

Background

Food production is worldwide one of the greatest challenges for the years to come. The world population will continue to increase, and because of rising incomes the demand for food will increase even more. At the same time, the agricultural areas where food is produced are under pressure. One of these pressures is climate change, leading to rising sea water levels and thereby aggravating salinization of surface and groundwater in coastal areas, like in Myanmar (Figure 1). Saline agriculture therefore can be one of the solutions to this problem as it supports the use of salt tolerant crops to sustain crop productivity.

Introduction

The Embassy of the Netherlands initiated this quick scan to assess the potential for saline agriculture in the Ayeyarwady Delta in Myanmar. The Netherlands is world leading in saline agriculture. Arcadis has long-term experience in the Ayeyarwady Delta in Myanmar and noticed the importance of new forms of agriculture while formulating with partners (WUR) and many stakeholders involved an integrated strategy for the Delta in 2017. Organisations like the Salt Doctors and WUR have experience with research, pilots and implementation of saline agriculture practices, in the Netherlands and worldwide. Several successful cases in Asia (Bangladesh and Pakistan) demonstrate the need for longer term planning and the potential of saline agriculture. While the Salt Doctors and WUR provide technical know-how, Arcadis provides the local experience and on-the-ground knowledge of water management in the Ayeyarwady Delta of Myanmar.

Project objectives

The primary objectives of this quick scan for the Ayeyarwady Delta and Yangon Region were:

1. To explore if introducing salt tolerant crops and improved management practices has potential and supports the development of sustainable climate-smart agriculture in the coastal areas of Myanmar.
2. To form the basis for long-term engagements from the Netherlands with creating resilient coastal areas in Myanmar

Project title:
Quick Scan on Saline Agriculture in the Ayeyarwady Delta of Myanmar

Location:
Ayeyarwady Delta, Myanmar

Duration project:
6 months

Starting date:
August 2019

Consortium partners:
Arcadis (lead), Wageningen University & Research (WUR), The Salt Doctors

Client:
The Netherlands Government

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The long-term aim is to secure food production, improve nutrition intake and increase income for the local farmers, with attention to biodiversity and environmental impacts.

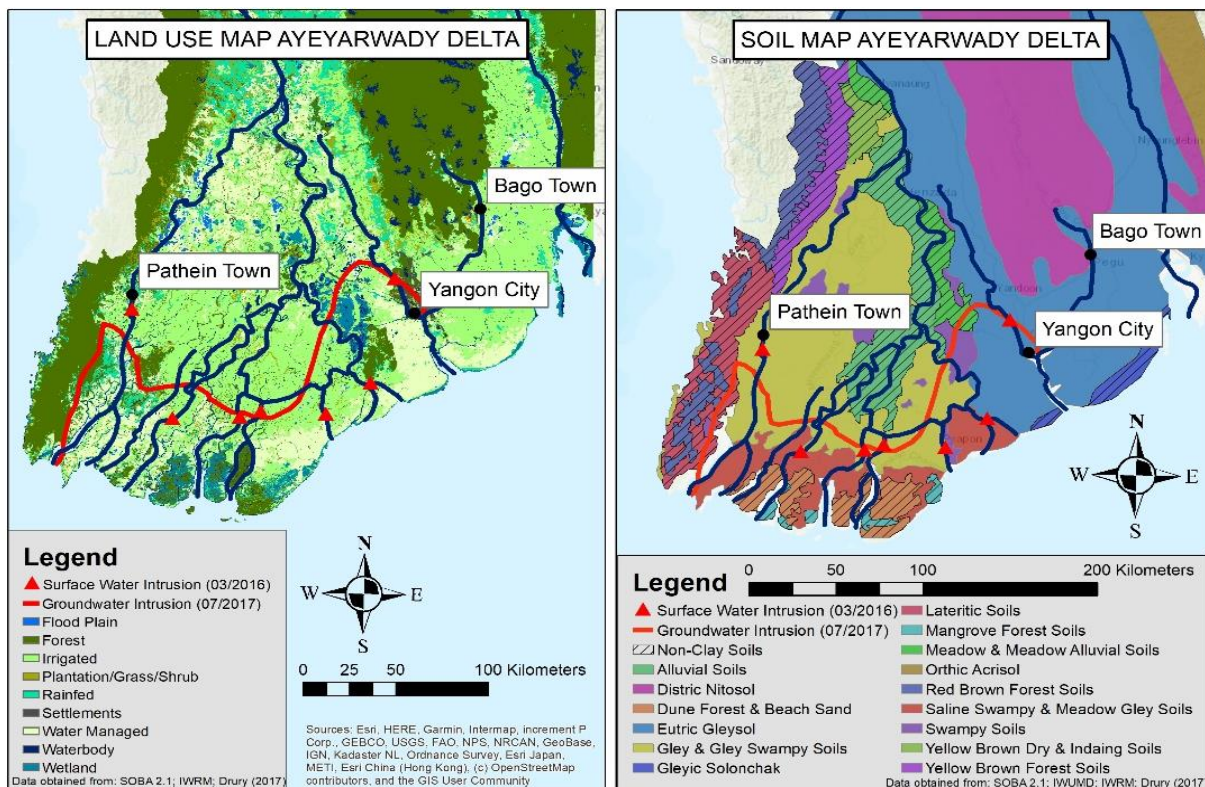


Figure 1: Land Use and Soil Map of Ayeyarwady Delta showing surface and groundwater salinity intrusion fronts (>1500 µS/cm).

Mission Observations

During the quick scan, field visits to several townships in the Ayeyarwady Delta (i.e. Pyapon, Bogale, Dala, Kungyangon), and discussions with various stakeholder parties enabled the analysis of the saline agriculture potential. Several observations were made of which the following are pivotal:

1. Salinity is a seasonal problem. Farmers mainly grow rice until mid-December, and experience saline conditions from Jan to May in the dry season. Most farmers only grow one crop (rice), a second crop is not possible when using the 145-day variety. Around 770,000ha is suitable for saline agriculture in the delta based on saline groundwater fronts.
2. Farmers have little to no experience regarding growing crops under saline conditions. When introducing a second crop, it should not only be salt tolerant, but also soil type, growth cycle and market demand should be considered.
3. Farmers have little capacity to invest in crop diversification and little experience with crop cultivation besides rice.
4. There are vegetable crop varieties with salinity resistance available and piloted outside of Myanmar (Salt Doctors).
5. No training is currently available to train farmers on saline agriculture and to guide a pilot to experiment with saline agriculture.
6. Potential for embedding new knowledge and activities on saline agriculture: Both Ministry of Agriculture, Livestock and Irrigation (MOALI) and Yezin Agriculture University recognize the importance and expressed keen interest to join.



Figure 2 Soil testing in Bogale township



Figure 3 Water harvesting pond in Pyapon



Figure 2 Small sluice gate in Kungyangon

Recommendations

Whereas the initial focus of the quick-scan was on the delta, **the dry zone in Myanmar also seems to have high potential for saline agriculture** due to risk of saline groundwater which has been mentioned by different sources and mapped in the Ayeyarwady State of the Basin report on ground water (SOBA 2a AIRBM Project). The soil type in the dry zone seems to be more suitable for saline irrigation than the dominant clay soil in the delta. In order to assess the potential in the dry zone, **a scoping mission to this area by the experts is required.**

As a second crop in winter season (Jan-Mar) might have potential given smart water management, **a prefeasibility study on this is recommended for a selection of townships** in Yangon Region and the eastern part of Ayeyarwady Region.

Improved data collection and monitoring of groundwater, surface water and soil type is required. A data collection and monitoring plan needs to be developed for a detailed assessment for the best locations for saline agriculture in Myanmar. Both for the dry zone and for the Ayeyarwady Delta. This plan can also include a capacity building component, such as training and additional soil analyses for calibration of existing analyses at the Land use Division.

Regarding a long-term study or research programme, a good governance structure is required as well. With regard to agriculture and monitoring, and identifying the type and amount of irrigation taking place in the areas of interest, a township level committee has already been appointed in order to plan and make decisions on these. This committee can also play an important role in a pilot or shift to saline agriculture.

Additionally, **the mid- and long-term effects of climate change on salinity and implications for investments in those areas, now and in the future, should be studied and accounted for.**

Capacity Building

Stakeholder Involvement and Capacity Building are highly important to develop, select and prioritise future project steps. **It is recommended to train and involve local farmers on short and midterm in pilot crop trials and business development** and to invite government officials with regard to regulations and extension follow up. The selected pilot locations can be used for demonstration, but also to organize workshops and training session for farmers and extension officers, so that the new knowledge and skills can be implemented at their own farms. **It is recommended to use an adjusted PIP approach (WUR).** To reach real impact for the hundreds of thousands of farmers affected by salinity, **it is key to develop an approach for upscaling.**