

BO-43-003.01-015 - Interim Reporting

BO-43-003.01-015 Add Q4 Inventory re-use water and nutrients Colombia

Executive Summary

- This is the interim reporting for BO-43-003.01-015, Add Q4 Inventory re-use water and nutrients Colombia.
- This is a 2-phase project from the start, with phase 1 in 2018 (this report) and phase 2 in 2019.
- The scope of the project changed slightly over time, in two ways; (i) from a more research-oriented outlook to a more investment-oriented outlook; (ii) from a more re-use oriented outlook to a more circular agriculture-oriented outlook
- Chapter 1 is the status of the work on the relationship between the LNV and the Colombian investments related towards circular agriculture/ CA (both The Netherlands and Colombia are spearheading CA in their respective regions)
- Chapter 2 is the status as was before the slight change in scope and for which many contacts have already been approached and communicated with.
- There is great interest in Colombia in: (i) cooperation with The Netherlands; (ii) the subjects and actions that were communicated with the Colombian counterparts in the course of the work.
- In The Netherlands, also the Ministry of Infrastructure and Water Management is also involved as well as RVO. In Colombia, there are also good contacts with the private sector (including former project partners Nestlé and Nespresso).
- Deliberations are underway for phase 2 of the project.

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1 DRAFT Note on the 'Colombia Workshop'

Context

By 2050, the global population will have grown to around 9.5 billion people. Unless we change our patterns of production and consumption, we will exhaust the planet's resources. Circular agriculture enables us to produce enough food for everyone within the boundaries set by our planet. Circular agriculture is based on the principle of optimising the use of resources, including land and water.

The traditional "linear approach" to agriculture (i.e. extraction of resources, use and disposal of waste) often leads to a high pressure onto downstream water resources, both in terms of quality and quantity. Polluted water from the rivers is traditionally (re)used by local farmers located downstream in the basin to irrigate agricultural products for production of food. This brings a potential (health) risk for the food chain. If the principles of circular agriculture can be applied, safe food production will be achieved while limiting the inputs required (e.g. water, nutrients, biomass, energy). This will lead towards an enhanced symbiosis between agriculture and nature.

Objective

The overall objective of the Workshop is to share the concept of circular agriculture from both Colombian and Dutch viewpoint and to identify the best ways to cooperate on this in practice and how to bring it further across the world.

The specific objectives of the Workshop include to:

- Share the concept of circular agriculture in Colombia, as part of the Colombian strategy to enhance the circular economy strategy of Colombia, including experiences.
- Share the concept of circular agriculture in The Netherlands, including international and Dutch experiences (Systemic-Horizon2020, Agriport A7, ...).
- Identify the possibilities to cooperate on applying the principles of 'circular agriculture' in Colombia in practice, through identification of:
 - the best level to 'pilot' circular agriculture in terms of scale, i.e. field, local, regional or national, with:
 - the most promising locations(s) for the pilot(s)
 - the requirements to enhance the symbiosis of agriculture and nature
 - large investment programmes towards 'circular agriculture'
 - the required partners from government, the agricultural sector, academia and financing institutions.

Circular economy in Colombia

In 2018, Colombia presented its National Strategy towards a circular economy (<http://www.minambiente.gov.co/index.php/noticias/4225-colombia-le-apuesta-a-las-9r-en-economia-circular>). With this Strategy, Colombia intends to transform the production and consumption chains by closing the circles of materials, water and energy, being pioneers in Latin America. To implement the Strategy, several Ministries are involved, including Environment, Trade, Agriculture, Housing, Education, Transport and Mining. The lines of action in this Strategy include:

- Industrial products and materials
- Packaging materials and packaging
- Optimization and use of biomass
- Water cycle
- Sources and use of energy
- Materials management in urban centers
- Communication and civic culture.

Potential participants

Government:

- Colombia:
 - national:
 - Ministries of Agriculture and Rural Development: Agrosavia (Min of Ag), ...
 - Environment and Sustainable Development; IDEAM (Institute of Hydrology, Meteorology and Environmental Studies)
 - Finance;
 - Housing, Cities and Territories)
 - regional: Regional corporations; Cities
 - APC – DNP (National Planning Directorate)
- Netherlands: Ministries of Agriculture, Nature and Food Quality; Infrastructure and Water Management; Foreign Affairs (EKN?); Economic Affairs and Climate (RVO?)

Private Sector:

- Colombia:
 - CNA-ANDI (National Centre of water from the National Association of entrepreneurs and companies);
 - Nestlé-Nespresso (building on their investments in the recent large coffee PPP)
 - Water providers (drinking water, etc.)

Agriculture sector:

- Colombia: ASOCOLFLORES, ASOHOFrucol, FNC, FEDEPALMA, ..., FAO representative,
- Netherlands: ... (Agriport A7; EU-WssTP; EKN?)

Academia/ Consulting:

- Colombia: UNAL, University of Boyaca, ..., Tecnalia, CENICAFÉ, CATIE-Colombia, ...?
- Netherlands: WUR.

Financing institutions:

- Colombia: ...
- Netherlands/ international: RVO, FMO, IADB, World Bank, ...

Expected output of the Workshop

The workshop will result in:

- a concise report on the workshop
- identified:
 - similarities and differences between circular agriculture in Colombia and The Netherlands
 - potential area to 'pilot' circular agriculture, at various scales (various scales and sectors)
 - stakeholders willing to participate in following-up potential pilots
 - the need for large investment programmes towards 'circular agriculture'
 - possible financing mechanisms and steps to reach those

Logistics

Date: first half of April 2019?

Venue: ... (in a city that is interested?)

Principal local organiser: ...!! (a city?)

Draft Programme

First Indicative programme Colombia Workshop

time	Day #1	
09.00	Words of Welcome, Colombia Opening by LNV (Context and Purpose of the Workshop) Introduction to the programme by t.b.n. Circular economy in Colombia by t.b.n. Experience from Colombia by t.b.n.	
10.30	Coffee-Tea Break	
11.00	Circular agriculture in The Netherlands by t.b.n. Examples, from Europe and The Netherlands by t.b.n. Plenary Discussion	
13.00	Lunch break	
14.30	Identify the possibilities to cooperate on applying the principles of 'circular agriculture' in Colombia in practice, through identification of the best level to 'pilot' circular agriculture in terms of scale, i.e. local/ municipal, regional or national. Group photo	
	Day #2	
9.00	Identify the possibilities to cooperate on applying the principles of 'circular agriculture' in Colombia in practice, through identification of: <ol style="list-style-type: none"> 1. the most promising locations(s) for the pilot(s) 2. the most promising 'sectors/ crops' 3. possibilities to enhance the symbiosis between agriculture and nature 4. the required partners from government, the agricultural sector, academia and financing institutions. 	
10.30	Coffee-Tea Break	
11.00	Funding possibilities, Colombia Funding possibilities, The Netherlands	
13.00	Lunch	
14.30	Recommendations on follow-up	
16.30	Closure by t.b.n.	

2. Cooperation with Colombia on Water and Nutrient Reuse for Agriculture, a Concept Note

Introduction

The government of The Netherlands, Ministry of Agriculture, Nature and Food Quality (hitherto referred to as LNV), is considering a long term effort regarding circular agriculture with a water for food dimension and this Concept Note is to explore the interest of Colombia to become partner for a specific initiative on the development of circular agriculture in Colombia from the start point of water. The Ministry of LNV has asked Wageningen UR to go the process required to pre-formulate a proposal for this initiative, in cooperation with Colombian stakeholders.

Three phases are identified:

1. Identification of interest and contribution of the potential stakeholder partners. Several institutions are already working in water management in Colombian, often related to agriculture but usually in an isolated situation. It is essential to identify and involve relevant stakeholders to ensure collaboration and the direct uptake of the results.
2. To formulate, on the basis of all contributions of partners, a proposal for a two-year cooperation, to be ready by April 2019.
3. The execution of the initiative.

Approach outline

Rural areas upstream in a basin provide food and clean water, as well as other ecosystem services to cities, in a way that now we would define as a "linear agricultural approach"(extraction of resources, use and disposal of waste). Sometimes this "traditional" agriculture also leads to a high pressure onto downstream water resources, both in terms of quality and quantity. Afterwards, peri-urban rivers also suffer from high pressure because of the (treated) wastewater discharged from various sources, like urban or industrial.

The "polluted" water from these rivers is traditionally (re)used by local farmers located downstream of large cities to irrigate agricultural products to feed the city. This brings a potential (health) risk for the food chain. But if agricultural best management practices are applied, safe food production could be achieved, while limiting the inputs required (water and nutrients) and potentially acting as a buffer for the environment located downstream.

For that reason, the circular agriculture dimension (nexus food-water-cities-ecosystem) should be explored in a more holistic approach in order to determine the best possible conditions. This leads to the following questions:

- Is it possible to directly/indirectly reuse the (treated) wastewater and other waste to regain the nutrients e.g. to produce safe agricultural products? Which kind of cost-effective by-products management systems are required?
- Can agriculture/soil deliver cleaner water to the ecosystem acting as a buffer?
- Can the ecosystem supply cleaner water to agriculture and society?

These questions should be addressed in a holistic way by implementing several pilot cases at different levels, including at least:

1. Indirect reuse for horticultural peri-urban agriculture near the city of Bogotá. Aim: risk assessment of indirect water reuse; develop cost-effective technologies to limit the risk; best ways to feed the city.
2. Direct wastewater reuse (from wastewater treatment facilities) in water scarce areas under the Colombian water reuse regulation. Aim: assess the potential of direct water reuse in Colombia in water scarce areas to produce safe food and to limit urban water pollution.
3. Direct reuse/ treatment of effluent or by-products from rural areas in the coffee region. Aim: explore the potential of nature-based solutions (e.g. green filters) to treat effluents from the coffee sector for reuse and to produce biomass.

A proper dissemination of the best practices and technologies required for the safe reuse of water and nutrients is key to guarantee the success of this initiative.

Potential Colombian partner organisations/stakeholders

In this phase, the potential partners for the foreseen project need to be selected based upon their interest and added value for the project. This is an ongoing activity and that is explored further before being able to define the exact details of the project. For the time being, the following organisations have shown an early interest:

1. **Colombia: Ministry of Agriculture - Agrosavia**

Agrosavia shows their interest to further develop the topic of water and nutrient reuse and to explore how they can link-up their activities in this topic into the LNV initiative. The activities on the reuse of by-products is being explored. Agrosavia is identifying additional budget contributions (from the MoA as well as the Central government). Two potential ongoing activities of Agrosavia are identified up to now for linking up:

- Irrigation of horticultural products with "polluted water". The objective of the study is i) to evaluate the risk of irrigation with (waste)water from peri-urban rivers by assessing the fate of pollutants (metals, microbiological and pesticides) in three environmental compartments (water, soil and crop) in two locations of Colombia (Cundinamarca - Bogotá river and Nariño); and ii) to develop effective treatments to guarantee a safe food production. Total budget of around 100-150 K€ (potential in-kind contribution for the LNV initiative).
- Integrated tool (platform) to support the agri sector in Colombia. By combining (geo) information from different sources (weather, soil, water, crops, best practices, etc.) the platform will advise and support farmers to make better decisions, in order to reach the potential production. Several Colombian institutions will be involved with the tool, such as IDEAM, IGAC, UPRA, etc. Total budget of around 175 K€ (potential in-kind contribution for the LNV initiative).

Additionally, Agrosavia owns a 4 ha water reuse facility from a former project about good farming practices for horticulture irrigation with treated wastewater. This facility could be used for new studies, but investments are required.

2. **Colombia: Ministry of Environment**

This Ministry shows great interest in the topic, since it is their mandate to regulate water reuse practices in Colombia. Today, the Ministry is in the process to review the current rule 1207/2014 on Reuse of treated wastewater for irrigation and industrial purposes. Within this review, the Ministry expects to be able to facilitate reuse in the coming years, especially in areas suffering from water scarcity. Other Ministries are actually required to be also involved in the initiative, such as the Min. of Agriculture and the Min. of Housing. The Ministry of Environment is willing to support the LNV initiative and to propose pilot areas. The Ministry's contribution is yet to be specified.

3. **International: CATIE**

CATIE expressed their interest to be involved in the initiative and is willing to contribute in: i) the development of good management practices at watershed level, including the topic of water and nutrient reuse as a key element; ii) dissemination and technology transfer. CATIE has interest in including sectors such as coffee or palm which should be explored for additional pilot cases. The budget contribution from CATIE has not been confirmed yet but in earlier stages about 100 k€ as in-kind contribution has been mentioned.

4. **International: WUR**

WUR will act as a representative of LNV in the initiative, coordinating and bringing their knowledge on the topic and sharing practical experiences from Dutch and European cases.

5. **Other Colombian and international potential partners/ stakeholders** could be considered in the preparation of the foreseen project, including e.g. the following entities:

- a. Empresa de Acueducto de Bogotá or others water providers
- b. CNA-ANDI (national centre of water from the national association of entrepreneurs and companies)
- c. IDEAM (Institute of Hydrology, Meteorology and Environmental Studies)
- d. Regional Corporations
- e. Nespresso and Nestlé, building on their investments in the IWM project (a PPP on water management) in the coffee sector (including e.g. CENICAFÉ (FNC))
- f. European and international platforms/initiatives such as the EU-WSSTP.