholders at different levels, which co-exist in the implementation process.

III. The novelty of MOTA

What is then so special from MOTA? Is it useful to have another framework to assess project implementation? What is the comparative advantage of MOTA over other frameworks? This section will explore what MOTA can offer to practitioners and researchers that aim to compare plans and strategies.

Assessment of plans and projects has usually been carried out with the use of a variety of decision support techniques, where Multi-Criteria Analysis (MCA) and Cost Benefit Analysis (CBA) are two well-known analytical tools that are used to support the evaluation decision (Kompas and Liu, 2013). Recently, Robust Decision Making (RDM) has contributed with the identification of robust strategies, identifying vulnerabilities and tradeoffs required. Also, when environmental impacts must be considered, Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) are common tools used (Alshuwaikhat, 2005; Glasson & Therivel, 2013).

MCA is a method that evaluates different options against multiple objectives or criteria. The criteria are ranked (or weighted) in terms of their relevant importance. Each decision option is scored against each criterion, this score is summarized in a table. The goal of MCA is to provide information to decision makers by assessing that whether the plan achieves the stated objectives. The main merit of MCA is that it provides a method of taking account of non-monetary impacts. However, MCA has no built-in standard of value, meaning that the outcomes of the analysis depend on the weights allocated to the criteria by the researchers (Sugden, 2007).

Cost Benefit Analysis (CBA) is the most common evaluation technique for assessing infrastructural plans nowadays (Beria, Maltese, & Mariotti, 2012). CBA assesses different plans against a single criterion: "net benefit." Money is the only measure unit to translate all costs and benefits associated to a plan or a project. The strength of CBA is that it is based on well-understood theoretical foundations and a built-in standard for value (money). However, CBA only allows project objectives in which impacts can be measurable in monetary terms.

The dimensions that are usually measured in a project are focused on *performance* indicators, like MCA, CBA, RDM propose, such as number of houses built, number of people benefited, percent of population working or money saved by protecting against floods. Although these elements are valid and required, they are certainly not enough to define if a project will be actually *adopted* by local people and *implemented* by the institutions, especially when such projects required institutional regulations and enforcement at local levels. Here is where MOTA comes in, as seen in Figure 1 and 2.
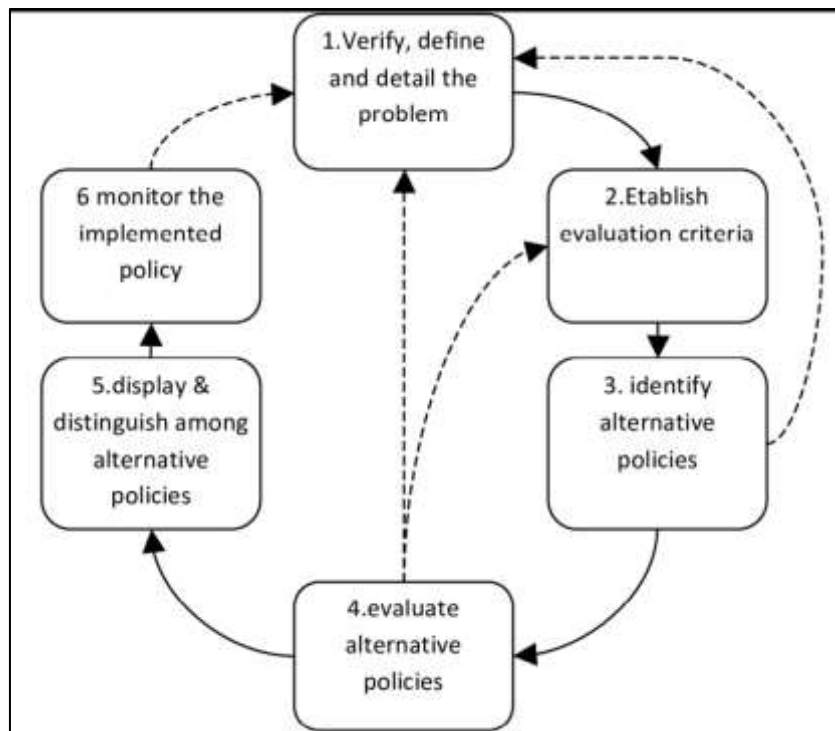
Figure 1. Policy Analysis Cycle (Patton & Sawicki, 1993). The focus of these planning initiatives (CBA, MCA and MOTA) is on the fourth step, the evaluation of alternatives of plans and policies.
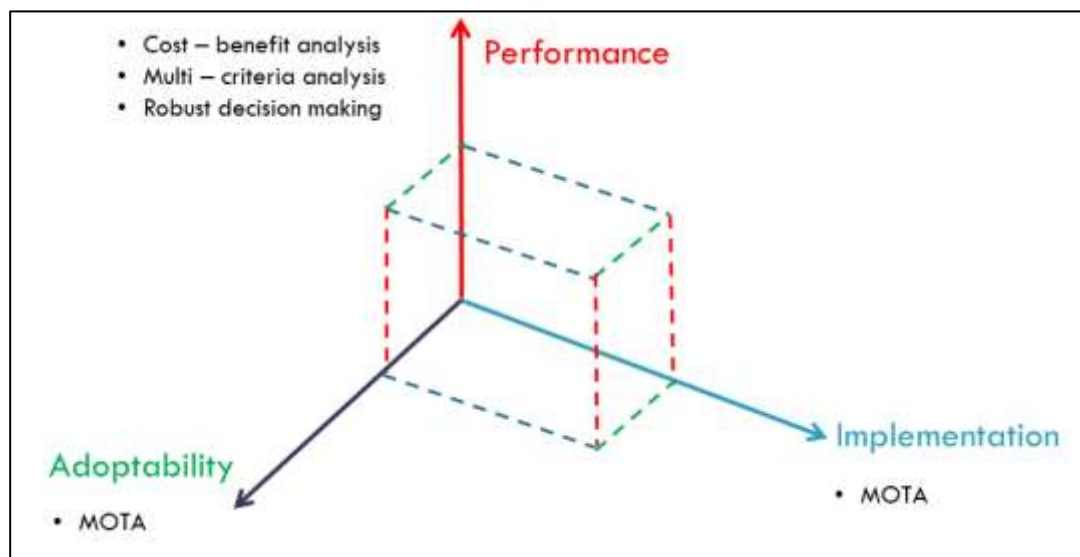
Figure 2. Dimension of plan evaluation.

From the figure, *Social Adoptability* (sometimes here called just adoptability) refers to the extent in which a project or plan is successfully *adopted* by the people directly influenced by the outcome of it. These are usually farmers, citizens, or group of actors who share a common affection by the execution of a project. On the other hand, *Governmental Implementability* (sometimes called just implementability) refers to the likelihood that different government and semi-public agencies will be able to support plan implementation.

What MOTA offers is a way in which these gaps in *adoptability* and *implementability* can be measured quantitatively, and offers a better overview of where the gaps are. Therefore, there are 2 kinds of MOTA tools: the *Social Adoptability* MOTA, which relates to how the people on the "ground" adopts to a project, like farmers, citizens, fishermen, etc. And the *Governmental Implementability* MOTA, which focuses on institutional actors that make implementation feasible, and who have some unique characteristics that distinguish them from the stakeholders on the ground. These features of MOTA are useful for exploring what can be done beyond monetary terms, to re-direct a plan, policy or project proposed.

In the following chapter we will present the details of the framework.

The MOTA framework explained

14

IV. MOTA framework

The Motivation and Ability (MOTA) framework takes a multi-stakeholder and multilevel approach to assess and compare projects and plans, centering on the integrated relationship between "Trigger-Motivation-Ability". The outcomes are then conveyed through a combination of motivation and ability of multiple stakeholders, at different co-existing levels in the implementation process (Nguyen et al., 2019) The MOTA approach is illustrated in Figure 3 with its main components.
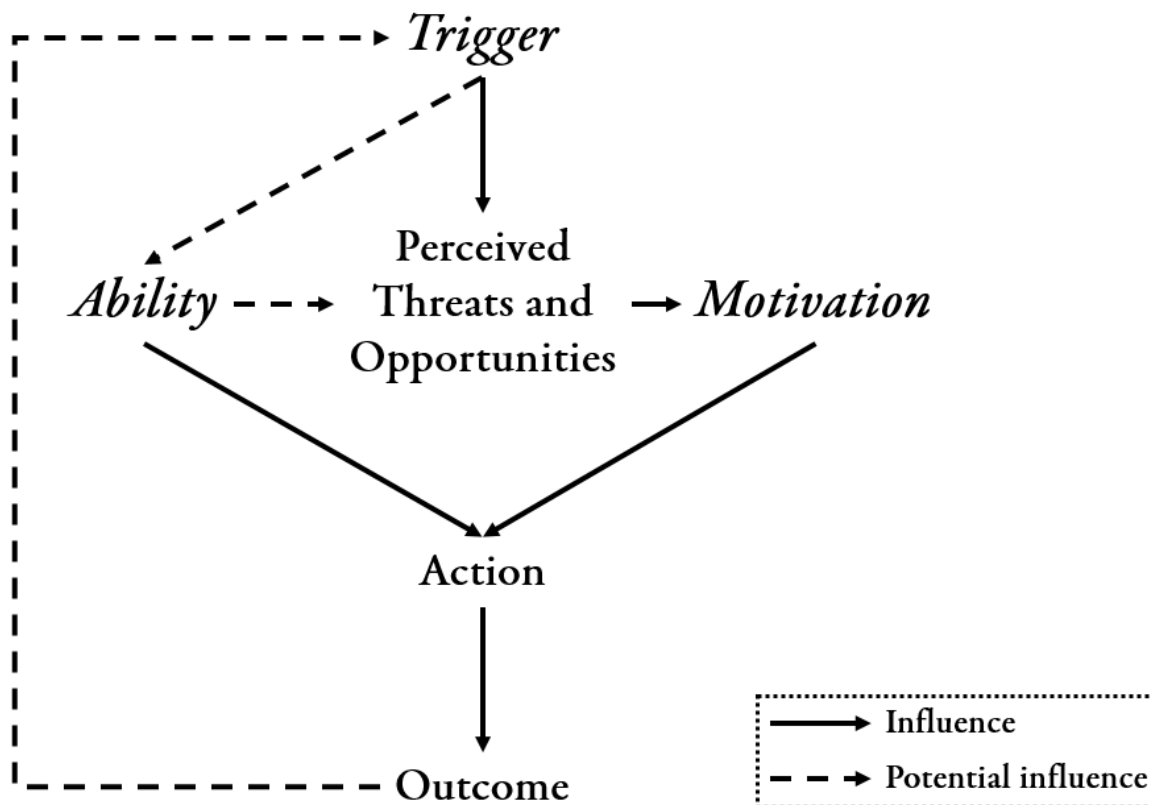
Figure 3. MOTA framework: from trigger to rational action, adapted from (Phi et al., 2015)

This framework recognizes that the influence of a *trigger* on a motivation is shaped by one's *perception of threats and opportunities,* or subjective assessment of that trigger, which may be either positive or negative and range in intensity from weak to strong. In other words, a specific trigger may be perceived as a threat, as neutral, or as an opportunity.

Next, actors' actions and decisions are influenced by their *motivation* and *ability*. What actors do is based on their perception of some causative factor (the trigger), their preference and level of commitment (motivation), and their capacity to act in a given manner (ability, whether technical, financial, or institutional). The framework thus focuses on the integrated relationship between these three key variables: Motivation, Ability, and Trigger.

One of the relevant aspects of the MOTA framework is that through surveys, can offer quantitative indicators to the motivations and abilities of different actors. This quantification is useful to visualize

(like in Figure 4) whether a stakeholder is lacking behind in motivations and/or abilities towards a specific plan.

MOTA Group of Actors
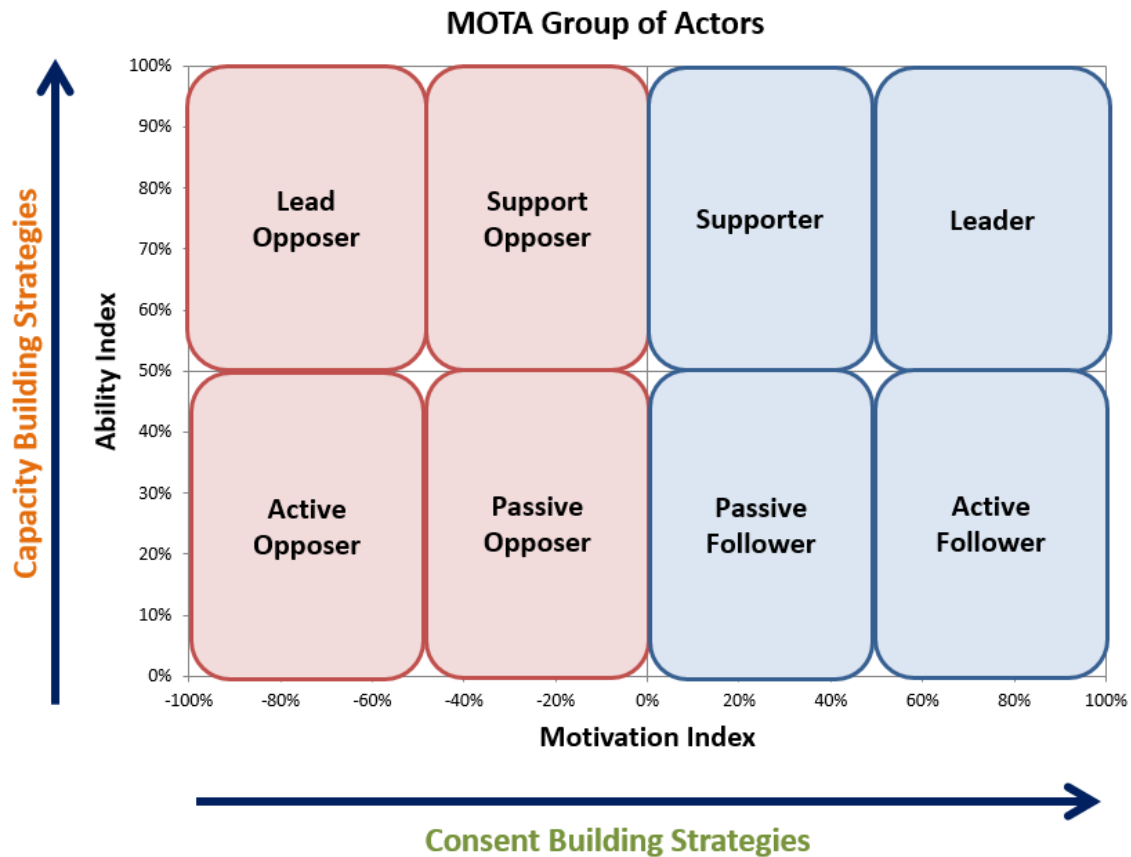
Figure 4. Type of actors according to MOTA classification.

Identifying the degree in which specific motivations and abilities associate the stakeholders as – for example – *leaders* or *opposers,* is useful to identify then the strategies to follow in order to make such change in behavior happen. More specifically, as capacity and consent building strategies.

Improving the abilities of the stakeholders in order to achieve certain required skills is known as *capacity building*. On the other hand, the improvement of motivation of stakeholders towards a specific plan can be determined as *consent building*. Through MOTA, these gaps can be identified and specific actions can be proposed to improve the motivations and abilities towards a plan. Figure 4 shows these axes as well.

Why is this MOTA important for the comparison of plans or strategies? As the Cost Benefit Analyses or Multi-Criteria Analyses tools do, MOTA aims to compare how a plan or a project could be adopted by relevant actors. This means that by defining a plan (understood here as a trigger), the chain of events on the Motivations and Abilities can be traced, to understand better how the actions and outcomes would be, in a quantified way, if they would be as expected by the project/plan owner aims, and what can be done from *capacity and consent building* to improve it.

In order to better understand what MOTA does and how it works, some clarifications will be made on the definitions used in the framework.

Definitions

Some key elements that MOTA uses are the concept of Trigger, Motivation and Ability. These concepts have different perspectives and have different uses depending on the context and the authors, however here we are using a concept that will help to use the MOTA framework in a wide range of applications of plan and project implementations with multiple stakeholders involvement.

Trigger: Triggers are events that cause actors to consider a change in behavior. Trigger events can occur suddenly or gradually. In planning terms, planners would hope that the establishment or announcement of a new plan is a trigger for action among the implementing agencies and different stakeholders. However, triggers can also be external events: new information presented to actors, new market trends or even natural events.

Perception: Is the impression that an actor has regarding a situation. In the context of MOTA, this perception is usually related to the effects of plans on their lives. These can be neutral, perception of a threat or an opportunity.

Motivation: In the context of MOTA, the motivation is a pre-condition for action, together with ability. In the public policy domain that involves this tool, the motivations can have two classifications, depending on what kind of actors are scrutinized. One group are the *"ground" stakeholders*, who are mainly the ones in the field regarding a specific plan. They are citizens, farmers, users, etc. The types of motivations in this group are their points of view on *threats* and *opportunities,* which are related to the *adoptability MOTA.*

The other type of actors are the institutional or governmental ones. These type of actors can be local authorities, department of agriculture, or Ministries. The motivations assigned to them are *perception of risk, perception of solutions* and *institutional mandates*. These motivations are used in the *implementability MOTA.*

Ability: This concept can be understood also as influence, capacity or power. This relates to all the requirements on money, time, physical or mental efforts that allow change to happen. In general, these abilities can be grouped in *Financial, Institutional, Social* and *Technological.*

Action: The concept of action here focuses on the result of motivation and ability in presence of a trigger. Under the frame of strategic planning, this is actions are expected to be *target behaviors* (Fogg, 2009) from different stakeholders regarding a plan*.*

Outcome: The outcome is the visible result of an action, which is not only noticeable by the actor itself but also by the other stakeholders around a plan. This "explicitness" of the outcome is considered to affect back and be an additional trigger that affects the whole behavioral change.

Problem owner: Most of the situations which MOTA analyzes (called problems also throughout the Manual), have usually a person or institution who is interested in solving or understanding better the conflict present. This actor is called here the problem owner.

With the MOTA framework clarified, the rest of this Manual presents the steps required to apply the MOTA framework for assessing plan implementation and adoptability.

Differentiation between motivations and abilities

As a rule of thumb, for the cases where it is not clear, a **motivation is some event or condition that encourages or pushes something to happen, whereas an ability is something the stakeholder must have (also as intangible) that allow or hinder things to happen.** For example, lack of money is a recurrent argument when exploring the motivations and abilities, but also the question arises whether the argument sometimes is a lack of financial ability or if it is a threat. In the case of a farmer that needs it to adequate her infrastructure, is a case of ability. However if the lack of financial opportunities is forcing people to move out of their land, seems more to fall into the threat (demotivation) part.

The MOTA steps

V.   Steps for MOTA implementation

This chapter contains the core elements of this manual: a step by step guide, on how to apply the MOTA framework. The general overview is presented in the following box.

MOTA Steps

1.   ***Problem definition of when to use MOTA***. Why use MOTA? In which situations? An adequate preliminary research should be done here to identify the key elements where MOTA can contribute.

2.   ***Specifying the relevant MOTA elements***. Here we will translate the challenges found in the previous step into specific relations with *Motivations*, *Abilities* and *Triggers*.

3.   ***Survey preparation***. How will be the MOTA components measured? By surveys (namely Questionnaires and Interviews). Here we will see how to translate the MOTA attributes into questions.

4.   ***Survey implementation***. This step presents the fundamental advices for an adequate survey implementation.

5.   ***Data processing and analysis***. Once data is gathered, what to do with it? How to process it? This step presents the main tools used: MOTA scoring and (multi-variable) statistical analyses.

6.   ***Synthesis and recommendations***. How to translate the findings into useful information for planners and decision makers? Here are some tips on how to translate this information.

---

(1) Definition of when to use MOTA

This first stage of the MOTA steps aims to clarify what the actual problem is, and from this, specify how the MOTA tool will be helpful to differentiate specific elements during the planning phase of a project. For doing this, the explicit questions to answer are:

- **Why would MOTA be `useful for analyzing this case?**

- **What is the (part of a) plan that will be the focus of MOTA?**

As mentioned before, MOTA helps to assess plan's strategies that are not considered by conventional cost –benefit analyses or technical measurements.

 The following sub-steps will help to narrow down this and offer answers to the questions mentioned above.

Steps: Definition of when to use MOTA

1.	Identification of background information

2.	Stakeholder identification

3.	Definition of spatial and temporal boundaries

4.	Final problem definition for using MOTA

---

a) Identifying background information

What is the aim of the MOTA tool? It is useful in situations where policy strategies are being compared regarding the stakeholders' motivations and abilities.

 Prior to developing the full MOTA tool, it is important to get an overview of the current situation and specify the focus of the plan(s) to assess (sometimes called here also problem definition).

To refine this focus, it is recommended to start with an open perspective on what the plan(s) aim to achieve and gather as much as information possible. Based on this information, you can identify important elements that should be taken into account while using the MOTA tool. Please keep in mind that the framework (and more specifically the survey in practice) will focus on the motivations and abilities of different stakeholders.

There are a number of ways that can help to identify the problems and focus areas, such as: **literature review**, **focus groups** and **consultation with experts**. One or more of these may be used to define the problem more precisely. See the boxes below to understand better each one of the tools and when to use them (Fink, 2003).

Review of literature

This should be the first step on any background search. Doing a literature review can be done on all reports (public or not) on a certain topic. By doing this in a systematic way, you can find whether there are gaps that need to be filled by using other tools.

Focus groups

This is a meeting with usually a maximum of 10 participants, where they can share their opinions and perspectives on a specific issue. The focus groups are moderated by a trained leader that guides the dynamics of the discussions.

When asking for information in this way, there may be limitations or control over what a group of people say, so it is advisable to additionally seek for other ways to find background information.

Consultation with experts

This way of identifying objectives is based on the opinions of knowledgeable people around the topic (academics, local leaders, government officials, etc.). They way of doing this can be by asking by email, phone or by setting up a panel to discuss the right objectives and problem definition. It is important to ask your respondent for other people that might be important and should be included.

When to use which? If possible, all of them, as they offer different actors' perspectives on a plan/strategy/alternative. At least, the literature review. Although all tools would be needed, *time* and *budget* will determine the suitable tools to select before jumping into doing the surveys.

During this process, is important to clarify the terminology and ambiguous terms that will be used with the stakeholders (as their terms around the same topic may vary) and how it is connected to the general terminology of the plan/strategy/alternatives (s). For instance, government officials may refer to a river or area by its technical name (e.g. Mekong river), yet it may have a different name for the people on the field in their daily life (e.g. the big river).

b) Stakeholder identification

In setting the challenges when evaluating plans, you might end up with different perceptions of **why** it is a problem (or not) according to **who** (the actors). For the application of MOTA it is key to identify and list these actors, as well as the level of involvement they have in the situation you aim to clarify. As the list grows, it is advised to do the following:

1.   Make an identification of the actors according to the role they fulfill in the plan. This may not be in individual terms (i.e. name of people), but on the role they have in the problem you are exploring, according to attributes they have. For example, you may find actors that belong to a group of "farmers" in general. However, depending on the level of analysis you define, you may classify them by their attributes further as "farmers near the road" or "farmers without proper access to the road". Similar sub-groups would apply with other variables such as demographics, money, etc.

2.   Document for each of the identified actors what you find about their interests, problems, conflicts and fears around the plans and in general (See Table 1).

These actors who have a vested interest are called *Stakeholders*. They are (groups of) people or organizations who can affect or be affected in the sequences of any action or policy taken. They can be individuals or organizations that share a common interest or perspective in a particular issue. The stakeholder identification scans all the stakeholders who have a specific concerns in the plan to be analyzed. The goal of the stakeholder identification is to establish the key actors related to the plan and assess their interests, positions and importance.

Once the stakeholders have been identified, a stakeholder analysis table can be created. The table should list all stakeholder groups and their characteristics, influences, importance, impacts and attitudes. Although the focus should be on the motivations and abilities, in this stage we want to gather as much as possible from their perception.

Stakeholders	Role	Position	Impact of the project on them	Influence on project execution	Perception
Farmers	Affected by national irrigation plan	Situated in the northern region of the province	High	Medium	Not enough government support to change production systems
					They produce what has been produced always
Department of agriculture	Execution agency of the plan	Depends on Ministry of Agriculture	High	High	Farmers have been receiving incentives since 2005
					The direction of the ministry is to develop the most market-favourable products
Local authority	Supervision of plan implementation	Depends on the provincial authority. Doesn't have influence in agricultural policies	Low	Low	The funds received are insufficient to help all the farmers to change. There have been some rumours of mismanagement.

Table 1. An example of stakeholder identification

A Stakeholder identification and analysis can be much more elaborate and a broad set of tools are available to use. However for the purpose of this Manual, we are limiting the elements to the ones mentioned in Table 1. For further exploration on which other approaches to use in the multi-actors aspect in planning and decision making, you can refer to the work of Hermans & Cunningham (2018).

c) Define temporal and spatial boundaries

Once the main actors and main challenges have been identified in the two previous steps, the first stage to narrow down the scope is to define **when** (time) and **where** (space) you want to focus in the

problem. By doing this, you will most probably sacrifice elements that you have considered as interesting or even important, yet it forces to focus on specific part of the problems, or even, in possible specific solutions that you may be interested to explore. It is always important to keep in mind that the focus of the MOTA tool is on the motivations and abilities of stakeholders on plan/strategy/alternative(s), so this will also help on directing the boundaries you define.

A practical tip for doing this is to identify and write down the timeframe in which you will be focusing on, usually the same time horizon of the plan under analysis, as well as the place that will be the area (region or space) of analysis of the case. By doing this, you will target fewer actors, but their relevance in the timeframe and space you are analyzing will be more precise. The following example can illustrate the previous point better.

By setting these boundaries you won't necessarily ensure that the problem will be meticulously defined, but it will increase the "resolution" of what you are looking at, helping to understand better your main interest and causal relations in your problem.

> **Example 1**. *In a project that aims to analyze the adoptability of building a bridge to connect two communities, you may had initially included as relevant stakeholders the potential users of the bridge from both communities, as well as the decision-makers from them. However, if you restrict the problem to the health effects on the people **while** this project is implemented, your focus groups will probably be the inhabitants near the bridge location (space), and the timeframe would be some years before and after the bridge is built (time). This allows to focus more on the concerns of this specific people in more dimensions within a narrower period of time.*

d) Final problem definition for using MOTA

With the previous filtering, you should have a more precise problem scope, constrained in time and space, with a set of defined actors that have a clear relation to the plan you are focusing on. The resulting list of actors should be sufficient enough (between 3 to 10) so the complexity of the problem still remains, and the contrasts that arise can be understandable. However, it should not too be broad either so the problem overview is unclear.

Now is when the applicability of MOTA is clearer: when there is a sufficient amount of identified actors affected by different strategies and interests, in specific time and space, so that the tool can bring applicable insights to decision makers in complex situations. If the number of actors doesn't reflect adequately the multiplicity of the problem, the scope can be adjusted by changing the space or time frame considered.

In this final step of the problem definition, to give clear answers to the first questions addressed, is important to filter again by asking the following: to **whom** would this be information useful? How would it be applied if motivations and abilities of these actors are identified? Is probable that in the previous steps this has already been partially answered, however is crucial to have it clear now, as this defines the specific objectives of using MOTA.

By asking who is interested in the motivations and abilities of the actors defined so far, you are indirectly asking what the specific objectives or even possible solutions are that a "problem owner"

wants to clarify. This brings up the following: the expectation around MOTA should be related to what it can offer. In the end, the insights of MOTA will be on Motivations, Abilities and Triggers, and thus, the final recommendations will be mainly on capacity and consent building strategies, according to what is found using the MOTA tool. Finding this information in this stage is a key to take fully advantage of MOTA in the later stage.

In this point should be clear what kind of approach will be used, if the *Social Adoptability* or the *Governmental implementability* MOTA, or both, according to the problem defined and the stakeholders to be surveyed in it. Both are often useful, yet the priority should be defined for one.

To recap, the answers to the questions posted at the beginning of this *problem definition* section would be:

3. **What is the (part of a) plan/strategy/alternative that will be the focus of MOTA?** The identification of background information and stakeholders gives a general overview of the problem to be analyzed. Once this is bounded in time and space, it will give the starting point to define where to focus in the complexity of the problem.

4. **Why would MOTA be useful for analyzing this case?** Once the problem is identified and bounded, the motivations, abilities and triggers of different actors around it should be identified, discriminating why they are mentioned by actor *X* or *Y*. Matching how the problem relates to the motivations, abilities and triggers is the way to identify the objectives of using the MOTA tool.

In general, the tool reflects on the **Capacity** and **Consent building strategies**, as shown in figure 4 and which will be further explored in step 6. This comes from the understanding of the Motivations and Abilities read from the actors on the field.

As a final remark, it is necessary to mention that the process of problem and objectives definition is not a linear one, and may actually require iterations to fully comprehend the dimension of the problem to be explored, or to match it adequately with MOTA.

(2)   Specifying the relevant MOTA elements

This first part of developing the MOTA framework focuses on exploring the topics/questions to be asked in the surveys, mainly around the *Triggers*, *Motivations* and *Abilities*. As these are very varied and context specific, there are no fixed set of questions that can measure these variables straightforward. They have to be built for each case. There are, however, some ways to start getting such information and build those questions, which we will explore here: first the triggers, then the motivations and the abilities. These will be explained for both *Social Adoptability MOTA* and *Governmental Implementability MOTA.* This is the structure of the section:

Identifying the MOTA attributes

1.   Definition of current and potential triggers

2.   Definition of expected motivations

3.   Definition of possible Financial, Institutional, Social and Technological abilities

---

In this section, we will discuss how to identify 1) triggers, 2) motivations, and 3) abilities (see figure 5). The component *perceived threats and opportunnities* will be "understood" as part of the *motivations*.
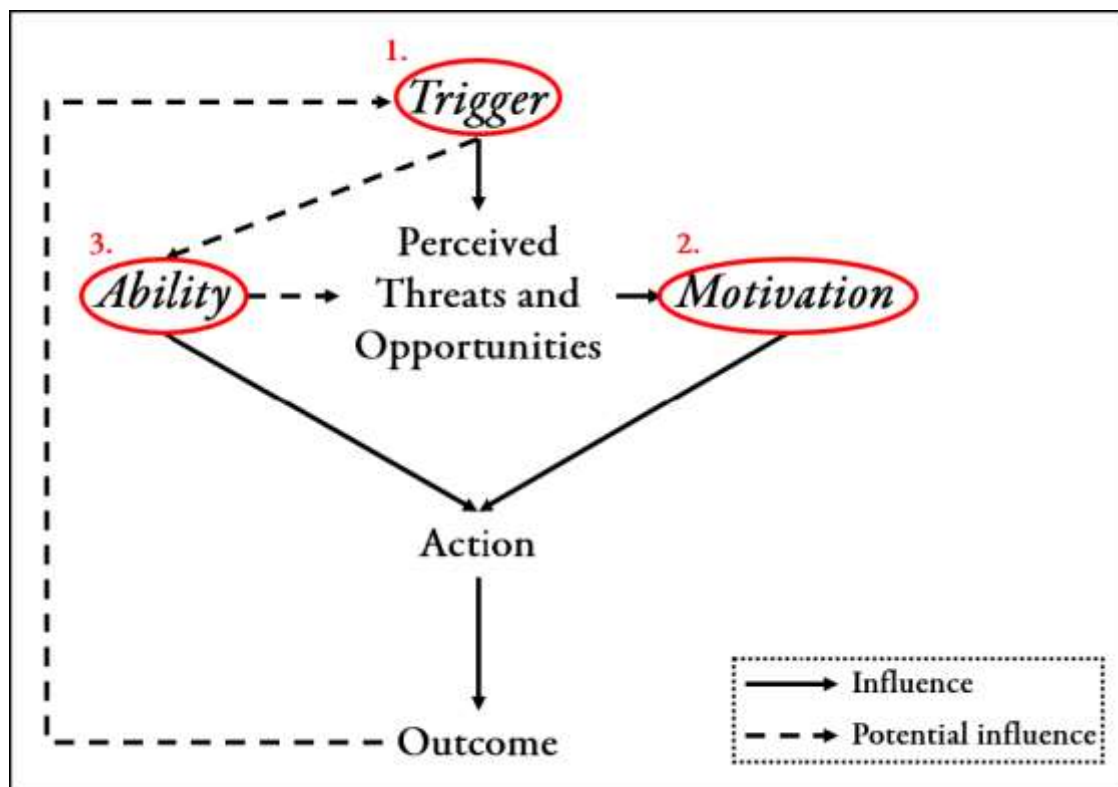

Figure 5. What to focus when applying the MOTA tool?

a) Definition of current and potential triggers

The triggers, as said in the Definitions section, is considered to be any external factor that "promotes" the action. As it names shows, is a spark, a provocation that encourages a change through the *perception of motivations* and the existing *abilities.* In the specific case of plans and strategies comparisons by MOTA, such plans are considered to be the triggers of different stakeholders, among many others. The objective here is to see what the effects would be of the triggers provided by the *plan/strategy/alternatives (s)* being analyzed*.* However, also other important triggers of the context from the stakeholders should be addressed here.

The following items present some factors that can be considered as triggers:

(i). Release of a new national agricultural plan. (Trigger of specific interest)
(ii). An extreme natural phenomenon such as a flood/drought event. (Contextual trigger of a natural event)
(iii). Increased migration into one region. (Contextual trigger of population pressure)
(iv). Sudden variations of prices of agricultural products. (Contextual trigger of market behavior)

The definition of triggers goes first as it would give the basic units of structure to understand the current and potential behavior of the different stakeholders involved. It helps defining a context to identify a story from the motivations and abilities.

The idea is to get all the relevant triggers, including, market developments, social, environmental, etc. which may have an effect on the expected actions of the stakeholders.

b) Definition of expected motivations

Depending on the type of actors that are the aim of the interview, sometimes the motivations can still be grouped more concisely than threats and opportunities. As explained in the MOTA framework section, the motivations can be classified as the perceived **threats** and **opportunities** of the stakeholders towards something in the future, in this case, towards changes that a plan or strategy proposes. The following are examples that be considered a threat or an opportunity perceived from a plan for using in the *Social Adoptability MOTA*:

Threats for environment & livelihood:

(i). Life threat: Such as health affectation or security threat
(ii). Stability threat: Challenges status quo and are elements that affect the stakeholder's perception of stability. For instance, a sudden increase in price of products or services (e.g. energy price), forcing an actor to change his buying patterns to adjust to this.
(iii). Environmental threat: Changes that are perceived as threat in the environment, for instance more pollution or affecting the vegetation.

27

Opportunities:

In the same line as the threats, the opportunities have the same elements but inversed:

(i).   Life improvement opportunity: Improvement of the lifestyle or health conditions due to a plan.

(ii).   Stability opportunities: When a specific plan offers stability to a volatile environment. For instance, the construction of a bridge between two communities helps to create a more stable, constant and safer way of commuting.

(iii).   Environmental opportunities: When a strategy being evaluated offers opportunities *perceived* as environmentally beneficial for the stakeholders. For instance, the implementation of a project that delimits environmental boundaries for constructing.

To identify opportunities and threats, is filtering threats and opportunities mentioned in the stakeholder identification.

In case the analysis focuses on institutional or governmental aspects, hence the *Governmental Implementability* MOTA, a third aspect can be added; perception of institutional mandates:

Perceptions of threats: When there is an explicit presence of risk perceived, either in an institutional level or for the people that the institution is representing. E.g. a project that puts in risk of flood a province, as perceived by the local department of infrastructure. Also, there is often a strong focus on political threats (unpopularity with certain decisions) or by media (negative attention).

Perceptions of opportunities (solutions): When there are solutions perceived as opportunities for the institutions themselves or for the people they represent against a particular problem. E.g. a project improves irrigation infrastructure in a municipality, as perceived by the department of Agriculture. At the same time, there is a focus on the political or media opportunity (improving public image).

Perception of the institutional mandates: When there is a balance (or misbalance) between a situation and the mandates from the government. It refers to the level of "alignment" between what is to be done with what will be done. E.g. an initiative that improves the agricultural productivity by farming fruits in a region, but goes against the main mandate of "rice region" stated by the national government. Here the perception is of misbalance.

Examples 2 and 3 explain the differentiation between different type of motivations, and triggers around it.

Example 2 (threats and opportunities).

A group of organizations who currently have access to safe drinking water are told that a national government's project to renew the aqueduct system of the city will enhance the number of people who have access to this resource, with a lower cost of water use in the future for everyone. However, to do this, the local implementing agency (actor A) will have to cut the regular supply of water during some weeks in an area with hospitals (actor B) and industries (actor C), who rely heavily on this resource. The local authorities say that there would be intermittent availability of water for some weeks until the construction is completed. To see the adoptability of the measure, a focus group discussion was carried out with different participants from stakeholders A, B and C to gather their opinions about the project.

These were some of the arguments mentioned by actor C, the hospitals representatives:

1. *The hospital doesn't have the infrastructure now to withstand a water shortage or interruption. The amount of patients they handle is too high to create unsafe conditions for them (**threat** perceived).*

2. *They say that the price of water doesn't them affect much, as within a relatively broad range of water price, they would anyway for it (**no opportunity** perceived by them).*

Also the industries (actor B) representatives mentioned the following around their motivations:

3. *The industries have a collective reservoir of water for the production plants that can withstand under regular production for a month, so it should be enough to handle the shortage (**no major threat**).*

4. *The water consumption is critical for their production costs, as they use it for cooling purposes at their current scale, so they would be happy to make the change (**opportunity** perceived from the project proposed)*

Example 3 (threats, solutions and mandates). Following the previous example about water shortage, the local authority (actor A) was asked about the motivations around the implementation of this project. They mention that:

5. *A big part of the citizens are having water shortages, which has caused some manifestations against the industries (**trigger**) present in the city using the same resources. (**threats** perceived)*

6. *There has been a regional plan of water coverage for long ago with plan of action (**solution** acknowledged there) , however this is not part of the major's agenda (**mandates** are not clear enough).*

Now is important to keep the elements that fall under the motivations part selected. The next step will present how to include them as questions for the survey.

29

c) Abilities: Financial, Institutional, Social and Technological

As explained also in the *MOTA framework* section, abilities can be classified as *financial*, *institutional*, *social* and *technological*. This set of competences describe the capacities that the actors would need towards certain plan or strategy proposed. The classification of the information in the abilities part is done in the following way: taking the data gathered from the background information and, if required, going to tools such as focus group discussions to filter or enhance. Although apparently clear, is important to explain the elements of each one of the abilities proposed:

Financial ability: Indicates the amount of financial support or services available to undertake a selected strategy or plan, such as; *Money as cash or savings* in a bank and; *Availability of loans* from institutions or people. This applies for both *Adoptability* and *Implementability MOTA*s.

Institutional ability: Refers to the degree in which support is present from the formal institutions to follow a strategy that is being evaluated and also includes non-official institutions. The following factors can fall into the concept of institutional ability, yet it is not limited to them. For *Social Adoptability MOTA*:

1. Access to established institutions. E.g. the level of accessibility by citizens to the health agency of a city.

2. Access to regulations in place. E.g. If citizens are eligible to receive an unemployment subsidy, how easy is for them to know about it and access it?

3. Additional (local) informal institutions. E.g. The presence and involvement of Civil Society Organizations.

For *Governmental Implementability MOTA*, the following are some relevant factors:

4. Support for the execution of the plan from the local government (means that they are aware and support the execution of the plan, e.g. city or town mayor, governor of a province).

5. Support from specific authorities (e.g. Department of Agriculture, Department of City Planning, etc.) that are part of the plan implementation

6. Support from external agencies that have influence in bigger institutions, e.g. NGOs or foundations interested in the problem.

7. Support from local non-formal local associations. E.g. group of farmers who meet every month to share common problems and solutions.

Technological ability: This component is related to the level of knowledge and technological equipment available to develop the strategy that is being evaluated. These apply for both *Social Adoptability* and *Governmental Implementability MOTA*s. The following can be considered as technological abilities:

1. Physical infrastructure to undertake a plan (i.e. irrigation infrastructure, roads that allow access to markets)

2.   Natural conditions that allow the execution of a plan (i.e. land and weather suitability)

3.   Specific knowledge to execute a project (i.e. capacitation on operation of a specific equipment, knowledge on adequate agricultural practices and products that can be developed)

Example 4 describes a case in which the elements of abilities are described, and will be also used in the explanation of the motivations.

Example 4 (Financial, Institutional and Technological Abilities). Following the previous example of water shortage, the following were some of the arguments stated by the <u>local implementing agency</u>:

> 1.   *The regional government has never mentioned this in the regional development plan explicitly or reached us about it (lack of **institutional** support)*
> 2.   *The budget for this kind of initiatives should be there, there is a fund for healthcare development where money could be taken from (**financial** argument)*
> 3.   *There are people who wouldn't support the change, as they rely heavily on continuous supply of water for their businesses (**motivation** argument)*
> 4.   *In order to do this, we would have to bring a specialized team from the capital city to open up the streets and enhance the capacity (the argument is **technological**, however not clear whether it is lacking or not)*

The following were some of the arguments stated by the <u>industry</u> representatives:
> 5.   *The local government has not told us about this before, are there guarantees that this will be working after one month, or compensations about it? (**Institutional** argument around the uncertainty)*
> 6.   *Each company has a water-reserve tank that allows self-sufficiency for at least one month (**technological** argument in favor)*

In the example just mentioned, you may notice that not all the components of abilities are necessarily perceived by all the relevant actors.

(3)   Survey preparation

This section will cover the elements required for a proper survey preparation, described in the following checklist.

Survey preparation
1.   Definition of data collection methods

2.   Designing the survey instrument

3.   Pre-testing the survey

As the *Government Implementability* MOTA is done usually through interviews, this step is often less elaborate compared to the *Social Adoptability*, which tends to use questionnaires for large groups of people.

a) Definition of data collection and methods

Once the elements of Abilities, Motivations and Triggers are identified from the previous step, the preparation of the survey requires identifying the following elements:

Geographical and socio-economic location of stakeholders to make the survey.

This step involves the definition of what stakeholders will be taken for the survey. According to the information gathered so far in the section "*Definition of when to use MOTA"* and after classifying it in the previous sub-sections, you have already a geographical and temporal location of the main stakeholders. From these, according to your problem definition, you may want to survey specific ones related to your problem.

If the information on the stakeholders you want to survey is insufficient or not clear enough regarding their motivations, abilities and triggers, you can always use the tools mentioned in the *Identifying background information* sub-section to deepen in this with different data gathering methods.

How will information be collected?: Questionnaires and interviews.

Depending on the scope of the problem you want to analyze, the type of survey to use will change. For example, if the stakeholder groups are illiterate, in-person interviews are the preferred option. A survey which is developed in written form (such as questionnaires) must provide clear instructions to the respondents in what kind of information is expected. In general, two type of survey instruments are recommended for executing MOTA surveys, which are interviews and questionnaires, which are explained in the boxes below, based on the recommendations of (Fink, 2003). More on the details on how to use these tools will follow on the next sub-section of Designing the Survey Instrument.

Interview. This survey tool requires at least two people, the interviewer and interviewee. This tool is especially useful when the information to gather is not completely clear before the survey and steering the conversations and questions *during* the survey is required. Also when deepening in a topic is required. The pitfall of this tool is the high amount of resources to gather data, as usually this requires time and multiple interviews to get the required information around motivations, abilities and triggers.

The interviews are more likely to be used in the *Government Implementability MOTA.*

Questionnaire. It is composed of questionnaires that each individual respondent can answer by itself. Although there are numerous ways to deliver this information, here we recommend to complete the questionnaire "on site", meaning that it is answered in a specific place with the supervision of a trained coordinator of the questionnaire.

This kind of survey is especially useful when:

1. A large amount of individuals are required to answer.

2. The questions around motivations, abilities and triggers are clear to answer and can be asked straightforward.

3. In the MOTA case, this questionnaires consist mainly of questions that have answers in ordinal variables, this is, that answers have a classification of "low – medium – high" or a range that moves between "Agree" and "Disagree".

   The questionnaires are more likely to be used in the *Social Adoptability MOTA.*

Aligning resources: time, budget and number of interviews.

The time (when to do the surveys) and budget are highly interdependent, and moreover, they strongly determine the number of surveys to do. Although in theory there are statistical minimum limitations of the sampling for the validity of the data to be processed, in practice the constraint is in the upper limit. If the resources constrain the number of questionnaires or interviews to do, then the problem definition should be redefined and adopted to the budget when possible. More details on the number of interviews in the *Survey Implementation* section.

b) Designing the survey instrument

There are numerous recommendations on how to design a survey and specific guides to do so (Fink, 2003; Marsden & Wright, 2010; Rossi, Wright, & Anderson, 2013), however here we will attain to the points on how to develop the questions focusing on what kind of information will be gathered, which in this case is related to the motivations, abilities and triggers. As mentioned in the previous sub-section, the possible survey instruments are usually chosen between 2 options, **questionnaires** or **interviews**.

As the information to be gathered is related to *motivations, abilities and triggers* of the stakeholders on the plan(s) to be evaluated, the questionnaire or interview should have these elements of the framework clearly defined (i.e. sections clearly addressing each one of them), which also changes according to what kind of survey is to be used. Also, because of the uniqueness of these elements between the actors, the surveys have to be developed separately for each type of stakeholder, based on the gathered information until now on their *motivations, abilities and triggers*.

In questionnaires and interviews the process has to be almost crystal-clear to the respondents, and room for misinterpretation should be minimized. In order to have effective surveys, the following elements should be present:

1.   **Straightforward**. These type of questions don't allow ambiguity to get accurate and consistent answers.

2.   **Questions must be purposeful**. This is, that the questions can be readily identified as part of the survey objective. If not, it should be clarified in the text why that type of question is there.

3.   **Concrete**. Adding specific time and spatial components, as well as clearly defined terminology, helps to make the questions more concrete for the participants.

   Types of questions

Depending on what kind of information you want to gather, the responses you allow can be **open** or **closed.** An **open** questions allows the interviewee to respond to your question in his or her *own words.* If the answers are *pre-selected*, then it is considered a **closed** question. Yet on the **closed** questions there are further classifications of the answers you can get:

4.   **Nominal:** When you ask to select from specific answers. For instance: Select Yes or No if there to the following questions – Have you more than 5 members in your family? (Y/N), have you taken loans from the bank in the last 3 years? (Y/N)

5.   **Ordinal:** When you ask to grade in a continuum of perceptions and the options have relative values between them. For example: Select the degree in which you agree with the following sentence: I had enough information to select among the internet service providers – a. *Disagree*, b. *Neither disagree nor agree* c. *Agree*

6.   **Numerical:** When the input ask for is a specific number. E.g. Please write your age, or write the number of members in your family.

The specific questions of motivations and abilities often will be either **ordinal** or **numerical,** as they will be quantified afterwards.

   Contextual questions

Before running into motivations, abilities and triggers, it is important to remark some points regarding the context. Although the idea of *measuring* motivations and abilities is the core of MOTA,

34

you will have to define a context where the information gathered makes sense, to understand why it is perceived like that. To collect this data, you will have to ask specific questions about the context. For instance: age, names or roles (more on this later on the anonymous data collection part), type of livelihood and income are some examples of this actor's attributes to support new groupings later on. This is defined by the type of data you want to analyze apart from identifying motivations and abilities. This will be critical to determine the best policy recommendations. Table 2 shows some real case contextual questions.

SECTION A: SOCIO-ECONOMIC CHARACTERISTICS AND PRODUCTION OF HOUSEHOLDS	
5- Name respondent:	6- Age:
7- Gender: ①male ②female	8- The highest class/education:
9- Family size (persons):	10- Number of employees (persons):
11- Phone number:	12- Housing: ①permanent ②semi-permanent ③temporary
13- Facilities (can choose multiple answers): ① Scooters/ manual motorbike ② Automatic motorbike ③ Flush toilets (septic tank included) in the house	④ Fridge ⑧ Car ⑤ TV ⑨ Electrical generator ⑥ Air conditioning ⑦ Washing machine
14- Large mechanized engines for production purpose (tractors, harvesters, tillers ...): ① Yes ② No	
15- The area of land: .... m2 The area of arable land: .... of which: 1- Cultivation: .... công = 0.1 ha 2- Aquaculture: .... công 3- Other: .... công	16- Land ownership household: 1- Land owned by household: ....% 2- Other: ....% Total: 100.0%

17- Information on the cultivation					
STT	Crops (rice is recorded separately for each case)	Area (công)	Do they cultivate it during the flood season (August to November) or not?	Harvest period (months)	Farming experience (years)
1			① yes ② no		
2			① yes ② no		
3			① yes ② no		
4			① yes ② no		

Table 2. Examples of contextual questions with also some – partly – *abilities* questions, such as number 13, 14, 15 and 16.

Developing the questions about motivations, abilities and triggers

The main advantage of using the MOTA tool is that it proposes a way to *measure* the MOTA attributes, i.e. motivations, abilities and triggers of the stakeholders based on the background information gathered.

The first element to ask about is **motivations**. By starting to ask about this, is easier to explore the history behind the drivers and perceptions on current situations. Also as it is easier to start with the perceptions and feelings around a topic. Taking the *threats* and *opportunities* or *risk, solutions* and *mandate*, already identified in the previous step, they should be translated into questions on **ordinal scale**. For example, if a motivation from the background analysis showed that a group of citizens with small businesses see an *opportunity* in the construction of a highway as part of a plan that is being evaluated, the question (or sentence) of this opportunity could be translated as:

> *Rate the following sentence(s) according to your perception: The construction of the highway will benefit me economically:*
>
> *A. Strongly disagree, B. Disagree, C. Neutral, D. Agree, E. Strongly agree*

Or also could be asked as:

> *What do you think will be your economic condition be after the construction of the highway?*
>
> *A. Much worse, B. Worse, C. Equal as now, D. Better, E. Much better*

From all the list of possible motivations of the actors, it is important to mention that you will find some that are similar or repetitive and it is probably better to merge them. It is important to keep a consistent type of answer. This means that if you choose answers like strongly agree… strongly disagree, try to use it always when asking in ordinal scale. The same applies if you use "worse…better", "satisfied… unsatisfied", etc. Table 3 shows part of real case questions for motivations.

Table 3. Example of questions on motivations.

In a similar way as the motivations, for the **abilities** you will bring the background information classified in *Financial, Institutional, Social* and *Technological* into questions that can fit as ordinal scale. For example, if the ability "check" from the background analysis showed that a group of fishermen say they cannot change from fishing to other livelihood because 1.) they don't have the knowledge to do that change that the government proposes to agriculture (technological) and 2.) don't have any money to invest on that (financial). This could be translated into the following questions:

As a summary of this section, the following example shows a simplified case with possible questions to make in a questionnaire or survey.

> *How is your financial capacity to adopt other livelihood?*
>
> *A. Low B. Medium C. High*

> *Please rate the degree in which you agree with the following statement:*
>
> *I have enough knowledge to shift my livelihood to agriculture*
>
> *A. Completely disagree B. Disagree C. Agree D. Completely agree*

Table 4 shows part of real case questions for financial and technical abilities:

SECTION F: ABILITY IN CROP CONVERSION/DIVERSIFICATION *First, please evaluate your ability in planting the existing crop according to several indicators as listed.* *Second, Let's assume that you will convert to the crop type that chosen as Priority 1, please evaluate your ability in planting the new crop.*	Existing crop			Priority 1:		
Financial ability	Low	Average	High	Low	Average	High
32- The availability of capital for preparing seed, fertilizer and pesticides.	①	②	③	①	②	③
33- The availability of capital for the preparation of land/farm	①	②	③	①	②	③
34- The ability to supply others:	①	②	③	①	②	③
Technical ability	Low	Average	High	Low	Average	High
35- Technology to grow and cultivate crops	①	②	③	①	②	③
36- Source of local available seed	①	②	③	①	②	③
37- Relevance of soil conditions	①	②	③	①	②	③
38- The degree of information available about the needs of the market	①	②	③	①	②	③
39- The degree of information available about the product at wholesale markets	①	②	③	①	②	③

Table 4. Example of questions on abilities.

For developing the **trigger** questions you need to know what has molded the perceptions of the actors, which often brings very different answers. To handle this, you may prefer leaving open questions or partially open questions to the respondents. For example, following the previous example of the highway, you may want to ask about their opinions about the business and the growth perspective in the region, as well as additional triggers that affect this. These could be translated into:

How would the highway affect your business? explain _____	*To what extent did the construction of the road B 15 years ago affected you to move here?* 1. High, B. Low C. None , *because _____*
How did the flood in 2017 affect you / your livelihood? explain _____	

Table 5. Example of questions on triggers.

SECTION B: AWARENESS ON THE IMPACT OF CLIMATE CHANGE AND FARMING CONDITIONS

21- Is there an impact due to changes in flood regimes on the current farming practices of the households:..........
① No   ② Yes, but not serious   ③ Yes, and serious

22- Is there an impact due to changes in sediment on the current farming practices of the households:..........
① No   ② Yes, but not serious   ③ Yes, and serious

23- Is there an impact due to changes in drought on the current farming practices of the households:..........
① No   ② Yes, but not serious   ③ Yes, and serious

24- Commenting on the current cultivation practices compared to five years ago.
Income: ——— Irrigation:——— Transportation: .... Material: .... Seeds:.......... Cultivation techniques............. Machinery: .... Policy on extension agriculture:.......... Credit Policy :..........
Purchasing system:.......... Hiring employees:...........
① harder ② much harder ③ the same ④ favourable ⑤ very favourable

Table 5 shows part of real case questions for identifying triggers:

For a real case where the *Governmental Implementability* MOTA is used, see the applying MOTA real case 2. For now, example 6 shows a case in which the elements presented in this section around designing the survey instrument are summarized.

Example 6. The national government wants to enforce a policy that changes the use of coal to natural gas throughout the country, especially in the industrial regions where is pretty much consumed, however there also the majority of household still use coal for cooking and heating. In a preliminary background analysis you found the following points:

Industry:

1.   *They cannot afford to pay for natural gas as energy source, the price is almost 5 times that of coal (threat / financial ability).*

2.   *The government just wants to enforce such law without considering the implications for the industries (trigger)*

Citizens:

3.   *There is an increasing amount of cases of people sick due to smoke from using coal at home (opportunity).*

4.   *They don't have the equipment to use the gas in their kitchens/houses (technical ability / threat).*

With this information, these are some questions that could be drafted for households:

1. In which district do you live? (closed nominal question/about context)

1.   *District 10 – B. District 11 – C. District 12*

2. How many other family members live with you? (closed numerical question/ about context) _____

3. What would be the change of the quality of the air in your house with a change to natural gas? (question regarding motivation / ordinal answer)

1.   *It would be worse – B. It would be the same– C. It would improve*

4. Rate the following sentence: I have the necessary technology to shift to Natural Gas (question regarding ability / ordinal answer)

1.   *Agree – B. Neither agree nor disagree – C. Disagree*

5. Please write down what would be needed for you to make a change to natural gas? (Question on trigger / open question)

*The questions for the **industry** in this example could be:*

1. Rate the following sentence: We can make a transition to natural gas in the next 5 years. (ability / ordinal)

2.   Agree – B. Neither agree nor disagree – C. Disagree

2. What are the reasons that allow (or don't) your organization to make such transition in the next 5 years (trigger / open question). _____

Table 6 and Table 7 show example structures to follow the design survey instruments according to the *motivations* and *abilities* framework*.*

Table 6. On the right side, example on how to propose questions for *adoptability* MOTA.

Dimensions	Sub-dimensions	Indicators / example	Questions / example question
Ability	Financial	Level of financial ability to adopt the business to the agricultural transformation	To what extent do you agree that you have enough money to transform to another crop?
			□ Completely disagree □ Disagree □ Neutral □ Agree □ Completely agree
	Institutional	Level of support perceived from the local authorities on the transformation proposed	To what extent do you agree that transforming to new crops will be supported by the governmental agencies?
			□ Completely disagree □ Disagree □ Neutral □ Agree □ Completely agree
	Technological	Level of technological tools already existing to adopt such transformation	To what extent do you agree that your have enough equipment and knowledge to adopt the transformation proposed?
			□ Completely disagree □ Disagree □ Neutral □ Agree □ Completely agree
Motivations	Threats	Level of climate stability that supports a new crop from transformation	To what extent do you agree that the climate is favorable for the new crops to bring?
			□ Completely disagree □ Disagree □ Neutral □ Agree □ Completely agree
	Opportunities	Level stability of markets to encourage transformation	To what extent do you agree that the market for the future crops is stable?
			□ Completely disagree □ Disagree □ Neutral □ Agree □ Completely agree

Dimensions	Sub-dimensions	Indicators / example	Questions / example question
Ability	Financial	Level of financial ability to execute the adoption of agricultural transformation	To what extent do you agree that your agency has enough resources to enable the transformation to the proposed crop?
			□ Completely disagree □ Disagree □ Neutral □ Agree □ Completely agree
	Institutional	Level of support perceived from higher authorities/other agencies on the transformation proposed	To what extent do you have support from the agricultural agency (or any other agency that needs to be involved) to help the transformation to new crops?
			□ Completely disagree □ Disagree □ Neutral □ Agree □ Completely agree
	Technological	Level of technological tools already existing to adopt such transformation	To what extent do you agree that your have all the equipment and knowledge to do such transformation
			□ Completely disagree □ Disagree □ Neutral □ Agree □ Completely agree
Motivations	Perception of Risk	Level of risk from changing to a new crop	To what extent do does the new crop scheme changes the activities that you execute now?
			□ Completely disagree □ Disagree □ Neutral □ Agree □ Completely agree
	Perception of Opportunities (Solutions)	Level of solutions available to support the change	To what extent do you agree that the solutions available will sufice the agricultural transformation proposed?
			□ Completely disagree □ Disagree □ Neutral □ Agree □ Completely agree
	Perception of insitutional Mandates	Level of compliance of the change with the current mandates	To what extent do you agree that your new crops are in favor of the land use plan of the area?
			□ Completely disagree □ Disagree □ Neutral □ Agree □ Completely agree

Table 7. On the left side, example on how to propose questions for *implementability* MOTA .

c) Pre-testing/piloting the questionnaire

After finishing construction of the questionnaire for the interview, the draft version needs to be pre-tested before applying it at full scale. Pre-test phase is to be conducted with a small group of stakeholders. Because the purpose of pretesting is not to quantify the quality of the questionnaires, the number of attendants can be small, preferably five to ten. The main aim of pretesting is to help identifying what are the problems with "codification", how clear the questions are, whether interviewers are comfortable with the questionnaire or not and if the respondents understand the questions.

Behavior coding for interview questionnaires is the technique developed to monitor interviews using standardized questionnaires (de Leeuw, 2012). The aim of the technique is to test if the interviewer or respondent have troubles asking or answering the questions. Table 8 presents a form for rating questions using behavior coding scheme. The form includes two parts, one for the interviewer and the other is for the respondent. The list of behavior to code was adopted from Oksenberg, Cannell, & Kalton, 1991

Behavior coding for each question begins by the interviewer reading out the question word by word. In case the interviewer has to change the question, he or she has to tick the two options of change in interviewer part depending on level of change. After or while speaking out the question, the interviewer pays attention to respondent's answer or reaction and fills in the form accordingly. It is noted that coding of respondent's behaviors does not always stop at single coding. Depending on how respondent understands about the question and interviewer clarification, there are cases respondent's behavior involves many coding. Interviewer while doing the pretest interview, can take note of the question-answer process for each question. Interviewer can also record the process and fill in the form later.

Pretesting assessment form

Interviewer:..

Respondent: ....

Province: .... District:..Commune: ....

Duration of interview:...

Question number	Interviewer			Respondent						Note
	Major change	Slight change	Exact	Refuse to answer	Don't know	Give inadequate answer	Ask for clarification	Interrupt the question	Give adequate answer	
1										
2										

Table 8. Form for rating questions in pretest. Adopted from de Leeuw (2012).

The Note column gives space for the interviewer to note down briefly the reason of respondent's behavior. For instance, the interviewer can note down the technical word in the question that respondent does not understand, making him do not know how to answer.

After pre-testing, the first complete version of the interview guide should be improved with the feedbacks taken from these pilot and modify it if necessary. Depending on the time and financial resources of the project, the updated version of interview guide can be pre-tested again before using it in the real survey.

(4) Survey implementation

In this implementation phase, the most important concern is to obtain an acceptable response rate that minimizes selection biases and errors. In addition, identifying sample size from the population, particularly during the planning stage, plays an important role to achieving success with a survey. Finally, it is compulsory for the surveyor to ensure confidentiality / anonymity of the interviewing data.

a) Increasing response rate

Increasing the questionnaire response rate is crucial for the validity and usefulness of the survey and the MOTA framework. The higher the response rate, the more data could be interpreted and analyzed. Some factors affecting the response rates of the survey are cultural background of respondents, incentives (monetary and material incentives), and length and time of collection period. All of them should be addressed in order to improve the completion rate of the survey.

There is no one solution which could increase the response rate in any scientific research using MOTA framework. However, it needs an effective combination of common strategies incorporated in the design, development, and administration of surveys in maximizing response rate. According to Sincero (2012), five elements could be considered to improve the response rate as follows, some which have been partly addressed in previous steps already:

1. Choose the appropriate type of survey: type of survey such as online or face-to-face questionnaire should be wisely chosen based on the purpose of the research because each type of survey has different characteristics. These characteristics may affect the response rates of the interviewees.

2. Keep the questionnaire as short and simple as possible: Complex questionnaires with many open-ended questions cause difficulties for interviewees in response.

3. Add a personal touch to the invitations: this is much required for online interviews to increase the response rate.

4. Provide incentives: although there have been many controversial debates in terms of ethical consequences by providing incentives or not to the interviewees from their sharing information, it is always an effective action for paying the respondents who spent time and effort to answer all questions. Kumar (2014) states that it is unethical only if the incentives is done before the interview is taken.

5. Follow up and remind the respondents: it should be understood that the respondents, who applied for indirect interviews, are able to forget the emails sent by the interviewers. Therefore, it is better to remind the respondents in case their feedback is delayed within 10 days after delivering the online/indirect questionnaire.

An additional factor that is critical to any survey is the role of the interviewers during the interview. The key to assure the quality of the work is an **effective** system of supervision. Each supervisor/interviewer should be responsible for a small number of interviewers, which helps to control the data assurance and data quality by guiding the interviewees with any misleading terms (or even errors!) that may appear.

45

b) Sample size

Identifying the sample size (people who will take the survey) from the target population is required. It needs to be determined before the survey implementation, depending on whether it is a qualitative or quantitative research. Whereas it is guided that the sample size should be pre-determined in a quantitative research based upon the resources available, MOTA framework more focuses on qualitative research that the sampling is collected until a point of data saturation reached. This means that the determination of sample size for the MOTA framework depends on the research objective, whether for qualitative or quantitative assessments. In quantitative research, statistical analysis is needed: the greater the sample size, the more accurate the estimate of the parameters for the true population.

c) Sampling methods – how to select who to ask?

Who should answer the surveys? You may already know which stakeholders to ask, but not how to select them. No sample (selection of people from the a bigger group) is perfect, and there will be bias and error always, however if it is possible to reduce it, it should be done, or if not, at least must be mentioned why. Here are some recommendations for it.

Before anything, the definition of objectives of why using MOTA should be clear from the previous steps, so the stakeholders selected are already classified at least by the relation with the problem, i.e., position in an organization, if the person is affected by the plan in a positive/negative way, if they have knowledge from the past or future of the project.

Samplings can be considered either *probability* and *non-probability* samplings. The first one focuses on picking "randomly" individuals in the group of stakeholders of interest (i.e. farmers under 35 years old). The second one, non-probability sampling, is used when is not possible to randomly or freely select individuals. Here, more than specific techniques, is important to acknowledge that there will be situations in which the actors participation will be biased, i.e. older people will be more likely to participate, or that there are external biases, such as government limitations, or economic limitations by the people participating.

If the sampling is not appropriately distributed for the purposes of the MOTA survey, the response rate strategies should be reconsidered.

d) Confidentiality

Ethical issues, especially confidentiality or anonymity of the data, should be seriously considered in the phase of implementing data collection. Confidentiality and anonymity of the data collected from participants are central to ethical research practice in social research (Wiles, Crow, Heath, & Charles, 2008). Kumar (2014) says that sharing information collected from interviewees with others for purposes rather than research is unethical. The findings from the interview-based data collection are sometimes needed to be put into the context of the study population; of which, the information provided by interviewees is make sure to be kept anonymous. In addition, ensure that the information sources of data collection cannot be identified.

Quick MOTA assessment

Although a full survey implementation is needed to assess a real case analysis, a quick MOTA assessment can be conducted in a light approach. A small 1 day designed workshop for a group from 10 -30 people for e.g. scanning the MOTA elements can be easily set up. This type of format can also be used for a MOTA training class.

Example: In a training workshop on 20th Oct. 2016 in Ho Chi Minh city, Mr. Ho Long Phi gave an assignment on assessing the implementability of two specific measures: (option 1) small scale infrastructure to convey fresh water in the area, and to adapt to a saline / brackish situation, or (option 2) large scale infrastructure to secure fresh water and protect the area against salt water intrusions in the Mekong delta. Roles representing stakeholder groups were created: Dutch (P)rofessionals, (A)uthority, (F)resh water farmers, (B)rackish water farmers, (S)aline water farmers.

Figure 6. Training MOTA section

Based on their interest they had to develop their role's MOTA score (see figure below for option 1). The MOTA result of the assessment in the various stakeholder groups, from the assessment showed that there is more motivation for implementing option 1, however both options show limited abilities for implementation.
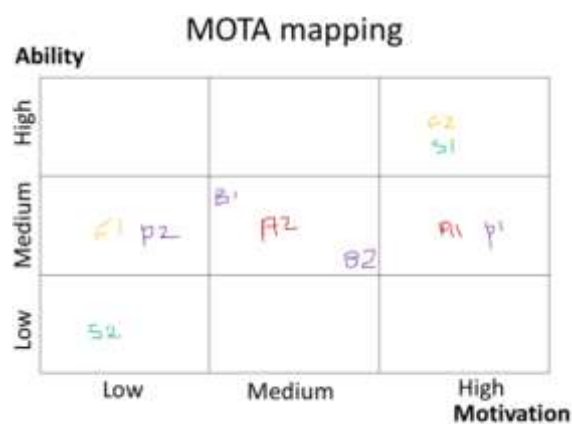

Figure 7. Results of MOTA mapping from training section

(5)   Data processing and analysis

This step presents how to transform the data gathered so far in a way in which it is understandable and suitable for analysis.

a) Conceptualizing the MOTA framework

Although in step 2 the conceptualization was already done, this process can be a whole independent work by itself, as Kulsum et al. (2019) did it, where the conceptual MOTA can also be a final result of using the MOTA framework. The length and depth of the study depend on the extent by which all the MOTA elements must be described to explain a specific situation or problem. Therefore, this step can be further included in Data processing and analysis if required.

b) Data entry

Once the surveys are taken and the data is there in papers/online, now what?

The first step is to organized the collected data in a form that allows effective data analysis. The data entry should be done by any software that has the ability to check the logical consistency of the input. This means that using a program like MS Excel would help to input the data, although there are many other software products that can help for this and many other statistical analyses (SPSS, Stata, R or Python to name a few). Is important to organize the data in a way in which the differentiation between motivations, abilities, triggers and context are clearly defined.

For most of the ordinal data – i.e. the questions that were answered as *completely disagree, partly disagree, partially agree, completely agree,* or in a similar fashion– the way to convert it to numerical data is through the process of normalization.

Normalization

Normalization, in this context, is the process of organizing the ordinal data from the surveys to present it all in a similar language that can make it comparable. In this case, the objective is to translate such data from *highly agree – highly disagree* to values between **– 1 to +1** (which would represent the range from opposition to support of the statement) for the *motivations*. For the abilities, as the scoring represents enough or insufficient ability (but never really opposition), the scale is **0 to +1**.

The following example helps understanding the translation process better.

What do you think will be your economic condition be after the construction of the highway?

A. Much worse, B. Worse, C. Equal as now, D. Better, E. Much better

And let's say that one of the interviewers selects B. Worse.

The calculation to define the grade between -1 and 1 would be to give an equidistant value to each grade. In this case, each answer would have the following values:

1.   -1

2.   -0,5

3.   0

4.   +0,5

5.   +1

Therefore, the selection of B would mean that this person, for this questions, grades as -0.5

After normalization, questions values are grouped as motivations or abilities, and the average of them is taken per group of stakeholders, or, if some higher priority is given to some types of questions, they should be then weighted differently when calculating the average.

c) MOTA scoring

The MOTA score is used as an indicator for implementation probability of a project or plan. It is the multiplication of the Motivation Score (- to +1) with the Ability score (0 to +1). A project with high Motivation score may just show high consent, but availability of ability may set limits for implementation. Without precautions of Ability, a project can get stuck during implementation. In case of multiple tiers of either Motivation or Ability, or both, the average scores will be used instead. This score may be used as a general picture in a single number, however for serious analysis it should be broken down into (at least) the Motivation and Abilities scores.

d) MOTA mapping

The MOTA Mapping is done by projecting the Motivation and Ability individual scores onto two-dimensional planes (See Figure 8. and note the axis -1 to 1 for Motivation and 0 to +1 in Abilities). The horizontal axis measures the motivation scores and the vertical one stands for the ability scores. On the right side of horizontal direction (motivation) are supporter/follower stakeholders and on the left side are those who oppose. People who have motivation and ability over 50% are likely to be leaders or champions on the initiative being evaluated (most supporting group). MOTA mapping

could provide information regarding the direction of plausible outcomes as a function of Motivation and Ability among different groups of respondents, illustrating the feasibility of an implementation (e.g., a lower score may signal a less feasible plan). In general, MOTA scores may vary widely across the projected domain; the aggregation of collective action is relevant to the feasibility and can be intuitively classified into eight zones as shown in Figure 8.
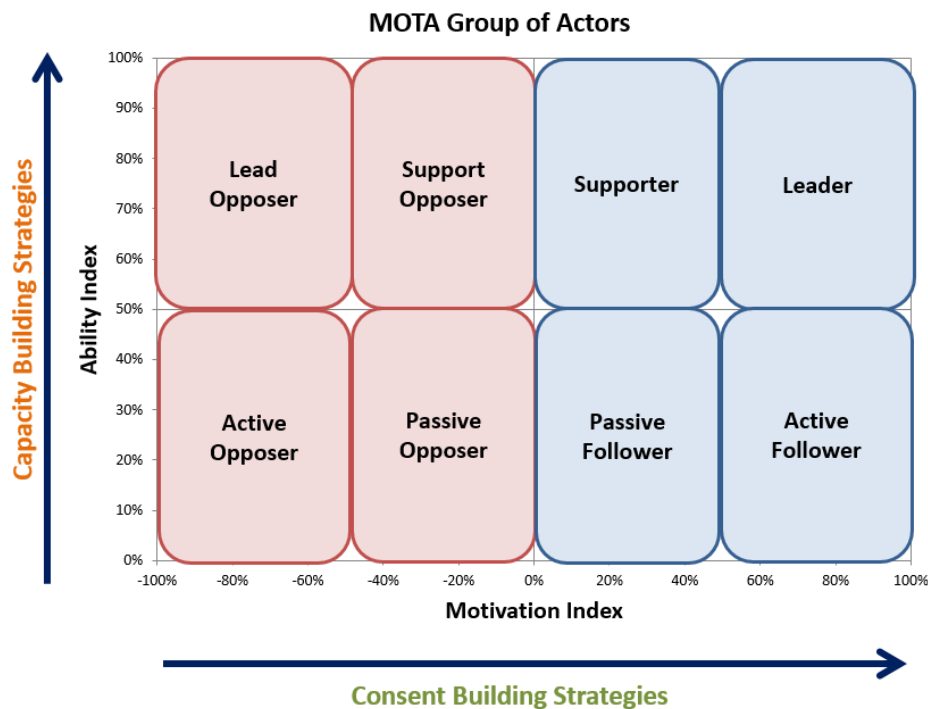
Figure 8. MOTA Mapping

e) Data analysis

In order to gather useful insights of the data gathered, there are some tools that can be used to analyze the data. Statistical methods can be employed for these analyses, which include -but are not limited to- regression methods or multivariate analyses such as: *Principal Component Analysis* (PCA) and *Hierarchical Cluster Analysis* (HCA), which help to determine the main parameters that explain the final responses, and to identify the group of respondents present in the whole dataset, respectively. These statistical analyses serve to reveal the hidden patterns among the communities' motivations and abilities in adopting new livelihood models. Via incorporating respondents' perceptions regarding their living conditions in PCA in the form of supplementary factorial variables, hidden drivers or Triggers constituting the diversity of MOTA scores can be revealed. Here we will not explore these methods exhaustively, however for further details about Principal Component Analysis theory the work of Smith (2002) shows with detail how it works. Some practical guides on how to use it with Python can be found in (Plotly, 2019). For Hierarchical Cluster Analysis, details on the theory can be found in the work of Greenacre (2008), and tools on how to implement it in Python can be found in Jupyter notebooks viewer's webpage (Jupyter, 2019) and additionally on Scikit-learn (Scikit-learn, 2019).

An example which uses PCA and HCA is presented in case study 1 section MOTA real case.

f) Identification of triggers

Apart from MOTA scoring and mapping, it is important to identify the underlying triggers by exploring respondents' perceptions of socio-economic and environmental conditions, which are asked during the interview stage. These were gathered through open discussions with respondents at the beginning and also during the surveys. With the help of tools such as PCA and HCA for large amounts of data, these triggers are identified and clustered.

(6)   Synthesis and recommendations

The previous sections presented the preparation and implementation of the MOTA tool, and how to process the data gathered. In this section, we will present how these results are presented and what recommendations can be drawn from them. First, the findings on motivations and abilities will be presented in specific in tangible strategies for decision-makers. Second, a better understanding of what recommendations can be taken out from this tool will be presented, and third, the limitations of the analyses will have to be clearly explained and we will offer some tools that may help in monitoring other elements of the stakeholders involved.

a) Capacity and Consent building recommendations, how and where to move

The results of MOTA, are related to motivations and abilities, however they should be explicitly translated into tangible recommendations for action. For doing this translation, if we look at again figure 6 – **MOTA mapping**, there are 2 aspects to consider. Firstly, the motivation "gaps" are considered a "gap" in *consent building* strategies. This term brings a broader perspective of the challenges for stakeholders to consent a specific plan, and what would drive them to do (or not) so. On the other hand, the ability "gaps" found will be translated into *capacity building* strategies. The term refers to the level of resources required to successfully implement a plan under evaluation. Each one of them should be elucidated in the following way:

Consent building: The scores obtained for motivation should be explored further to find which factors have been the most influential for obtaining such score, as well as the type of actors behind. By identifying these factors, as well as the triggers associated with this group of stakeholders, specific patterns and common elements can help building a discourse for addressing them, explaining the path presented by Figure 3 of the MOTA framework. The final goal is to show a path to increase the motivation of the actors towards a plan implementation when possible, or point out what needs to change in order to implement a similar idea.

Capacity building: The type of analysis for capacity building is similar to the consent building, but rather focusing on the elements of the Financial, Institutional, Social and Technological abilities. They should help creating a consistent storyline of **which** actors have **what** ability problems, and in overall, increase the degree of ability towards the implementation of a plan.

Figure 6 presents the connection between *capacity and consent building* requirements around a plan, and how can actors move from less capacity or consent towards a plan to a more active and supportive role.

b) Recommendations on options given the current plans

The applied case of Famers adoptability in page 62 is a good example to show how the MOTA analysis can be translated to recommendations. There the main insights of recommendations are presented and can serve as a guide.

Translating the previous findings on capacity and consent building into recommendations implies translating the insights from terms of the participants to terms understandable for decision-makers. The following are some recommendations when reporting the possible paths to make a concrete proposal to make a change plausible:

1.   **Clarify the relevance of the policy / project issue**: Why is this analysis relevant, in which context?

2.   **The message should be targeted to specific actor(s)**: This helps determining the right terminology and background to set the proposed recommendations.

3.   **Examine the political and economic climate**: How is the political environment and economic situation in the moment you make the recommendations?.

4.   **Identify boundaries and already existing strategies**: Is there a similar ongoing analysis already? How is this connecting with that? What are the limits of the recommendations proposed in time and budget, as well as how "doable" they are.

5.   **Identify alternatives**: If possible, adjust and understand which additional alternatives can be presented in your recommendations, so the set of solutions can be addressed in different ways.

6.   **Making the recommendations usable**: They should be succinct, readable, accurate and concise. Language should be simple and understandable.

7.   **Show impact on the real world**: Show how the recommendations presented would make a change and an impact in the real world for the project(s) /plans(s) under evaluation, with real examples or expected outcomes.

8.   **Emphasize action**: The recommendations from using MOTA should appeal to address the stakeholders' involvement in a ways in which it has not been done before. Therefore, it is decisive to highlight the importance of presenting clear specific and doable actions.

c)   Limitations of the results obtained – Other tools

As highlighted throughout the whole document, the focus of the MOTA tool is to expose the stakeholders' motivations and abilities, which includes their threats, the opportunities they see and the abilities they have to adapt to a specific proposed future. As any tool, the MOTA framework has its own limitations and they are highlighted here.

To start, the topics that MOTA would take into consideration are strongly dependent on the perceptions of the stakeholders selected, implying this that this focus on *their* perception may skip important topics around a plan implementation. For example, environmental aspects are usually crucial for the implementation of infrastructure plans, however from some stakeholders' perspective it may happen that these elements are omitted due to the temporal relevance of other problems.

Also, as part of the boundaries of MOTA, is important to mention that the relationships' between actors falls outside the scope of this analysis. This concept is also important for a successful plan implementation, especially understanding the alliances and conflicts. A specific case of this would be, for instance, understanding the resource dependencies, which are not explicitly addressed by the MOTA framework, as well as neither the transactional analysis to understand this relationships. Argumentative analysis, also part of the shaping of perceptions among stakeholders, is not

considered. To dive more on this, the work done by Hermans & Cunningham (2018) offers a broad set of tools to complement these analyses on stakeholders.

Real cases applying MOTA

VI.   Real cases applying MOTA

After reviewing throughout this Manual the concepts around the MOTA framework and how to apply them, in this final chapter you can find some real cases which have used the MOTA methodology. The following are two cases with different scenarios and actors:

(1) Farmers adoptability in agriculture transformation

(2) Strategic (district/province) land use plan in Ben Tre

The following table offers some overview of these cases.

	Case 1	Case 2
Objectives	Farmers adoptability in agriculture transformation	Implementation of (strategic) delta plan at local government level
Stakeholders	Farmers	Local officers
Samples size	50	25
Methods	Questionnaires	Interviews
	MOTA scoring	MOTA scoring
	MOTA mapping	MOTA mapping
	Multivariable statistics	

(1) Case 1: MOTA Farmer adoptability in agriculture transformation

This case study was carried out within the framework of IUCN's 'Integrated Planning to Implement the Convention on Biological Diversity Strategic Plan and Increase Ecosystem Resilience to Climate Change' project conducted by the Center of Water Management and Climate Change (WACC), Vietnam National University – Ho Chi Minh City. This study aimed to add a bottom-up perspective to inform planning practices based on local behaviors and preferences. Major outcomes of this study were recently published in (Nguyen et al., 2019). Hereby, a synthesis is presented

a) Step 1. Problem definition of when to use MOTA

Background information

Sustainable livelihood development is an on-going challenge worldwide and has regained importance due to threats of water shortages and climate change. To cope with changing climatic, demographic and market conditions in the Vietnam's Mekong Delta (VMD) an agricultural transformation process is suggested in the recent Mekong Delta Plan.

This agricultural transformation process requires the implementation of alternative livelihood models. The majority of current agricultural livelihood models in the VMD have been introduced by the government in a top-down manner. In this study we applied a bottom-up approach to understand the motivations and abilities of local farmers to adopt alternative livelihood models

Stakeholder identification

The interviewed farmers of various livelihood models were consulted with local authorities in the communes/districts and representatives of IUCN. The livelihoods include (1) Double rice; (2) Upland crop; (3) Intensive shrimp; (4) Rice-Shrimp; (5) Mangrove shrimp; (6) Salt production; (7) Intensive shrimp; (8) Rice-Shrimp.

Spatial and temporal boundaries

The survey took place in November 2015 at Ba Tri and Thanh Phu districts, Ben Tre province of farmer households in each selected commune (Bao Thanh in Ba Tri District and An Thuan in Thanh Phu district).
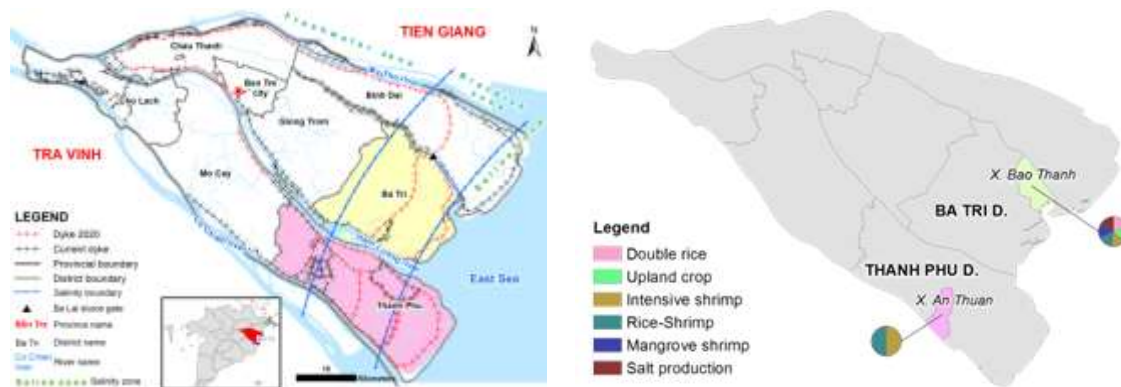
Figure 9. Study locations in the Vietnamese Mekong Delta

Final problem definition for MOTA

In this study, we aimed to add a bottom-up perspective to inform planning practices based on local behaviors and preferences. By incorporating the abilities and motivations of local farmers, insights are gained about the gaps between the desired situation and the local situation. So doing can not only help in setting strategic goals for regional development but also in understanding the type of policy interventions and implementation strategies that are needed to address anticipated challenges.

b) Step 2. Specifying the relevant MOTA elements

The survey questionnaire are designed into four topics (Table 9):

No		Topics of Questionnaire
1.	Questionaire Section A to H	Household characteristics (assets, production activities, irrigation and drainage scheme, credit, income and expenses, social activities, ect.).
2.	Questionaire Section I, J, K	*PERCEPTION:* Farmers' perceptions on: 1. Changes of economic and technical conditions related to farming in the last 5 years. 2. Risks of nature (climate, water resources, ect.). 3. Eco-farming and ecology conservation.
3.	Questionaire Section K7	*MOTIVATION:* Farmers' motivation to proposed[*] sustainable farming alternatives
	Questionaire Section K8, K9	Farmers initiative on sustainable farming alternatives
4.	Questionaire Section L	*ABILITY:* Farmers' self-evaluation on their adaptation ability to the sustainale farming alternatives.

Table 9. Survey questionnaire design and MOTA assessment

c) Step 3 Survey preparation

Data collection and methods

The format of the interviews were individual questionnaires with 50 farmers

Survey instrument

The interviewers were trained to fully understand the questionnaire before starting the survey. The survey was supported by local government in informing farmers to join the interview.

d)   Step 4. Survey implementation

Data was obtained through 100 structured interviews (with questionnaire) of farmer households in each selected communes (Bao Thanh in Ba Tri District and An Phu in Thanh Phu district). Each interview takes about 1 hour. Detail information of the site location and households are shown in Table 10.

District	Commune	Samples	Livelihood
Ba Tri	Bao Thanh	10	Double rice
		8	Upland crop
		8	Intensive shrimp
		8	Rice-Shrimp
		8	Mangrove shrimp
		8	Salt production
Thanh Phu	An Thuan	25	Intensive shrimp
		25	Rice-Shrimp

Table 10. Collected samples at Ba Tri and Thanh Phu districts

e) Step 5. Data processing and analysis

Based on these interviews, MOTA scoring and mapping of farmers at are presented. In addition, the statistical methods i.e. multivariate analyses using Principal Component Analysis (PCA) and Hierarchical Cluster Analysis (HCA) are used. These statistical analyses serve to reveal the hidden patterns among the communities' motivations and abilities in adopting new livelihood models. Via incorporating respondents' perceptions regarding their living conditions in PCA in the form of supplementary factorial variables, hidden drivers or *Triggers* constituting the diversity of MOTA scores can be revealed

1.   Motivation and Ability

Interviews investigated farmers' Motivation and Ability to change cropping systems given their perceptions of current and changing conditions as discussed above. For motivation, answers ranged from 1 to 5 as from lowest to highest for Thanh Phu and Ba Tri districts, as shown in Figure 10.
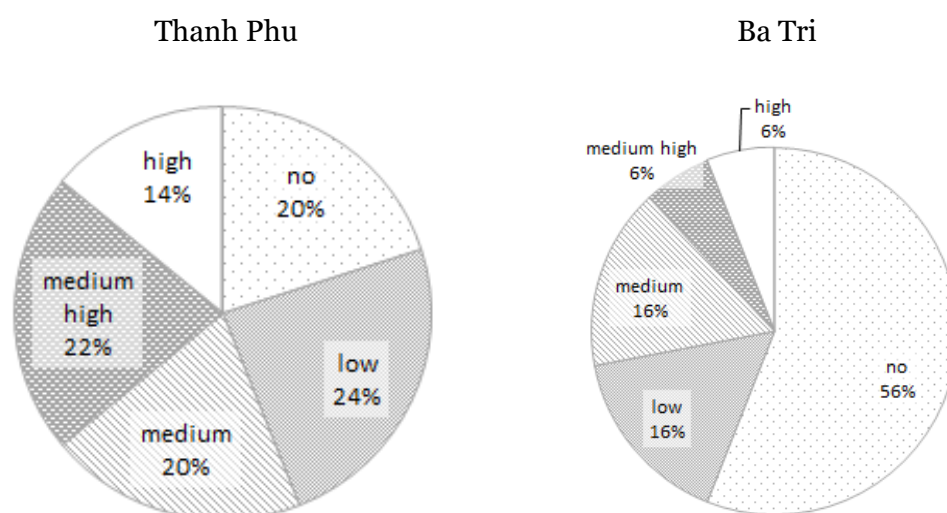
Thanh Phu   Ba Tri

Figure 10. Farmers' motivation towards changing livelihood systems

The result shows that farmers' motivation to change livelihoods in Thanh Phu is higher than in Ba Tri (Figure 10). The proportion of farmers who prefer to maintain the same cropping system is only 20% in Thanh Phu while 56% in Ba Tri. In Ba Tri, those who did not want to change gave the following reasons: afraid of failure (28%) (primarily due to shrimp disease); inappropriate conditions (20%); afraid of no or low profit (12%); purely don't want to change (10%); and no capital (8%). In Thanh Phu, the reasons given by those who did not want to change were: afraid of low or no profit (16%); shrimp disease (12%); inappropriate conditions (8%); lack of technical capacity (8%); and surely don't want to change (2%). For both districts, regarding those wanting to change, in order to increase income was the most commonly cited reason (motivation) (41% in Thanh Phu and 16% in Ba Tri), followed by changing water conditions (a trigger), as salt water has severely intruded recently (4% for both of districts).

District	Hamlet/ Commune	Samples	M	Ability			MOTA	
				F	T	I		
Ba Tri	AP 6	3	0.00	0.42	0.70	0.70	0.00	**0.10**
	THANH LOI	5	0.00	0.30	0.59	0.56	0.00	
	THANH PHU	7	0.50	0.57	0.68	0.79	0.34	
	THANH PHUOC	13	0.21	0.29	0.57	0.62	0.10	
	THANH QUY	14	0.23	0.29	0.54	0.42	0.10	
	THANH THO	8	0.22	0.28	0.44	0.70	0.10	
Thanh Phu	AN DIEN	3	0.42	0.50	0.67	0.77	0.27	**0.35**
	AN HOA	1	0.25	0.75	0.80	0.70	0.19	
	AN HOI A	5	0.35	0.80	0.66	0.72	0.25	
	AN HOI B	14	0.45	0.55	0.68	0.71	0.29	
	AN NINH A	13	0.62	0.52	0.65	0.72	0.39	
	AN NINH B	13	0.37	0.48	0.60	0.70	0.22	
	AN THUAN A	1	1.00	1.00	0.85	1.00	0.95	

Table 11. Motivation, Ability and MOTA scores in Ba Tri and Thanh Phu District

Table 11 summarizes the Motivation and Ability scores of respondents from two study sites averaged by hamlets/communes. The overall MOTA score of each hamlet/commune is calculated by multiplying the associated Motivation score by the Ability score (averaged across three categories). The overall MOTA score of the two districts is calculated by normalizing the MOTA scores of its respective associated hamlets/communes. In general, the MOTA score of Ba Tri is lower than that of Thanh Phu. More specifically, the average Motivation score of Ba Tri is 0.19 that is inferior to Thanh Phu being 0.51.

Similarly, the Ability scores of the two are 0.47 and 0.59, respectively. Of the three Ability aspects, respondents from both districts show the highest confidence in Institutional, followed by Technical and Financial. Differently put, respondents are the most concerned of the budget for realizing the livelihood transformations (if need be) the most, while at the same time, relatively in favor of the advancements of technologies and the institutional support from the government.

MOTA mapping

Since no farmers objected outright to livelihood transformations, their positions would all be grouped on the right-hand side of a MOTA map (Figure 11), depicting positive, if somewhat weak, support for changes. The markers represent the hamlet/communes of Thanh Phu (left) and Ba Tri (right). The coordinates of each hamlet/commune marker inherit from the respective Motivation and Ability scores summarized in Table 12. In general, most hamlets in Ba Tri are passive followers. Those in Thanh Phu district lie between the supporter group and leader group. They have the medium motivation and high ability, so they can be leaders or supporters, depending on the benefits they see from making a livelihood transformation. An Hoa, An Hoi A, An Hoi B, An Dien, and An Ninh B

hamlets all belong to the "supporter" group, with high ability but the low motivation for transformation. An Ninh A and An Thuan hamlets fall in the "leader" quadrant, and a such can be the lead group for livelihood transformation processes.
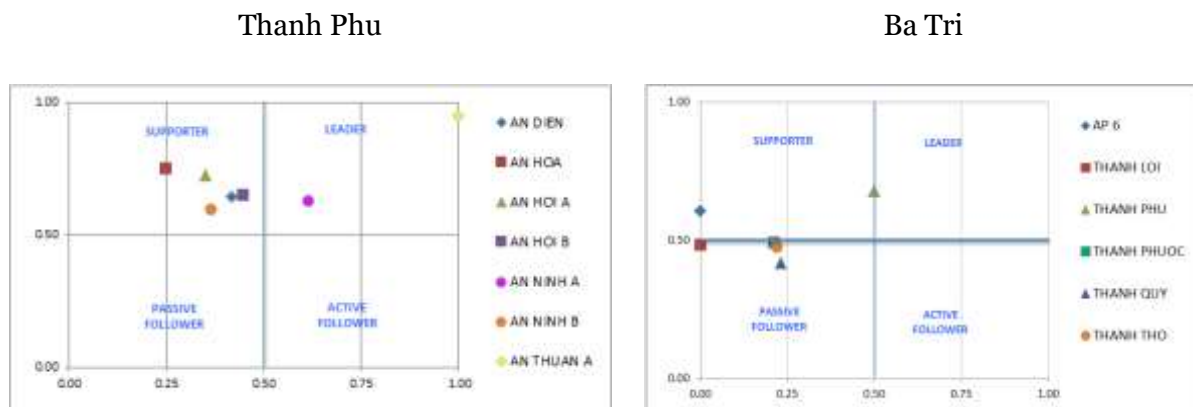
Thanh Phu   Ba Tri

Figure 11. MOTA Mapping for Farmer adoptability in agriculture transformation

Relationship of Perception with Motivation and Ability

The sample data were verified using the Kaiser-Meyer-Olkin statistic equal to 0.69 (>0.5) and Bartlett's Test of Sphericity (<0.05), thereby supporting the use of factor analysis methods. The first two principal components account for 72.9% of the extracted variance (Figure xxx). The first principal component, representing 51.91% of the extracted variance, separates responses with divergent scores in Institutional Ability and Technical Ability. These two variables are also positively correlated with one another. The second principal component, representing 20.99% of the extracted variance, distinguishes responses with divergent Motivation and Financial Ability scores, on the one hand, and points to the negative correlation between these two variables, on the other. The relative lengths of each arrow on the factor map represent the relative explanatory capabilities of the variables. The collected responses, accordingly, are most explained by Motivation and Financial Ability. From the factor map generated from the PCA, an HCA was performed to distinguish individuals according to their motivation and abilities, as depicted in Figure 12.
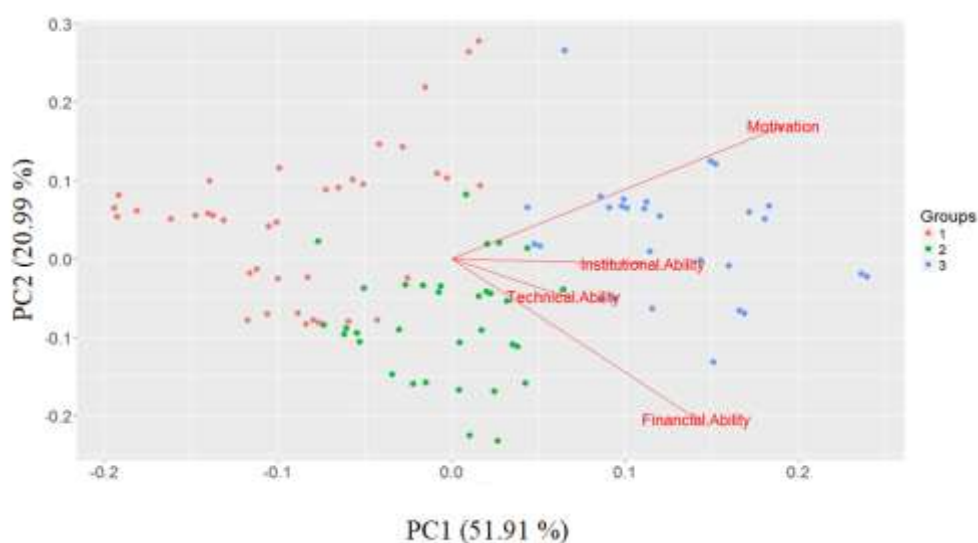
Figure 12. Results of Principle Component and Hierarchical Cluster Analysis

Of the three groups of individuals classified in Fig. 12, Group 3 has the highest motivation as well as abilities. In contrast, Group 1 has the lowest scores, while Group 2 falls in the middle of the range. These conclusions were drawn by comparing the means in each group with the overall mean of the entire population. For instance, the overall Motivation of all 100 individuals is 0.345, while the respective scores of Group 1 – 3 are 0.186, 0.181 and 0.759, respectively. These differences were then verified through the tests of significance.

In search of the Triggers, the supplementary factorial variables were analysed. Among those evaluated, only six appear as significant, as summarized in Table 12 (variables that remained insignificant across all groups are not shown). With regard to location, Group 1 is most associated with Ba Tri, Group 3 with Thanh Phu, and Group 2 is not explicitly characterized. With respect to variables associated with respondents' perceptions, Group 3 distinguishes itself the most from the norm via optimistic assessments of Material, Seed Quality, and Techniques, and pessimistic assessments of Ground Water and Market Price. Groups 1 and 2, on the other hand, are not significantly characterized by any categorical variables.

MOTA (Overall Mean)	Group 1	Group 2	Group 3
Motivation (0.345)	Low (0.186)	Low (0.181)	High (0.759)
Financial Ability (0.4475)	Low (0.179)	Average (0.598)	High (0.642)
Technical Ability (0.6105)	Low (0.469)	Average (0.688)	High (0.716)
Institutional Ability (0.659)	Low (0.502)	Insignificant	High (0.87)
Location	Ba Tri	Insignificant	Thanh Phu
Triggers			
Material	Insignificant	Similar	Better
Seed Quality	Insignificant	Insignificant	Better
Techniques	Insignificant	Insignificant	Better
Ground Water	Insignificant	Insignificant	Worse
Market Price	Insignificant	Insignificant	Worse

Table 12. Characteristics of each Cluster

Combining the two preliminary observations above render important implications regarding the Triggers to adopt new livelihood models, including both the acknowledgement of threats related to Ground Water and Market Price; and confidence in emerging opportunities related to Techniques, Seed quality, and Materials. These perceived threats and opportunities constitute important driving forces to motivate action, or in this case, adopt new livelihood models.

f) Step 6. Synthesis and recommendations

In this case study, the MOTA framework was used to assess the motivation and abilities of farmers in two coastal districts in Ben Tre province. This showed that motivations and abilities were quite diverse among farmers and there is a clear link between motivation and ability. The high motivation group has high ability in finance and technology (e.g., favorable existing water infrastructures). The MOTA analyses showed the motivations to transform the new livelihood in both districts are still rather low though farmer's abilities are mostly above the average values. This finding implied that the transformative program needs first to focus on raising motivations of farmers, e.g. via showed cased livelihood models (including market linkages), providing efficient water resources, agriculture training incentives. This study has demonstrated for example, financial and water resources are

limiting factors that affect the transformative process. In addition, with the use of multivariate analyses, this study was able to identify the underlying "trigger" factors – i.e. perceived threats (Ground Water and Market Price) or opportunities (Techniques, Seed quality, and Materials) – behind farmers' different levels of motivation and abilities.

(2)   Case 2: MOTA governmental actors on implementation of Mekong Delta Plan

This case study was carried out within the research project 'Strengthening Strategic Delta Planning in Bangladesh, the Netherlands, Vietnam and beyond', conducted by TU Delft, the Netherlands and the Center of Water Management and Climate Change (WACC), Vietnam National University – Ho Chi Minh City. This study aimed to gain insight in whether and how the MOTA approach can be applied in the context of strategic delta planning. We therefore conducted a case study focusing on the local governmental actors – the bureaucracy – that have to translate abstract strategic goals and visions into concrete plans and activities at local level. This work is part of the paper from (Korbee, Hermans, Nguyen, & Phi, forthcoming)

a) Step 1. Problem definition of when to use MOTA

1. Background information

The Mekong Delta Plan (MDP) has been developed to gain a vision for the Mekong Delta in Vietnam under conditions of climate change. The MDP has been developed by the Vietnamese government in cooperation with a Dutch consortium of knowledge institutes. The main vision of the MDP follows a scenario of modernizing the agricultural sector into an agro-business, controlling seasonal river flooding, and adaption to salinity intrusion. The MDP is also a reaction on the Vietnamese practice of 'Master Planning'; this is a very top-down and sectoral form of planning, in which each department – at various levels – produces their own plan, leading to a plethora of plans.

Stakeholder identification

To study the enabling and constraining conditions of implementation aspects of strategic delta plans, we conducted a strategic MOTA analysis, focusing on the local government actors/departments. These local government actors are crucial link between the strategic and the operational (implementation) level. They play a key role in translating the more abstract strategic goals and objectives of a strategic delta plan into practices on the ground.

Spatial and temporal boundaries

The Mekong Delta Plan has been developed for the whole of the Mekong Delta. In this study, the focus will be on the implementation of (elements from) the MDP in Ben Tre province. The coastal region of Ben Tre has to deal coping with salinity and introducing new farming systems. The main focus for this zone is the 'Brackish water economy and advanced coastal protection'. The relevant elements of these two zones for Ben Tre are: adaptation to a saline water environment and securing fresh water supply.

Final problem definition for MOTA

The MDP has been extensively discussed at the national level, however, there is no indication how well this strategic plan fits with the reality on the ground. How well will the vision and ideas from the

65

MDP fit in the local setting? And; what implementation strategies can be applied to counter possible implementation gaps or difficulties?

b) Step 2. Specifying the relevant MOTA elements

After specifying the final problem definition for MOTA for this case, we started to develop the MOTA attributes. The MOTA attributes were based on desktop research in combination with expert interviews (amongst other Andrew Wyatt of IUCN).

1. Definition of potential triggers

Potential triggers for this study were primarily defined by governmental incentives, i.e. the publication of and discussions on the MDP, as well as other (new) requirements for provincial and local plans. A second set of potential triggers was defined by a recent saline intrusion event.

Definition of potential motivations

In defining potential motivations, we made a subdivision between perception of threats, perception of opportunities (solutions) and perception of institutional mandates. These MOTA attributes were primarily identified through the problem definition as presented in the MDP, complemented with current issues in Ben Tre.

Based on the MDP problem analysis, we defined three main attributes for threats; risks resulting from climate change, economic risks, and demographic risks. For the perception on solutions, we kept this subdivision (climate adaption, economic transformations and adapting to demographic changes) and added current provincial and local land-use, socio-economic and agricultural plans as possible solutions.

The third aspect, perception of institutional mandates, we decided to break up into two aspects. First a set of informative questions on the role of the interviewees in developing and implementing provincial/local land-use, socio-economic and agricultural plans. A second set were more subjective questions on the perceived role of the interviewees; their own perception of their role (i.e. improving lives of farmers/citizens of Ben Tre, influencing the debate on climate change, improving plans and policies) as well as space perceived to alter/improve current practices.

Definition of potential abilities

For the definition of potential abilities, we made the division between institutional, financial and technical abilities. For the institutional abilities, we defined cooperation as primary attribute for this study; Cooperation with other governmental actors, with market actors, with civil society, between farmers, with consultants, with international donors etc. For financial abilities, we defined that budgeting (from national to provincial to local actors) was the prime ability to focus on. Lastly, for technical abilities we defined both knowledge on farming systems as well as knowledge on drawing plans and data provisioning as defining attributes.

c) Step 3 Survey preparation

1. Data collection and methods

The format of the interviews were extensive group interviews, with selected representatives.

Survey instrument

We developed a topic-list that consisted of five main topics. The interviews started with general questions and open questions on the knowledge about and perceptions on the goals and objectives stated in the MDP. Secondly, we asked the respondents to their responsibilities, mandates and tasks regarding provincial plans. The third part were questions related to the relation between these MDP goals and existing plans and policies. The third topic were the motivations, consisting of perceptions on the risks, perceptions on possible solutions, and perceptions on institutional mandates. The fifth topic concerned the abilities to change, consisting of the following points the financial abilities, the institutional abilities, and the technical abilities.

The survey interviews were grouped in five topics:

No		Topics of Questionnaire
1.	General questions (questions 1-2)	Names and functions of respondents, knowledge on MDP
2.	Provincial plans: (questions 3-6)	Provincial plans: Mandates, responsibilities, and tasks.
3.	MDP relation with provincial plans (questions 7 -12)	Introduction to topics adaptation to salinity & agricultural modernization. Perceptions, obstacles, changes regarding these goals.
4.	Motivations (questions 13- 15)	*MOTIVATION:* Perceptions on risks, problems and solutions about adaptation to salinity & agricultural modernization
	(questions 16 – 17)	Perceptions on professional role
5.	Abilities (questions 18- 29)	*ABILITY:* Institutional, Technical and Financial abilities

Table 13. Topic of the questionnaires to ask about.

d) Step 4. Survey implementation

Data was obtained through semi-structured interviews with representatives of key strategic actors. To select the appropriate actors for our analysis, we followed the governmental structure of Vietnam.

1. At the provincial level, we included the Department of Agriculture and Rural Development (DARD), Department of Natural Resources and Environment (DoNRE) and the Department of Planning and Investment (DPI). DARD and DoNRE have an important role in key sectors for delta planning such as water resources, land use and agriculture. DPI is added to the analysis, as they are responsible for the allocation of funds for planning and implementation and have been given a leading role in regional cooperation between provinces.

2. At district level, the main governmental institutes are the people committees. For our analysis, we focused on two districts; Than Phu and Ba Tri. Both districts are located near the coast, but are different regarding the fresh water availability. Ba Tri district is protected by a

dike-system, resulting in a fresh water basin. In Than Phu district, this dike-system is largely lacking, resulting in a large brackish water zone.

3.   At commune level, we included a farmers-perspective – in Than Phu this consisted of a farmer cooperative, and in Ba Tri, of representatives of local farmers in the communes of Phu Ngai, Ba Tri and Vinh Hoa.

The interviews typically lasted for approximately three hours. We conducted a first round of interviews in April 2017, and after an initial analysis of the acquired data, included a second round of interviews in October 2017. The second round of interviews was initiated to include a second district to our analysis, as well as the Department of Planning and Investment, whose strategic role within the MDP implementation only surfaced after our initial round of interviews. These interview data were supplemented by case-related documentation and data obtained from earlier MOTA research activities in the region.

e)   Step 5. Data processing and analysis

Based on these interviews and the analysis of the interview reports, MOTA assessment matrices for the actors were developed. These matrices follow the conceptual model. Various analyses were conducted, including a comparative analysis of (the elements constituting) motivation between the studied actors; a comparison of the (elements constituting) abilities between the studied actors. These analyses provide information on the strategic actor network and insights into which actors could form coalitions to support implementation of strategic delta plans. In analyzing the data, we assumed a causal relation: if motivations and abilities of the local level actors would be consistent with the MDP problem analysis and proposed solutions, this would be more likely to lead to local implementation actions that are in line with the MDP goals.

Figure 13. Motivation – Ability grid of local government actors regarding a) agribusiness and b) adaptation to salinity

f)   Step 6. Synthesis and recommendations

The analysis shows that there is a high motivation to modernize the agricultural sector, but a low motivation to adapt to salinity. This motivation to change is not always substantiated in actions, due to a lack of (financial and institutional) abilities. The attempted changes (actions) primarily focus on creating an agribusiness model, based on the current water availability. We therefore conclude that the implementation of the MDP in Ben Tre province is negatively affected by a discrepancy in motivations between local and national level actors, and a lack of abilities of local actors to initiate and facilitate change. However, our analysis also shows that these motivations and abilities of governmental actors are not fixed, but can be changed. Triggers, such as new policies, additional resources and events such as the Mekong Delta Forums can help to change plan implementation feasibility. As the MDP programming phase is likely to lead to further triggers for changes in local level motivations and abilities, it is therefore recommended that the MOTA assessment is repeated in due time.

The analysis shows furthermore, that the actors currently have low motivations and abilities to alter the current planning practices. In the case of the MDP, many of the local level implementation abilities are limited to the development of local level plans. The abilities for the further actions to implement these local level plans seem to depend on financial and technical support from major international donors.

References

Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior 1. *Journal of Applied Social Psychology*, *32*(4), 665–683.

Alshuwaikhat, H. M. (2005). Strategic environmental assessment can help solve environmental impact assessment failures in developing countries. *Environmental Impact Assessment Review*, *25*(4), 307–317.

Beria, P., Maltese, I., & Mariotti, I. (2012). Multicriteria versus Cost Benefit Analysis: a comparative perspective in the assessment of sustainable mobility. *European Transport Research Review*, *4*(3), 137.

de Leeuw, E. D. (2012). *International Handbook of Survey Methodology*. New York: Routledge. https://doi.org/10.4324/9780203843123

Fink, A. (2003). *The Survey Handbook*. 2455 Teller Road, Thousand Oaks California 91320 United States of America: SAGE Publications, Inc. https://doi.org/10.4135/9781412986328

Fogg, B. J. (2009). A behavior model for persuasive design. In *Proceedings of the 4th international Conference on Persuasive Technology* (p. 40). ACM.

Glasson, J., & Therivel, R. (2013). *Introduction to environmental impact assessment*. Routledge.

Greenacre, M. (2008). *Chapter 7. Hierarchical cluster analysis*. Barcelona. Retrieved from http://www.econ.upf.edu/~michael/stanford/maeb7.pdf

Hermans, L. M., & Cunningham, S. W. (2018). *Actor and Strategy Models: Practical Applications and Step-wise Approaches*. Hoboken, NJ, USA: John Wiley & Sons.

Jupyter. (2019). Comparison of Python packages for hierarchical clustering. Retrieved April 8, 2019, from https://nbviewer.jupyter.org/github/OxanaSachenkova/hclust-python/blob/master/hclust.ipynb

Korbee, D., Hermans, L. M., Nguyen, H. Q., & Phi, H. L. (forthcoming). Navigating the bureaucracy: analyzing implememtation feasibility for the Mekong Delta Plan, Vietnam. *Journal of Environmental Planning and Management*.

Kulsum, U., Timmermans, J., Thissen, W., & Khan, M. S. A. (2019). Exploring community livelihood adaptation under uncertainty for adaptive delta management: a case of polder-30 near urban influence in southwest Bangladesh. Dhaka, Bangladesh: Presentation at the 7th International Conference on Water and Flood Management, IWFM, BUET.

Kumar, R. (2014). *Research Methodology: A Step-by-Step Guide for Beginners*. SAGE.

Marsden, P. V, & Wright, J. D. (2010). *Handbook of survey research*. Bingley, UK: Emerald Group Publishing.

Nguyen, H. Q., Korbee, D., Ho, H. L., Weger, J., Phan, T. T. H., Nguyen, T. T. D., … Ho, L. P. (2019). Farmer adoptability for livelihood transformations in the Mekong Delta: a case in Ben Tre province. *Journal of Environmental Planning and Management*, 1–16. https://doi.org/10.1080/09640568.2019.1568768

Oksenberg, Cannell, & Kalton. (1991). New strategies for pretesting survey questions. *Journal of Official Statistics*, *7*(3), 349.

Patton, C. V, & Sawicki, D. S. (1993). *Basic methods of policy analysis and planning* (3rd ed.). New York: Routledge, Abingdon, UK.

Phi, H. L., Hermans, L. M., Douven, W. J. A. M., Van Halsema, G. E., & Khan, M. F. (2015). A framework to assess plan implementation maturity with an application to flood management in Vietnam. *Water International*, *40*(7), 984–1003. https://doi.org/10.1080/02508060.2015.1101528

Plotly. (2019). Principal Component Analysis in Python. Retrieved April 8, 2019, from https://plot.ly/ipython-notebooks/principal-component-analysis/

Rossi, P. H., Wright, J. D., & Anderson, A. B. (2013). *Handbook of survey research*. New York: Academic Press.

Rothschild, M. L. (1999). Carrots, sticks, and promises: A conceptual framework for the management of public health and social issue behaviors. *Journal of Marketing*, *63*(4), 24–37.

Scikit-learn. (2019). Hierarchical clustering. Retrieved from https://scikit-learn.org/stable/modules/clustering.html#hierarchical-clustering

Sincero, S. M. (2012). *Pilot survey*. *Explorable. Accessed* (Vol. 15).

Smith, L. I. (2002). *A tutorial on principal components analysis*. Retrieved from http://www.cs.otago.ac.nz/cosc453/student_tutorials/principal_components.pdf

Sugden, R. (2007). *Integrating cost-benefit analysis and multi-criteria analysis of flood and coastal erosion risk management projects*. London: Department for Environment, Food and Rural Affairs Flood Management Division.

Walker, S. (2001). Opportunities for balancing conflicting economic, social and environmental pressures on river basins through an integrated approach with stakeholder involvement. *IAHS Publication*, 175–182.

Wiles, R., Crow, G., Heath, S., & Charles, V. (2008). The management of confidentiality and anonymity in social research. *International Journal of Social Research Methodology*, *11*(5), 417–428.