

Ministry of Agriculture, Nature and Food Quality



Circular Agriculture; where Colombia and the Netherlands meet

Prioritized circular agriculture focus areas in Colombia and corresponding working agendas 2020-2022 for the agricultural department in Bogota

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Agricultural department

Embassy of the Kingdom of the Netherlands in Bogota, Colombia

Preface

The Netherlands is the second largest exporter of agrifood products worldwide and leader in efficient agricultural production and technology. On the one hand, these are statistics of which we are proud since we are a tiny country. On the other hand, we are also aware that sustainable production is increasingly necessary. Agriculture is one of the sectors most affected by climate change while having a great impact on the environment due to the pressure it exerts on natural resources and the waste and emissions it generates.

For this reason, the Minister of Agriculture, Nature and Food Quality of the Netherlands, Carola Schouten, in September 2018 presented the vision on circular agriculture. It describes how agricultural production systems will have to move from the focus on the continuous reduction of production costs towards a continuous reduction of the consumption of raw materials, the careful management of soil, water and nature, guaranteeing a greater appreciation of producers.

As the Dutch agrosector imports products from all parts of the world and also exports products to the rest of the world, the transition to a circular agriculture does not stop at the Dutch borders. Moreover, problems such as loss of biodiversity, water scarcity and soil erosion, to which circular agriculture is the answer, are global. That is precisely why we aim to cooperate with other countries, also with countries of origin of many agricultural products such as Colombia, to realize the ambitions in relation to circular agriculture.

In November 2018, Prime Minister of the Netherlands Mark Rutte and Minister Carola Schouten visited Colombia. Minister Schouten focused her visit on circular agriculture and sustainability of agricultural value chains. As a follow up of the visit of Minister Schouten to Colombia and to strengthen the transition towards a more circular agriculture in the Netherlands and Colombia, the agricultural department of the embassy of the Kingdom of the Netherlands developed a strategy on how to implement the circular agriculture policy in Colombia, which is quite a green field area and therefore quite a challenge. The strategy consists of a vision resulting in six prioritized focus areas and corresponding working agendas which contain concrete activities to support circular agriculture. The strategy will be implemented in the coming years.

I am very proud of the strategy that lays before you and very motivated and enthusiastic to start working on the activities it proposes. I would like to highlight that Colombia, as one of the first countries in Latin America, has developed a National Circular Economy Strategy of which agriculture is a crucial part. Moreover, in Colombia there are already various examples of best practices in relation to circular agriculture. Think of the RedES-CAR program of the Los Andes University in the Cundinamarca department, which is an excellent example of cooperation between the private, academic and public sector that results in more sustainable business practices. Finally, the willingness of different actors in Colombia to work together with us on circular agriculture is very promising for the future. All this generates a unique momentum for the Netherlands to cooperate with Colombia to achieve a more circular agriculture in the coming years.

The development of this strategy would not have been possible without the many conversations, meetings and discussions we had with the public sector entities, the private sector federations, numerous companies, research institutions and universities from both Colombia and the Netherlands. Moreover, the pro-active attitude and the ambitious plans of these different actors have been crucial for the development of the activities within this strategy.

With this strategy, we hope to inspire other countries and actors to prioritize circular agriculture in the future. Our planet and future generations demand sustainable and circular ways to produce our daily food.

Patricia de Vries Agricultural Councellor for Colombia, Peru and Ecuador



Official visit Dutch Prime Minister, November 2018 Photo: Press office Presidency Colombia

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Executive summary

In September 2018, the Dutch Minister of Agriculture, Nature and Food Quality presented the vision on circular agriculture. The vision maps out the road in the near and distant future for a transition in agriculture from continuously increasing production and cutting costs towards agricultural production with as low as possible pressure on the environment and natural resources by closing agricultural production cycles. To realize this ambition, the Netherlands not only works within its own borders, but also aims and needs to cooperate with other countries, like countries of origin on which the Netherlands is dependent for its imports.

In Colombia, the agricultural department (LAN Bogota) of the Dutch embassy has developed a strategy for the coming years to realize the transition towards a more circular agriculture. This strategy is structured in two phases. First, a vision has been developed, resulting in six prioritized focus areas in Colombia related to circular agriculture. The vision is based on interviews with stakeholders from the private, public and academic sector in Colombia and on the analysis of trade, policies, goals, know-how and activities in Colombia and the Netherlands. The prioritized focus areas are:

- 'Water for agriculture' in palm oil, banana, flowers and coffee.
- Valorization of biomass in palm oil, banana and coffee.
- Reduction of (single use) plastics in banana and flowers.
- Integrated pest management in banana, palm oil and flowers.
- Alternatives for animal feed imports in poultry and pork.
- Valorization of poultry and pork manure.

Secondly, for these prioritized areas, working agendas for the coming years for the agricultural department of the Royal Netherlands Embassy in Bogota have been defined. To develop the working agendas, LAN Bogota has actively approached a wide variety of actors in Colombia and the Netherlands to gauge their interest to work on circular agriculture and to identify financing sources. The conversations with these different actors gave insights into what activities LAN Bogota could develop, join or stimulate, with which actors and how to finance them. Consequently, LAN Bogota brought the different actors together in order to make ideas, plans and possibilities more concrete. This has resulted in the formulation of a wide variety of activities where different actors from Colombia and the Netherlands can cooperate.

The working agendas are divided into two parts. The first part contains activities that do not fit merely within one of the prioritized focus areas; these are the overarching and more general activities. The second part of the working agendas contains activities that fall under one of the six prioritized focus areas.

The proposed overarching and more general activities of the working agendas are the following:

- MoU on circular economy and circular agriculture between the Netherlands government and the Colombian government.
- Dutch–Colombian B2B platform on circular agriculture and living lab for best practices.
- Mapping of Dutch companies offering technological and digital solutions for smallholders related to circular agriculture.
- 100% circular Netherlands pavilion when participating in agricultural fairs.
- Circular agriculture hackathon during Expoagrofuturo 2019.

The first prioritized focus area is 'water for agriculture' in the palm oil, banana, coffee and floriculture sector. In the palm oil and banana sector, it is proposed that the activities are centralized in the Northern region of Colombia, due to the region's water scarcity, presence of palm oil and banana producers who export to the Netherlands, common irrigation practices, possibilities for economic development, and possibilities for cooperation with crucial allies. The proposed activities address efficient water use on farm level and integral water management on a regional level via feasibility studies, demonstration projects and capacity building programs. The activities in the coffee sector aim to reduce the costs of externalities in coffee production by addressing water pollution, water use and other environmental and social impacts. The activities in the floriculture sector address water governance issues in the Cundinamarca department to improve sustainable use of the region's water resources. In Cundinamarca 60% of all flowers are produced.

The second prioritized focus area is valorization of biomass in the palm oil, banana and coffee sector. The activities aim to valorize the residual plant material by transferring it from waste material into an extra source of income. The activities support best practices and bring the results of the valorization of biomass research within the K₂K agreement between WUR and Cenipalma in the palm oil sector from the desk to the field.

The third prioritized focus area is reduction of (single use) plastics in the banana and floriculture sector. The proposed activities in the banana sector aim to introduce a biodegradable alternative for plastic use during the production and transport of the bananas in cooperation with frontrunner companies in sustainability. The activities in the floriculture sector aim to characterize the plastic use and disposal an afterwards aim to lower plastic use via the development of environmental footprints.

The fourth prioritized focus area is integrated pest management in the floriculture, banana and palm oil sector. The activities aim to establish market access in Colombia for biological control solutions to offer alternatives for the

use of pesticides via continuing talks with governmental entities and lobbying to change current legislation on the import of biological control solutions.

The fifth prioritized focus area is alternatives for animal feed imports in the poultry and pork sector. The proposed activities aim to generate a protein transition in Colombia through the local production of insects for animal feed. To reach this protein transition, an analysis of the possibilities in Colombia for local insect rearing for animal feed in the poultry sector including an action plan to set up a demonstration project. Furthermore, it is proposed that a Dutch expert will give a presentation on insects for feed in the annual and bi-annual congresses of Fenavi and PorkColombia. LAN Bogota also participated in the first seminar on insect production for feed purposes in Colombia in November 2019.

The sixth prioritized focus area is valorization of pork and poultry manure. The proposed activities aim to valorize manure by transferring it from waste into an extra source of income. A first step is capacity building via education of pork farmers how to transfer manure into biogas or fertilizer. Also, it is proposed that A Dutch expert will give a presentation on valorization of manure in the annual and bi-annual congresses of Fenavi and PorkColombia.

The efforts of LAN Bogota on circular agriculture have not merely resulted in this strategy. The development of the strategy has led to numerous new alliances and partnerships with already familiar actors in Colombia and the Netherlands but also with actors that were not on LAN Bogota's radar before. Furthermore, the introduction of the vision and the concept of circular agriculture in Colombia during talks with other actors and during workshops, seminars, fairs and other events has resulted in familiarity with the vision and concept by actors in Colombia. These actors now speak about circular agriculture and discuss it amongst each other. Moreover, LAN Bogota formed part of the National Circular Economy team of the Colombian Ministry of Environment and Sustainable Development during the development of this strategy. This close cooperation has resulted in the development and execution of projects and workshops and has been very important for building and expanding networks in circular

economy and agriculture in Colombia. In this respect, LAN Bogota has been very instrumental in setting the Colombian agenda.

The working agendas will be guiding the activities of LAN Bogota in Colombia in relation to circular agriculture in the coming years. In addition to these working agendas, some actions are necessary to further strengthen the transition to a more circular agriculture in Colombia and the Netherlands which cannot be addressed in Colombia, but should be addressed in the EU and in the Netherlands. To make agricultural value chains that connect Colombia and the Netherlands more circular and sustainable, the principles and criteria of voluntary certification schemes should be tightened. Voluntary certification schemes like Fair Trade, Rainforest Alliance and RSPO could be much more instrumental in the actual farm business practices and production in Colombia, such as pesticide use, plastic use and water management. The Dutch government can lobby to tighten the principles and criteria and include also reduction of plastic use and improve water management during production. Organic certification schemes could be a first start, since the consumers are likely more willing to pay a little extra for alternatives for single use plastics for example. Moreover, the Dutch government can lobby on EU level to ban single use plastics within agricultural production in third countries via EU legislation. In the light of the new European Green Deal, the momentum is excellent to lobby for such a ban. Finally, financial funds are an important means for the realization of the circular agriculture vision and to operate effectively as Dutch government abroad. Currently, the LAN network has little or no funds at its disposal for activities related to circular agriculture. A fund that makes it possible to finance small-scale seed money projects or pilots in the field of circular agriculture abroad would strengthen the transition towards circular agriculture.

What Who How

Overarching activities

MoU on circular economy and circular agriculture between the Netherlands and Colombian government.	\triangleright	EKN MADS MADR	\triangleright	N.A.
Dutch–Colombian B2B platform on circular agriculture and living lab for best practices.	\triangleright	LAN-B RVO HH	\triangleright	RVO/PSD- Toolkit
100% circular Netherlands pavilion when participating in Colombian agricultural fairs.	\triangleright	LAN-B HH	\triangleright	LNV-PIA
Hackathon on circular agriculture during Expoagrofuturo 2019.	\triangleright	LAN-B Agrilink	\triangleright	LNV-PIA
Mapping of Dutch companies offering technological and digital solutions for smallholders related to circular agriculture.	\triangleright	LAN-B LNV RVO	\triangleright	N.A.
	-			

Water for agriculture

Workshop 'Towards an integral water management for a circular agriculture' to identify challenges, best practices and leads for future cooperation.	\triangleright	LAN-B WUR MADS AU Agrosavia CATIE	\triangleright	LNV
Feasibility study and demonstration project for the introduction of efficient irrigation techniques in the palm oil sector in the Northern region of Colombia.		LAN-B RVO Deltateam Fedepalma Cenipalma MADR MADS	\triangleright	PvW (RVO)

Water management in the banana sector in the Northern region of Colombia ; feasibility study of introduction of Dutch technology and an analysis of the region's water availability and water use.	⊳	LAN-B FAO Asbama Augura	\triangleright	TBD
Training program of palm oil and banana producers to improve water governance in the Northern region of Colombia.	⊳	LAN-B IHE Delft WUR AU UM	\triangleright	TBD, Nuffic / Tailor-Made Training Plus Pending
Implementation of the RedES-CAR program in the Magdalena department, focusing on palm oil and banana producers.	\triangleright	LAN-B AU MADS	\triangleright	TBD (MADS pending)
Supporting impact projects to lower external costs in coffee production via the True Cost Pricing project.	⊳	LAN-B MVO Nederland BZ RVO	\triangleright	TBD
Water security strategy in the Cundinamarca department focused on the floriculture sector.	⊳	LAN-B Asocolflores Ceniflores	\triangleright	TBD
Valorization of b	ion	nass		
Support of exemplary examples of valorization of plant material in Colombia.	⊳	LAN-B	\triangleright	N.A.
Application of results of the valorization of biomass research within the K2K agreement between WUR and Cenipalma in the palm oil sector.	⊳	LAN-B WUR Fedepalma Cenipalma MADS	\triangleright	TBD



Dutch expert presentation on insects as alternative protein source for animal feed at the academic agenda of the annual and bi-annual congresses of PorkColombia and Fenavi.	\triangleright	LAN-B Fenavi PorkColombia	\triangleright	LNV / PIA RVO / BPA
Participation in the first seminar on insect production for animal feed purposes in Colombia. Valorization of ma	D	LAN-B WUR UNAL	\triangleright	N.A.
Capacity building of pork and poultry producers how to transfer manure into biogas or organic fertilizer.		LAN-B PorkColombia FENAVI MADS	\triangleright	TBD
		lathaulau da		

- EKN = Embassy of the Kingdom of the Netherlands MADR = Ministry of Agriculture and Rural Development (Colombia)
- LAN-B = LAN Bogota
- HH = Holland House
- WUR = Wageningen University & Research
- FSI = Floriculture Sustainability Initiative
- BZ = Ministry of Foreign Affairs (the Netherlands)
- AU = Los Andes University
- UM = Magdalena University
- MVO = Corporate Social Responsibility
- UNAL = National University of Colombia
- FAO = Food and Agriculture Organization
- MADS = Ministry of Environment and Sustainable Development (Colombia)
- RVO = Netherlands Enterprise Agency
- LNV = Ministry of Agriculture, Nature and Food Quality (the Netherlands)
- PvW = Partners for Water
- PIA = Program International Agribusiness
- Nuffic = Dutch Organization for Internationalization in Education
- N.A. = Non Applicable
- TBD = To be decided
- PSD T = PSD-Toolkit

1. Introduction

Farming, horticulture and fisheries are innovative sectors in the Netherlands and have contributed significantly to the economy and prosperity of the country. Supply chains from producer to consumer function very efficiently at low costs, and they are supported by world-class scientific research and vocational training. As a result of this and as a result of the history of the Netherlands as a trading country with the rest of the world, we have become the second-largest exporting country of agricultural products in the world.

Characteristic for agriculture nowadays in the Netherlands is the emphasis on cutting costs and increasing production, resulting in enlargement of scale. In the market, this often goes hand in hand with small and sometimes even negative margins for farmers. This makes the sector vulnerable in economic terms.

Furthermore, the continuous reduction of costs and increasing production also lead to higher pressure on the environment, with loss and deterioration of natural resources; biodiversity, water (quality and quantity), air, soils and nature. The Dutch government recognizes that with current production methods and consumer behavior we put a heavy burden on our planet.

In September 2018, the Minister of Agriculture, Nature and Food Quality Carola Schouten presented the vision of circular agriculture named 'Agriculture, Nature and Food: Valuable and Connected.' This policy document envisions a transition from continuously cutting costs towards agricultural production with as low as possible pressure on the environment and natural resources; water, air, nature and biodiversity. Healthy soils are a sine qua non.

In June 2019, the Minister of Agriculture, Nature and Food Quality presented an ambitious plan on how to realize this transition to circular agriculture. The plan, titled "on the road with a new perspective", describes what is already happening in the field of circular agriculture and how the government and other actors will facilitate further steps in the transition, such as the creation of areas for experiments, new legislation and allocation of funding.

The transition towards circular agriculture does not stop at the Dutch borders. Soil degradation, loss of biodiversity, water scarcity and the critical position of farmers are global issues related to agriculture. Also, agricultural supply chains from producers to consumers nowadays often are international. Not only agricultural production and exports are key to the Dutch economy, but our agricultural sector and food industry are also guite dependent on imports of agricultural products and raw materials. Therefore, working towards more circularity also means working towards more circularity of the international value chains and food production in the countries of origin, EU countries and countries where the Netherlands markets circular agricultural products. Consequently, the Netherlands aims to cooperate with other countries to realize the ambitions concerning circular agriculture. Since the specific circumstances and the agro-trade relation with the Netherlands vary per country and because working towards circular agriculture is new ground, there is no blueprint of how to execute the transition towards a more circular agriculture. Therefore, the specific approach will differ per country.

In Colombia, the agricultural department (LAN Bogota) at the Dutch embassy has developed a strategy how to implement the policy on circular agriculture in Colombia in the coming years. This "special assignment" was developed in two phases. The first phase of the assignment was to identify and prioritize focus areas of circular agriculture in Colombia. This identification is based on the bilateral agricultural trade between Colombia and the Netherlands, the priorities in the LAN vision 2018-2022 and developments and opportunities in Colombia related to circular agriculture that were identified via interviews with stakeholders of the private, public and academic sector in Colombia. This resulted in a long-list of possible focus areas of circular agriculture in Colombia. In continuation based on the long-list, a short-list of focus areas has been defined. These prioritized focus areas are selected from the long-list by looking at additional motivations to focus on these areas, such as on-going circular agriculture initiatives in Colombia, the existence of Dutch know-how and technology in these focus areas and EU and Dutch policy priorities.

During the second phase of the assignment working agendas for the coming years for LAN Bogota have been formed. To create the working agendas, LAN Bogota has approached a wide variety of actors in Colombia and the Netherlands. The conversations with these different actors gave insights into what activities LAN Bogota could develop, join or stimulate and with which actors. Consequently, LAN Bogota brought the different actors together to make ideas, plans and possibilities concrete. This has resulted in the formulation of a wide variety of activities where different actors from Colombia and the Netherlands cooperate.

This document is divided in seven chapters. After this first introduction chapter, chapter two offers a conceptualization of circular agriculture. Chapter three contains the analysis of the potential focus areas of circular agriculture in Colombia for LAN Bogota; the long-list. Chapter four continues with the analysis of the Dutch and Colombian policy priorities relating to circular agriculture, Dutch know-how and technology and on-going initiatives of circular agriculture in Colombia, providing instruments to prioritize within the long-list. This leads to the identification of a short-list of prioritized focus areas of circular agriculture in Colombia. Chapter five contains the working agendas. It offers overarching and more general activities that contribute to circular agriculture and activities for each of the prioritized focus areas. Chapter six offers recommendations to LAN Bogota and the Dutch government on how to further strengthen the transition towards a circular agriculture in Colombia. Finally, chapter seven gives a reflection on LAN Bogota's participation in the Colombian government and the Los Andes University.

2. Conceptualization of circular agriculture

The Dutch policy document on circular agriculture defines circular agriculture as agricultural production with as low as possible pressure on the environment and natural resources; water, air, nature and biodiversity. Healthy soils are a "sine qua non".

We can achieve this by going from a linear agriculture as it is now to circular agriculture, closing agricultural production cycles from the producer until the end-consumer, thereby reducing "leakages" from the system by reducing spillage and waste. Circular agriculture is among others about reducing the amount of inputs into the system of chemical fertilizers, pesticides and (single-use) plastics, as well as reducing the use of water. Circular agriculture also entails a reduction of emissions during the production cycles. And circular agriculture is about re-using and adding value to material that is currently perceived as waste like plant residues, manure, water, packages, food spillage, etc.

To make this transition possible, there are certain requirements. The importance of farmers as producers of our daily food and their work and efforts have to be better acknowledged and valued again. And it is crucial that the farmers must receive fair prices and have a fair income and livelihood. Not only farmers are responsible for making this transition happen; we all together are responsible and all actors will have to contribute to and invest in changing the system to make this happen; government, private sector, education, research and development, consumers and financial instruments.



3. Analysis of the potential focus areas of circular agriculture in Colombia

The identification of the potential focus areas of circular agriculture in Colombia is made based on three aspects. First, it is based on the main agricultural trade from Colombia to the Netherlands. This is where the Netherlands can have a (positive) influence and an active role in working towards circular agriculture, both in the Netherlands as in Colombia. Therefore, an overview of the main agricultural trade from Colombia to the Netherlands is offered in this chapter. Secondly, it is based on the LAN vision on agriculture in Colombia for the period 2018-2022. This vision sets out the priorities of the work of LAN Bogota concerning agriculture and this framework indicates which sectors and themes to focus on. Last but not least, the identification is based on interviews with Colombian stakeholders concerning circular agriculture. An overview of the main outcomes of these interviews is offered in this chapter.

3.1. Main agricultural trade from Colombia to the Netherlands

The Netherlands is an important trading partner for Colombia. In 2018, the total number of exports from Colombia to the Netherlands had a value of 1,056 million euros and the total number of exports from the Netherlands to Colombia had a total value of 715 million euros. The trade relationship between the countries, especially the exports from Colombia to the Netherlands is, next to coal exports, characterized by a strong focus in agro-food commodities. In November 2018 the Dutch Prime Minister Mark Rutte and Agriculture Minister Carola Schouten visited Colombia. This visit has stressed the big potential of Colombia to become a strategic partner in the global trade of sustainable food, raw materials and basic agro-commodities both to the Netherlands and to the European Union (EU).

As the figures above demonstrate, Colombia exports much more agricultural products and raw materials to the Netherlands than it imports. And exports are

increasing. More sustainable production, prevention of spillage, reduction of waste and less pressure on natural resources in this country of origin will most definitely contribute (and might even be indispensable) to closing agricultural production cycles. Also, the vision on circular agriculture of the Netherlands stresses that working towards circular agriculture also means working towards sustainable import of agro-food commodities from different parts of the world. Consequently, the Netherlands pursues an active role to improve sustainability and circularity in the main agricultural exports from Colombia to the Netherlands. In 2018, Colombia exported a total amount of 501 million euros of agricultural products to the Netherlands. The most important exports in relation to agrofood commodities are palm oil and its fractions (239 million euros in 2018), fruits (150 million euros in 2018) of which bananas and plantains are the most important (59 million euros in 2018), cut flowers (87 million euros in 2018), coffee (30 million in 2018), sugar (5 million euros in 2018) and cacao (4 million euros in 2018)¹. Therefore, these six agricultural value chains are considered as important when defining the potential focus areas on circular agriculture in Colombia.

3.2. The vision of LAN Bogota (2018-2022)

In October 2018, LAN Bogota presented its vision for the period 2018-2022. This vision defines the areas of work of LAN Bogota:

- 1. Inclusive growth and development of the Colombian countryside.
- 2. Feeding the cities
- 3. Exploiting export potential
- 4. Sustainable agricultural production chains

Within these areas, the following sectors are prioritized: horticulture (vegetables, fruits and flowers), palm oil, coffee, cacao and animal production (among others poultry). These agricultural value chains coincide with and confirm the above mentioned priorities.

3.3. Interviews with Colombian stakeholders concerning circular agriculture

To further identify potential focus areas of circular agriculture in Colombia, interviews with Colombian stakeholders were held. The Colombian stakeholders have been identified via the existing network of LAN Bogota. The stakeholders can be divided into three different groups: Private sector representatives, governmental entities and research. The main focus points identified are: efficient water use during and after cultivation, re-use of water and nutrients, valorization of biomass, reduce plastic use, pesticide use, chemical fertilizer use, prevent food waste, improve income/livelihood farmers and valorization of manure.

3.3.1. Private sector representations (agricultural federations)

Coffee sector, Federación Nacional de Cafeteros



The federation is well-organized. As such, they can implement projects and they run various projects related to circular agriculture. From water projects to soil projects, to projects that try to find ways to make modern technology available for small-scale farmers.

Concerning circular agriculture, the federation identifies three major themes of interest: water, soils and waste.

 Some coffee cultivators have almost closed the water cycle according to the federation. Coffee cultivation in Colombia does not require irrigation and also the amount of water to wash the coffee cherries after harvest is in some cases low (1/2 liters of water per kilogram of coffee cherries). However, in many cases water use after harvest is still high (until 25 to 30 liters of water per kilogram of coffee cherries).

¹ https://ec.europe.eu/eurostat



- Coffee producers currently do not value all biomass. The pergamo is most often used as fertilizer and therefore an environmental risk.
- Soils are vulnerable to erosion due to the steep slopes on which the coffee is cultivated.



The association of Colombian flower exporters, Asocolflores, is a well-organized and professional organization. Its main activities are related to innovation, representation of the private sector, market promotion and sustainability. Concerning circularity, there are four main challenges according to the association: water management, pesticide use, fertilizer use, and plastic use.

- Fresh cut flower cultivations use irrigation water and available water sources are in some cases being overexploited. Hence, integral management of the producers' water resources is one of the sector's main objectives.
- Pesticide use in the sector is high. Options for integrated pest management exist but are (still) limited. The association would like to intensify work on the theme of integrated pest management.
- In the production schemes of flowers chemical fertilizers are used. In the future, these could be (more) replaced by alternatives, like organic fertilizers.
- Plastics are widely used in the sector. The association indicates that it has ambitions to be a frontrunner on this topic and aims to find ways to limit (single-use) plastic use.



The federation is highly professional and well-organized. They run various initiatives in the theme of circular agriculture, mostly in post-harvest aspects and less in production aspects. The federation conceptualizes sustainability as social, environmental and economical. The main themes identified by the federation to work on in the coming years concerning circularity are water use, pest control, biomass valorization and fertilizer use.

- Palm oil is also cultivated in regions where water is scarce. In some regions, there is already water stress. Technology to make efficient use of water is available, but a viable business model for producers to make use of the technologies is missing. Besides using less water, also governance of water within a watershed is one of the federation's goals. This is inter-sectorial. One of the goals is to experiment with sustainable water governance on a watershed level. Another issue in water management is awareness of farmers how much water they apply to their fields. The amount of water that is required is often known, but awareness about the amount of use is unknown.
- Pest control is an issue to improve in the coming years. The level of pesticides is often high in palm oil cultivation. Also, pressurized irrigation instead of flood irrigation can prevent spreading of (root) diseases.
- Chemical fertilizers are used in the production of palm oil. In the future, these could be replaced by alternatives, like organic fertilizers.
- There are already various projects by the federation to make use of biomass. For example, a project where they use the rest product of the fresh fruit bunches to construct roads, rest products used for animal feed and rest products used as energy for boilers.

Avocado sector, Corpohass



The federation is relatively new compared to the federations of other sectors like coffee and palm oil. Therefore, the federation is putting most efforts into establishing market access, promotion and research. Until now, in relation to sustainability and circularity the federation has not been active, apart from one study on environmental impacts of the avocado production. Expectations are that the avocado sector and exports will significantly grow in the coming years. The main theme concerning circular agriculture in the avocado sector according to the federation is uniform quality.

• Due to a difference in quality between different shipments of avocado, sometimes a whole shipment is refused to enter the European market and is thrown away. This results in (food) waste.



The Colombian Banana Growers Association, Augura, is a professional association that is well-organized. 85% of the banana exports from Colombia go to the European market. These include exports from smallholders, because they are organized in groups. Banana production mainly takes place in two different regions: Uraba and Magdalena. Uraba is mostly rainfed agriculture whereas Magdalena is mostly irrigated agriculture. All of the banana production is certified. 15% of the production costs are spent on certification. Concerning circular agriculture, the association identifies six main themes of interest: water use, plastic use, biological control, biomass, chemical fertilizer use and new banana varieties.

 Water in the Magdalena region is scarce and water sources are often overexploited. In Uraba most production schemes are rainfed but productivity could be increased by application of irrigation. More efficient water use is one of the goals of Augura. Recently, they started a new irrigation project, financed by the World Bank. This project takes place in Uraba to identify the benefits of a private irrigation scheme in the region.



- Banana production uses great amounts of single-use plastics to wrap the bananas during production and afterwards during transport. One of the goals is to reduce the use of these plastics. With help of the Dutch embassy, Augura already set up some projects where plastics are re-used through cooperatives run by displaced women and demobilized paramilitaries.
- Pesticide use is high in banana production. To reduce pesticides by integrated pest management is in the interest of Augura.
- Plant residues often return to the soil as a natural fertilizer. It is a challenge to find better ways to make use of this source of biomass, since it is an environmental risk.
- Chemical fertilizers are used in the production schemes of banana. In the future, these could be replaced by alternatives, like organic fertilizers.
- There are few banana varieties and the one cultivated in Colombia, Cavendish, is vulnerable to diseases. Therefore, Augura puts in lots of efforts to discover new suitable banana varieties. Currently, they are cooperating with Wageningen University on this topic.
- The Netherlands worked with a Dutch/Australian company to convert banana tree material into paper for the production of carton boxes, to get rid of paper pulp import and give more value to organic material produced at banana plantations.





The federation is, compared to the other well-organized and experienced federations, relatively poorly organized. Between cacao producers, there is a lot of difference in productivity. Although few, some producers reach levels of 2000 kg/ha, whereas others reach levels of 100 kg/ha. This difference is due to underdevelopment of certain regions related to violence in rural areas and due to access to technologies. Concerning circular agriculture, the main themes according to the federation are cacao as a peace crop and agroforestry.

- Cacao is used as a "peace crop" to replace illicit crops. This potentially strengthens the socio-economic position of farmers.
- Cacao plantations in Colombia are almost always agro-forestry systems. The agroforestry systems have a positive impact on biodiversity and nature.



The federation has many years of experience and is well-organized. It is highly interested in the theme of circular agriculture and the federation has its own environmental strategy. Also, the management team of the federation is closely linked with and cooperating with the circular economy team of the Colombian government. The main themes relating to circular agriculture according to the federation are the use of poultry manure and finding alternatives for the import of animal feed.

 One of the problems in the sector is that poultry manure is often burned or without any treatment applied to the field, which pollutes the soil, the air and surface- and groundwater. To be able to process the manure into fertilizer, legislation has to be changed. Related to this topic, FENAVI runs different projects like processing of manure into fertilizer and recovery of polluted soils. A major part of the animal feed is imported from outside of Colombia, the majority being corn and soybean from the United States. This results in high production costs since transport is expensive. Also, the burden on the environment is high. Therefore, the federation is highly interested in developing ways to substitute these imports. Especially the use of locally grown insects as a protein source for animal feed is an interesting option for the federation.

Beef cattle farming sector, FedeGan 🥠



The federation is politically powerful. The image of the sector in the country is controversial as it is linked to land speculation, deforestation and land accumulation. Almost all beef cattle farming is extensive in land use. Concerning circular agriculture the federation works on one topic: a farming system with (more) trees.

• The system with trees is implemented via a project named Proyecto Colombiano Ganadería Sostenible. This project changes a normal pasture into "silvopastoral", which means that trees are planted on the land. The result is a more

Pork sector, PorkColombia



The federation is well-organized and works on the theme of sustainability. In total there are about 8800 pork farmers in Colombia. Most of these farms are family farms. The main themes relating to circular agriculture according to the federation are valorization of manure, alternatives for animal feed imports, climate adaptation and mitigation and alternatives for growth stimulators.

• The federation executes research projects on valorization of manure. The projects look to biogas and to organic fertilizers as possible uses for manure. Currently, the normative framework in Colombia is impeding advancements

on this topic. For example, it is not allowed to transport the manure to a central location where the manure of several farmers could be processed. Therefore, farmers can only process the manure on their own farms.

- PorkColombia contracts agronomists to visit farms to advice farmers about sustainable business practices such as valorization of manure.
- Colombian pork farmers use many growth stimulators during the production cycle. PorkColombia would like to cooperate with the Netherlands to find alternatives for these growth stimulators.
- PorkColombia is interested in alternatives for animal feed. Alternatives can be food waste and local insect breeding.

3.3.2. Public sector entities

The Colombian Ministry of Agriculture and Rural Development

The Ministry works in four agricultural value chains that relate to the prioritized value chains in this strategy: cacao, avocado, palm oil and banana. Within these agricultural value chains, several topics relating to circular agriculture are identified as challenges for the coming years by the Ministry.

 The relation between upstream and downstream users of ecosystems. For example, the highlands in Colombia are an important ecosystem. They filter water from the air which makes water available in lower areas. Therefore, it is important that these highlands are protected and that agricultural activities are limited in the highlands. However, downstream farmers who rely on the water availability generated by the highlands do not want to pay for protection. Similar upstream and downstream relations exist in various parts of the country. Ways to sustain these relations sustainably and equitably have to be looked for.

- Efficient use of water in the cultivation schemes of palm oil and bananas. Besides, re-use of water and of the nutrients in the water in these cultivation schemes should be addressed.
- The use of pesticides. Especially in the cultivation of bananas a high number of pesticides is used.
- To lower the use of plastics in the production and packaging of bananas.
- The use/valuing of biomass in the production cycle of banana and palm oil.
- To make the farmer part of and let him or her work in sustainable production cycles. Often it is difficult for farmers to work more sustainable/circular, because of the economic position of the farmer and due to the possibly remote location of the farm. In addition, his or her cultural background and the custom to work in a certain way can impede a change towards more sustainable/circular practices.

The Colombian Ministry of Environment and Sustainable Development: The National Circular Economy team



The Colombian government established a team to develop a national strategy on circular economy. This team is part of the Ministry of Environment and Sustainable development but cooperates with all relevant Ministries.

As one of the first countries in Latin America and the Caribbean, the Colombian government is developing a national strategy on circular economy which will be executed in the period 2019-2022. The National Circular Economy Strategy is a program which objective is to maximize the added value of production and consumption systems in economic (profitability), environmental (climate change) and social (employment) terms, based on the circularity of flows of materials, energy and water. As such, the strategy will encourage companies,

consumers and other actors who are part of value chains to develop and implement new business models and transform existing production and consumption systems.

The National Strategy emphasizes six lines of action represented in six cycles: (i) Industrial materials and products; (ii) Packaging and packaging materials; (iii) Optimization and biomass utilization; (iv) Water cycles, (v) Sources and use of energy; (vi) Management of urban material. The lines of action of packaging and packaging materials, optimization and biomass utilization and water cycles are mostly linked with circular agriculture.

- Packaging and packaging materials among others entails the use of plastics. Plastic use is often high in different agricultural sectors.
- Optimization and biomass utilization relates to circular agriculture. In many different agricultural sectors, biomass (plant residues) are currently not used or not valued. Sectors with a high potential to add value to biomass are banana, palm oil and coffee.
- Water cycles relate in different ways to circular agriculture. It relates to more efficient use of water in agriculture for example via the application of irrigation technologies. Also, it relates to the re-use of water and the nutrients in water.



AsoCars is the representation of all the regional environmental authorities of Colombia. Therefore, they can play a role in the dissemination of projects and knowledge on circular agriculture. In relation to circular agriculture, AsoCars currently works and aspires to work on the following themes and in the following sectors:

- A project to process pork manure into biogas and organic fertilizer in cooperation with PorkColombia.
- AsoCars aspires to cooperate with coffee farmers on best practices and within the poultry sector on processing chicken manure into fertilizer.

3.3.3. Research institutes and knowledge centers

Agrosavia, the Colombian agricultural research institute



The Colombian Agricultural Research institute, Agrosavia, is a research institute which purpose is to work on the generation of scientific knowledge and agricultural technological development. The focus of Agrosavia concerning circular agriculture is on various themes:

- Increase in agricultural production.
- Fruits.
- Efficient use of natural resources.
- More profit for producers/farmers.
- The improvement of logistics to prevent spillage after harvest. Especially in the future, Agrosavia wants to work on this topic.

Agrosavia identifies several "opportunities" in Colombia concerning circular agriculture:

- There are several crops that produce biomass. One of the goals is to add value to this biomass.
- In the pork and poultry sector, the manure produced is often not used while this could be a valuable product to use as organic fertilizer.
- In Colombia post-harvest losses are high. There are possibilities to improve quality and to prevent losses.

 Integrated pest management: Agrosavia works with some biological control mechanisms, but only in the area of research. Cooperation with a commercial party to bring these new developments/local know-how to the market would be an opportunity.





CIAT traditionally works mostly on research in rice, beans, yuca and pasture. Nevertheless, CIAT also performs research in oil palm, cacao and cattle farming. The focus in relation to circular agriculture is on the following themes:

- Connecting producer and consumer.
- Increase productivity while using less land.
- Together with the Ministry of Environment and Sustainable Development and Fedepalma, CIAT has the ambition to work on water efficiency and integrated pest management in the future.

The Los Andes University



The university addresses the theme of circular agriculture in different ways; the execution of the programs RedES-CAR and MAS.

The Sustainable Business Network program (El programa Red de Empresas Sostenibles, RedES-CAR) is an alliance between the public, private and academic sectors, which began in Colombia in 2013 and which promotes the productive transformation of companies in the Cundinamarca region (Sabana of Bogota) through the application of change strategies following different routes: Cleaner Production, Industrial Symbiosis and Integrated Water Management. As such, RedES-CAR encourages changes towards environmentally sustainable production in business networks and production chains, through the implementation of training, capacity building and monitoring of productive transformation in these companies. Different aspects of the program relate to circular agriculture. First of all, the overall aim of the program to make business practices more sustainable. Second, the sub-program Integrated Water Management, which promotes integrated water management among groups of companies belonging to shared basins. Third, many companies in the floricultural sector participate in the program and aim to make their business practices more sustainable and more circular.

The Sustainable Agribusiness Model (Modelo Agronegocios Sostenibles, MAS) is an alliance between various research institutes and education centers funded by Ecopetroleo (the largest Colombian oil company). The objective of the program is to contribute to the productive transformation and the generation of opportunities for economic, social and environmental development of the farmers in the Meta region. This through the impulse of its agricultural processes, in four agro-food chains: Cocoa, banana, passion fruit and coffee. Currently, the program focuses mostly on market access and business development of the Meta farmers and consequently is less related to circular agriculture. However, MAS also aims to establish a network between participating actors. Now that this network exists and farmers have also developed viable business models, there will be opportunities to implement different aspects in the program, such as ways to produce circularly.

3.4. Overview of potential focus areas of circular agriculture in Colombia

The analysis in this chapter demonstrates a variety of potential focus areas of circular agriculture in Colombia. This paragraph gives an overview of all the identified potential focus areas in former paragraphs. On the Y-axis, all the themes relating to circular agriculture in Colombia are listed. On the x-axis, all identified value chains relating to circular agriculture are listed. Each theme in combination with a sector that is marked with an x is a potential focus area.

	Palm oil	Cacao	Flowers	Coffe	Banana	Avocado	Poultry	Cattle	Pork	General
Efficient water use during cultivation	х		х		x					
Efficient water use after cultivation	x			x						
Water re-use / nutrient re-use	х		х							
Valorization of biomass	x			x	х					
Reduce plastic waste			х		х					
Integrated pest management	х		х	х	х					
Reduce chemical fertilizers	х		х		х					
Prevent soil erosion				х						
Prevent / reduce food waste										х
Reduce emissions										
Improve income / livelihood farmer										х
Alternatives for animal feed imports							x		х	
Valorization of manure							х		х	

4 • Additional motivations to select focus areas of circular agriculture in Colombia

Chapter three demonstrates all the potential focus areas in relation to circular agriculture in Colombia for LAN Bogota. To make a selection out of all these potential focus areas and to prioritize for which focus areas working agendas for the coming years will be developed, additional motivations have to be identified. If there exist additional motivations it makes more sense to select and prioritize a focus area. This chapter contains an analysis of additional motivations of why to focus on certain areas.

Different types of additional motivations for each focus area have been reviewed. These additional motivations can be grouped as follows:

- Existing Dutch know-how and technology.
- EU and Dutch policy priorities (apart from the circular agriculture vision).
- Colombian policy priorities (apart from the circular economy strategy).
- On-going initiatives in circular agriculture in Colombia.

Furthermore, difficulties to select and prioritize a focus area are identified in this chapter. On the one hand, difficulties can make it complex or even impossible to work on a certain topic. On the other hand, difficulties can also be a first entrance to work on a topic.

4.1. Dutch know-how and technology

Know-how and technology are an important part of the realization of the transition towards circular agriculture. Over the years, the Netherlands as being the second-largest agricultural exporter in the world and with a focus on sustainability, has developed technologies and know-how that offer solutions

to the challenges of maintaining and increasing agricultural productivity in a sustainable way. The next list offers an non exhaustive overview of agricultural know-how and technology which the Netherlands has to offer via research and knowledge centers and the private sector.

- Precision agriculture: During the production cycle plants and animals receive accurate and precise amounts of inputs to have an optimal growth curve with the use of technology (GPS, ICT applications, robots, sensors, etc.). Precision agriculture optimizes production and results in more circular cultivations.
- Climate-smart agriculture: An approach that helps to guide actions needed to transform and reorient agricultural systems to effectively support development and ensure food security in a changing climate, for example via salt tolerant-crops.
- Efficient water use: Reducing the amount of water use in agriculture via smart water management (geodata, ICT, sensors), irrigation techniques and analysis of the water flows required for the production and processing of food.
- Re-use of water and nutrients: Re-use and closing cycles in water and nutrients.
- Agro-logistics: Efficiency improvement in agricultural products and food transport.
- Valuation of biomass: Transforming biomass (plant residues, organic waste, etc.) in valuable products (energy, compost, etc.).
- Food waste prevention: Solutions to prevent food waste.
- Integrated ecosystem/watershed approach: Effective (water) management often requires an approach at river basin/watershed/ecosystem level. The Netherlands has a long history with redesign and multi-stakeholder processes at the level of water management units, catchment areas and ecosystems.

- Alternatives for pesticide use: Integrated pest management via biological pest control solutions.
- Organic fertilizers: The development of alternatives for chemical fertilizers, like processing manure into organic fertilizers.
- Re-use of and alternatives for plastics: Solutions to re-use plastics and (bio) alternatives for plastics.
- Emission reduction: Solutions to reduce emission in farming and horticulture via techniques like solar panels, filter systems, and greenhouse technology.
- Alternatives for feed import: Extensive experience in the Netherlands and abroad in insect production for feed and food.
- Animal welfare: Experience with the implementation of high standards on animal welfare.

4.2. EU and Dutch policy framework related to circular agriculture

This paragraph summarizes the international policy documents from the European Union and the Dutch government that relate to circular agriculture.



In December 2019, the European Commission (EC) presented the European Green Deal. Executive Vice-President of the EC, Frans Timmermans, will be steering the implementation of the Green Deal. The Green Deal paves the way for Europe to become the first climate neutral continent by 2050. The roadmap to implement the Green Deal contains key policies and measures aimed at transforming the EU into a fair and prosperous society with a modern

resource efficient and competitive economy, where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use.

Part of the Green Deal is the 'Farm to Fork' strategy. This strategy will pave the way to formulate a more sustainable food policy. It will strive to stimulate sustainable food consumption, promote affordable healthy food for all and will improve the position of farmers in the value chain. The strategy aims to tackle climate change, protect the environment and preserve biodiversity. More specifically, the 'Farm to Fork' strategy contains measures, including legislative ones, to significantly reduce the use and risk of pesticides, chemical fertilizers and antibiotics.

NIWA: Dutch International Water Ambition, July 2019



Fitting within the vision towards circular agriculture and with an outwardlooking approach, the Netherlands published the Dutch International Water Ambition (NIWA - Nederlandse Internationale Water Ambitie). This strategy, a sequel of the previous 'International Water Ambition - IWA' from 2016, is focused on how the Netherlands cooperates to contribute to water security and water safety worldwide.

Under the NIWA, several Ministries are involved: Foreign affairs, Agriculture, Nature and Food Quality, Economic Affairs and Climate and Infrastructure and Water. Each Ministry involved contributes to the greater common goal with its own input and responsibility; increase water security and water safety in the world of humans, plants and animals, and optimize the Dutch contribution to this and Dutch earning capacity. Nevertheless, every Ministry also has its responsibilities and focus areas. Within NIWA the Ministry of Agriculture, Nature and Food Quality focuses on the coherence between water and the production of food and the preservation of nature and biodiversity, whereby circular agriculture is used to optimize the use of raw materials and residual flows. In relation to circular agriculture specifically, NIWA states the following: "Food production cannot do without, but with less water and circular agriculture offers solutions to reduce this significantly".

International food security policy priorities of the Netherlands, June 2019



The three main aims of the Dutch food security policy for the period of 2016-2030 are:

- Better food for 32 million children.
- Sustainable increase in productivity and income of 8 million small-scale farmers.
- Contribute to the ecologically sustainable use of 8 million hectares of agricultural land.

Crucial to reaching these aims is a worldwide transition to more sustainable and circular food systems. Globally, intensifying production, maximizing the value of the harvest (including "residual flows") and reinvesting part of the revenue in the capacity of the agro-ecosystem are the three components of efficient circular agriculture.

To achieve food security, it is important to look at the entire food supply system. A circular system where people know what healthy food is, whether it is safe, where it comes from and how and by whom it was produced. It starts with the farmer, with access to land, water, fertilizers, knowledge and financial services. And after the harvest with storage, processing, cooling, transport, access to markets and a fair price.

In close relation to the transition towards circular agriculture, the Dutch food security policy focuses mainly on the dissemination of innovative techniques, climate adaptation and reducing food losses. Without adapting to the changing climate, productivity and income of farmers will decline and the food security situation in many areas will become untenable. The Netherlands focuses on investments in increasing the resilience and adaptability of small-scale food producers, for example with better weather information and the cultivation

of drought, disease or salt-resistant crops. The Netherlands is at the forefront in these areas. The aim is to spread climate-smart technologies that have already proven themselves in practice, such as planting of ground cover plants, application of water efficient techniques and diversification in cultivation plans.

Worldwide, one-third of the food produced is lost. Reducing food losses makes a significant contribution to improving food security in the world. This is an opportunity for the Dutch agro-food cluster. Efforts in the field of innovation, training and knowledge dissemination for the transition to circular agriculture will integrally reduce food losses.

Finally, the Dutch food security policy highlights the importance of the availability of good plant and animal source material. The Netherlands is at the forefront of this field. Dutch companies and knowledge institutions are already working in several countries on strengthening the seed sector so that local farmers have access to high-quality starting material.

Dutch government policy on biodiversity and food security, April 2019



The Netherlands acknowledges that biodiversity is crucial for food security, economic development and many different ecosystem services. Frameworks for sustainable use and conservation of biodiversity are currently often insufficient. Since biodiversity and food security are a coherent whole, it is of key importance to connect food (production) and nature. This is reflected in the vision "Agriculture, Nature and Food, valuable and connected". This vision aims to combine nature and food production systems on a global level.

In addition to the policy goals reflected in the vision of circular agriculture, the food security policy and the international water ambition that contribute to the conservation of biodiversity, The Netherlands supports a variety of projects and programs to conserve biodiversity. Among others, The Netherlands encourage companies to produce and purchase deforestation-free, for example through the Sustainable Trade Initiative (IDH) and Solidaridad. Within the "Amsterdam

Declarations Partnership" the Netherlands, along with seven other European countries, develops EU-policies against deforestation. Also, the Netherlands supports the Landscape Program of IDH. This program is developing an approach in six countries of origin of international value chains (such as cocoa, coffee and palm oil) to achieve ecologically and socially sustainable management of production areas. This contributes to better water management, forest conservation and the prevention of land degradation and environmental pollution.

Dutch government policy on cacao, May 2019

The Netherlands is the world's largest importer of cocoa beans. Therefore the Netherlands can and wants to make a difference in the cocoa chain. The government stated in the vision of Agriculture, Nature and Food Quality that with regard to raw materials such as cocoa, the strong Dutch position in the value chain should be used as a lever for making production more sustainable. Making cocoa production and trade more sustainable makes an important contribution to inclusive globalization and the achievement of sustainable development goals (SDGs).

To reach the goal of global sustainable production and trade of cacao, the Netherlands will work towards good working conditions and production practices that prevent damage to the environment. In 2010, Dutch companies, organizations and the government committed themselves to the ambition of 100 percent guaranteed sustainable cocoa consumption by 2025 via a sustainability agreement. IDH (Sustainable Trade Initiative) is the facilitator of this agreement. The focus here is on livable incomes for farmers and other players in the cocoa chain, combating child labor, and combating deforestation.

CSR Agreement floriculture sector, July 2019



A part of the Dutch floriculture sector has joined forces with the Dutch government, a trade union and an NGO to agree on a more responsible approach to international production and trade in ornamental plants. The agreement is

supported by a part of the sector and more companies are expected to join in the coming months. Sigrid Kaag, Minister for Foreign Trade and Development Cooperation and Carola Schouten, Minister of Agriculture, Nature and Food Quality, signed the agreement on behalf of the Dutch government. It was signed on behalf of the private sector by individual companies, Royal FloraHolland (auction) and representative organizations.

All parties involved identified the major risks in the sector in relation to human and environment and prioritized these risks as crucial themes to improve in the coming years. Concerning circular agriculture the specified themes are climate change, fair income, land access, water use and environmental impact of pesticides. As such, the agreement is closely related to circular agriculture and the execution of the agreement will contribute to the transition towards circular agriculture. The agreement will be executed in the next three years. The first steps will be to start projects concerning living wage and the impact of crop protection products on people and the environment.

CSR Agreement for the food products sector, May 2018



Many of the food products found in Dutch shops or the ingredients that go into these products are produced elsewhere, in countries where human rights, worker health and safety, and the environment may be at risk. These problems are often so complex that any business acting alone will achieve very little. That is why this agreement has been signed by a broad coalition of parties consisting of sector organizations, trade unions, the Dutch government, and civil society organizations.

Actors that have signed the agreement agreed to identify such problems as low wages and child labor and help combat them. They support the right of negotiation by independent trade unions and occupational health and safety for workers. They also commit themselves to reduce damage to the environment and the climate.

CSR Agreement Dutch banking sector, December 2016



A coalition of banks, the Dutch Banking Association (NVB), trade unions, civil society organizations (CSOs), and the Dutch government have concluded an agreement on CSR. They aim to work towards a situation in which human rights are respected. The agreement focuses on two areas of banking activity: corporate lending and project finance.

Concerning circular agriculture and Colombia, the signing partners analyze the value chains of palm oil and cacao. The main focus is on human rights, which also has links to circular agriculture; sustainable and inclusive economic growth, decent work and labor rights.

4.3. Colombian policy analysis related to circular agriculture

This subchapter contains an analysis of policy documents of the Colombian government that relate to circular agriculture (apart from the national circular economy strategy, which is already used to determine the potential focus areas in chapter three).

Plan Nacional de Desarrollo (2018-2022): Pacto por Colombia, pacto por la equidad.



The National Development Plan sets out the strategic guidelines for the coming years (2018-2022) of the Colombian government. In relation to agriculture, the plan has several focus areas.

- Rural social planning, in which key will be the inclusion of women in the process of land formalization and the consolidation of the Social Property Planning plans.
- Productive ordering of the countryside, and in this, the strategies are aimed at encouraging the efficient use of rural land and promoting climate-smart agriculture models.

- "Sanitary diplomacy", which is focused on strengthening ICA and Invima (both counterparts of the Dutch NVWA), on developing a health admissibility plan and on promoting the adoption of good farming practices.
- The development of public goods in the rural sector, where there are strategies to improve the quality and coverage of connectivity and commercialization in rural areas and strengthen the public land adaptation service. In this regard, the government estimates that land adaptation would make 46% of the agricultural frontier workable, but today only 6% of potential land is reached with this.
- Improving financing and risk management schemes for agricultural activities.
- Improving rural activities not related to the sector, like to boost industry and commerce activities in rural areas.
- Institutional reform of the sector, like the implementation of a national system of agricultural information.
- Increase the amount of land in the country that will be under irrigation with at least 150,000 hectares via public-private partnerships. The country counts 18 million hectares that require irrigation, while only 6% of these 18 million hectares are currently under irrigation. In addition, public-private partnerships are contemplated to make existing irrigation schemes more productive and efficient. Eventually, these aims on water for agriculture will make the agricultural sector in Colombia more productive, competitive and profitable.

4.4. (On-going) initiatives and future leads in Colombia related to circular agriculture



This subchapter offers an analysis of (on-going) initiatives in circular agriculture in Colombia: programs, projects, pilots, companies' business practices, etc.

- aQysta: A Dutch company that aims to provide sustainable hydro-powered pumping solutions that can have a positive economic, environmental and social impact. aQysta's most sold product is the Barsha pump. It is a water wheel propelled pump that utilizes the energy from the flow of rivers and canals to pump water without requiring any fuel or electricity to be operated. As such, the pump can irrigate up to 2 ha of land. aQysta entered the Colombian market in 2019.
- Biorgani: A company that develops biodegradable plastics and is currently in Colombia experimenting in the banana sector in cooperation with Control Union.
- CBI (Center for the Promotion of Imports) program on fruit exports: The program stimulated and improved quality, service and production processes in different fruit value chains, among others avocado.
- Control Union: A certifying company that performs audits for voluntary certification schemes. In Colombia Control Union cooperates in projects related to circular agriculture, for example to find alternatives for plastic use in the banana sector.
- Cooperation on circularity in palm oil production between the Netherlands and Colombia: In November 2018 the Colombian National Federation of Oil Palm Growers (Fedepalma), Solidaridad, the Dutch Oils and Fats Association (MVO) and the Sustainable Trade Initiative (IDH) signed an intention statement to improve sustainable practices in the Colombian palm oil industry. The agreement supports promotion of good labor practices, social inclusion, protection of high conservation value areas (biological, ecological, social or cultural) through responsible supply chain management and further development of a circular economy approach in palm oil production.

- Cooperation between Wageningen University and the research center of Fedepalma (Cenipalma): A knowledge to knowledge (k2k) cooperation on circular agriculture in the palm oil sector. The goal of the agreement is to generate research on more efficient use of land, nutrients and biomass.
- Cooperativa de Cafecultores de Anserma: Project in Anserma where
 a cooperation of coffee farmers implement measures to make coffee
 cultivation more sustainable, especially focused on water management after
 harvest. The project makes use of the lessons learnt from 'Manos al Agua'.
- Daabon company: A company that produces organic palm oil, banana, coffee and avocados based in Santa Marta. Daabon has various circular business practices, like re-using biomass as compost and re-using water in palm oil production.
- Dorset: A Dutch company that sells machinery in Colombia to process chicken manure into organic fertilizer.
- Ecoflora and AsoBioCol: Ecoflora is a Colombian company producing biological alternatives for pesticides. Ecoflora is part of AsoBioCol, an association in Colombia that is formed by companies that develop biological alternatives for pesticides and join forces to lobby for better market access for their products.
- Good Stuff International (GSI): A Dutch company that develops ICT applications for farmers to improve precision agriculture in Colombia.
- GRI Sustainability report of Asocolflores: The fresh cut flower association Asocolflores has executed an investigation on the sustainability of the sector. This report was partly financed by the Dutch embassy.
- Grupo Aliar, La Fazenda: Cattle farming and pig production near Villavicencio. Fazenda aims to optimize its circular business practices. Among others the

company re-uses manure as organic fertilizer to grow crops to produce its own animal feed.

- Grupo de Investigación en Ciencia Aplicada para el Desarrollo de la Ecoregión (GICADE): Colombian research institute that works on circular agriculture topics, among others on water management in the coffee sector.
- Hocotec: Sustainable pig production near Villavicencio. The company works with Dutch standards for pig production and processes pig manure into organic fertilizer and biogas. The work in Colombia is subsidized via the Dutch DGGF-TA fund of RVO.
- Holland Circular Hotspot: A Dutch public-private platform in which companies, knowledge institutes and (local) governments work together internationally with the aim of exchanging knowledge and stimulating entrepreneurship in the field of circular economy. Holland Circular Hotspot is investigating possibilities to relate to circular agriculture in Colombia.
- Kinti Coffee: Dutch company that imports coffee beans from one of the poorest regions in Colombia. The company uses its know-how and experience to produce sustainably and to have a positive impact on the farmers' livelihoods. The work in Colombia is subsidized via the Dutch DGGF-TA fund of RVO.
- Koppert, Thatchtech and Van Iperen: Dutch companies that produce biological alternatives for pesticides and all have an interest to get access to the Colombian market.
- Manos al Agua: public-private partnership to enable and improve the systems of intersectoral cooperation, sustainable coffee farming, environmental protection and decision-making that contribute to face the challenges of water imbalance in the coffee sector and its value chain, establishing environmental, social and production conditions to alleviate

poverty and encourage peaceful coexistence and sustainable development in the Colombian countryside.

- MAS model: A sustainable agribusiness model that contributes to the productive transformation and the generation of opportunities for economic, social and environmental development of the farmers in the Meta region. The model works with cacao, banana and coffee producers. The program is executed by the Los Andes University and funded by Ecopetrol.
- NederBV: A Dutch company closely connected with the WUR that experiments with the cultivation of banana on substrate in Guatemala and the Philippines. Banana production on substrate reduces the risk of diseases and results in less use of water, fertilizer and pesticides. NederBV aims to implement bananas on substrate in Colombia. Furthermore, NederBV monitors and evaluates the Fusarium action plan in the Uraba region in Colombia.
- Nvest: A Dutch company in Colombia that assists other companies to turn waste into design products. It has the ambition to work with waste streams from the agricultural sector. Also, it wants to set up a physical space where entrepreneurs with circular products could develop prototypes to showcase their products/solutions.
- Orange export: A Dutch company that exports lemons to the European market. Orange export has the ambition to not use any plastic in the future to cultivate and transport its lemons.
- Production of insects for animal feed: Three different small-scale initiatives on insect production for animal feed exist in Colombia. Two initiatives are still in the phase of development: EntoPro and Inseco. EntoPro is an affluent of Universidad Nacional de Colombia based in Bogota which aims to produce feed via the Black Soldier Fly in the near future. Inseco is a startup idea from the company Jaguar that presented during the Hackathon in Expoagrofuturo in Medellin. They aim to produce insects in the future amongst others for

feed purposes. The other initiative is from Universidad Nacional de Colombia. The University set up a project in Antioquia to produce Black Soldier Flies for fishfeed. This project is currently executed.

- PorkColombia and AsoCars: PorkColombia is the private sector representation of the pork sector and AsoCars is the national representation of all environmental authorities. They cooperate in a project where pork manure is transferred into fertilizer and biogas.
- PUM (Netherlands Senior Experts): Managers program where senior experts share their knowledge on a one-on-one basis. Either through short-term and repetitive advisory missions at the work floor, or through online coaching activities. PUM is also active in Colombia and can possibly contribute to circular agriculture activities in the future.
- RedES-CAR program: A sustainable business network program in Cundinamarca that encourages changes towards environmentally sustainable production in business networks and production chains. Related to circular agriculture they work with flower producers. The program is executed by the Los Andes University. The program has a sub-program focused on integrated water management. The strength of the program is capacity building by bringing actors (companies, the environmental agency, academia) together to think and search for cooperation to make business practices more sustainable.
- Rodenburg biopolymers: A Dutch company that valorizes the side stream of the potato processing industry by processing potato starch into bioplastics.
- Rombouts Agroecology: A company that seeks new forms of cooperation between different stakeholders to restore landscapes. The company runs a project in Buga, Valle de Cauca.

- Sanam: Colombian company that valorizes residues from coffee sector by transferring these residual streams into antioxidants to be used in cosmetics. Sanam has a subsidiary in the Netherlands.
- Soil & More: A Dutch company that aims to make farming practices more sustainable. The company most often works directly with farmers to work towards more circularity, improved soil management, water efficiency and reduction of chemical fertilizers and pesticides. Soil & More is active in Colombia in various activities. Together with MVO Nederland and Solidaridad they develop a dashboard to calculate the true price in the coffee sector (true cost pricing project). Furthermore, they work directly with farmers in the banana, coffee and avocado sector. Finally, Soil & More works with Nvest to develop ways to valorize biomass from different agricultural value chains and transfer the biomass into design products.
- Solidaridad Colombia: Projects on labor condition, living wage, environment and deforestation in the production cycles of coffee, cacao, banana, palm oil, cattle farming and sugarcane.
- Sylvaphane Holland: A Dutch company developing sustainable, bio-based packaging material and producing in several European countries. The company is investigating opportunities to start business in Colombia. It cooperates with a German company Bio4Pack to export and produce biobased packaging material in Colombia. Currently, the companies started talks with Grupo Nutresa in Antioquia and with Invest Pacific in Valle de Cauca. RVO (DGGF) is offering support.
- The Cacao Origins Program by IDH (The Sustainable Trade Initiative): The program supports companies using relatively small volumes of cocoa to become involved in sustainability projects at the origins of their cocoa supply chain and contribute to the overall sustainability of cocoa products linked to the Dutch market. The program is financed by the Dutch Ministry of Agriculture, Nature and Food Quality.

- The Coffee Quest: A Dutch company that imports high quality coffee beans and works towards sustainable production of coffee beans and short supply chains.
 The work in Colombia is partly subsidized via the Dutch DGGF-TA fund of RVO.
- The 'evidence for policy' project of IHE Delft: The research institute for water education IHE Delft executes the 'evidence for policy' project in Colombia. The project consists of three smaller research projects on (ground) water resources. The first project is on sustainable groundwater use to wash bananas in the Uraba region. The second project is on the use of surface water and groundwater for irrigation practices in the sugarcane sector in the Valle de Cauca. The third project is on the reasons why the setup of irrigation schemes in the Atlántico department has so far not been successful.
- The Manq'a project of ICCO and Melting Pot: A social business model that envisions smallholder family farmers and young people having better (decent) job perspectives, gaining more self-confidence, able to generate their own sustainable income, and conscious of the importance of locally produced, nutritious food.
- True Cost Pricing project: A project on how to establish the true cost price of the production of coffee, thereby including social and environmental costs. They aim is to eventually lower these costs. The work in Colombia is subsidized via the Dutch DGGF-TA fund of RVO. Parties working on this project are MVO Nederland, Solidaridad and Soil & More.
- VanPlestik: A Dutch company that transforms plastic waste into unique, high-quality and affordable plastic objects via a 3D printer. VanPlestik has the ambition to become active on the Colombian market.
- Voluntary certification schemes: Various agricultural sectors in Colombia use voluntary certification schemes to assure quality, sustainability and social inclusiveness. Amongst others palm oil, banana, coffee, flowers and cacao use these schemes. The most famous schemes in Colombia are Global G.A.P., Rainforest alliance, Fair Trade and RSPO.

• Yellow pallets: A Dutch company that produces transport pallets by using banana fiber from banana plants. This banana fiber is most often biomass that is perceived as waste. The company is based in Costa Rica, but is investigating the possibility to open a fabric to produce the transport pallets in Colombia.

4.5. Difficulties to advance with circular agriculture in Colombia

This paragraph identifies difficulties to advance with circular agriculture in Colombia. Difficulties can be of any type, like legislation that prohibits certain circular practices or a sector being poorly organized.

Integrated pest management and biological control



Many of the crops that define Colombian agriculture (coffee, banana, flowers, avocado, etc.) have a high use of pesticides in common. FAO has clearly determined this to be a risk to the environment, biodiversity as well as to human health of those involved in the production. Legislation in the European Union moves towards less use of pesticides, which could jeopardize exports from Colombia to the European market in the future.

For many of these pests, biological solutions like the implementation of predatory mites, parasitic wasps and entomopathogenic nematodes exist. These natural solutions provide a clean alternative without putting pressure on the environment, risk for human health or damage to the biodiversity. Apart from this, there is a financial side to take into account as well. Without the frequent use of pesticides, both quality and quantity of production increases in many crops. Especially in ornamentals like roses this is well documented where an increment of 10 to 15% in production can be expected once frequent pesticide sprays are replaced by the use of beneficial insects and mites for pest control.

Currently, part of the biological solutions is provided through local production in Colombia. However, with only local production large steps in the replacement of pesticides cannot be expected. At the moment, transparent and executable rules for the import of products from (foreign) companies who offer a systembased approach without pesticides for pest control are lacking.

National legislation and enforcement of legislation



Legislation can be an impediment to advance on circular agriculture in Colombia. There can be existing legislation that is an impediment, like legislation that prohibits the re-use of water in agriculture and the re-use of the nutrients in the water in agriculture.

Besides, there can be legislation required to advance with circular agriculture that is currently not in place, like legislation that would prohibit certain unsustainable practices as burning residuals or using single-use plastics.

Accessibility to modern technologies for smallholders



Innovations and technology that stimulate the transition towards circular agriculture often require relatively high investments for (small-scale) farmers. Therefore, it is difficult to make these innovations and technologies available for smallholders.



Funds are an important instrument to realize the transition towards a more circular agriculture. However, the Colombian Ministry of Environment and Sustainable Development, in charge of the implementation of the circular economy strategy, has limited funding mechanisms available to stimulate the implementation. LAN Bogota and the Dutch government in general have merely some small funding instruments available for Colombia. Therefore, to accelerate circular agriculture in Colombia and as such contribute to the realization of the circular agriculture vision, finding possibilities to fund initiatives will be a challenge.

Inclusion of the Dutch private sector in the realization of the circular agriculture agenda in Colombia



LAN Bogota aims to provide opportunities and benefits for the Dutch private sector when implementing the circular agriculture agendas. Entering the Colombian market can be a barrier for Dutch companies due to geographical distance and cultural differences. Also, LAN Bogota and the Ministry of Agriculture, Nature and Food Quality do not have an overview of the Dutch companies offering technological and digital solutions for circular agriculture. It is therefore a challenge to include the Dutch private sector in the realization of the circular agriculture agenda in Colombia.

4.6. Prioritization of the focus areas

In this subchapter, a short-list of prioritized focus areas is offered. The shortlist is deduced from the long-list in the foregoing chapter as at this moment it is impossible to develop detailed working plans for all areas and we need to prioritize. This deduction is based on the additional motivations listed in this chapter and the weighing of these additional motivations by LAN Bogota; some additional motivations are more important from the perspective of LAN Bogota than others. In annex 1 an overview of these additional motivations per focus area is offered. This results in the following short-list of focus areas.



5. The working agendas

The foregoing chapters describe the vision on circular agriculture of LAN Bogota based on an extensive analysis. Eventually, the vision has been boiled down to six prioritized focus areas. To implement the vision on circular agriculture in the coming years working agendas have been developed. For this LAN Bogota has proactively approached a wide variety of actors in Colombia and the Netherlands to gauge their interest to work on circular agriculture and more specifically, to work on one of the six prioritized circular agriculture focus areas. The discussions with these different actors gave insights into what activities LAN Bogota could develop, join or stimulate and with which actors. Consequently, LAN Bogota brought the different actors together to make ideas, plans and possibilities more concrete. This has resulted in the formulation of a wide variety of activities where different actors from Colombia and the Netherlands cooperate. As such, this pro-active work of LAN Bogota has resulted in new alliances between the embassy and Colombian and Dutch actors on the theme of circular agriculture.

The activities on circular agriculture are new ground and the market does not always facilitate these activities in its early stage. Hence, financial contribution of the public sector is in some cases necessary to initiate circular business practices in agricultural activities. Therefore, LAN Bogota also tried to find ways to (partly) finance some of the formulated activities in the working agendas. This search has resulted in numerous meetings and discussions with people who manage financial instruments at RVO, FMO, the EU, FAO, the Dutch Ministry of Agriculture, Nature and Food Quality, the Dutch Ministry of Foreign Affairs, The Dutch Ministry of Infrastructure and Water, the Topsectoren, Dutch and Colombian Universities and research institutes, the Colombian Ministry of Environment and Sustainable Development, the Colombian Ministry of Agriculture and Rural Development, etc.

The efforts of LAN Bogota to bring actors together, formulate activities and find ways to partly finance these activities have resulted in working agendas that offer possibilities for LAN Bogota to implement the circular agriculture vision in Colombia. They offer activities to develop, to join or to stimulate. Each activity lists its context, a description of the activity, what actors the activity can be executed with and - if required - mentions ways to (partly) finance the activities. Some activities are overarching and do not fit within one of the specific prioritized focus areas. These activities are listed in the first subchapter; overarching and more general activities. The other activities fit within one of the prioritized focus areas and are listed in the second subchapter; activities per prioritized focus area. The working agendas will guide the work of LAN Bogota and the Dutch Ministry of Agriculture, Nature and Food Quality on circular agriculture in Colombia in the coming years.

5.1. Overarching and general activities

This subchapter offers an overview of the overarching and general activities that do not fit merely within one of the prioritized focus areas.

Memorandum of Understanding on circular economy and circular agriculture

In 2019 the Colombian government has published the National Circular Economy Strategy as one of the first countries in Latin America. The main responsibility for development of the strategy lays with the Colombian Ministry of Environment and Sustainable Development that works in close cooperation with other ministries like the Ministry of Agriculture and Rural Development. Agriculture is an important part of the National Strategy due to the focus on residual use, efficient water management and valorization of biomass.

The Netherlands Embassy and in particular LAN Bogota works in close cooperation with the Colombian government on circular economy and circular agriculture, since within both countries the themes are high on the agenda. A team member of LAN Bogota attends meetings of the National Circular Economy team regularly, the Embassy and the Colombian government update each other on a regular basis about developments related to circular economy and circular agriculture and the embassy and the Colombian government develop activities together. The theme no doubt will be high on the agenda of the visit of the Colombian President and a business delegation to the Netherlands later this year as well. To formalize this active cooperation between both countries, a Memorandum of Understanding (MoU) on circular economy and circular agriculture between the Embassy of the Kingdom of the Netherlands and the Colombian Ministry of Environment and Sustainable Development will be signed. The MoU will (further) encourage cooperation between the public sector, the private sector, the academic sector, knowledge centers and nongovernmental organizations. The MoU will list the themes and the scope of cooperation between both countries. In addition to the Ministry of Environment and Sustainable Development, also the Ministry of Agriculture and Rural Development might sign the MoU. This will facilitate further cooperation on the topic of circular agriculture. The aim is to sign the MoU as soon as all involved parties agree on the content. In annex 2 a draft version of the MoU is included.

Dutch—Colombian Business to Business platform on circular agriculture and living lab for best practices

In Colombia farmers have limited awareness about the available technology, expertise and know-how that addresses circular agriculture. For many Dutch companies Colombia is far away and they have limited awareness about the needs of Colombian farmers in relation to more sustainable agriculture and hence the possibilities the Colombian market offers. There is a gap between demand and supply.

To address this gap, a Business to Business (B2B) Dutch-Colombian circular agriculture platform and living lab for best practices could be a solution. It would be a (virtual) space where Colombian producers and producer organizations and Dutch companies can meet, offering on the one hand their needs and on the other hand their solutions. The platform and living lab would also develop and communicate the best practices. The aim is that the platform and living lab will be financially sustainable without subsidies after its initial phase of set-up. Based on talks with the private sector, knowledge institutes, governmental entities and the non-profit sector, LAN Bogota identified the need and opportunity for a B2B platform and living lab on circular agriculture that brings together supply and demand and develops and demonstrates best practices. At the moment it does not exist. There already exist G2G platforms and Public-Private Partnerships (PPP) in Colombia on sustainable agriculture. However, these platforms and PPP's are not very practical and solution oriented and generally do not reach small and middle income farmers.

LAN Bogota perceives it valuable and necessary to further validate its assumptions about the need, the content and set up of such a platform and living lab. Therefore, as a first step it is proposed to perform a detailed study to verify the assumptions about the added value of such a platform and living lab, about its financial sustainability after its creation, to determine its most viable ins and outs and to identify the most suitable form to finance its set-up. This study will be performed in 2020. Afterwards, when the study would demonstrate that a B2B platform and living lab is viable and also offers a (business) plan for the set-up and implementation of the platform and living lab it can be developed. To finance the study to explore the business idea of the B2B platform on circular agriculture and living lab for best practices, a proposal is being developed within the Private Sector Development (PSD) Toolkit instrument from RVO.

In the analysis of the set-up of the study and afterwards in the set-up of the platform and living lab, LAN Bogota closely cooperates with Holland House. Holland House is the Dutch-Colombian Chamber of Commerce and based in Colombia for over six years. It has expertise on and experience with B2B platforms, since Holland House functions itself as a B2B platform, although with a completely different focus than a B2B platform and living lab on circular agriculture since Holland House relates to all possible fields in which Dutch companies are active in Colombia. Also, the B2B platform might identify and include Dutch agro companies which are currently not part of Holland House. The possible role Holland House, and other actors, might have in the embedding and set-up of the B2B platform and living lab will also be investigated during the initial study phase.

Mapping of Dutch companies offering technological and digital solutions for smallholders related to circular agriculture

In Colombia, there are about 2.5 million farmers. Most of these farmers are smallholders; more than 70% of all farmers cultivate less than 5 ha of land. These farmers have little to zero access to technological and digital solutions that facilitate (sustainable) farming practices.

There exist a wide variety of Dutch companies offering technological and digital solutions for smallholders. Most of these companies are active in Africa and Asia, due to the high amount of small-scale farmers and financial flows. Although Colombia also has a high number of smallholders, almost none of these companies are active in Colombia.

LAN Bogota wants to have insights in and information on the Dutch companies offering these kind of solutions for smallholders in other countries. With this information, LAN Bogota could identify companies that could be interested to enter the Colombian market and that offer solutions related to circular agriculture that might benefit the Colombian market. Nevertheless, there is currently no complete overview of Dutch companies offering technological and digital solutions for smallholders. The knowledge is limited to country level where agricultural departments know which Dutch companies are active on its market.

LAN Bogota wants to develop an overview of Dutch companies offering technological and digital solutions for smallholders. The activity aims to combine knowledge on country level to offer insights into what companies could be a benefit for other markets. This will also benefit these Dutch companies since it might result in possibilities to expand activities and enter new markets. This overview will be made available for all agricultural departments. Also, it is recommended that the overview will be maintained and kept updated at the Ministry of Agriculture, Nature and Food Quality or RVO in the Netherlands. The information can be incorporated in the B2B platform mentioned above, through which technological solutions can become more easily available for Colombian (small)farmers and the Colombian market more easily accessible for the Dutch companies offering these solutions.

100% circular Netherlands pavilion at agricultural fairs

The pavilions and stands at agricultural fairs are built and only a few days later taken down. A lot of the material to build the pavilion and the stands is merely used for a few days and afterwards thrown away. Therefore, the environmental footprint of fairs is often quite big.

Every year the Netherlands participates in the Expoagrofuturo; one of the most important fairs in Latin America specialized in agribusiness, technology and innovation. LAN Bogota organizes the Dutch pavilion at these fairs, together with Holland House, the bilateral Chamber of Commerce.

In line with the circular agriculture vision, in 2019 LAN Bogota's goal of the fair was to (further) position the concept of circular agriculture in Colombia. This was reflected in the pavilion and the stands of the Dutch companies. Following the concept of circularity, only recycled and/or reusable materials were used to build the pavilion.

The walls and floor of the pavilion were built with compressed OMS wood or 'compressed sawdust' thick boards. For each individual stand, a Holland logo was made from corrugated cardboard cutouts. The paint used on the floor area was water based. All 13 tables and 37 chairs were made from locally sourced wood. The vertical garden was made up of three locally sourced plants and all plants were sprayed with organic fertilizers as to conserve their texture and colors during the fair. At the Dutch pavilion, drinks were only served in glass bottles and ecological carton cups.



LAN Bogota will continue to construct the Dutch pavilion and its individual stands during the agricultural fairs a 100% circular by using recycled and reusable material. Also, LAN aims to re-use part of the material used in Expoagrofuturo of 2019 again in Expoagrofuturo of 2020.

A circular agriculture Hackathon during Expoagrofuturo 2019

To position the concept of circular agriculture in Colombia, a hackathon on circular agriculture was organized during the Expoagrofuturo in 2019. The hackathon took place the on 18th and 19th of September. During these two days, teams gathered and competed to find solutions to the challenges that circular agriculture is currently facing in Colombia. To make the hackathon possible, LAN Bogota partnered with Agrilink, Grupo Bios, Ruta N, Comfama, Partners 4 startups, Universidad Pontificia Bolivariana, the Mayor's Office of Medellin, Oracle and Holland House.

Even though the agricultural and rural contexts of Colombia and the Netherlands are quite different, the challenges were focused on the topics of the circular agriculture policy that can be tackled in Colombia, for instance, closing the cycles of production, reduction and reuse of production residues, increasing productivity and adding value to food waste. The main objective was to find new solutions for farmers and agribusinesses in harmony with the environment that could be applied at local, regional or country level.

After a jury deliberation composed by representatives of each one of the partnered institutions; the winning team was "Jaguar Ecosystem", a group of people working on the increase of productivity and quality of small producers creating high-impact business cases. Jaguars' winning "Inseco" initiative which they pitched during the hackathon proposes the production of flour and fertilizers made of insects fed with organic waste. The model consists of three key points: reducing the use of imported protein bases, reducing food waste and improving management of organic waste. This fits well in our priority themes.

Having an economic alternative for protein production creates a great impact in reducing costs for farmers with animal production who would have a product with the same or higher protein content. It should be noted that there is currently no supply on an industrial scale of this kind of products in Colombia. Therefore, it is a very innovative proposal that is in line with the vision of circular agriculture.

The winning team has been awarded with a study trip to the Netherlands for a week in 2020 where the team members will have the opportunity to get to know first-hand practical examples of the experiences and views of different actors from the public and private sector and knowledge centers around the theme of circular agriculture to further develop business ideas.



5.2. Activities per prioritized focus area

This subchapter offers an overview of the activities that fit within one of the prioritized focus areas. It is divided in six parts, corresponding the six prioritized focus areas.

5.2.1. 'Water for agriculture' in the palm oil, banana, flower and coffee sector



The paragraph on 'water for agriculture' consists of four parts. First, an overarching activity is presented. This activity covers all four sectors. Second, the activities in the palm oil and banana sector are presented. These activities take place in the Northern region of Colombia. Third, the activity in the coffee sector is mentioned. Fourth, the activity in the flower sector is presented.

5.2.1.1. Overarching 'water for agriculture' activity

Workshop 'Towards integral water management for a circular agriculture'

As an implementation of the vision of circular agriculture and the visit of minister Carola Schouten to Colombia in November 2019, the WUR organized a workshop on integral water management for a circular agriculture in Colombia in December 2019. The workshop was financed by the Dutch Ministry of Agriculture, Nature and Food Quality. The WUR closely cooperated with LAN Bogota to organize the workshop.

In September 2019, a first visit of the WUR to Colombia took place to identify possibilities to organize a workshop on water management and circular agriculture. LAN Bogota assisted the WUR in identifying opportunities. This led to a cooperation of the WUR with the Ministry of Environment and Sustainable Development, the Los Andes University and its RedES-CAR program and two research institutes named Agrosavia, the Colombian agricultural research institute, and CATIE, one of the CGIAR institutes.



In December 2019, the two-day workshop took place. The aim of the workshop was to identify differences and similarities in circular agriculture between the Netherlands and Colombia, to demonstrate best practices, to identify challenges, to identify possibilities for future cooperation (areas, value chains, sectors and actors), to identify financing possibilities and to develop a plan of action how to follow up on the results of the workshop.

The workshop was attended by a large number of different actors who all have a stake in Colombian agricultural water management; the public sector, the private sector federations and individual companies, academia and the international community. In total, more than 70 people, 30 institutions and 20 speakers participated.

Besides the WUR, various Dutch actors participated in the workshop. Amongst others, the Dutch company Coffee Quest presented its best practices in water management in the coffee sector and the Dutch Water Authorities presented their approach to integral water management in Colombia. LAN Bogota presented the vision of circular agriculture and its aims and projects in relation to 'water for agriculture' in Colombia.

The main results of the workshop were identification of on-going activities in Colombia, alignment of the goals of different private, public and academic actors, new partnerships between participants, identification of institutions interested to work on circular agriculture and an action plan with activities to develop and implement.

The possibilities for follow-up of the workshop are the elaboration of a joint policy document of the organizers of the workshop, the creation of a water reuse advisory board offering (inter)national expertise on regulation, good practices and business priorities, the mapping of initiatives to connect, articulate and identify existing and new opportunities and the creation of a real scale water reuse experience in a small or medium scale city to test and show the suitability of circularity. The execution of these activities will depend on the availability of funds for these activities.

5.2.1.2. Palm oil and banana in the Northern region of Colombia

Colombia is generally considered as a water abundant country. For a large part of the country this is true; many regions receive year-round rainfall and do not face water shortage or water stress. However, for a considerable part of the country it is not true. Some parts of Colombia do face (severe) water shortage and water stress. Hence, water availability is geographically spoken unequally divided. Therefore, efficient water management is a priority for the water scarce regions of Colombia.

The Northern part of Colombia – which is a Delta - is a region that faces water shortage. The departments of Magdalena, the North of Cesar and the South of La Guajira are located in the Northern region of Colombia. LAN Bogota will focus its efforts to address the theme of 'water for agriculture' in relation to the palm oil and banana sectors in these departments. There are various reasons to choose this area.

First of all, the departments of Magdalena, the North of Cesar and the South of La Guajira experience a yearly dry season of five to six months most often without any rains. During the dry season, there is high and often inefficient water use in the region, especially by banana and palm oil producers. This results in severe water scarcity and water stress. Climate predictions also show a decrease in rainfall in the near and far future, while water extractions are expected to grow. Secondly, these departments are one of the main areas of palm oil and banana production in Colombia. Palm oil and bananas are two of the prioritized sectors in the theme of 'water for agriculture'. The palm oil and banana producers are the main agricultural water users in the region and hence contributing to the water scarcity of the region.

Thirdly, both palm oil and banana production in the region require irrigation, especially in the dry season. The irrigation practices of both cultivations demand large amounts of water, because almost all irrigation occurs via surface irrigation; an irrigation practice by which you flood your lands. Water saving

irrigation techniques like sprinkler and drip irrigation are not in place in the palm oil cultivations and hardly in place in the banana cultivations. Therefore, there is room to introduce technological water saving solutions to use water efficiently and at the same time increase production.

Fourth, the region offers possibilities for economic development via irrigated agriculture. The region is familiar with agriculture and next to tourism most people work in the agricultural sector. In addition, the departments are not in the Andes and in near distance of harbors, which facilitate exports. Because the area under cultivation is relatively flat, mechanization is possible.

Fifth, LAN Bogota will intensify its cooperation with the Deltateam of the Ministry of Infrastructure and Water and with the Partners voor Water (PvW) program of RVO in the coming years on the theme of 'water for agriculture'. The Deltateam and PvW also aim to intensify their activities in the Northern region in relation to 'water for agriculture'.

The focus of LAN Bogota to address 'water for agriculture' in the banana and palm oil sectors in the Northern region has resulted in the formulation of a variety of activities in the departments of Magdalena, the North of Cesar and the South of La Guajira, which are listed below.

A feasibility study and demonstration project on the introduction of efficient irrigation techniques in the palm oil sector

Palm oil is high on the bilateral agenda between Colombia and the Netherlands. Palm oil is the main agricultural export product from Colombia to the Netherlands and Colombian palm oil is considered relatively sustainable in comparison with palm oil from countries like Malaysia and Indonesia, since it is less subjective to deforestation. During the visit of Minister Schouten to Colombia in November 2018, palm oil was also an important discussion point. The Minister highlighted the role of the Netherlands as a leading nation in supporting sustainable production and trade of palm oil. During this visit, three bilateral memorandums were signed. A Government-to-Government (G2G) agreement where Dutch and Colombian Ministries of Agriculture agreed to increase collaboration in the palm oil sector. A Business-to-Business (B2B) agreement where Dutch and Colombian organizations (MVO and Fedepalma) signed a Joint Declaration to achieve 100% sustainable palm oil exports by 2021 according to RSPO criteria. A Knowledge-to-Knowledge (K2K) agreement where Dutch and Colombian partners (Wageningen University and Cenipalma) agreed to develop a joint research program to boost a circular economy in the palm oil sector. This research program addresses efficient use of land, nutrients and biomass.

The above demonstrates that palm oil is at the centre of attention in the bilateral relationship between Colombia and the Netherlands and many efforts to further improve sustainability within the sector are performed. Nevertheless, water management during production is a theme that is relatively absent within the on-going initiatives.

Water management in the palm oil sector is a theme that requires attention within the bilateral relationship between Colombia and the Netherlands, particularly in the Northern zone due to the presence of palm oil producers and water scarcity. In the dry season, all palm oil producers use irrigation. Water is extracted from rivers and in some cases groundwater is extracted via wells. All producers make use of surface irrigation (flooding), an irrigation practice that uses big amounts of water. Hence, there are no water efficient technologies like sprinkler or drip irrigation in place.

Furthermore, apart from water efficiency at farm level, two other issues of water management should be addressed according to Cenipalma. One issue is water re-use in the oil palm processing mill. The processing mill is where the palm fruit, the fresh fruit bunches, are processed. In this process a lot of water is used, which afterwards could be re-used. Currently, most often this water is treated as waste and disposed, producing a lot of methane gas which is far more detrimental for the environment than CO₂. The other issue is a water governance approach for the whole region, including all water users. Currently, data on water availability and water use in the whole region is missing to draft policies to address water stress. Also, the different stakeholders do not sit together at the same table to draft a solution together. A water governance approach should be developed.

Cenipalma, the research organization of the private sector representation of palm oil cultivators (Fedepalma), has an experimental farm in the Northern region. On this location, Cenipalma centers its research on water management. Since two years, Cenipalma experiments with three different types of irrigation techniques; surface irrigation, sprinkler irrigation and drip irrigation. Cenipalma compares these three systems by looking at its efficiency via productivity and its economic investment costs.



Hence, technology to make efficient use of water is present in the area via the experiments of Cenipalma. Nevertheless, farmers in the region so far have not yet adopted efficient irrigation techniques. This has to do with several reasons, among others the initial investment costs are high, farmers are used to surface irrigation, there is water scarcity and water stress but there is still no water conflict, maintenance costs of efficient irrigation systems are unknown, etc.

LAN Bogota, the Deltateam and PvW are developing a project with Cenipalma on efficient water use in the Northern region. The project will be supported by The Colombian Ministry Environment and Sustainable Development and the Colombian Ministry of Agriculture and Rural Development. LAN Bogota, PvW and Cenipalma are setting up a Terms of Reference to execute a feasibility study on the introduction of efficient irrigation techniques in the palm oil sector at farm level. The Dutch private sector and academia can apply and eventually execute the project in cooperation with Cenipalma. The project will be executed in 2020 and is financed by PvW resources.

The project will be a first step in the cooperation between PvW, the Deltateam and LAN Bogota on 'water for agriculture'. The aim of all three parties is to continue to cooperate and develop other activities in the Northern region.

Water management in the banana sector

The banana sector is one of the main water users in the departments of Magdalena, The North of Cesar and the South of La Guajira. The sector is aware of the water scarcity, water stress and of the future prospects of even more severe water stress. The sector is actively looking for solutions to address the issue. The private sector representations of the banana producers (Asbama and Augura) have identified main needs to address water scarcity. First, technical solutions to capture and save rain water in the wet season are needed. The region experiences a long dry season with most often no rainfall at all, but the region also faces a wet season in which a lot of rainfall occurs. Second, there is no knowledge of the exact amount of water availability and water use at farm level

and neither at a regional level. This data should be identified to create policies to address water scarcity. Third, the different stakeholders in the region do not sit together to come up with joint solutions. Multi-stakeholders discussions on water governance at a regional level should be initiated to integrally address the problem of water scarcity.

LAN Bogota is in close contact with FAO Colombia, Asbama and Augura to find solutions to the necessities that these local stakeholders have identified. Two concrete solutions are of interest to the banana sector and FAO Colombia and the technology for these solutions is available in the Netherlands. First of all, Acacia Water, a Dutch consultancy firm, has a technique to recharge aquifers during the wet season to make water available in the dry season. Asbama, Augura and FAO Colombia are familiar with the technique and would like to set up a pilot project. Second of all, FAO developed a tool named Water Productivity Open-access portal (WaPOR) to analyze water availability and water use via satellite data. The tool has been financed by the Dutch government. Asbama, Augura and FAO Colombia could use the tool to gather data on water availability and water use in the region, which due to several reasons has not been possible yet.

LAN Bogota is identifying possibilities to (partly) finance a pilot project of the aquifer recharge technique of Acacia Water. A first step would be a feasibility study of the technique in the region and a second phase would be a pilot project. A possibility would be the DHI financial instrument of the RVO. The scheme partly finances feasibility studies and demonstration projects.

The Dutch Ministry of Foreign Affairs is currently establishing test cases of the WaPOR tool in different countries. Colombia is currently not amongst them. LAN Bogota can investigate whether the Northern region of Colombia (in the future) could be included as a test case.

Water governance approach and training of palm oil and banana producers

In the departments of Magdalena, the North of Cesar and South of La Guajira many different actors have a stake in the area's water use. Next to palm oil and banana producers, other crops like mango, papaya and citrus fruit and industry, tourism, society and nature demand water. The private sector representations of the palm oil and the banana sectors (Fedepalma, Asmaba, and Augura) all addressed the need to develop a water governance approach for the whole region including all stakeholders.

LAN Bogota is in close contact with WUR and IHE Delft institute for water education in relation to the topic of water governance in the Northern region. Both Dutch research institutes have experience in Colombia with projects on water and agriculture, have a wide network in Colombia and have the ambition to continue to be active in Colombia in the field of 'water for agriculture'. Therefore, LAN Bogota has invited WUR and IHE Delft to develop a proposal on a water governance approach in the Northern region. The proposal will be developed for the tailor made training plus program of Nuffic. This program aims to improve overall functioning of organizations by training its staff. As such the program can solve knowledge and skills challenges of the stakeholders' staff in relation to water governance, by specifically targeting its capacity needs. LAN Bogota will support the proposal development and if approved its implementation.

LAN Bogota is also investigating the possibility to apply for the Dutch Fund for Climate and Development (DFCD) of FMO, SNV and WWF to develop a water governance approach in close cooperation with Fedepalma, Asbama and Augura, including all stakeholders. This fund especially aims to adapt to climate change, also in relation to water management and agricultural production chains. A first step would be to apply to the origination facility which offers assistance to develop a viable business model. DFCD is analyzing whether Colombia will be part of the originating facility in 2020. A second step could be to apply for funding of a viable business case developed by Fedepalma, Asbama and/or Augura.

Implementation of the RedES-CAR programme in the Magdalena department

The Los Andes University executes the Sustainable Business Network program of Cundinamarca, Red de Empresas Sostenibles (RedES-CAR), which is financed by the regional environmental authority, the CAR Cundinamarca (Corporación Autónoma Regional de Cundinamarca). RedES-CAR is a program that encourages changes towards environmentally sustainable production in business networks and production chains. In relation to circular agriculture the program works with flower producers. Flower production is an important agricultural activity in this Department. The program has a sub-program focused on integrated water management, GIA (Gestión Integral de Agua). The strength of the RedES-CAR program is capacity building by bringing different actors (the private sector, the environmental agency and academia) together to think about and search for cooperation to make business practices more sustainable. The results of the program are successful and unique in Colombia. The cooperation between the private, the public and the academic sector has resulted in more sustainable business practices of 570 companies on a voluntary basis; think of increased water security, CO2 savings, reduction in plastic waste, etc. Furthermore, the program enabled companies to 'learn by doing', has created new bonds between companies and has improved the relationship between companies and society.

A team member of LAN Bogota formed part of the RedES-CAR team at the Los Andes University for half a year on the invitation of its (Dutch) director, Bart van Hoof. This allowed LAN Bogota to get to know the program from nearby by joining field visits to different companies, amongst others flower producers. This firsthand experience showed the unique cooperation between the private, public and academic sector; a form of cooperation which is known as the 'golden triangle' or 'triple helix' and which is well-known in the Netherlands.

LAN Bogota recommended the Los Andes University to replicate the RedES-CAR program in other parts of the country. The Los Andes University is now having discussions with the Colombian Ministry of Environment and Sustainable Development to finance and implement the GIA sub-program (integrated water management) of RedES-CAR in the Magdalena department focusing on the palm oil and banana producers. As such, because of the close cooperation of the Embassy / LAN Bogota with the Los Andes University and in particular the RedES-CAR program, RedES-CAR's future plans align with LAN Bogota's 'water for agriculture' focus.

5.2.1.3. The coffee sector

Water use in the coffee sector is different in Colombia in comparison to many other coffee producing countries. Colombian coffee production does not require irrigation practices because of climate conditions. Coffee in Colombia is produced in Huila, Cauca, Nariño, Caldas, Risaralda, Quindío, Antioquia and the Sierra Nevada. In all these regions there is sufficient rainfall year-round for rainfed coffee production. Nevertheless, after harvest when the coffee beans are washed, large amounts of water are often used. In this post-harvest process up to 30 liters of water per kilogram of coffee beans is normal. Also, this postharvest water use often results in downstream water pollution. Technological solutions can reduce this high water use to half a liter per kilogram of coffee beans. Some coffee producers do have these technological solutions in place, however this is still a limited amount.

Water management issues in coffee production in Colombia have been addressed by the Manos al Agua project, which was financed by the Dutch Government and focused on climate smart coffee. The project ran from 2013 till 2018. It reached 11,000 coffee producing families and covered 41.000 ha and 25 river basins. The project has a total cost of 20,000,000 euros. Although the project has a large outreach, after the project evaluation in 2019 the results were disappointing since it did not lead to economically viable sustainable business practices that could be repeated and implemented after the project. The Dutch government is analyzing whether lessons can be learned from the project and is looking for a new opportunity to implement a project on coffee production and water use in the framework of the Valuing Water Initiative. A follow-up project would have two aims: first, it should address local needs and second, it should aim to lower the external costs of coffee production.

LAN Bogota cooperates with relatively small Dutch coffee bean importers and toasters, like Coffee Quest and Kinti Coffee. These coffee importers work exclusively and directly with smallholders who grow specialty coffees, paying a fair price to the producers. These coffee importers continuously work on the improvement of social and environmental aspects.

Follow up of the True Cost Pricing project

The price of a cup of coffee usually does not include the external costs of coffee production. Most often it is based on production costs without taking public (environmental and societal) costs into account. These external costs are diverse, like the use of water, water pollution, soil erosion, soil pollution, an unfair income for farmers, etc. These costs are also hard to calculate and to quantify. MVO Nederland is executing the True Cost Pricing project in the Colombian coffee sector. The project is financed by the DGGF-TA financial instrument of RVO. With a tool developed by Solidaridad, Soil & More, EY and True Price the true price of coffee production can be calculated. The tool focuses on five impact areas: biodiversity, water use, living income, soil erosion and climate change.

During 2019 and 2020 the tool is being tested in Colombia. The tool is tested - and improved- in five different cooperatives that all buy specialty coffee beans from smallholders. Also in 2020 and in 2021, the tool will be used to setup and execute impact projects to lower the external costs. The project contributes to circular agriculture and in particular to the 'water for agriculture' prioritized focus area. Also, the project works with the same stakeholders as where LAN Bogota works with, smallholders who produce specialty coffees in short chains and aim to improve social and environmental aspects. Therefore, LAN Bogota closely monitors the project and its results. Also, it stimulates further set-up and execution of impact projects. LAN Bogota has linked the Valuing Water Initiative and the True Cost Pricing project to each other in order to discover synergies and possibilities to (partly) finance follow up of the project.



5.2.1.4. The flower sector

In the IMVO CSR agreement of the floriculture sector in the Netherlands which was signed in 2019, different actors agree on a more responsible approach to international production and trade in ornamental plants. Although the total exports of flowers from Colombia to the Netherlands is relatively small compared to other countries like Ethiopia and Kenya, and therefore was initially excluded, Colombia will now as a result of the lobby of LAN Bogota, also be analyzed within the IMVO agreement. Water use is one of the seven focus areas in the agreement.

LAN Bogota and the for now implementing party of the agreement, FSI, are in close touch for coordination of activities and where possible join efforts. LAN Bogota updates FSI about the developments in relation to the flower sector and circular agriculture and FSI updates LAN Bogota about how the agreement will include Colombia. This close cooperation serves to be complementary to each other and to not replicate efforts.

The floriculture sector is a very advanced agricultural sector in Colombia in terms of water use. Almost all companies in Cundinamarca have drip irrigation techniques in place and harvest rainwater for irrigation purposes. However, looking at regional and watershed level instead of farm level, water management is a challenge. This is in particular the case in the Cundinamarca department where 60% of all fresh cut flower production is located. The region's water resources are often overexploited by different water users. Water sources originate in the highlands. Due to deforestation these highlands and its water sources are at risk. The RedES-CAR program in Cundinamarca has already addressed this issue of water security and several flower companies are participating in the program. Nevertheless, there is still an urgent need for an integral water approach in the region.

Development of a water security strategy in the Cundinamarca department

LAN Bogota closely cooperates with one of the private sector representations of the floriculture sector, Asocolflores, to address water security in Cundinamarca. An investigation can take place if PUM, Netherlands Senior Experts Program, could be used in 2020 to come up with an integral water management approach in the Cundinamarca region. PUM could offer expertise on how to address the water security issue. Possibilities for financing via PUM are currently being investigated.

5.2.2. Valorization of biomass in the palm oil, banana and coffee sector



Palm oil, banana and coffee cultivation result in big amounts of plant material that is most often not used or could be used more efficient. In the case of palm oil, the residual plant material is the fresh fruit bunch once the oil is extracted, in the case of banana the residual plant materials are the stem and the leaves of the banana plant and in the case of coffee the residual plant material is the skin of the coffee cherry. In some cases this plant material is burned or thrown away in the surroundings of the plantations, with negative environmental consequences. In other cases, the residual plant material is applied to the cultivations as fertilizer without composting it beforehand. This way of using the residual plant material has no negative environmental effects but is inefficient, since the material should be composted before being applied to the field to have a positive impact.

The big amount of residual plant material in palm oil, banana and coffee production could be used more efficiently. There are different possibilities. The material could be composted and be applied to the cultivations. As such, it functions as an organic fertilizer. Also, the plant material can be processed into other products with an added value like transport pallets. Both possibilities valorize the residual plant material and transfer it from waste or useless material into a cost reduction or an extra source of income.

Support of exemplary examples of valorization of plant material in Colombia

The valorization of residual plant material in palm oil, banana and coffee production in Colombia is far from normal practice. However, there do already exist examples of a more efficient use of the residual plant material.

Daabon is a company that produces among others organic palm oil. Daabon composts the fresh fruit bunches of the palm oil production after the oil extraction. Afterwards, the material is applied to the fields as fertilizer.

Sanam is a Colombian company with a subsidiary in the Netherlands that valorizes residues from the coffee sector, the skin of the coffee cherry, by transferring this coffee cherry skin into antioxidants to be used in cosmetics.

Yellow pallets is a Dutch company that produces transport pallets by using banana fiber from the stem of the banana plant. Hence, Yellow Pallets processes plant material that is normally perceived as useless into a product with added value. The company is based in Costa Rica. In 2020 the company aims to build a production facility to process the stem of the banana tree into transport pallets in the Northern region of Colombia, due to the high amount of banana plantations in the region, which do currently not valorize the plant material.

LAN Bogota will support Dutch companies that valorize plant material of the palm oil, banana and coffee sectors to gain market access. For example, Yellow Pallets can be supported to build a production facility in the Northern region via pointing out subsidy schemes and sharing of contacts in the banana sector. Also, the B2B platform on circular agriculture and living for best practices can demonstrate, promote and further develop startups and companies that use residual plant material of the palm oil, banana and coffee sector efficiently.

Follow up of the K2K cooperation in circular agriculture in the palm oil sector

As a result of the visit of Minister Carola Schouten to Colombia in November 2018, the Dutch Ministry of Agriculture, Nature and Food Quality initiated and financed a Knowledge to Knowledge (K2K) agreement between WUR and Cenipalma to be executed in 2019 and 2020. The K2K aims to boost a circular economy in the palm oil sector. It addresses efficient use of land, nutrients and biomass.

One of the three focus areas of the K2K agreement is efficient use of biomass; residual plant material of the palm oil production. Within this content area research has been performed on the valorization of the fresh fruit bunches after oil extraction. The research demonstrates that the fresh fruit bunches after oil extraction can be fermented via a steaming process. This process results on the one hand in methane that can be processed into other gases and consequently can be released into the environment. Methane is a greenhouse gas with a very negative impact on the environment. The impact of methane on the environment is ten times higher than the impact of CO₂ on the environment. On the other hand the process renders nutrients that can be used as fertilizer.

This technique results in improved circularity of the oil palm processing mill. The innovation is the result of combined efforts of WUR, Cenipalma and Fedepalma. Both the Dutch Ministry of Agriculture, Nature and Food Quality as well as Fedepalma have invested time and money in the research project. Therefore, all parties would benefit from the implementation of this technique in practice once this research project has been finalized at the end of 2020.

LAN Bogota emphasized to WUR and Cenipalma the necessity to develop ways to implement this technique in practice at the end of the joint research program and therefore the need for a viable business case of the technique. Also, LAN Bogota is stimulating WUR and Cenipalma to present its results in an easy to grasp and attractive manner, for example via infographics. Implementation of the technique at the end of the research collaboration could be discussed with frontrunner companies like Daabon. Furthermore, in the scope of the National Circular Economy Strategy, the Colombian Ministry of Environment and Sustainable Development will develop practical methodological guidelines for farmers and producers how to valorize residual plant material within the production processes. The technique could be included in these practical methodological guidelines.



The remaining two focus areas of the K2K agreement; efficient use of land and efficient use of nutrients are still being investigated in 2020. Afterwards, once the results will be presented, LAN Bogota can investigate how to follow up on these results.

5.2.3. Reduction of single-use plastics in the banana and flower sector



In the banana and floriculture sector, large amounts of (single-use) plastics are used. In the banana sector, there are two main streams of plastic. The first stream of plastic is generated during cultivation of the bananas. Each banana plant produces a bunch of bananas, which are harvested after 12 weeks. During these 12 weeks the bunch is covered with a plastic bag. This is to maintain quality of the banana; to prevent it from being damaged by weather, birds and pests. This stream of plastic ends up in Colombia. Banana producers throw the plastic away or pay for the recycling of the plastic. The second stream of plastic is generated by the transport of the banana. To protect the banana during its journey to other countries and continents, the bananas are packed in a plastic bag within a cardboard box. This plastic ends up in other countries in places like supermarkets and customers have to pay for the recycling of this plastic.

In the floriculture sector, there are also two streams of plastic. The first one is plastic that is used to construct the greenhouses where the flowers are grown. In Colombia, all flower producers grow the flowers in greenhouses made of plastic. This plastic has to be replaced after a maximum period of two years. After those two years, the plastic is recycled within Colombia. The second stream of plastic ends up in foreign countries where the flowers are shipped to. In these countries, this plastic is thrown away or in the best case it is recycled. The second stream of plastic in the floriculture sector is significantly bigger than the first stream of plastic.

The private sector representations of both sectors (Asbama, Augura and Asocolflores) do not have an overview of the total plastic use within the sector. Neither do they have an overview of what percentage of the plastic is being recycled at this moment. This lack of knowledge is related to the fact that attention for plastic use in Colombia is relatively new and that markets where these producers export to have not yet made demands to reduce or ban plastic

use. Hence, there is no policy in place to limit or ban (single-use) plastic use in these sectors. Also, there are no alternatives like biodegradable plastics in use in the banana and floriculture sector in Colombia.

Introduce alternatives for single-use plastics in the banana sector

Banana producing companies in Colombia that are frontrunners within the sector in sustainability are actively looking for alternatives for their plastic use. So far, there are no companies that already use alternatives for plastics since no viable alternatives have been encountered. For example, Daabon has tested an alternative biodegradable bag to use during the cultivation of the banana plant. But the bag could not face high temperatures, sunlight and humidity and disintegrated already within a few weeks.

LAN Bogota aims to introduce alternatives for plastic use in the banana sector. LAN Bogota has linked Rodenburg, a Dutch company that produces biodegradable plastic made a.o. of potato starch coming from the skin of the potato, to Daabon and Uniban. Both companies are highly interested to do business. Daabon and Rodenburg aim to set up a pilot in 2020 in the production sides of Daabon with the biodegradable plastics of Rodenburg. Also, they would like to test a plastic bag used for transport of the banana. This bag enlarges the shelf life of the bananas due to enhanced atmosphere circumstances during transport.

Furthermore, another opportunity is to give the single-use plastics a second life. LAN Bogota has connected VanPlestik, a Dutch company that offers machines to turn plastic waste into design products, with the banana industry to identify business opportunities.

A lowering footprint project in the floriculture sector

The association of flower producers Asocolflores and its research body Ceniflores aim to reduce plastic use. Hence, several actions are required. First of all, an analysis and characterization of plastic use in the sector is necessary; data gathering. Second, when this information is available it should be presented to the sector and other actors and be combined with other environmental data of the sector, like pesticide use and water use. Data on pesticide use and water use of most flower producing companies in the Cundinamarca department is often available via Asocolflores. The environmental data of companies and a part of the sector could be presented via 'environmental footprints'. Once this information is available and these footprints are created, a strategy can be developed how to lower the footprints with special attention to plastic use and alternatives for plastic use could be identified and introduced.

Together with the Floriculture Sustainability Initiative (FSI), Asocolflores and Ceniflores, LAN Bogota, aims to analyze and characterize plastic use, develop environmental footprints and afterwards develop a strategy to lower the environmental footprints. To complete these steps, LAN Bogota is in contact with the WUR to create a (research) internship for a Master's student. This student could be guided by Asocolflores. Moreover, LAN Bogota applied for the policy supporting research budget 2020 which is managed by the Dutch Ministry of Agriculture, Nature and Food Quality to implement the before mentioned steps.

5.2.4. Integrated pest management in the palm oil, banana, coffee and flower sector



The use of pesticides in Colombian agriculture is high, also in the production of palm oil, banana, coffee and flowers. The use of these high amounts of pesticides leads to environmental damage like biodiversity loss and water pollution. Also, pesticides are unhealthy for human beings. People who work in the fields spraying these pesticides and consumers of these agricultural products are exposed to health risks. In the palm oil, banana and coffee sector some companies produce without the use of pesticides. These organic companies usually develop their own pest management strategies. However, these companies are scarce in Colombia.

Market access for biological control solutions

Biological control solutions control pests, weeds and plant diseases using other organisms. Several Dutch companies are developing biological control solutions on an commercial scale like Koppert, van Iperen and Thatchtech.

In various neighboring countries like Peru and Chile, important exporters of agricultural fruits and vegetables, import of these biological agents is possible. For a long time LAN Bogota has been trying to gain market access for Dutch companies that develop biological control solutions. Especially, because these are sustainable products that can replace pesticides and as such lower negative environmental impact, improve work conditions and lower consumer health risks. It still is very difficult – if not to say impossible - for Dutch companies that develop and export biological control solutions to enter the Colombian market, because of the restrictive but mostly inadequate legislation for the import and use of biological control solutions. Under the current process getting an environmental license de facto is impossible.

Due to the difficulties that the biggest Dutch company has experienced for over five years now to become active on the Colombian market, the company is considering to cease its efforts. This of course is not in the interest of Colombia to develop a more sustainable agriculture, like their neighboring countries are doing. Biological control is an important component of Integrated Pest Management and fundamental in fighting climate change and reducing negative impacts on the environment, for human health of both producers as consumers and to achieve the Sustainable Development Goals and implement the National Circular Economy Strategy.

LAN Bogota will continue its efforts vis a vis the Colombian government, striving for transparent, sensible and implementable legislation for the import of biological agents.



Cooperation with the IMVO CSR Floriculture Agreement and FSI

The IMVO CSR Floriculture agreement which has been signed in 2019, addresses the need and ambition to lower pesticide use within the floriculture sector and to work on Integrated Pest Management. Hence, LAN Bogota aims to cooperate with the implementing party of this agreement, the Floriculture Sustainability Initiative, to reduce pesticide use in the floriculture sector in Colombia for example via the lowering environmental footprint project of which pesticide use is part.

5.2.5. Developing alternatives for animal feed imports in the poultry and pork sector



In Colombia, animal feed in the poultry and pig sector is almost always imported. Colombia is among the top importing countries of protein sources for animal feed. The protein usually comes from the United States (soybean and corn). These soybean and corn imports are expensive. This feed production for poultry and pork competes with food production for humans. Also, the transport from the United States to Colombia of these products result in pressure on the environment. Moreover, these imports have a high economic cost, since transport within Colombian is expensive. Therefore, the poultry and pork sector are very interested in alternatives to reduce dependency on imports and lower production costs.

Local insect rearing for animal feed in the poultry sector

The Dutch embassy and the private sector federation of the poultry sector, Fenavi, will sign a MoU in 2020 to formalize and intensify cooperation. The areas of cooperation between the embassy and Fenavi are alternatives for the import of animal feed, valorization of poultry manure, Antimicrobial Resistance (AMR), animal welfare, territorial planning and nutrition/food security. Hence, Fenavi is a crucial and instrumental partner for LAN Bogota to develop alternatives for the imports of animal feed.

Insects offer a circular and sustainable alternative for the imports of animal feed. Insects can be reared on organic leftover streams like various vegetable waste, manure and waste streams from the food industry. Insects upgrade these low-value waste streams into a high-value protein and fat source. Moreover, insects can be reared locally on farm, or on an industrial scale nearby poultry farms. Therefore, the production of insects as feed also provides important opportunities for improving livelihoods of smallholder farmers and developing inclusive business and reduction in production costs.

Especially the Black Soldier Fly (BSF) is suitable for production of protein for animal feed. The BSF is present in tropical and subtropical regions of the world. Larvae can develop on several waste streams including vegetable and fruit waste, animal manure and human excrements resulting in significant waste reduction and high nutritional quality insect biomass. Larvae can be harvested after approximately two weeks under optimal diet and temperature conditions. The BSF is not considered a pest and is not known as a vector of diseases. Adults are not attracted to human habitats and do not constitute a nuisance. Also, the BSF proves to be a high-quality feed ingredient for fish, poultry and pig production. An advantage of the BSF in the Colombian context is that the BSF does not have to be introduced, since it already occurs in Colombia.

The production of the BSF as protein source for feed has been initiated in various parts of the world, such as Europe, North America, Africa and Asia. In Colombia, there is one on-going initiative that produces the BSF for feed. The Universidad Nacional de Colombia set up a small-scale research project in Antioquia to produce the BSF for fish feed. The main goal of the research project is to stimulate the re-integration of ex FARC combatants. Apart from this small-scale research initiative, insect rearing for feed purposes in Latin America remains to be developed.

The Netherlands is one of the pioneers and frontrunners on insect rearing for feed. There are various companies active in different segments of the insect for feed sector. Companies producing the insects, companies producing feed and companies offering capacity building and education on how to rear insects for feed. Some of the companies focus on solutions for smallholders and others focus on the production on an industrial scale. Also, several Dutch companies have already entered foreign markets.

A first step in the introduction of insects as feed as an alternative for feed imports in the poultry and pig sector in Colombia is an analysis of the opportunities of the BSF production for feed in Colombia in the poultry sector, including the analysis of legislative barriers. This analysis will lead to recommendations and an action plan to set-up a first pilot to rear insects on waste streams for feed production in the poultry sector in Colombia. To develop the analysis, recommendations and the action plan, LAN Bogota cooperates with Fenavi, the WUR, Universidad Nacional de Colombia, two Dutch feed producing companies (Bestico and Trouw Nutrition) and two Colombia companies in the poultry sector (Operadora Avícola and Aves Emaus). This led to the development of a proposal for a seed money project of the Topsectoren by the Dutch Ministry of Agriculture, Nature and Food Quality. The proposal, named 'Protein transition in Colombia; Insects as feed for a circular agriculture' has been approved and will be executed in 2020.

The project aims to be an important start of a protein transition towards circular feed production in Colombia. After completion of the project, the aim is further generate capacity building for insect production for feed in Colombia, to establish necessary market conditions for insect rearing in Colombia and to implement an economically viable business case where insects (the BSF) are reared on waste streams for feed purposes in the poultry sector. LAN Bogota will also address together with the industry possible legislative barriers for insect rearing in Colombia. In a later stage, the experiences will be shared with the pork sector and LAN Bogota aims to cooperate with the private sector federation of the pork sector.

Participation in the academic agenda of the bi-annual and annual congresses of PorkColombia and FENAVI.

The private sector representations of the poultry and pork sector in 2020 will have their bi-annual and annual congresses. These congresses last a couple of days and deal with a variety of topics that are of interest to the sectors. It is combined with a commercial trade fair. These congresses are attended by a large part of the sector and by other actors like public entities, academia and the international community.

The Dutch embassy is invited to participate in the academic agenda and to invite Dutch experts to give a presentation of a theme which is of interest to the sectors and in which the Netherlands can offer expertise. In 2020, LAN Bogota will invite a Dutch expert on insect production for animal feed purposes. This will further disseminate and create awareness of the possibilities of insect production for feed in Colombia and it will stimulate LAN Bogota's goal to reach a protein transition towards circular feed production in Colombia, using Dutch know how and technology.

The first seminar on insect production for feed purposes in Colombia

The 20th of November of 2019, LAN Bogota participated in the first Colombian seminar on insects as protein source for animal feed for a circular agriculture. The Universidad Nacional of Colombia hosted the seminar. Wageningen University also participated in the seminar.

The seminar aimed to spread research and processes that have been carried out in Colombia and the Netherlands with the use of insects as protein alternatives to a wider public of governmental entities, private sector federations and academia. As such, the seminar brought together a large number of different actors, most of whom learned about the theme of insects as protein source for animal feed for the first time. It demonstrated that insects as feed can be a circular and sustainable alternative for feed imports in Colombia and could result in business opportunities and empowerment of smallholder farmers in Colombia's rural areas. Also, the seminar already addressed (future) challenges to develop insect production for feed in Colombia.

LAN Bogota presented the vision on circular agriculture and how insects as feed contribute to a more circular agriculture. Moreover, LAN Bogota demonstrated the experiences that already exist in the Netherlands with insects as feed and introduced several frontrunner companies working in the sector.

5.2.6. Valorization of manure in the poultry and pork sector



The poultry and pork sector produce enormous amounts of manure. The manure is most often perceived as waste. It should be removed which can be costly for farmers. In other cases, the manure ends up in the environment, for example in surface waters like rivers and lakes, or is burned resulting in water, soil and air pollution. Law enforcement in Colombia could be improved.

Both Fenavi and PorkColombia have the ambition to valorize manure and to reduce the pressure on the environment. In the MoU between the Dutch embassy and Fenavi valorization of poultry manure, introducing Dutch know how and technology, is one of the areas of cooperation. In meetings between LAN Bogota and PorkColombia the topic has been elaborately discussed as well. The Ministry of Environment and Sustainable Development also prioritizes valorization of manure in the poultry and pork sector within its National Circular Economy Strategy.

There are already examples in Colombia where poultry and pork manure is valorized. For example, the Dutch-Colombian pig producing company Hocotec processes manure into fertilizers and biogas. This process takes place on its own farm. Doing this transfers a waste product into a product with added value.

Capacity building to valorize pork manure

In meetings with LAN Bogota, PorkColombia expressed the need to educate farmers on the possibilities to valorize manure. Currently, some farmers already valorize manure by processing it into fertilizer and biogas, like Hocotec. However, most farmers do not know how to do this.

LAN Bogota can aim to cooperate with the Ministry of Environment and Sustainable Development and with PorkColombia, to draft an action plan how to work on capacity building amongst farmers. In a later stage, a similar action plan can be developed in the poultry sector with the Ministry and Fenavi.

6. Recommendations

During the conversations LAN Bogota had with all the different actors some themes have occurred that could not (yet) be translated in concrete activities. These themes have been gathered and translated into recommendations to LAN Bogota and to the Dutch government to further strengthen the transition towards a more circular agriculture in Colombia.

6.1. Recommendations to LAN Bogota

Let the vision and prioritized SDGs guide LAN Bogota's work

For the agricultural department new activities to join, set up or cooperate with will come up in the coming years. There will likely be too many activities to dedicate time to given the number of people working in the agricultural department and size of the working area. LAN Bogota has prioritized several SDGs that are key to LAN Bogota's work. These SDGs are LAN's Bogota translation of its vision. Let the vision and prioritized SDGs be a guiding principle to decide whether or not to dedicate time to certain activities. In annex 3 an overview of the prioritized SDGs is included.

Go for small wins

Small wins (small steps and examples), such as projects or partnerships are very useful to make progress in the transition towards a more circular agriculture. It prevents from being overwhelmed by the complexity of the transition and from focusing merely on one large project that in the end might turn out unfeasible or unsuccessful. Also, small wins do not require large funds. It also helps to prevent postponing the transition. In other words, with small wins you move from talking to action. Small steps also evoke less resistance in the transition towards circular agriculture. Afterwards, these small wins can be communicated to others, applied elsewhere, broadened, deepened and upscaled, for example via the B2B platform.

Continue to create awareness for circular agriculture in Colombia

The vision and the concept of circular agriculture are new in the Netherlands, but even newer in Colombia. The Dutch embassy and its agricultural department have introduced the vision and the concept of circular agriculture in Colombia during their talks with other actors such as private sector federations, governmental entities, companies, research institutes and universities and during workshops, seminars, fairs and other events. This has resulted in familiarity with the vision and concept by actors in Colombia. Moreover, these actors now speak about circular agriculture and discuss it. This familiarity and engagement with circular agriculture in Colombia is also related to the National Circular Economy Strategy of the Colombian Government. Due to this national strategy, Colombian actors understand the relevance and need to address circular agriculture. This awareness creation and agenda setting of circular agriculture in Colombia by LAN Bogota is important to cooperate with other actors in activities related to circular agriculture. Also, it is instrumental to find new alliances between actors. Hence, it is recommendable to continue to raise awareness and to keep on presenting and mentioning circular agriculture whenever possible and appropriate.

Communication to the Netherlands

This circular agriculture vision and working agendas will lead to the implementation of a variety of activities in Colombia related to circular agriculture in the coming years. It is recommendable to communicate the vision and the activities and its results to the Netherlands via publications and informative talks with people and actors in the Netherlands. On the one hand, this is beneficial for the Minister of Agriculture, Nature and Food Quality to demonstrate how her efforts abroad support a circular agriculture in the Netherlands. On the other hand, it demonstrates to other Dutch actors like knowledge institutes and companies what possibilities circular agriculture in Colombia can offer them. As such communication of results also creates awareness amongst actors in the Netherlands.

The avocado sector

The avocado sector is not prioritized within the circular agriculture strategy, since the sector is relatively new in Colombia and inexperienced. Therefore, the sector focuses on growing in terms of production and export. Sustainability and circularity are not priorities for the private sector representation. Even though Colombian and Dutch stakeholders identify possibilities and room for improvement related to sustainability and circularity in the avocado sector, Colombian actors (the private sector federation and companies) currently are not very much interested in cooperation on these themes.

Nevertheless, the sector, as well as its export to Europe and the Netherlands, is expected to grow in the coming years. Therefore, it is recommendable to follow developments within the sector and lobby to focus more on sustainability and circularity.

6.2. Recommendations to the Dutch government

Improvement of voluntary certification schemes

The agricultural products that Colombia exports to the Dutch and European market are often certified by voluntary certification schemes like RSPO, Fair Trade, Global GAP and Rainforest Alliance. These certification schemes could be much more instrumental in the social and environmental sustainability of the agricultural value chains and in possible improvements regarding social and environmental sustainability. While LAN Bogota spoke with Dutch and Colombian actors active in Colombia two topics have been identified in which voluntary certification schemes can be improved to improve environmental and social sustainability.

Firstly, water management during production is often not or little included in the principles and criteria of these certification schemes. Therefore, water management is often poorly addressed in the business practices of companies that are certified. Secondly, conventional and organic certification schemes do not address (single use) plastic use. This results in little attention to plastic use by producers/companies.

Both shortcomings, no or little attention to water management and plastic use, could be addressed in these voluntary certification schemes. The reduction or elimination of (single-use) plastic use could in first instance be included in organic certification schemes, because consumers buying organic products are probably also willing to pay a little extra to reduce plastic use.

The principles and criteria of the voluntary certification schemes are every once in a while revised and adapted. The Dutch government could lobby to better address water management during production and plastic use in the voluntary certification schemes.

Lobby to ban (single use) plastics via EU legislation

The reduction or elimination of (single use) plastic use, could be stimulated via voluntary certification schemes, but also via EU legislation.

Like the Dutch government, the EU is very ambitious on circularity and sustainability in food policy. In December 2019, the EU presented the European Green Deal which paves the way for Europe to become the first climate neutral continent by 2050. The deal also includes the 'Farm to Fork' strategy that aims to stimulate sustainable food consumption, promote affordable healthy food and to better position farmers in the value chain.

The Dutch government can lobby at EU level to ban (single use) plastics within agricultural production chains and imports from third countries like Colombia in EU legislation. Due to the recent launch of the European Green Deal the timing is good to address and lobby for these issues.

A fund for circular agriculture for the LAN network

Funds are an important means for the realization of the circular agriculture vision and to operate effectively abroad as Dutch government. Currently, the LAN network has practically no funds at its disposal for activities related to circular agriculture. A fund that makes it possible to finance small-scale seed money projects or pilots in the field of circular agriculture abroad would strengthen the transition towards circular agriculture. A fund similar to the former 'KNIP' fund for nature projects and biodiversity. Given the expectation that in the future also in other countries the LAN network will actively work towards the realization of the circular agriculture vision, such a fund would be likely very effective.

An overview of the Dutch private sector offering technological and digital solutions for smallholders

One of the activities in the working agendas is to develop an overview of Dutch companies offering technological and digital solutions for smallholders. This overview will be made available for all agricultural departments. To effectively include the Dutch private sector offering technological and digital solutions for smallholders in agricultural activities abroad it is recommended to maintain, extend and update the overview at the Ministry of Agriculture, Nature and Food Quality or the RVO in the Netherlands.

7 • Reflections on LAN Bogota's participation in the Colombia's Circular Economy team and the RedES-CAR team

During the development of the vision on circular agriculture and the corresponding working agendas in Colombia, LAN Bogota formed part of the National Circular Economy team of the Colombian Ministry of Environment and Sustainable Development and the RedES-CAR team of the Los Andes University. Bart van Hoof, strategic advisor of the Minister of Environment and Sustainable Development and director of the RedES-CAR team invited LAN Bogota to participate in both teams. The participation in both teams allowed the Dutch embassy to have a look behind the scenes. It demonstrated how the National Circular economy team and the RedES-CAR team operate.

First of all, the participation of LAN Bogota intensified the cooperation between the Dutch embassy, the Los Andes University and the Ministry of Environment and Sustainable Development. It resulted in the development and execution of projects and workshops between these actors and in vice-versa participation in conferences. During these activities, LAN Bogota also came in contact with other actors. As such, via the intensified cooperation, new partnerships and alliances with actors who were unknown before were established. For example, due to the invitation of Bart van Hoof to participate in a seminar on sustainability in agro-enterprises organized by CIAT and the Los Andes University, LAN Bogota came in touch with actors who also lobby to facilitate market access for biological control solutions. It has therefore been very important for building and expanding networks in circular economy and agriculture in Colombia.

Secondly, participation in the RedES-CAR team showed how unique and successful the program is. It demonstrated the cooperation between the private, public and academic sector; a form of cooperation which is known as

the 'golden triangle' or 'triple helix' and which is well-known in the Netherlands. In Colombia this type of cooperation is rare. This cooperation resulted in more sustainable business practices of 570 companies on a voluntary basis; think of increased water security, CO2 savings, reduction in plastic waste, etc. Furthermore, the cooperation enabled companies to 'learn by doing', has created new bonds between companies and has improved the relationship between companies and society.

Thirdly, at the same time, the participation in the RedES-CAR team also shows the necessity to address and support sustainable and circular business practices via programs like RedES-CAR, because companies are often not cooperating with each other or with other sectors and are putting pressure on the region's natural resources, for example via uncontrolled water extractions.

Fourth, the participation in the National Circular Economy team demonstrated how the team applies aspects of the Dutch Circular Economy strategy within its strategy. For example, the Colombian National strategy is based around six different themes, apart from one added theme, these themes are the same as the themes used in the Dutch Circular Economy Strategy.

Fifth, it showed how the National Circular Economy team aims to be inclusive to reach its goals via inclusion of actors in different sectors and different regions of the country. It sets up regional pacts to stimulate and support all regions of the country to join the National Circular Economy Strategy. In addition, the team develops alliances with all possibly involved actors in society to get them on board of the National Strategy.

Sixth, on the other hand, the participation in the National Circular Economy team demonstrated that inter-ministerial relations are complex. The National Circular Economy falls under the Ministry of Environment and Sustainable Development, but cooperates with almost all other Ministries. The cooperation between Ministries is not always fluent and harmonization of policies and activities might be a long process.

Finally, although Colombia has its challenges in relation to sustainability and circularity, the participation in both teams showed the high ambitions and efforts of different actors in different sectors in Colombia, (government, academia and private sector) to be more sustainable and more circular and to live in closer harmony with the environment.

Annexes

1. Overview of potential focus areas including additional motivations to focus these areas

This annex offers the decision making tool which has been used to choose the prioritized focus areas. It gives an overview of the focus areas and the additional motivations to focus on these areas. The first column of the table shows the potential focus areas already identified. The second column indicates if there is a link to Dutch know-how and/or technology for this focus area. The third column offers additional motivations to select and prioritize the focus area like a well-organized private sector or policy priority in the Netherlands or Colombia. The fourth column demonstrates possible difficulties to overcome when working on these focus areas.

Difficulties to overcome	Making modern water saving technologies accessible for farmers with little investment possibilities
Additional motivations	 The palm oil federation is well-organized and works on sustainability. Intention statement between Dutch and Colombian actors to make palm oil production more circular The palm oil value chain is part of the banking agreement Palm oil is the number one agro-commodity exported from Colombia to the Netherlands On-going initiative on circularity in palm oil by Wageningen University and CeniPalma Projects on palm oil by Solidaridad On-going initiative by Daabon company Sustainable certification scheme in palm oil Efficient water use is a priority in the international water ambition Efficient water use is a priority in the international food security policy of the Netherlands Efficient water use is part of the circular economy strategy of the Colombian government The national development plan stimulates improvement of irrigation schemes
Link to Dutch know-how and/ or technology	+
Focus area	Efficient water use during cultivation in palm oil

Focus area	Link to Dutch know-how and/ or technology	Additional motivations	Difficulties to overcome
Efficient water use during cultivation in	÷	 The banana association is well-organized and works on sustainability Banana is the number two agro-commodity exported to the Netherlands from Colombia Projects on banana by Solidaridad 	Making modern water saving technologies
banana		 Sustainable certification scheme in banana On-going initiative MAS works with banana producers 	accessible for farmers with little
		• Efficient water use is a priority in the international water ambition • Efficient water use is a priority in the international food security policy of the Netherlands	investment possibilities
		 Efficient water use is part of the circular economy strategy of the Colombian government The national development plan stimulates improvement of irrigation schemes 	

Difficulties to overcome	Making modern water saving technologies accessible for farmers with little investment possibilities	
Additional motivations	 Asocolflores is well-organized and works on sustainability. Flowers are the number three agro-commodity exported to the Netherlands from Colombia Dutch agreement floricultural sector GRI Sustainability report of Asocolflores GRI sustainability report of Asocolflores Efficient water use is a priority in the international water ambition Efficient water use is a priority in the international food security policy of the Netherlands Efficient water use is a priority in the international food security policy of the Netherlands Efficient water use is priority in the international food security policy of the Netherlands Efficient water use is part of the RedesCar program Efficient water use is part of the circular economy strategy of the Colombian government The national development plan stimulates improvement of irrigation schemes 	
Link to Dutch know-how and/ or technology	+	
Focus area	Efficient water use during cultivation in flowers	

Efficient water + The coffee federation is well-organized and works on sustainability. use after - Projects on coffee by Solidaridad and project of Manos al Agua Cultivation in - Sustainable certification scheme in coffee Our-going initiative by Kinti Coffee - On-going initiative by Kinti Coffee On-going initiative by Kinti Coffee - On-going initiative by Kinti Coffee True cost pricing project coffee - On-going initiative by the Coffee Quest Fifticient water use is a priority in the international water ambition - Efficient water use is a priority in the international water ambition Of Fifticient water use is part of the circular economy strategy of the Colombian govi - Efficient water use is part of the circular economy strategy of the Colombian govi	Focus area	Link to Dutch know-how and/ or technology	Additional motivations	Difficulties to overcome
Use after Projects on coffee by Solidaridad and project of Manos al Agua Sustainable certification scheme in coffee On-going initiative MAS works with coffee producers On-going initiative by Kinti Coffee On-going initiative by the Coffee Quest On-going initiative by the Coffee Quest True cost pricing project coffee Efficient water use is a priority in the international water ambition Efficient water use is a priority in the international food security policy of the Net Efficient water use is part of the circular economy strategy of the Colombian govi 	Efficient water	+	 The coffee federation is well-organized and works on sustainability. 	
cultivation in Sustainable certification scheme in coffee On-going initiative MAS works with coffee producers On-going initiative by Kinti Coffee On-going initiative by the Coffee Quest True cost pricing project coffee True cost pricing project coffee Efficient water use is a priority in the international water ambition Efficient water use is a priority in the international food security policy of the Net Efficient water use is part of the circular economy strategy of the Colombian govier 	use after		 Projects on coffee by Solidaridad and project of Manos al Agua 	
coffee • On-going initiative by Kinti Coffee producers • On-going initiative by the Coffee Quest • True cost pricing project coffee Quest • Efficient water use is a priority in the international water ambition • Efficient water use is a priority in the international food security policy of the Net • Efficient water use is part of the circular economy strategy of the Colombian gov	cultivation in		Sustainable certification scheme in coffee	
 On-going initiative by the Coffee Quest On-going initiative by the Coffee Quest True cost pricing project coffee Efficient water use is a priority in the international water ambition Efficient water use is a priority in the international food security policy of the Net Efficient water use is part of the circular economy strategy of the Colombian gove 	coffee		 On-going initiative MAS works with coffee producers 	
 On-going initiative by the Coffee Quest True cost pricing project coffee Efficient water use is a priority in the international water ambition Efficient water use is a priority in the international food security policy of the Neti Efficient water use is part of the circular economy strategy of the Colombian gove 			On-going initiative by Kinti Coffee	
 True cost pricing project coffee Efficient water use is a priority in the international water ambition Efficient water use is a priority in the international food security policy of the Neti Efficient water use is part of the circular economy strategy of the Colombian gove 			On-going initiative by the Coffee Quest	
 Efficient water use is a priority in the international water ambition Efficient water use is a priority in the international food security policy of the Neti Efficient water use is part of the circular economy strategy of the Colombian gove 			• True cost pricing project coffee	
 Efficient water use is a priority in the international food security policy of the Netl Efficient water use is part of the circular economy strategy of the Colombian gove 			• Efficient water use is a priority in the international water ambition	
Efficient water use is part of the circular economy strategy of the Colombian gove			• Efficient water use is a priority in the international food security policy of the Netherlands	
			ullet Efficient water use is part of the circular economy strategy of the Colombian government	

Focus area	Link to Dutch know-how and/ or technology	Additional motivations	Difficulties to overcome
Efficient water	+	• The palm oil federation is well-organized and works on sustainability.	
use after		 Intention statement between Dutch and Colombian actors to make palm oil production more circular 	
palm oil		• The palm oil value chain is part of the banking agreement	
		• Palm oil is the number one agro-commodity exported from Colombia to the Netherlands	
		 On-going initiative on circularity in palm oil by Wageningen University and CeniPalma 	
		 Projects on palm oil by Solidaridad 	
		 On-going initiative by Daabon company 	
		 Sustainable certification scheme in palm oil 	
		• Efficient water use is a priority in the international water ambition	
		• Efficient water use is a priority in the international food security policy of the Netherlands	
		• Efficient water use is part of the circular economy strategy of the Colombian government	

Focus area	Link to Dutch know-how and/ or technology	Additional motivations	Difficulties to overcome
Water re-use /	+	• The palm oil federation is well-organized and works on sustainability	Colombian
nutrient re-use in also also		 Intention statement between Dutch and Colombian actors to make palm oil production more circular 	national اعطنطعنا
		• The palm oil value chain is part of the banking agreement	hinders re-use
		ullet Palm oil is the number one agro-commodity exported to The Netherlands from Colombia	of water and
		 Projects on palm oil by Solidaridad 	nutrients
		 Sustainable certification scheme in palm oil 	
		 On-going initiative by Daabon company 	
		 On-going initiative on circularity in palm oil by Wageningen University and CeniPalma 	
		• Efficient water use is a priority in the international water ambition	
		• Efficient water use is a priority in the international food security policy of the Netherlands	
		• Efficient water use is part of the circular economy strategy of the Colombian government	

Difficulties to overcome	Colombian national legislation	hinders re-use of water and nutrients		
Additional motivations	 The flower association is well-organized and works on sustainability. Flowers are the number three agro-commodity exported to the Netherlands from Colombia Dutch agreement floricultural sector 	 GRI Sustainability report of Asocolflores Sustainable certification scheme in flowers Efficient water use is a priority in the international water ambition 	 Efficient water use is a priority in the international food security policy of the Netherlands Efficient water use and floriculture are part of the RedesCar program 	• Efficient water use is part of the circular economy strategy of the Colombian Government
Link to Dutch know-how and/ or technology	+			
Focus area	Water re-use / nutrient re-use in flowers			

Valorization + • The palm oil federation is well-organized and works on sustainat of biomass in of biomass in more circular • Intention statement between Dutch and Colombian actors to mamore circular • Intention statement between Dutch and Colombian actors to mamore circular • The palm oil • The palm oil value chain is part of the banking agreement • Projects on palm oil by Solidaridad • Projects on palm oil by Solidaridad • On-going initiative by Daabon company • On-going initiative on circularity in palm oil by Wageningen Univivienter and security policy of the Netherlands • Maximizing the value of the harvest (including "residual flows") is international food security policy of the Netherlands • Biomass is part of the circular economy strategy of the Colombia	Link to Dutch know-how and/ or technology	Difficulties to overcome
of biomass in palm oil Intention statement between Dutch and Colombian actors to ma more circular The palm oil The palm oil value chain is part of the banking agreement Projects on palm oil by Solidaridad Projects on palm oil by Solidaridad On-going initiative by Daabon company On-going initiative by Daabon company On-going initiative on circularity in palm oil by Wageningen Univ Initiative on circularity in palm oil by Wageningen Univ On-going initiative on circularity in palm oil by Wageningen Univ Initernational food security policy of the Netherlands	The palm oil federation is well-organized and works on sustainability +	
 The palm oil value chain is part of the banking agreement Palm oil is the number one agro-commodity exported to the Net Projects on palm oil by Solidaridad Sustainable certification scheme in palm oil On-going initiative by Daabon company On-going initiative by Daabon company On-going initiative on circularity in palm oil by Wageningen Univ Maximizing the value of the harvest (including "residual flows") is international food security policy of the Netherlands Biomass is part of the circular economy strategy of the Colombia 	Intention statement between Dutch and Colombian actors to make palm oil proc more circular	uction
 Palm oil is the number one agro-commodity exported to the Net Projects on palm oil by Solidaridad Sustainable certification scheme in palm oil On-going initiative by Daabon company On-going initiative on circularity in palm oil by Wageningen Univ Maximizing the value of the harvest (including "residual flows") i international food security policy of the Netherlands Biomass is part of the circular economy strategy of the Colombia 	• The palm oil value chain is part of the banking agreement	
 Projects on palm oil by Solidaridad Sustainable certification scheme in palm oil On-going initiative by Daabon company On-going initiative on circularity in palm oil by Wageningen Univ Maximizing the value of the harvest (including "residual flows") i international food security policy of the Netherlands Biomass is part of the circular economy strategy of the Colombia 	Palm oil is the number one agro-commodity exported to the Netherlands from C	lombia
 Sustainable certification scheme in palm oil On-going initiative by Daabon company On-going initiative on circularity in palm oil by Wageningen Univ Maximizing the value of the harvest (including "residual flows") i international food security policy of the Netherlands Biomass is part of the circular economy strategy of the Colombia 	Projects on palm oil by Solidaridad	
 On-going initiative by Daabon company On-going initiative on circularity in palm oil by Wageningen Univ Maximizing the value of the harvest (including "residual flows") is international food security policy of the Netherlands Biomass is part of the circular economy strategy of the Colombia 	Sustainable certification scheme in palm oil	
 On-going initiative on circularity in palm oil by Wageningen Univ Maximizing the value of the harvest (including "residual flows") is international food security policy of the Netherlands Biomass is part of the circular economy strategy of the Colombia 	On-going initiative by Daabon company	
 Maximizing the value of the harvest (including "residual flows") is international food security policy of the Netherlands Biomass is part of the circular economy strategy of the Colombia 	On-going initiative on circularity in palm oil by Wageningen University and CeniP.	Ima
Biomass is part of the circular economy strategy of the Colombia	Maximizing the value of the harvest (including "residual flows") is a priority in the international food security policy of the Netherlands	
	Biomass is part of the circular economy strategy of the Colombian government	

	Difficulties to overcome										 	
-	Additional motivations	• The coffee federation is well-organized and works on sustainability.	 Projects on coffee by Solidaridad and Manos al Agua 	Sustainable certification scheme in coffee	On-going initiative MAS works with coffee producers	On-going initiative by Kinti Coffee	• On-going initiative by the Coffee Quest	• True cost pricing project coffee	 Maximizing the value of the harvest (including "residual flows") is a priority in the international food security policy of the Netherlands 	 Biomass is part of the circular economy strategy of the Colombian government 		
Link to Dutch	know-how and/ or technology	+										
	Focus area	Valorization	of biomass in	coffee								

Focus area	Link to Dutch know-how and/ or technology	Additional motivations	Difficulties to overcome
Valorization	+	• The banana association is well-organized and works on sustainability	
of biomass in		 Banana is the number two agro-commodity exported to the Netherlands from Colombia 	
banana		 Projects on banana by Solidaridad 	
		 Two harvests per year resulting in high amounts of biomass 	
		 Sustainable certification scheme in banana 	
		 On-going initiative MAS works with banana producers 	
		 Maximizing the value of the harvest (including "residual flows") is a priority in the international food security policy of the Netherlands 	
		 Biomass is part of the circular economy strategy of the Colombian government 	

Difficulties to overcome									
Additional motivations	 The banana association is well-organized and works on sustainability 	• Banana is the number two agro-commodity exported to the Netherlands from Colombia	 Projects on banana by Solidaridad 	 Sustainable certification scheme in banana 	 On-going initiative MAS works with banana producers 	ullet Plastic waste is part of the circular economy strategy of the Colombian government			
Link to Dutch know-how and/	+								
Focus area	Reduce plastic	waste in	banana						

Focus area	Link to Dutch know-how and/ or technology	Additional motivations	Difficulties to overcome
Reduce plastic	+	• The flower association is well-organized and works on sustainability.	
waste in		ullet Flowers are the number three agro-commodity exported to the Netherlands from Colombia	
flowers		Dutch agreement floricultural sector	
		• GRI Sustainability report of Asocolflores	
		 Sustainable certification scheme in flowers 	
		• The flower sector is addressed by the RedesCar program	
		 Plastics is part of the circular economy strategy of the Colombian government 	

Focus area	Link to Dutch know-how and/	Additional	Difficulties
	or technology	motivations	to overcome
Integrated pect	+	• The palm oil federation is well-organized and works on sustainability	Alternatives
management in		 Intention statement between Dutch and Colombian actors to make palm oil production more circular 	for pesticides
palm oil		• The palm oil value chain is part of the banking agreement	are almost impossible to
		ullet Palm oil is the number one agro-commodity exported to the Netherlands from Colombia	import due to
		 Projects on palm oil by Solidaridad 	legislation by
		Sustainable certification scheme in palm oil	the ANLA
		• On-going initiative by Daabon company	
		ullet On-going initiative on circularity in palm oil by Wageningen University and CeniPalma	

Focus area	Link to Dutch know-how and/ or technology	Additional motivations	Difficulties to overcome
Integrated pest	+	• The flower association is well-organized and works on sustainability.	
management in		Dutch agreement floricultural sector	
flowers		• GRI Sustainability report of Asocolfiores	
		Sustainable certification scheme in flowers	
		• The flower sector is addressed by the RedesCar program	Alternatives for pesticides
Integrated pest	+	• The banana association is well-organized and works on sustainability	are almost impossible to
management in		ullet Banana is the number two agro-commodity exported to the Netherlands from Colombia	import due to
banana		Projects on banana by Solidaridad	legislation by
		Sustainable certification scheme in banana	the ANLA
		 On-going initiative MAS works with banana producers 	

Focus area	Link to Dutch know-how and/ or technology	Additional motivations	Difficulties to overcome
Prevent soil	+	• The coffee federation is well-organized and works on sustainability.	
erosion in		 Projects on coffee by Solidaridad and Manos al Agua 	
coffee		Sustainable certification scheme in coffee	
		 On-going initiative MAS works with coffee producers 	
		On-going initiative by Kinti Coffee	
		 On-going initiative by the Coffee Quest 	
		True cost pricing project coffee	
Prevent /	+	 Reduce food losses is a priority in the international food security policy of the Netherlands 	
reduce food		• The Manq'a project of ICCO and Melting Pot addresses this focus area	
waste in			
general			

Focus area	Link to Dutch know-how and/ or technology	Additional motivations	Difficulties to overcome
Improve income / livelihood farmer in general	+	 Is prioritized by the international food security policy of the Netherlands Projects of Solidaridad focus on this theme The Colombian National Development Plan prioritizes this theme 	
Alternatives for animal feed imports in poultry	+	 The poultry federation is well-organized and works on sustainability On-going initiative by Terragrow On-going initiative by Dorset On-going initiative on production of insects for animal feed 	

_			
Focus area	Link to Dutch know-how and/ or technology	Additional motivations	Difficulties to overcome
Alternatives for animal feed imports in pork	+	 On-going initiative by Hocotec On-going initiative by Grupo Aliar On-going initiative on production of insects for animal feed 	
Valorization of poultry manure	+	 The poultry federation is well-organized and works on sustainability On-going initiative by Terragrow On-going initiative by Dorset 	
Valorization of pig manure	+	On-going initiative by Hocotec On-going initiative by Grupo Aliar	

2. Memorandum of Understanding on Circular Economy

- DRAFT February 2020 -MEMORANDUM OF UNDERSTANDING BETWEEN THE GOVERNMENT OF THE NETHERLANDS AND THE MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT OF COLOMBIA REGARDING COOPERATION ON CIRCULAR ECONOMY

The government of the Netherlands and the ministry of Environment and Sustainable Development of Colombia have a common interest to reinforce the ties of cooperation between the participants on the theme of circular economy;

The participants recognize the importance of circular economy for the environment and socio-economic development of both Colombia and the Netherlands;

The participants have a common interest to respect and implement the policy frameworks of both countries in relation to circular economy;

The government of the Netherlands and the ministry of Environment and Sustainable Development of Colombia, hereinafter referred to as the "Sides," agree:

ARTICLE 1. The policy context

The Colombian Government (2018-2022) launched the National Circular Economy Strategy which is led by the Ministry of Environment and Sustainable Development. The National Circular Economy Strategy emphasizes six lines of action represented in six cycles: Industrial materials and products, packaging materials, optimization and use of biomass, water cycles, energy sources and use of energy and management of materials in urban centers. By 2022, the percentage of solid waste actually used is expected to increase from 17 to 30%. The strategy aims to increase the rate of recycling and waste utilization, which today stands at 8.7%, so that it rises in the year 2030 to 17.9%.

The government of the Netherlands established in 2016 a Circular Economy policy programme, which is led by the Ministry of Infrastructure and Water. The policy programme prioritizes five sectors: Biomass and food, plastics, manufacturing, construction and consumer goods. In 2030, the policy programme aims for 50% less use of raw materials (minerals, fossil energy and metals). In 2050, the programme has the ambition to achieve an economy without waste, where everything works with reusable resources.

In September 2018, the Ministry of Agriculture, Nature and Food Quality of the Netherlands presented the vision of circular agriculture called 'Agriculture, nature and food: valuable and connected'. The policy document provides for a transition from continuous cost reduction to agricultural production with the lowest possible level of pressure on the environment and natural resources; Water, air, nature and biodiversity. This is achievable by moving from a conventional agriculture to a circular agriculture, closing the agricultural production cycles, thus reducing the "leaks" of the production system by reducing spills, waste and making supply chains more sustainable.

The Netherlands published in 2019 the 'Dutch International Water Ambition' (NIWA). This strategy focuses on how the Netherlands cooperates to contribute to water security in the world for people, plants and animals and optimize the Dutch contribution to this goal.

In 2016 the Dutch government published its international food security policy. The three main objectives of the policy for the period 2016-2030 are: Better food for 32 million children, sustainable increase in productivity and income of 8 million small scale farmers and contribute to the ecologically sustainable use of 8 million hectares of agricultural land.

ARTICLE 2. The purpose

The Memorandum of Understanding seeks active and proactive cooperation in the field of circular economy between both countries. Apart from cooperation between the two governments, this Memorandum of Understanding encourages cooperation between the public sector, the private sector, the academic sector, knowledge centers and non-governmental organizations.

On behalf of the Colombian government, the ministry of Environment and Sustainable Development signs the Memorandum of Understanding. However, this Memorandum also seeks cooperation from other ministries specifically with the ministry of Agriculture and Rural Development, the National Planning Department, the ministry of Housing, City and Territory, the ministry of Commerce, Industries and Turism and the ministry of Mines and Energy.

ARTICLE 3. The themes of cooperation

The Sides contemplate the following themes of cooperation under this Memorandum of Understanding:

- Public-private cooperation regarding Extended Producer Responsibility, focus on WEEE and Packaging Programs;
- Reduce plastic use in the banana and flower sector;
- Design of a waste tariff system based on to circular economy;
- "Water for agriculture" (water efficiency, water re-use, water pollution, etc.) in the palm oil, banana, flower and coffee sectors;
- Valuation of biomass in the palm oil, banana and coffee sector;
- Integrated Pest Management (IPM) in the flower, palm oil and banana sector;
- Alternatives for the import of animal feed in the poultry and pig sectors;
- Valuation of manure in the poultry and pig sectors;
- Cooperation between construction value chains in Colombia and the Netherlands to provide goods and services with a circular approach;
- Construction and demolition waste legislation;

- Alternative materials to substitute/improve raw materials in construction;
- Utilization of residual water nutrients;
- Utilization of rainwater;
- Public private collaborative platform on water streams in circular economy;
- Photovoltaic energy use in non-interconnected zones;
- Regulatory framework for geothermal energy; and
- Regulatory framework for Waste to energy.

ARTICLE 4. The scope of cooperation

To achieve the objective of this Memorandum of Understanding, the Sides will amongst others agree in the following manner:

- (a) Promote the exchange of policies, programmes, projects, and economic and regulatory instruments for prioritized themes in the field of circular economy;
- (b) Promote the technical, regulatory and managerial exchange in the field of circular economy;
- (c) Facilitate the transfer of technology and knowledge related to the prioritized issues in the field of circular economy;
- (d) Share knowledge of policies aimed at technological development and innovation, on the priority issues in the field of circular economy;
- (e) Share knowledge, information and technologies of the ministries, private sector, advisory groups and institutions of both Sides;
- (f) Carry out joint projects and studies and demonstrate the results;
- (g) Jointly prepare specialized courses or technical visits; and
- (h) Enhance private sector cooperation.

ARTICLE 5. Progress

For the effective realization in accordance with this Memorandum of Understanding, the Sides will conform two moments a year in which progress is monitored and evaluated. The ministries or departments of the Sides that will assemble are the following: The Embassy of the Kingdom of the Netherlands and the ministry of Environment and Sustainable Development of Colombia.

The Sides designate a representative as the contact point in each Side for the communication related to this Memorandum of Understanding.

ARTICLE 6. Expenses

Unless there is no agreement, the Sides cover their expenses respectively for the realization of this Memorandum of Understanding. For the realization, including cooperation activities, each Side uses the funds, officials, employees, and other resources in accordance with the law of each Side.

ARTICLE 7. Responsibilities

This Memorandum of Understanding does not assign any legal binding or legal obligation to the Sides, and no policy is applied that influences in the future any treaty, agreement, regional or international understanding between both Sides.

ARTICLE 8. Consultation

The Sides shall endeavor to solve the problems related to this Memorandum of Understanding through cooperation and mutual consultation, without the involvement of any Third Party.

ARTICLE 9. Protection and exchange of information

All reports obtained by cooperative activities pursuant to this Memorandum of Understanding may be used by the Sides.

Each Side protects any information obtained within this Memorandum of Understanding through exchange or related to intellectual property rights.

The Sides, regardless of the level of secrecy, may not disseminate by any means any information obtained by this Memorandum of Understanding, including documents, technologies, products, materials and exchange of technologies, without written permission of the other side.

ARTICLE 10. Termination

This Memorandum of Understanding will enter into force on the date of signing by the Sides and will be valid for three (3) years, with the possibility of extending the period after the evaluation by the Sides.

The termination of the MoU will not affect the continuation of the projects or activities that are being implemented to date, nor the validity of the agreements that have been derived from it.

This Memorandum of Understanding may be modified by additional clauses, with mutual written consent between the Sides.

If a Side delivers to the other Side a written notice of termination, this Memorandum of Understanding is terminated within 6 months, counted from the date of the written notification.

Signed in Bogota D.C., the XXXX of XXXX of 2020, in two (2) original copies, in Spanish and English language.

By and on behalf of the GOVERNMENT OF THE NETHERLANDS

By and on behalf of THE MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT OF COLOMBIA

3. Sustainable Development Goals to guide LAN Bogota's work

LAN Bogota has translated the vision on circular agriculture into a set of Sustainable Development Goals (SDGs). It offers LAN Bogota guidance to decide what activities to develop, join or stimulate and what activities to not focus on. Also, the SDGs can be used as a tool to monitor and evaluate the activities once they are being performed or completed.

The SDGs have been chosen as they are an international concept. Hence, actors in the Netherlands, Colombia and other countries within all sectors understand them and can relate to them.

SDG 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture.



 2.4: By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.

SDG 6: Ensure availability and sustainable management of water and sanitation for all.



- 6.3: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.
- 6.4: By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.

 6.a: By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programs, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.

SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.



- 8.2: Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on highvalue added and labour-intensive sectors.
- 8.4: Improve progressively, through 2030, global resource efficiency in consumption and production and endeavor to decouple economic growth from environmental degradation, in accordance with the 10 Year Framework of Programs on Sustainable Consumption and Production, with developed countries taking the lead

SDG12: Ensure sustainable consumption and production patterns



- 12.2: By 2030, achieve the sustainable management and efficient use of natural resources
- 12.3: By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses
- 12.5: By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse

SDG15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss



- 15.5: Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species
- SDG17: "building Partnerships" is a core activity of LAN Bogota in everything we do. By definition we work in partnerships with others; public sector, private sector, NGO's





LAN Bogota 2019

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