

# Deltas under Pressure

Report of the workshop:

'Drivers and Pressures affecting Food Systems in the Mekong delta, Vietnam'

Can Tho, 26-28 November 2019

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KB 35 Food Security and Valuing Water

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# 1 Background

## 1.1 Contributing to the research agenda for deltas

Deltas are dynamic systems providing conditions for economic activities such as agriculture and fisheries. At the same time, deltas are delicate systems that are vulnerable to climate change, notably sea level rise and associated saltwater intrusion, flooding, storms and drought. Additionally, existing problems related to poor agricultural practices, pollution, and urbanisation will most likely be aggravated by climate change. It is, however, also a catalyst prompting action towards more resilient and carbon neutral economic development pathways.

The mission of the knowledge base program 'Food security and valuing water' is contributing to SDG 2 'Zero Hunger' via interdisciplinary research (see [link](#)), works on strategic research laying the foundation for knowledge that will be relevant to policymakers and industrial partners in the coming 5 to 10 years.

One of the thematic areas under the "Food security and valuing water" knowledge base programs is the theme 'Deltas under Pressure', which aims to contribute to the development, design and implementation of transition pathways towards sustainable and climate-smart food systems in deltas by combining forces in the agri-food and water domains. In close cooperation with local scientists and other stakeholders, pilot studies are designed to understand the local food systems and define transition pathways towards sustainable food systems. Pilot areas for 'Deltas under Pressure' are the Mekong Delta in Vietnam and the Ganges Brahmaputra Delta in Bangladesh.

### **This report**

The focus of this report is on the development and design of a pilot study in the Mekong Delta. It provides an overview of the main outputs of a workshop that was held in Can Tho, Vietnam, from 26 to 28 November 2019. Can Tho University hosted the event through the Mekong Delta Development Research Institute (MDI).

#### MDI and CTU

The Mekong Delta Development Research Institute (MDI) is an interdisciplinary training and research organization of Can Tho University (CTU). MDI was established by CTU on March 24th, 2005 and originates from the Mekong Delta Farming Systems Research and Development Institute. As a unit of Can Tho University, the Mekong Delta Development Research Institute (MDI) is a leading interdisciplinary centre for applied research on rural resources management and socio-economic development in the Mekong region. For more information: CTU (<https://ctu.edu.vn/en>) and MDI (<https://mdi.ctu.edu.vn/en>)

## 1.2 Workshop scope

This workshop followed a scoping mission held in June 2019 (17-28<sup>th</sup>, internal report). During that scoping mission, Can Tho University (CTU) and more specifically the Mekong Delta Development Institute (MDI), was identified as key research partner. The three-day workshop in November 2019 aimed at bringing together different views of stakeholders, in order to formulate a joined research agenda, embedded in local research- and institutional structures, as well as agreement on the site of the pilot study.

Specific objectives were to:

- Evaluate the opportunities for optimal use of salinizing regions by producing and breeding salt tolerant crops and livestock with high potential to overcome stress situations
- Test different cultivars and breeds and their resistance to salt as well as pests and diseases
- Determine the most suitable farm management strategy or strategies to cope with changing saline circumstances
- Identify the trade-offs for obtaining the water quality (salinity) required and study the availability and effectiveness of water desalination/purification techniques
- Create enhanced insight in possibilities for reuse of manure and waste water in crop and vegetable production (i.e. circularity)

Through the workshop, WUR and MDI, together with other stakeholders such as SOFRI, provincial extension staff, and Tan Loc Path, cooperated to (i) identify a joint research agenda, including new approaches, strategies and transition pathways to work towards sustainable food systems (including farming systems) in the Mekong Delta and (ii) to optimize decision-making and increase adaptation capacity at farm level, to cope with climatic changes.

### 1.2.1 Link to Vietnam & Dutch cooperation

On April 9, 2019 the Vietnamese Prime Minister Nguyen Xuan Phuc and the Dutch Prime Minister Mark Rutte signed a Memorandum of Understanding (MoU) solidifying the long-term Netherlands - Vietnam cooperation on the 'Mekong Delta – Agricultural Transformation Program' (MD-ATP). Strategic cooperation on water management and agriculture started in 2013 with the Mekong Delta Plan which concluded that a shift towards agri-business focused on specialization is vital for a safe and sustainable socio-economic development of the Delta.

This conclusion is in line with the Vietnamese Governments 'Resolution 120', including a vision for 2100, published in October 2017. This resolution aims at the development of key agricultural value chains by making them highly sustainable and (export-oriented) and thereby increasing the competitiveness of the agricultural sector. This includes optimizing related business services and establishing an enabling institutional environment to support these chains. The Vietnamese government promotes the transformation of the agricultural economy under "new normal" situations, e.g. shifting to increased value and increased resilience to changes in climate and markets.

## 2 Workshop outputs

The objective of the workshop was to formulate drivers and pressures affecting food systems in the Mekong Delta, based on a common understanding of the key issues, and a research and action agenda linked to pilot areas in the Mekong delta. For more detailed objectives see paragraph 1.2.

The participants strived to formulate an interdisciplinary research agenda combining several expert fields (e.g. crop, livestock, water and climate) and link to public and private sector service provision (e.g. finance, seeds, agro-chemicals) and via the food systems also to consumers.

### 2.1 Understanding the Mekong Delta – 26 Nov

Day one focused on getting a common understanding of the delta and key issues that are relevant for the agricultural transition in the delta. In addition, information between the various disciplines and groups was exchanged to get a sense of methods applied and connection between the groups. Mapping between the institutes based on disciplines was relatively easy, connecting beyond disciplines did work well for livestock, crop and water. Despite this, we were not yet able to move into methods and tools and how we can collaborate between disciplines, as this will also depend on the actual sites and context-specific issues.

### 2.2 Field visit to potential pilot site – 27 Nov

The objective of the second workshop day was for participants to be able to enhance the understanding of salinity conditions, impacts of climate change, farming system strategies and existing climate change adaptation capacity, as well as supply-chain challenges for farmers. Finally, based on this enhanced understanding, participants are working towards fine-tuning the location of the pilot site. The field visit was instrumental to proceed in connecting between the disciplines and exchanging ideas to define common issues to work on.

### 2.3 Planning for action – 28 Nov

The objective of the final day was for participants to have an agreed-upon action plan for the next year, including timeline for data collection and other activities, and a clear division of responsibilities and tasks. The day started with an inventory of all participants impressions and thoughts, guided by the following questions:

1. What caught your attention during the field visit?
2. What did you like or dislike, and why?
3. What can we apply in our cooperation?

The common agenda, created based on the final question, consists of a clear list of common actions that was developed during the interactive session. A first draft including more details is presented in table 1.

Table 1. Research topics and details on activities for the year 2020

Topic	Detailed description of activities	Team-members	Deadline
<b>A.</b> Farming systems: fruit, vegetables, fish – crop calendar	A crop calendar is a table describing the entire crop growth cycle (including rain and dry season), specifying when crops, fruits and vegetables grow optimally, also indicating main risks and alternatives.  Livestock calendar (e.g. goat): critical moments will be defined	<b>Lotte Klapwijk</b> , Greet Blom, Jan Verhagen	31 March
<b>B.</b> Feed and livestock (trade-offs)	Trade-offs are derived from within the farming system calendar (topic A)  Nutrient cycles will be specified  Acceptable salinity levels will be identified for certain animals (to be specified)	<b>Charlotte Verburg</b> , Lotte Klapwijk, Greet Blom	31 March
<b>C.</b> Options in terms of water treatment and management	Scale: farming system level  Check ideas with CTU	<b>Raymond Creusen</b> , Gert-Jan Wilbers and Van Pham Dang Tri (CTU)	31 March
<b>D.</b> Follow-up meeting: VN-NL Mekong Delta Agricultural Transformation Programme	Minister of Agriculture has visited the 'programme'  Need to stay visible; once a selection is made for specific crops and/or regions, we need to take this into account	Contact points WUR: <b>Jan Verhagen</b> , Charlotte Verburg, Lotte Klapwijk	March
<b>E.</b> Map current farming systems in salt-fresh water zone	Current (integrated) farming systems will be mapped for the salt-fresh water zone in the Mekong Delta	<b>Jan Verhagen</b> , Lotte Klapwijk, Dr. Nhan, Thinkh	3 April
<b>F.</b> Meeting Vietnam	In advance:  -work together with CTU on an extended situation analysis (maps, visit farms, more specific data)  Meeting on 29 <sup>th</sup> April: main aim is to exchange information within the project-team	<b>Lotte Klapwijk</b> and other WUR colleagues  together with:  CTU VNFU SOFRI Tan Loc Path	17 – 30 April  29 April (date meeting)
<b>G.</b> Selection of pilot site	Pilot site(s) need to be clear after meeting in April 2020	<b>ALL</b>	30 April
<b>H.</b> Evaluating genetic diversity for salt and white fly resistance (for chili pepper) (27+28)	An experiment on genetic diversity for salt and white fly resistance (in chili pepper)  Four different <i>Capsicum</i> species	<b>Ben Vosman &amp;</b> Le Thi Kinh (Tan Loc Pat)	30 April
<b>I.</b> Policy: national to local level	Existing policy framework: Transition in Agriculture	<b>Jan Verhagen</b> , Dr. Nhan, Esther, Mrs. Ha (VNFU)	31 May
<b>J.</b> Farming systems indicators (part 1)	To create clarity on current ongoing farming systems work: indicators measured per system component, definition of success	<b>Lotte Klapwijk</b> , Dr. Tin & Duyen	31 June
<b>K.</b> Transition pathways and farmer choices	Opportunities / scenarios and their consequences provided: incl. specifying the	Prof. Thu, Duyen, <b>Esther Koopmanschap</b> ,	21 July

	<p>conditions for certain choices and implementation, based on a mapping exercise of the current food system in the Mekong Delta with a specific focus on certain key-value chains</p> <p>Trade-offs for integration</p> <p>Open interviews with # farmers according to the so called 'Planned Behaviour' methodology (Annette Pronk, in Indonesia)</p>	<p>Charlotte Verburg, Lotte Klapwijk</p> <p>Input from CTU! (perhaps together with students)</p>	
<b>L.</b> Indicators Farming Systems (part 2)	Addition + specification to ongoing farming systems work (topic J): indicators per system component, definition of success, etc.	Dr. Tin, Duyen, <b>Lotte Klapwijk</b> and Charlotte Verburg	31 December
<b>M.</b> Literature review on fruit trees	Literature review focuses on the most relevant fruit trees for the Mekong Delta (mango, dragon fruit, long an, pomelo, etc.)	<b>Ben Vosman</b> and SOFRI	31 Dec
<b>N.</b> Study different shrimp production systems	<i>Perhaps:</i> using questionnaire of Dolfi Debrot (50-60 ponds, range from extensive to intensive production systems)	CTU colleague + WUR	
<b>O.</b> Baseline assessment of the productivity of relevant animal types in relation to salt intake in the pilot site in Vietnam (and therefore in comparable areas of the Mekong Delta)	Paper	<b>Charlotte Verburg</b> (Lotte Klapwijk, Greet Blom)	31 December 2020

# 3 Conclusions and next steps

This chapter summarises briefly the challenges as identified, foreseen and prioritised to be addressed in the frame of the 'Deltas under Pressure' project. Challenges will be reviewed and further specified or adjusted, after initial studies have been undertaken. Additionally, other challenges are expected to become clear at a later stage in the project.

## 3.1 Major challenges

### Main challenges

- Increased, and increasingly varying, salinity
- Increased drought, leading to a lack of fresh water, in turn leading to an increase in ground water extraction, leading to conflicts (e.g. between saline and fresh water food production)
- Reduced crop yields (e.g. rice) – due to increased climatic stresses
- Increase in pest and disease prevalence for vegetables, fruit, shrimp and livestock
- Price fluctuation (local + international) and market saturation
- Environmental pollution in the form of chemical fertilizers, pesticides and antibiotics
- Low quality of fodder / livestock feed, and trade-offs between crop and livestock components
- Increasing livestock production without increasing GHG emissions

## 3.2 Main conclusions

### Key-conclusions derived from the workshop are:

- Sóc Trang province is a suitable location for our pilot study; the exact location of the research site will be decided early next year
- The pilot study will take place in an area where water conditions are changing during the year; due to salt water (in dry season) and fresh water (in wet season) availability
- A major socio-economic driver is a change in (sub-)national policy; the focus shifted from rice cultivation to the production of fruits, vegetables and livestock
- There is a need for adaptive and integrated farming systems, including context-specific innovative techniques, to ensure resilient systems, adapting to climate change
- Current climate change scenarios foresee an increase of pests and diseases; Tan Loc Path wants to collaborate on increased salinity tolerance and white fly resistance in chili pepper
- We lack detailed insight on different system components and functioning of current farming systems; this needs to be established early in the next year
- Within the framework of the Food Systems Approach, our focus is on agricultural production, closely connected to most of the main environmental drivers
- As our current workplan lacks a consumer/market connection, and also to better understand key-drivers of system change, it will be essential to describe and map the current food systems of the Mekong Delta, using the WUR Food Systems Approach (Berkum et al., 2018)
- We are aware that the current work plan still lacks an articulated gender and youth component; this will be considered during the field trials planned, but especially, while formulating possible transition pathways