



PROJECT SUMMARY

Feasibility study and cost-benefit analysis for increased water efficiency and fertigation techniques in Colombian palm oil production

Project duration: June 2020 – November 2021
Reference: Partners for Water PVW4A20012

BACKGROUND

The Netherlands is internationally well-known for its expertise on water management and crossovers like water for agriculture, which is therefore one of the cornerstones of the bilateral relationships the Netherlands maintains as part of the Netherlands International Water Ambition (NIWA). Colombia is one of the seven priority delta countries in the framework of the NIWA, which results in collaboration on topics of water management, coastal protection, governance and nexus based combinations like water and agriculture.

Water efficiency in the palm oil sector is one of the prioritized topics for the coming years and is a cornerstone of the bilateral agenda on circular agriculture of the Dutch Embassy in Colombia. As part of the Partners for Water program, a project has been initiated to foster collaboration between Dutch and Colombian governmental, knowledge and private stakeholders in the field of water efficiency in palm oil production in Colombia. Due to its key position in the Colombian palm oil sector and its interest the issue of water management, this effort focuses on a collaboration with Fedepalma, specifically its research organisation Cenipalma.

Cenipalma has an interest to intensify its research on water efficiency at field level. More knowledge on the actual irrigation requirements of palm oil cultivations in the northern regions is needed. Also, there is limited knowledge available on the possibility to combine efficient irrigation practices like drip irrigation with fertilizer use (so called fertigation systems). Current drip irrigation systems are placed at the surface of the fields, while (permanent) subsurface systems could probably be another option to further reduce evaporation because they are laid underground.

AMBITION

The project stimulates and supports the adoption of more efficient irrigation techniques by Colombian palm oil production farmers. To do so, the limiting factors for this adoption are (further) investigated and addressed in a feasibility study and indicative cost-benefit analysis. To convince farmers to adopt these techniques, a pilot study will be implemented at the demonstration field of Cenipalma and two leading farmers in the area. The study will specifically include an advice on knowledge development and implementation of water measurement techniques like

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Consortium

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the use of sensors and adoption of fertigation systems through a small scale demonstration project. A combination of convincing arguments, a viable business case and an on-field application of fertigation use and sensors in efficient irrigation systems will increase the likeliness of moving away from conventional practices. These innovations in water and fertilizer management on a farm level could benefit both the environmental as well as the economic sustainability of palm oil production.

PROJECT ACTIVITIES AND APPROACH

In the implementation phase, a pilot project will be developed at the demonstration site of Cenipalma. The project will implement a sensor setup and a tailored dashboard for smart irrigation and fertigation. This is done in close collaboration with Cenipalma. Sensors can be used to help the grower to measure crop development and environmental factors. New techniques enable growers to exchange data easier and faster. Delphy Digital, a team within Delphy, uses in-field sensor data to create applications for cultivation management, containing irrigation and fertigation modules. Data-driven models and systems translate data into concrete advices and actions for cultivation optimisation on a strategic, tactical and operational level, which makes it possible to optimize the input and output directly.

As part of the project activities, Delphy Digital will develop a dashboard for smart irrigation and fertigation in palm production in Northern Colombia. The dashboard will include advice on irrigation, fertigation and fertilization for palm trees. Furthermore, the consortium will install sensors to monitor the most important parameters regarding good and efficient palm oil production (e.g. information on soil moisture, weather, the irrigation system, soil moisture content and the timing for irrigation and fertigation). Consortium partners, together with Cenipalma experts, will collect the information and transfer it to a dashboard through "The Internet of Things". The sensors and innovative irrigation, fertigation and water harvesting systems will be installed at two hectares of the demonstration farm.



Campo Experimental Palmar de la Sierra – Image © Cenipalma