



South-south inspiration to connect SDG2 and SDG16 in former conflict areas

Promoting sustainable livelihoods of ex-insurgents in Colombia by insect farming

Karol Barragán-Fonseca, Julián Cortés Urquijo, Marcel Dicke, Ana Patricia Quintana

PUBLIC
REPORT 1289



WAGENINGEN
UNIVERSITY & RESEARCH

South-south inspiration to connect SDG2 and SDG16 in former conflict areas

Promoting sustainable livelihoods of ex-insurgents in Colombia by insect farming

Karol Barragán-Fonseca, Julián Cortés Urquijo, Marcel Dicke, Ana Patricia Quintana

This research was carried out by Wageningen University & Research and the Universidad Nacional de Colombia subsidised by the Dutch Ministry of Agriculture, Nature and Food Quality, within the framework of Policy Support Research theme 'Food Security and Valuing Water' (project number KB-35-008-012-WLR)

Wageningen Livestock Research
Wageningen, December 2020

Public
Report 1289

Barragan Fonseca, K., J. Cortés-Urquijo, M. Dicke, A. Quintana, 2020. *South-south inspiration to connect SDG2 and SDG16 in former conflict areas. Promoting sustainable livelihoods of ex-insurgents in Colombia by insect farming*. Wageningen Livestock Research, Public Report 1289.

Dit rapport presenteert de resultaten van een onderzoeksproject naar de mogelijkheid om de ervaringen opgedaan in Kenya met het ontwikkelen van insectenproductie voor veevoer in samenwerking met lokale boeren te benutten om insectenproductie in Colombia te initiëren. In dit project is specifiek de nadruk gelegd op de mogelijkheden van insectenproductie voor veevoer om de reïntegratie van ex-opstandelingen te bevorderen. Het onderzoek, uitgevoerd door onderzoekers van de Universidad Nacional de Colombia en Wageningen University & Research, heeft de eerste fase ontwikkeld van kennisuitwisseling tussen landen uit het zuiden. Met een kwalitatief-kwantitatieve methodologie gebruikt het project een analyse van documenten en interactie met focusgroepen om de huidige karakteristieken van de ex-opstandelingenpopulatie te identificeren. Dit rapport richt zich met name op de voorwaarden, benoemd door de ex-opstandelingen, waaronder zo'n project zou kunnen worden ontwikkeld en presenteert aanbevelingen voor verdere implementatie van een project in Colombia dat is geïnspireerd door de ervaringen in Kenya.

This report presents the results of a research project that analyzes the feasibility of learning from experiences of the Kenyan productive peasant developments in farming insect for animal feed to develop insect farming in Colombia, specifically to foster the current reincorporation process of ex-insurgents. The research, carried out by scientists from the Universidad Nacional de Colombia and Wageningen University & Research, develops an initial stage of knowledge exchange among countries of the global south. With a qualitative/quantitative methodology, the research employs documental analysis and focus groups to identify current features of the ex-insurgent population. The document highlights the conditions, suggested by ex-insurgent population, under which a similar project might be developed and presents some recommendations for a further implementation of a project in Colombia that is inspired by the experiences in Kenya.

This report can be downloaded for free at <https://doi.org/10.18174/539034>.



This work is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License.

© Wageningen Livestock Research, part of Stichting Wageningen Research, 2020

The user may reproduce, distribute and share this work and make derivative works from it. Material by third parties which is used in the work and which are subject to intellectual property rights may not be used without prior permission from the relevant third party. The user must attribute the work by stating the name indicated by the author or licensor but may not do this in such a way as to create the impression that the author/licensor endorses the use of the work or the work of the user. The user may not use the work for commercial purposes.

Wageningen Livestock Research accepts no liability for any damage resulting from the use of the results of this study or the application of the advice contained in it.

Wageningen Livestock Research is ISO 9001:2015 certified.

All our research commissions are in line with the Terms and Conditions of the Animal Sciences Group. These are filed with the District Court of Zwolle.

Public Wageningen Livestock Research Report 1289

Table of contents

Foreword	5
Summary	7
1 Introduction	9
2 Approach of this report	10
3 Theoretical approach	12
4 Socio-political context of the reincorporation process in Colombia	14
4.1 The agreement	14
4.2 Current situation of the reincorporation process	18
4.3 Other difficulties	20
5 Lessons learnt in producing insects for feed	22
5.1 Experience in Kenya	22
5.2 Current experience of insect production by ex-insurgents in Colombia	23
5.2.1 Linking community	24
5.2.2 Academia-community interaction	24
5.2.3 BSF production plant	24
5.2.4 Lessons learnt	24
5.2.5 Success factors	25
6 Enabling conditions for the upscaling of insect farming among communities in reincorporation	27
6.1 Main strengths of ex-insurgents' communities	27
6.2 Conditions to enable insect farming among ex-insurgents' communities	28
6.2.1 Economic conditions	28
6.2.2 Material conditions	28
6.2.3 Organizational conditions	28
6.2.4 Learning conditions	29
6.3 Additional elements to improve ex-insurgents' reincorporation process	29
6.3.1 Education and training	29
6.3.2 Organization	29
6.3.3 Productive projects	30
6.3.4 Human rights	30
7 Conclusions and recommendations	31
7.1 Conclusions	31
7.2 Recommendations	32
8 Acknowledgements	34
References	35

Abbreviations

ARN	Agencia de Reincorporación y Normalización (Reincorporation and Normalization Agency)
BSF	Black Soldier Fly
CE	Circular Economy
CONPES	Consejo Nacional de Política Económica y Social (National Council of Economic and Social Policy)
COP	Colombian pesos
COPAGROC	Cooperativa Multiactiva Agropecuaria del Común
CNR	Consejo Nacional de Reincorporación (National Reincorporation Council)
ECOMUN	Economías Sociales del Común (Social Economies of the Common)
ETCR	Espacio Territorial de Capacitación y Reincorporación (Territorial Spaces for Training and Reincorporation)
FARC	Fuerza Alternativa del Común (Alternative Revolutionary Force of the Common)
FARC-EP	Fuerzas Armadas Revolucionarias de Colombia, Ejército del Pueblo (Revolutionary Armed Forces of Colombia, People's Army)
ICIPE	International Institute for Insect Physiology and Ecology, Nairobi, Kenya.
ILIPA	Improving livelihood by increasing livestock production in Africa
PMI	Plan Marco de Implementación (Implementation Framework Plan)
PNRSE	Política Nacional para la Reincorporación Social y Económica (National Policy of Social and Economic Reincorporation)
SDGs	Sustainable Development Goals
SDG2	Sustainable Development Goal No. 2
SDG16	Sustainable Development Goal No. 16
UNAL	Universidad Nacional de Colombia
WUR	Wageningen University & Research

Figures

1	Structure of the formalization of the reincorporation process in the peace agreement.
2	ETCRs per region
3	NAR Mutatá, Antioquia; ETCR Colinas, Guaviare; and productive project of clothes manufacturing in the ETCR Tierra Grata, Cesar
4	Ex-insurgents' community involved in learning process of BSF production. Icononzo, Tolima
5	Karol Barragán and Ricardo Arciniegas at ICIPE, Nairobi (Kenya) with Dr. Chrysantus Tanga (left), and exchanging experiences with Kenyan BSF farmers (right)
6	Summary of lessons learnt and recommendations. Source: own elaboration

Tables

1	Ex-insurgents' nodes characterization
2	Main production lines in the 24 ETCRs of Colombia
3	Production lines of the NARs
4	Associative forms by nodes

Foreword

Within the Kennisbasis WR-theme *Food Security and Valuing Water*, the Universidad Nacional de Colombia and Wageningen University & Research have executed a project on *South-south inspiration for circular innovation of feed for aquaculture*. This project aimed to investigate how experiences in the development of insect production for feed in collaboration with farmers in Kenya can be used as inspiration for the production of insects as feed by ex-insurgents in Colombia. The experiences in Kenya had been derived from an NWO-WOTRO project carried out by Wageningen University & Research (the Netherlands) and the International Institute for Insect Physiology and Ecology (Kenya)¹.

We have executed the project in collaboration with ex-insurgents by documental analysis and through an interactive workshop organized from 19-21 November, 2020 in Bogotá, Colombia.

Project members were Karol Barragán-Fonseca², Julián Cortés Urquijo³, Marcel Dicke⁴, Ana Patricia Quintana⁵. Projectleader was Teun Veldkamp⁶.

¹ Improving livelihood by increasing livestock production in Africa: An agribusiness model to commercially produce high quality insect-based protein ingredients for chicken, fish and pig industries (ILIPA), <https://www.nwo.nl/projecten/w-08250202-0>

² Professor Animal Production Department. Faculty of Veterinary Medicine and Animal Production. Universidad Nacional de Colombia. Bogotá, Colombia.

³ Coordinator of the Educational Committee of ECOMUN. PhD candidate at the Sociology of Development and Change chair group at Wageningen University. Wageningen, The Netherlands.

⁴ Professor Social Work Department. Faculty of Human Sciences. Universidad Nacional de Colombia. Bogotá, Colombia.

⁵ Professor of Entomology at the Laboratory of Entomology. Wageningen University & Research. Wageningen, The Netherlands.

⁶ Senior Researcher Animal Nutrition at the Animal Nutrition Division of Wageningen Livestock Research, Wageningen University & Research. Wageningen, The Netherlands.

Summary

This report presents the results of a research project that analyzes the feasibility of learning from experiences of the Kenyan productive peasant developments in farming insect for animal feed to develop insect farming in Colombia, specifically to foster the current reincorporation process of ex-insurgents. The research, carried out by scientists from the Universidad Nacional de Colombia and Wageningen University, develops an initial stage of knowledge exchange among countries of the global south. With a qualitative/quantitative methodology, the research employs documental analysis and focus groups to identify current features of the ex-insurgent population. The document highlights the conditions, suggested by ex-insurgent population, under which a similar project might be developed and presents some recommendations for a further implementation of a project in Colombia that is inspired by the experiences in Kenya.

1 Introduction

Food security is important for both a healthy population that has enough food available as well as for social cohesion and stability. This project focuses on the opportunities to use South-South inspiration to achieve durable innovation of the production of animal proteins with a focus on insects as fish feed for aquaculture. Through a participatory approach with stakeholders, social expectations and needs have been investigated in the context of achieving innovation and developing sustainable food production and social stability.

Food security (SDG2⁷) and peace and justice (SDG16⁸) are closely connected. Peasant farmers play an important role in food security and social embedding. Social security is important for SDG2 as well as SDG16. Sustainable production of proteins is an important component of food security and healthy food production. Insects provide excellent opportunities for a circular production of animal proteins. This project focuses on aquaculture in a broad context. Experiences with the production of insects as feed by peasant farmers in non-conflict societies (Kenya) can be used to facilitate similar developments in conflict-torn nations (Colombia).

For such a South-South inspiration it is relevant to investigate which social and political circumstances contribute to the success of involving peasant farmers in the implementation of a sustainable circular food production. Knowledge of the success factors and how these can be used in former conflict areas can lead to inspiration to improve food production and stability in these areas. Such developments may lead to a direct coupling of SDG2 and SDG16. For this, it is important to investigate with ex-insurgents what the social expectations, needs and interests are to be able to achieve a just reintegration⁹ in society in which they feel recognized as full members of society by being members of social and economic networks. Currently, ex-insurgents in the process of reincorporation are embedded in the social, economic and political dynamics of rural areas in Colombia and this represents several strengths and threats. That is why it is academically relevant to explore the dynamics of the Colombian rurality and more specifically its link with the reincorporation process of ex-insurgents of the FARC-EP.

Since a few years, the Department of Animal Sciences of the Universidad Nacional de Colombia and the Cooperativa Multiactiva Agropecuaria del Común (COPAGROC), in collaboration with Economías Sociales del Común (ECOMUN), have developed a pilot project for production of Black Soldier Fly (BSF) for fish feed in the Territorial Space for Training and Reincorporation (ETCR) of Icononzo, under the framework of the academic-community alliance "Insects for Peace". This project has created learning curves among a few ex-insurgents and academics and several lessons were learnt. However, there is a lack of knowledge regarding the conditions under which such a project can be upscaled to other ETCRs and effectively provide a regular income and a sustainable livelihood to ex-insurgent communities. Thus, this report aims at answering the research question: *What are the social and political conditions of the rural productive dynamics of the Colombian population in the process of reincorporation into civilian life, in order to evaluate the replicability of foreign (Kenya) and local experiences (Icononzo) of insect production for peasant farmers?*

⁷ End hunger, achieve food security and improved nutrition and promote sustainable agriculture

⁸ Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

⁹ In research and policy making the term "Reintegration" is commonly used, however, in the Colombian case, the peace table decided to use the term "Reincorporation" in order to identify the current peace agreement and differentiate it from former experiences. In this report, we prefer to use the term Reincorporation to meet the requirement of peace delegates.

2 Approach of this report

To explore the research question mentioned above and as methodological approach, we proposed to the national cooperative of ex-insurgents, ECOMUN, the development of a Participative Action Research project¹⁰ —involving ex-insurgent representatives from seven regions¹¹ in Colombia who were chosen based on their representativeness in each region by ECOMUN's board— in which academics and ex-insurgents¹², through a 3-days' workshop, analysed the current situation of the reincorporation process and future expectations regarding the peace process and, specifically, in regards to the eventual implementation of a BSF production project in other ex-insurgent communities. We also employ a phenomenological approach in order to identify organizational aspects and their productive dynamics.

The methods used in this research involved documental analysis, focus groups, and analysis of quantitative data. To gather information we employed direct dialogue, participant observation, literature review and discussions among attendants. As part of the methods in the workshop we used mystiques, social cartography, energizers and ice breaker exercises.

Based on the documental analysis we identified categories of the social dynamics of the reincorporation process, and more specifically, of the productive nodes of the "*Piscicultura del Común*"¹³. To do that, we reviewed current research and reports from institutions, grassroots organizations, international NGOs and academics.

Focusing on the reincorporation process, the workshop was divided into three scenarios: recent past, present and future. In the first part, we addressed different questions and collective analyses to evaluate difficulties, emotions and general accounts of the reincorporation process in the last four years of the implementation of the peace agreement. We also provided a general overview of the BSF production achievements in Kenya (Barragán-Fonseca, et al., 2020; Chia et al., 2020; Chia et al., 2019; Onsongo et al., 2018) and in Icononzo. In the second part, we used social cartography to examine the current context of the reincorporation process by identifying geographically different regions involved in the *Piscicultura del Común* and the cooperatives and communities organized in each region. We also identified the existing productive projects, local actors, problems and difficulties, lessons learnt and cooperative achievements. Finally, in the third session, we explored the upcoming future by discussing what cooperative members would do differently and what are their current needs in order to improve and strengthen the existing cooperatives. At the end of the session, attendants discussed and proposed the conditions for the upscaling of the BSF production project in other ETCRs and among local communities in the territories. As part of the methods used, we made a literature review on the pitfalls and achievements of the reincorporation process in Colombia and about the impact of BSF production on communities in Kenya.

This report is organized as follows: after this introduction, we present the theoretical approach followed by a detailed account of the socio-political context of the reincorporation process based on the information gathered from the literature review and the workshop. Later we focus on current experiences of BSF farming and lessons learnt from projects in Kenya and Colombia. After that, we present the results of the workshop by depicting the conditions, proposed by the same ECOMUN representatives, under which such a project can be successfully developed. Finally, we analyse how the Kenya-Colombia

¹⁰ The analyzed population in this research comprises about 6194 people represented by their leaders who attended the workshop.

¹¹ Caribbean, North East, North West, South West, East, South and Center

¹² The ex-insurgents who attended the workshop represent seven large regions of Colombia which cover a large part of the reincorporation cooperatives and productive processes of ex-insurgents. They also are representatives of territorial cooperatives which at the same time are associated to ECOMUN.

¹³ "*Piscicultura del Común*" is an ongoing project supported by the European Union that focus on fish production and addressed by ECOMUN, and thus, there is an additional opportunity to encompass this current project with a future productive medium-scale initiative addressed to produce insects for fish feed in aquaculture, and in doing so, contributing to a sustainable reincorporation of ex-insurgents.

connection can be used in Latin America, especially in conflict-torn societies and, based on the findings, we draw conclusions and present recommendations.

3 Theoretical approach

To examine the features of the productive dynamics of the population following the reincorporation process in Colombia, aiming at developing a sustainable productive initiative requires to theoretically comprehend some social and political indicators within the framework of the Sustainable Development Goals or the 2030 agenda. Thus, we present the meaning of sustainability and connect it with circular economy, and with economy and politics in their relations with nature under the concept of Political Ecology. Finally, we posit a conceptualization of collective action which fits very well with the ECOMUN 's organizational experience.

Sustainability is a quality of the productive process which promotes the quality of human life and recognises the cultural and ecological bases which exist in a specific territorial context. This is a feature related to the economy and to the diversification of styles of development which consider the capacity of self-management and appropriation of nature by people (Leff, 2003). The principles of sustainability are social equity, cultural diversity, regional balance, autonomy and capacity of self-management of the communities (Leff, 2003).

From the perspective of sustainability, on the one hand, circularity is an important tool for food policies. The United Nations is committed to ending extreme poverty by 2030, and the SDGs should focus on circularity solutions to fight poverty. However, countries that have put Circular Economy (CE) on their agendas are developed countries (e.g. The Netherlands¹⁴, Finland, Germany, Japan), and only a few developing nations (e.g. India, Ghana, Brazil) are taking steps toward CE. There are direct and potential relationships between social dimensions and CE strategies, including hunger eradication (SDG2) and peace, justice and strong institutions (Padilla-Rivera et al, 2020). Kirchherr et al. (2019) quoted by Rodríguez-Anton et al. (2019) defined CE as "an economic system that is based on business models which replace the end-of-life concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes, with the aim to accomplish sustainable development, which implies creating environmental quality, economic prosperity and social equity to benefit current and future generations". On the other hand, a definition of economy is also problematic and, broadly, refers to the human actions that materialize the production of goods and services needed for sustaining of the human life in a determined context, or as expressed by Miller (2010: 4): "all of the diverse ways [in which] human communities meet their needs and create livelihoods together".

In rural areas, individuals, groups, institutions and social organizations dispose of different kinds of capitals and defend their interests (Bourdieu, 2007) in order to guarantee their livelihoods. Rural territories are social spaces that must consider the features of their population, peasant families, productive practices, cultural symbols and forms of social organizations. Rurality is also mediated by dynamics and conflicts that compromise the interests of those who inhabit the territories conditioned by power relations, knowledge and production (Tosabura, 1999).

Meanwhile, political ecology is a theoretical-methodological perspective that facilitates understanding the power that is intertwined around the relationships between social actors, nature and the economy in society. This epistemological approach studies the relationships of human beings and the environment, placing the political dimension of the economy, ecology and power at the center of the analysis (Santamarina, 2008; Vaccaro and Beltrán, 2007; Escobar, 1999). From the political ecology perspective, "sustainable" are those economic models which, in opposition to the limited vision of the extractivism, reach a human life in harmony with nature.

With these elements, one can say that ecological challenges of rural life are understood to be connected to places, processes with different scales and means that link social movements with broad political and economic concerns (Leff, 2003). The political ecology of agriculture is where social movements are

¹⁴ <https://www.government.nl/topics/circular-economy>

struggling over agricultural hegemony. Its political instruments but particularly the ontological, epistemic, and ethical conditions that allow for the construction of territorialities composed of diversified croplands, community forests, mountains, and rivers—which ultimately is a compelling image from their rural utopia— in opposition to large landholding agribusinesses with their green deserts bereft of small-producer families (Giraldo, 2019). A political ecology of food would investigate how human-nature interactions produce both enabling and disabling social and environmental conditions that contribute to or hinder the access to 'good food' for certain groups (Moragues-Faus, 2017).

In social action, the relationship with the neighbor appears in a double sense. On the one hand, the individual identifies itself with a group or collective subject and, on the other hand, each person enriches their personality by affirming themselves as a personal subject in their relationship with others (Quintana, 2005). The social organization is a structure made up of members and leaders at the levels of involvement and direction, seeking to mobilize to achieve a common goal. At the level of involvement, individual and collective participation guarantees that individual rights and the social movement as an organizational utopia are achieved as a vindication of the rights of people in a collective (Touraine, 1969). The first form of collective action is that which is expressed through the spontaneous association of individuals in groups of common interest. These groups are usually small and become an important instance of socialization. Depending on their coverage, network articulation and impact of their actions, they can be first, second or third order. Restrepo (1994) states that first-level social organizations correspond to groups with local coverage that seek to solve and cover immediate community needs; the second level are those associations that bring together more than one first-level organization seeking cohesion and strength in the transformation and improvement of the living conditions of the represented population; and the third level is associated with the dynamics of social movement as collective forms capable of making visible in public space a significant impact on society (Quintana, 2005).

4 Socio-political context of the reincorporation process in Colombia

The Colombian rurality has violently been conditioned by a process of “accumulation by dispossession” (Comision Histórica del Conflicto y sus Víctimas, 2015:58) in which the peasantry has been strongly affected in the last century. The economy of rural areas, has drastically changed in the last decades from traditional peasant farming to livestock production, monocrops, intensive agriculture and crops for illegal use. However, despite this displacement of the peasant economy, family farming is still producing around 83.5 % of the food consumed in the national territory (Minagricultura, 2016).

The absence of the Colombian State in rural areas has promoted, on the one hand, the appearance of illegal groups and mafias who violently control the use of the land either to speculate with the price of the land or to use it for crops for illegal use; and on the other hand, this absence has as well stimulated, in some cases, the development of communitarian and peasant organizations aiming at defending human rights, rising their level of organization and developing productive initiatives involving tourism, the production of coffee, livestock, tourism, and most recently agroecological production. The cultural diversity also plays an important role where indigenous communities, peasants, Afro-Colombians, settlers, big-land owners and livestock producers coinhabit the country side.

In that sense, the reincorporation process in rural areas also involves encounters and dialogues with ethnic communities and with a multiplicity of productive initiatives. Different voices (institutions, academics, national and international NGOs) have documented the reincorporation process in the last four years. In the following sections we try to sketch a general panorama of this process based on these sources and on the information gathered in the workshop.

4.1 The agreement

In November of 2016, the peace agreement between the Revolutionary Armed Forces of Colombia, People’s Army (FARC-EP), and the Colombian government was signed. As part of the agreement, several social transformations were established which include a Comprehensive Agrarian Reform¹⁵, solution to the problem of illicit drugs, the creation of a Truth, Justice and Reparation of Victims system, political participation and the overall implementation of the peace agreement which includes the reincorporation of combatants into civilian life and the delivery of weapons among other measures (Mesa de conversaciones, 2016).

The agreement stated a reincorporation process characterized for the integrality, sustainability, transience and the recognition of the members of the FARC-EP and their families. As mechanisms of this agreement, it established “the strengthening of the social network of the territories, the convivence and the reconciliation among those people who inhabit them, and ... the development of the productivity and local democracy”. The agreement also has a differential focus on human rights as recognizes “the individual freedom and the free exercise of rights of each one of the members of the FARC-EP, ... with emphasis on the women rights” (Estrada-Álvarez, 2020).

The reincorporation program also involves vocational training, the provision of a monthly allowance per ex-fighter (90% of a minimum Colombian minimum monthly wage), the support of productive projects with a one-time capital seed of 8 million COP (around 1800 euros), access to welfare services and housing alternatives, among others (Mesa de Conversaciones en La Habana, 2016), all of them funded by the National General Budget (Estrada-Álvarez, 2020).

¹⁵ The agrarian reform and the political participation clearly fit with the SDG2 and SDG16.

To develop this reincorporation process, the Colombian government, through the National Council of Economic and Social Policy (CONPES) launched the CONPES 3931 of 2018 (National Policy for the social and economic Reincorporation of ex-members of the FARC-EP) which includes the National Policy of Social and Economic Reincorporation (PNRSE) aiming to achieve four outcomes: i) the strengthening of the articulation and planning among involved actors in the reincorporation of ex-insurgents and their families, ii) the promotion of the communitarian reincorporation in the territories addressed to strengthen the social fabric, convivence and reconciliation, iii) the generation of the conditions for the access to programs, mechanisms and resources for the stabilization and the economic development of ex-members of the FARC-EP and their families according to their needs, interests and potentials and iv) access to fundamental rights for ex-members of the FARC-EP and their families (CONPES, 2018). Additional to that, another program, the Implementation Framework Plan (PMI) aimed at “facilitating the creation and setting up of the new political party that originates from the demobilisation of the FARC-EP and to guarantee the conditions for a sustainable social and economic reincorporation process of the FARC-EP into civilian life, as a community and as individuals” (PMI, 2018). The PMI, following the peace agreement, also defines two strategies: the political reincorporation through the creation of the political party, Alternative Revolutionary Force of the Common (FARC) which represents a fraction of the ex-insurgent population. And the social and economic reincorporation through the cooperative Social Economies of the Common (ECOMUN), a national umbrella cooperative which aims to develop cooperative businesses and productive projects addressed to the economic reincorporation of ex-insurgents. This cooperative promotes the collective reincorporation of ex-insurgents and aims to become a third-level cooperative (confederation) in the upcoming years (Estrada-Álvarez, 2020).

The agreement is put into practice through the creation of institutions, the formulation of norms and the development of strategies of reincorporation. In doing so, the National Reincorporation Council (CNR) —a concertation instance between the Colombian government and the FARC— was created aiming at developing two strategies: a political and a socioeconomic strategy (Instituto Kroc, 2020). For the monitoring of the process, the State created the Reincorporation and Normalization Agency (ARN) (Instituto Kroc, 2020). The international community also was involved through different instances such as the United Nations, the European Union, the USAID and international NGOs, among others, whose economic funds were put in a “common bag” managed by the Colombian state called the Fondo Colombia en Paz (Colombia in Peace Fund). FARC, for their part and following the peace accords, created the cooperative ECOMUN and other organizational forms in the territories (cooperatives, foundations, Associations, etc.). Considering the dynamics of the settlements, these new organizations were created based on the location of the ETCRs and the NARs. Additional institutions in charge of developing the implementation of the peace agreement are the Presidential Council for Human Rights, the Ministry of Work and the Ministry of Agriculture and Rural Development.

It is important to highlight that interactions —aimed at developing productive projects— among those actors exist at different levels: self-organization among ex-insurgents, arrangements for cooperation between international community and ex-insurgents’ organizations and arrangements for cooperation among the Colombian state, foreign donors and ex-insurgents’ organizations (Figure 1).

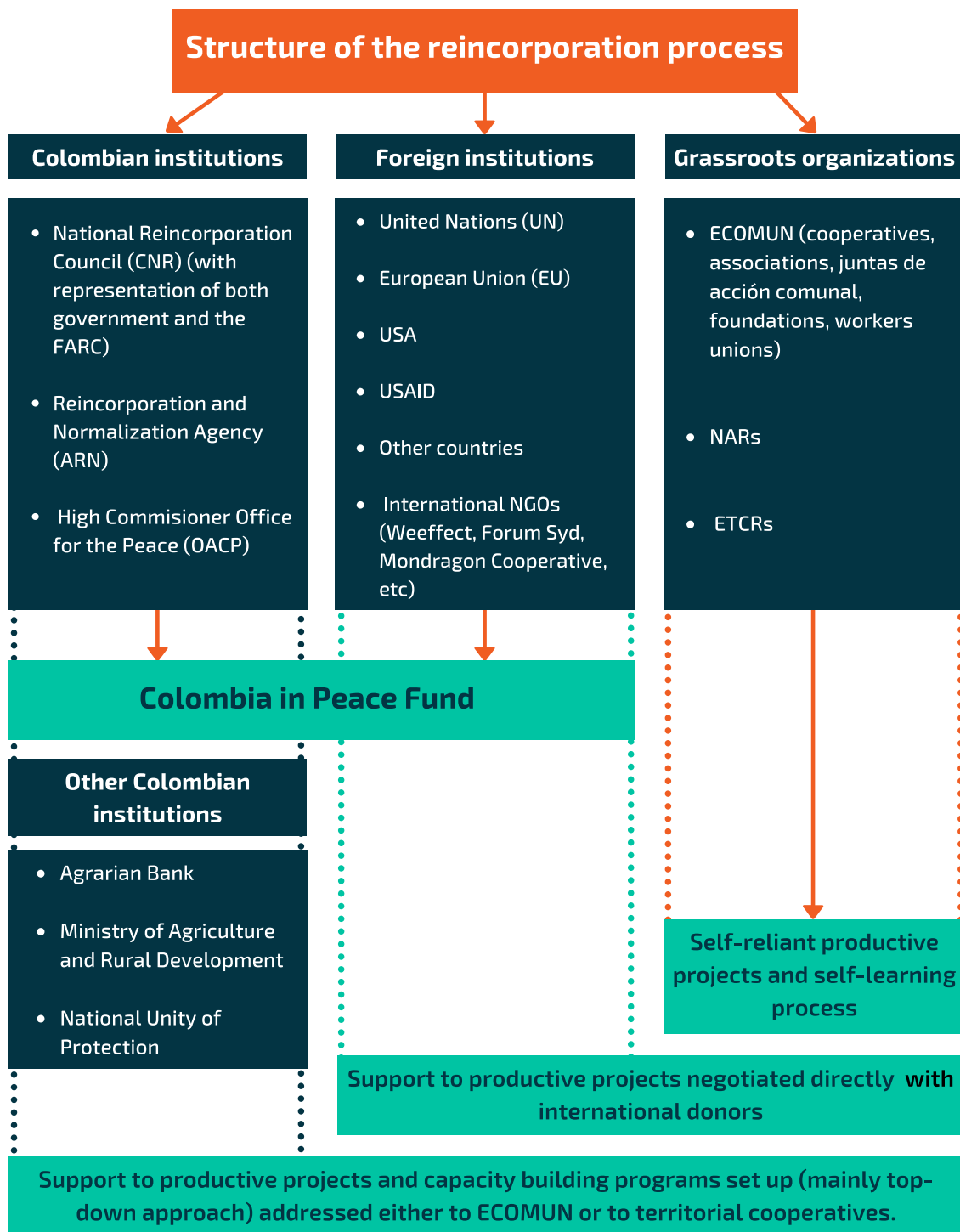


Figure 1 Structure of the formalization of the reincorporation process in the peace agreement.
Source: own elaboration

The settlement model for the population in reincorporation has changed since the signing of the peace agreement. At the beginning of the process, ex-insurgents were allocated to 26 Temporary Normalization Zones (ZVTNs) to start the process of delivery of weapons. After a period of eight months, these zones were transformed into Territorial Spaces for Training and Reincorporation (ETCR) (Figure 2). Today, only 30% of the ex-insurgent population live in 24 ETCRs established throughout the country (Figure 3). Furthermore, some groups of ex-insurgents moved to other places to create New Areas of Reincorporation (NARs) for different reasons: problems of security, proximity to their families and urban centers, better access to land and better conditions in places where the guerrilla FARC-EP had more political influence, among other reasons (CEPDIPO, 2020). Currently, there are 20 ETCRs and around 96 NARs.

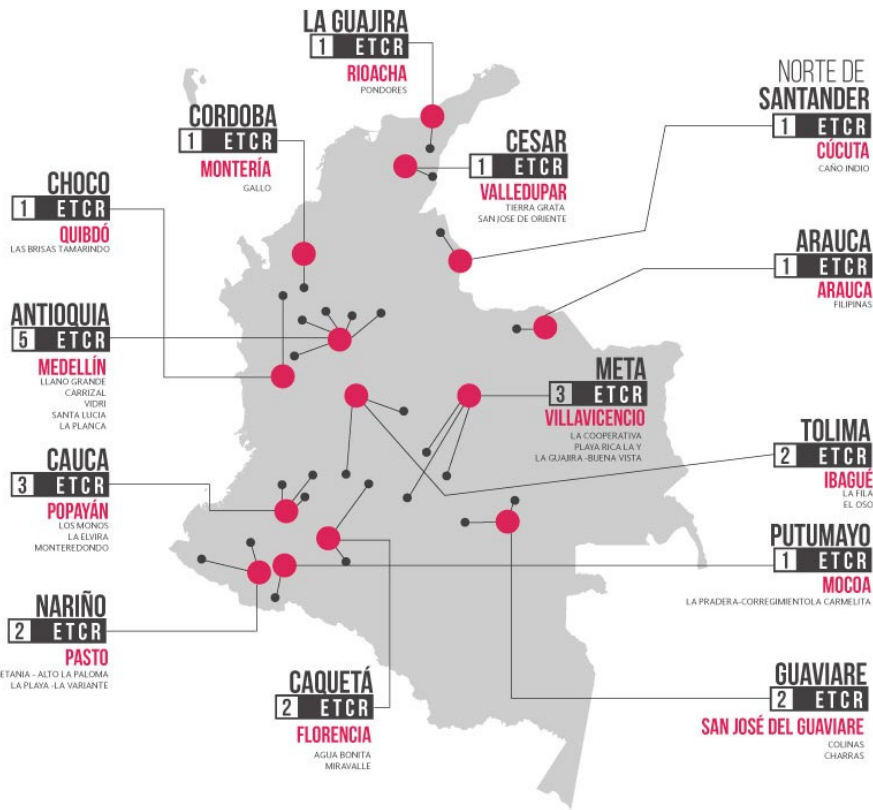


Figure 2 ETCRs per region. Source: Reincorporation and Normalization Agency. Retrieved from reincorporacion.gov.co.



Figure 3 NAR Mutatá, Antioquia; ETCR Colinas, Guaviare; and productive project of clothes manufacturing in the ETCR Tierra Grata, Cesar (From left to right). Source: Courtesy of Julián Cortés.

An additional organizational form is the territorial cooperative which in the majority of the cases fits with the distribution of the ETCRs and NARs. In some cases, an ETCR or a NAR has more than one cooperative. To facilitate the organizational process, ECOMUN’s cooperatives, supported by a three-years European Union project, are organized in seven geographic nodes (association of territorial cooperatives based on their ubication): Caribbean, North East, North West, South West, East, South and Center, which approximately organize around 4000 ex-insurgents (Table 1). It is worth highlighting that nowadays not all the ex-insurgent population of the FARC-EP (around 13000) are organized in cooperatives. This is explained by the existence of different trajectories of reincorporation. Many of them decided to develop individual projects of reincorporation which implied to use their seed money just to their personal projects, others came back to the war, again others decided to move to safer places where they do not have any kind of danger against their lives and keep anonymous.

Table 1 *Ex-insurgents' nodes characterization.*

Nodes	Organizational forms	ETCRs	ARs	Colombian regions	Men	Women	Total
South	16	4	4	Huila, Caquetá, Putumayo and south del Tolima	650	250	900
Center	38	2	13	Bogotá, Cundinamarca and North of Tolima	352	186	538
Caribbean	21	2	8	Pondores, Tierra Grata and Montes de María	583	257	840
East	13	5	3	Meta and Guaviare	472	410	882
North East	14	3	7	Magdalena Medio, North of Santander and Arauca.	460	198	658
South West	31	4	16	Nariño, Cauca and Valle del Cauca	549	426	975
North West	20	4	5	Antioquia, Chocó and Coffee Area.	700	300	1000
Total	153	24	56		3766	2027	5793

Output from the workshop

4.2 Current situation of the reincorporation process

Considering the integrality of the peace accords and the territorial focus of the reincorporation process, the outcomes of the peace agreement can be achieved in more than one decade. However, as said by the Kroc Institute (2020), considering the long-term implications of the agreement and the time needed to achieve its outcomes, it needs the commitment of the Colombian government and so, of the institutions in the territories.

After four years of implementation of the peace agreement, several voices have complained about the lack of implementation, especially by the new Colombian government. Estrada-Álvarez (2020) writes that this is due to “the persistence of the political violence, the legal insecurity and the pretention of the far rightwing sectors to politically capitalize the peace process”. Despite of that, the ex-insurgents’ population is developing their process “from below, putting in practice the idea of collective reincorporation and within a community” (Estrada-Álvarez, 2020).

In terms of reincorporation, current and modest achievements have been a result of ex-insurgent populations’ efforts rather than a result of government engagement with the peace agreement. Ex-insurgent communities, thus, have developed small scale cooperative businesses by their self-reliant efforts. Currently, there are about 150 territorial cooperatives with different productive initiatives such as traditional crops and animal production (fish, poultry and pigs) (Tables 2 and 3). From information provided by the ANR, 42% of the settlements of ex-insurgents have, as their main economic line, livestock production, poultry, fish and pig farming. A total of 33% of the ex-insurgent population living in the ETCRs are engaged in agricultural activities such as coffee cultivation, cocoa, home orchards, vegetable cultivation and small-scale farms. Only 17% of ex-insurgents in the ETCRs are engaged in service activities such as community markets and shops, as well as tourism and ecotourism. Based upon information provided by ECOMUN and the workshop, we determined that productive projects involve poultry, livestock, fish production, agricultural production in general, and other urban-based initiatives such as brewery, clothes and bags manufacturing, restaurants and communication.

Table 2 Main production lines in the 24 ETCRs of Colombia.

LIVESTOCK PRODUCTION	Cattle	Poultry	Pigs	Fish
	ETCR Pondores, Guajira	ETCR Llano Grande, Antioquia	ETCR Carrizal, Antioquia	ETCR Plancha, Antioquia
	ETCR Caño Indio, N.Santander	ETCR Agua Bonita, Caquetá		ETCR Santa Lucía, Antioquia
	ETCR la Fila, Tolima	ETCR Miravalle, Caquetá		
	ETCR Playa Rica la Ye, Meta			
	4	3	1	2
	TOTAL: 10 ETCRs			

AGRICULTURAL PRODUCTION	Coffee	Vegetable gardens, avocado, tomato tree, whole farm	Cacao	Caña Panelera (Sugar cane)	Maracuyá (Passion fruit)	Sacha-Inchi
	ETCR El oso, Tolima	ETCR Monterredondo, Cauca	ETCR la Playa/la Variante, Nariño	ETCR la Cooperativa, Meta	ETCR Colinas, Guaviare	ETCR Filipinas, Arauca
		ETCR Los Monos/Santa Rosa, Cauca				
		ETCR la Guajira/Buena Vista, Meta				
	1	3	1	1	1	
	TOTAL: 8 ETCRs					

TRADE AND SERVICES	Supermarkets, community stores, track adequacy			Turismo/Eco-tourism	
	ETCR Las Brisas Tamarindo, Chocó			ETCR Tierra Grata, César	
	ETCR la Elvira, Cauca				
	ETCR Charras, Guaviare				
	3			1	
	TOTAL: 4 ETCRs				

Without information	
ETCR Bordo	
ETCR la Pradera, Putumayo	
	2
	TOTAL: 2 ETCRs

Own creation based on information from ARN´s webpage.

Table 3 Production lines of the NARs.

Production lines	Nodes		North			South		
	Center	West	West	East	North	South	West	East
Cows	x	x	x	x	x	x	x	x
Fish	x	x	x			x	x	x
Poultry		x	x	x	x	x	x	x
Bees		x	x			x		
Pigs		x	x			x	x	x
Coffee	x					x	x	
Sacha-Inchi	x							
Sugar cane								x
Cacao				x				
Cassava								x
Green banana		x	x					x
Wood		x						
Fruits		x					x	x
Dairy						x		
Peasant farming					x			x
Shipping								x
Supermarkets, community stores		x				x	x	x
Tourism		x			x	x	x	x
Confection/Shoes repair		x	x	x				x
Art and culture						x		x
Others (Sports, environmental restoration, handicrafts. Etc)		x	x	x				

Own elaboration.

On the other hand, although there are some projects introduced and supported by international cooperation, they are still in the phase of implementation and their results can only be evaluated after a couple of years. Additional obstacles of the reincorporation programs are related to difficulties in access to land, difficulties related to capacity building among ex-insurgent cooperatives (entrepreneurial and

management skills, and so on), lack of security measures for the ex-insurgent population, difficulties in access to markets, loans and banking services, low level of investment and difficulties in setting up the cooperatives (ECOMUN, personal communication, 2020). Consequently, in the aftermath of the lack of implementation of the peace agreement, local communitarian and entrepreneurial productive initiatives are being developed by ex-insurgents which include the involvement of some local peasant population and victims of the conflict in those productive efforts.

Currently, the ongoing project co-funded by the European Union, "Piscicultura del Común" organized in seven geographic nodes (Caribbean, North East, North West, South West, East, South and Center), aims at benefiting approximately 12000 ex-insurgents and produce around 800 tons of fish per year. The project also plans to build seven processing plants, to provide training for 520 ex-insurgents, 21 direct jobs and 11000 temporary jobs among which 40% will be for women (ECOMUN, personal communication, 2020). This fish production line was prioritized by ECOMUN considering the preliminary productive initiatives developed by ex-insurgents which were focused on fish production and due to high potential of fish to be a sustainable food for inhabitants of the ETCRs and NARs.

It is also expected that the project can provide fish-based products that meet local and regional demand and perhaps, in a later stage, the international market. In this project, it is expected that the production of fish will be also combined with a model of sustainable integral farming. Communities in reincorporation are motivated to explore additional business opportunities that can be integrated with the fish project. For example, the project has destined a large amount of money to be invested in fish feed, purchasing it from local companies, which has caused the reflection of ECOMUN's board to explore alternatives to traditional ways of providing this feed and, perhaps, to make this need an additional business line of ECOMUN cooperatives.

4.3 Other difficulties

The complete and efficient operation of the CNR has not been fully implemented yet. Estrada-Álvarez (2020) suggests that "this is because the Colombian government not only did not provide the agreed scope, but also has been depriving its central role [of the Colombian government] in the [peace] process". The change of the political vision of the current government interfered with the implementation, leading to delays and breaches of the agreement, and has undermined the development of the normative frame (laws) and public policies.

At a territorial level, there is not a binding normativity that favors the permanent participation of institutions and municipalities in reincorporation areas. There are also "problems in structuring the productive projects, the absence of articulation with local communities, the limited institutional offer, the insecurity of the territories, the lack of coordination between ECOMUN and its territorial cooperatives and between them and their associates" (Estrada-Álvarez, 2020). The problem of security has increased in recent years, generating a humanitarian crisis characterized by a permanent violation of communities' human rights and the killing of social leaders and ex-insurgents (CSIVI-FARC, 2020; CEPDIPO, 2020), which means that the main goals of the peace accords are not met.

The nodes' representatives perceive that the difficulties of relationship with institutions has to do with the clear government rejection to the peace process and its disposal to change the agreement. This is evidenced in the lack of support in project formulation, in accompaniment to the current productive initiatives and in the lack of trust to contract ex-insurgents in the ETCRs for the different job positions generated by the projects of cooperation. ARN's functionaries do not seem to have a real commitment to the continuity of the project and they "just want to execute their work contracts" said one of the representatives. Ex-insurgents also allege a concrete intention from these functionaries to weaken the organizational process proposed by the communities in reincorporation by promoting individual reincorporation processes (as in the former model of reintegration of paramilitaries), by promoting local associations of producers that are not involved in political issues and by unacknowledging local leaderships.

Regarding access to land, a fundamental element of the peace agreement, no progress has been made to date. Only a few of the cooperatives could buy a piece of land thanks to their own savings and a couple of cooperatives could buy their places thanks to the government investment. Most of the communities of the ETCRs do not own the land and this makes it difficult to establish an agricultural project and to gain access to loans and bank services. Some attendants expressed their worries regarding the individual monthly stipend which has been an obstacle for strengthening the communitarian ties and because it generates dependence from the state institutions.

5 Lessons learnt in producing insects for feed

The demand for animal-derived protein sources will increase due to the combined effects of the growing human population and rising living standards in developing countries (FAO, 2009, 2013). Scarcity of resources has increased prices of animal feedstock during the last years, which represents 60-70% of production costs of animal production systems and results in competition between human food and animal feed. For instance, the use of ingredients like fishmeal, fish oil, soybean meal and grains is on the rise in both human food and animal feed (van Huis, 2013). Insects are protein-rich (Bosch et al., 2014) and have high feed conversion efficiencies and growth rates (van Huis, 2013), making them a high quality and potentially profitable feedstuff for production animals (Veldkamp et al., 2012, DeFoliart, 1989, 1992).

Animal production industry faces the challenge to develop innovative methods that are suited to meet future social, environmental and economic needs. Insects that can be sustainably reared on organic residual streams could offer a suitable alternative animal protein source (Smetana et al., 2016). There are various species of beetles and flies that can be reared on low-grade bio-waste and convert this substrate into high-quality proteins (Xiao et al. 2018, Van Huis et al. 2020). Examples are the beetles *Tenebrio molitor* and *Rhynchophorus* spp and the flies *Musca domestica* and *Hermetia illucens* (Barragán-Fonseca et al. 2017). Especially production of the Black Soldier Fly (BSF, *H. illucens*) has many advantages, making this species an ideal species to be produced as animal feed not only in large scale productions, but also in small and medium scale productions in order to improve livelihoods of small farmers (Chia et al. 2019).

The BSF is native to America and is widespread from Argentina to the central United States, crossing tropical and temperate regions (Sheppard et al., 1994). In Colombia it is found in the entire national territory with warm and temperate climates. For use as animal feed, the fly has several important advantages over other species of insects. The species is polyphagous, able to feed on a wide range of organic waste streams (Kim et al., 2011). Therefore, it is used in sustainable management of organic waste turning these residues into a high-quality nutrient source for animal feed (Veldkamp et al., 2012). As a result, this fly has been used efficiently as feed for a variety of animals, including pigs, poultry and fish, reducing the high costs of feeding (Barragan-Fonseca et al., 2017; Van Huis, 2020).

Although insects have been consumed in various cultures for many years, mainly collected in nature, the small-scale production of insects as food and feed has increased in recent decades due to the comparative advantages they have over traditional livestock. In several countries of the world such as Mexico, Brazil, Thailand, Kenya, Laos, Vietnam, among many others, the rearing of insects of different species as feed and food for self-consumption and as economic alternative for many small farmers has been established (Ramos-Elorduy et al. 2007; Domingues et al. 2020; Babarinde et al. 2020; Hawkey et al. 2020). For instance, in Thailand, more than 20,000 family farms rear insects for food and feed, thus providing them a clear position in Thailand's economy (Hanboonsong et al. 2013).

5.1 Experience in Kenya

In a research project, Wageningen University in collaboration with the International Centre for Insect Physiology and Ecology (ICIPE), executed a project to improve livelihood of smallholder farmers by increasing livestock production in Africa (ILIPA) through an agribusiness model to commercially produce high quality insect-based protein ingredients for chicken, fish and pig industries. This initiative showed how inclusive business models involving insects as ingredients in feed can contribute to solving socio-economic and environmental problems in developing countries, and how smallholder insect farmers have good opportunities to increase productivity and improving their livelihood (Chia et al. 2019b).

ILIPA identified as main elements to focus on, in order to implement the BSF as animal feed: 1. developing legislation, 2. scientific research in academia on producing BSF and using BSF in feed for pigs and poultry, 3. developing an enabling environment with trainers of trainers, leaving ample room for initiative by those that had been trained at ICIPE, (4) business development, e.g. small or medium scale BSF production, (5) developing (micro) financing, the financial part being an important topic.

They trained over 1026 farmers (686 males and 340 females), resulting in more than 37 new insect-based enterprises and cost-effectiveness of modular systems were established. These enterprises produce from 0.4 to 20 tons fresh BSF per week (Dicke 2019). The farmers produce BSF larvae for feeding their own farm animals or to sell them to feed millers. These initiatives have resulted in the development of a standard for insects to be used as feed so that their use has been regulated by the Kenyan authorities (Dicke 2019; Barragán-Fonseca et al. 2020).

On the other hand, they assessed the effects of replacing fishmeal as feed component by BSF meal on pig and poultry production which resulted in good livestock performance and, because of lower costs of BSF meal as compared to fishmeal, in a better return on investment (Chia et al., 2020a; Chia et al., 2018a; Chia et al., 2019a; Chia et al., 2020b; Chia et al., 2018b; Chia et al., 2019b; Onsongo et al., 2018). They determined that, as long as the fly larvae can be reared on substrates that are a true waste stream, the production of fly larvae as feed will not interfere with food production and will provide a sustainable alternative for fishmeal. Besides, it is also possible to use BSF frass. They found that BSF frass can be used as fertilizer, out-competing commercial organic and chemical fertilizers in terms of growth, yield and nitrogen use efficiency for maize, tomato, french beans and kales (Dicke 2019, Beesigamukama et al. 2020).

From a social perspective, ILIPA empowered women and helped them in generating a sustainable income in family farms. The project also contributed to the strengthening of family ties and the reconstruction of the family weave. And finally, the project also taught the importance to reduce costs of production by linking the different process of farming in a circular economy. Challenges for introducing insects as replacement of traditional protein sources for feed in rural communities include the development of the full value chain, including regulation, farmer acceptance, and feed miller involvement (Chia et al., 2019b, Barragan-Fonseca et al. 2020).

Finally, one can suggest that for the success of this kind of projects, it is important to be aware of different drivers: political, economic, cultural and demographic drivers, which are institutional and require a multi-stakeholder involvement. Thus, to effectively connect to the agribusiness value chain and supply fly larvae to national feed millers, smallholder farmers need to be organised in cooperatives in order to improve supply volume and empower them within the value chain (Chia et al., 2019b, Vernooij et al., 2019).

5.2 Current experience of insect production by ex-insurgents in Colombia

The Universidad Nacional de Colombia (UNAL) has implemented different projects with FARC-EP ex-insurgents, some of them related to support agricultural projects and to strengthen capacity building and food security. In doing so, UNAL initiated the project *Use of the Black Soldier Fly as an alternative feed to reduce costs and improve livelihood of ex-insurgents in reintegration process of Icononzo-Tolima*. Currently, this BSF production plant replaces 15% of the traditional fish feed of their tilapia production. Besides, this plant is also used as a training place for other ex-insurgents. Just as the project in Kenya, this project contributes to a circular agriculture that allows for the production of sustainable feed components without significant technology (Barragán-Fonseca et al. 2020). This initiative has three main results: linking community, academy-community interaction and BSF plant production.

5.2.1 Linking community

We achieved an integration of the community into the BSF production system. Together with the community, we made a diagnosis and recognition of available organic residues in the region to make efficient use of them and a projection of the pilot plant capacity. Workshops were held to disseminate the results and to approach the community to insect farming and to organic waste management. Ricardo Arciniegas, chosen by the same ETCR community, was the ex-insurgent leader of this initiative, and was involved from the beginning. The project has had continuous support from ECOMUN and the CORPOAGRAC cooperatives to have closer contact with the ex-insurgents' community, and to facilitate the implementation process in other ETCR's.

5.2.2 Academia-community interaction

Several students from UNAL were and are part of this initiative in Icononzo. Two bachelor students did their thesis and a graduate student from the Master's Degree in Animal Sciences was linked to the project. Another student made a didactic booklet for the ETCR community to learn about biological and productive aspects of the fly and a second one made the formulation of diets for BSF larvae, based on local resources from the municipality of Icononzo. Currently a student is developing the Project: "Performance of the black soldier fly, *Hermetia illucens* in diets based on plant residues as an alternative resource for feeding fish in Icononzo, Tolima (Colombia)". Apart from students, different UNAL professors and researchers from different areas (fish production, insect production, sociology, and arts) have been supporting the initiative.

5.2.3 BSF production plant

UNAL designed and built a small pilot plant for BSF production. Currently, work is being done to guarantee the permanent production of larvae to continue the productive cycle and to be used as fish feed, based on a circular economy system. UNAL has constantly monitored Ricardo Arciniegas to keep the process going. In addition, this pilot plant is being used to train smallholder farmers and other ex-insurgents about BSF production and organic waste management.

5.2.4 Lessons learnt

Working with a community requires constant dedication and a bi-directional learning process, where knowledge is not transmitted, but rather co-created and adapted to the community knowledge and to the resources of the region. Despite the workshops on production and the use of insects for feeding fish, only the practical results obtained generate credibility among community members. Finally, since this is a project related to the implementation of new technologies with species that depend on environmental conditions, the project must face factors that are highly variable and that affect the budget and the execution time of the project. In Figure 4 we show some pictures of the Colombian experience.



Figure 4 1. ETCR Antonio Nariño, Icononzo, Tolima. 2. UNAL and ex-insurgents' community involved in learning process of BSF production. 3. BSF pilot plant. 4. BSF mating and reproduction cages. 5. Ricardo Arciniegas giving a lecture at the Insects for Peace Symposium (Bogotá, November 2019). 6. BSF larvae room. 7. BSF prepupae. 8. Ricardo Arciniegas feeding tilapias with BSF larvae. 9. UNAL team which executed the project. 10. Ricardo Arciniegas showing a tilapia fed on BSF larvae.

5.2.5 Success factors

The Universidad Nacional de Colombia is widely recognized by the ex-insurgents' community due to its direct participation in peace building since the signing of the peace agreement. This recognition generated confidence among community members. Thus, we established a good working relationship and positive feedback throughout the process. Trust between community and academia, and the constant support of the community and the cooperatives, have managed to get the project ahead, despite delays due to environmental conditions and biological aspects of the species. The community is committed to the process and has high expectations regarding the results of this initiative and the possibility to implement it in other regions. The field of insects as feed and food is increasing, especially the use of insects as a productive alternative in peasant communities. This initiative being the first project in the area, makes it a benchmark in the country. Additionally, international support from Wageningen University & Research has been important to consolidate Insects for Peace (IFP) as an initiative to use insects as feed and food, to support peace and circular economy in Colombia, and in the near future, in other regions in Latin America. Through support by WUR and ICIPE, Ricardo Arciniegas and Karol Barragán were able to travel to Kenya to get acquainted with and learn about the WUR-ICIPE project, exchange knowledge, and to discover how Kenya's experience may contribute to expanding the project Insects for Peace in Colombia (Figure 5). On the other hand, WUR and UNAL organized a consortium consisting of small and large private industry (Colombian and Dutch), academia and the Dutch embassy in Bogotá, which identified opportunities, challenges as well as legislation and knowledge needs in order to develop insects for feed in Colombia, with a focus on the black soldier fly. A great interest was identified in developing black soldier flies for feed in Colombia by (a) insect farmers, (b) poultry farmers, (c) feed producers and (d) academia. Dutch private industry and academia are willing to help in developing this transition. There is a good basis for addressing the local knowledge gaps (Dicke et al. 2020).



Figure 5 Karol Barragán and Ricardo Arciniegas at ICIPE, Nairobi (Kenya) with Dr. Chrysantus Tanga (left), and exchanging experiences with Kenyan BSF farmers (right).

6 Enabling conditions for the upscaling of insect farming among communities in reincorporation

6.1 Main strengths of ex-insurgents' communities

As said before, almost 150 ex-insurgents' organizational forms were established throughout the national territory. These organizational forms include cooperatives, peasant associations, juntas de acción comunal, and joint stock companies (Table 4). The existence of such a quantity is an indicator of the organizational capacity of ex-insurgent population and represents the political capital facilitated by the peace agreement.

Table 4 Associative forms by nodes.

Nodes	Departments	Cooperatives	Associations	Foundations	Others without information	Total
South	Huila, Caquetá, Putumayo and South of Tolima	8	4	-	4	16
Center	Bogotá, Cundinamarca, North of Tolima	7	14	1	16	38
East	Meta, Guaviare	6	6	-	1	13
North East	Middle Magdalena, North Santander, Arauca	7	7	-	-	14
South West	Nariño, Cauca, Valle del Cauca	15	2	-	14	31
North West	Antioquia, Chocó, Coffee area	9	-	-	11	20
Caribbean	Guajira, Cesar and Bolivar	-	-	-	21	21
Total		52	33	1	67	153

Output from the workshop with ex-insurgents. November 2020

Productive initiatives of ex-insurgent communities, as said before, are mainly concentrated in agricultural and animal production activities. These activities fit well with the productive potential of each node.

This current social structure of ex-insurgent communities establishes several strengths that could facilitate, in general, the implementation of productive projects and so, positively affect the implementation of the peace agreement in Colombia. Based on the findings of the workshop we have summarized these strengths among ex-insurgent communities:

- Generation of regional leadership by ex-insurgent organizations with significant representation and legitimacy among the population in the process of reincorporation and among local communities.
- Broad commitment of the ex-insurgent communities towards the reincorporation process. Although a few people take up weapons again, the majority of the members of the ex-insurgent population carry out their own reincorporation process supported by their own efforts and generating an autonomic process.
- Democratic leadership among ex-insurgents around associative forms, in connection with grassroots organizations that already existed in the territories. Ex-insurgents have managed to articulate local grassroots associations around some incipient productive initiatives.
- Strong teamworking skills which have been strengthened by the transition from a pyramidal organization (the armed political party) to a more horizontal organization (the cooperative).
- Social ties established around social organizations represent an important potential to enable the implementation of agri-food initiatives among the population in reincorporation.

- Generation of more autonomy in the management of the productive initiatives which allowed them to generate more democracy and independence from external actors (such as the government and the political party bureaucracy).
- Important knowledge and a holistic sight of the territories in Colombia valuable for any kind of social and productive intervention in rural areas.
- Use of a specific form of knowledge exchange through oral transmission.
- Associations, *juntas de acción comunal* (communitarian local boards) and cooperatives have been strengthened by the leadership of former insurgents thanks to the lessons learned and political training from the former guerrilla group. Currently they are promoting solid social organizations in the territories supporting regional initiatives and environmental conservation.
- Increasing women participation thanks to their commitment to the reincorporation process and to their relevant role as leaders. Women leaderships and women committees are products of this process of solidarity economy.
- The promotion of family integration around the recovery of traditional family farming has allowed not only the involvement of people in agricultural activities and in the development of ex-insurgents' cooperatives and associations but also the application of prior knowledge on current situations.
- The relaunch of the historical claim regarding fair distribution of the land could allow the fortification of the current peasant movement and other kinds of social organizations.

6.2 Conditions to enable insect farming among ex-insurgents' communities

Based on suggestions by the workshop attendants and considerations revealed within the framework of the workshop we have identified several conditions which could enable the production of insects for feed among communities in reincorporation. To better explain them, we have used four categories: economic, material, organizational and learning conditions.

6.2.1 Economic conditions

Representatives of the nodes of the ECOMUN National Fish Project highlight the need for an economic feasibility study since they recognize the novelty of insect farming in Colombia. As second economic requirement, ex-insurgents propose to develop the project on their own land because, as expressed before, access to land has been identified as the most important strategical means of production which has not been totally solved by government programs of reintegration and, therefore, they ask international cooperation to invest in land for productive projects. As a third economic element, participants suggest to synchronize, if possible, the BSF productive project with the current *Piscicultura del Comun* project and analyse its applicability to other current productive endeavours to explore other uses such as poultry feed and the use of by-products (frass as fertilizer) in family, communitarian and agroecological farming. And fourth, attendants suggest to explore different levels of production scale: a small scale in an artisanal way addressed to feed animals on family farms, and a second one to communitarian and cooperative businesses which can produce insect feed with more aggregated value and with the use of modern technologies.

6.2.2 Material conditions

As material requirements, we agreed that a BSF farming project must be allocated to places where the environmental necessities are rigorously met to avoid losses in investments and where it is possible to have stable access to organic waste, possibly near urban centers. To improve the initial model, ex-insurgents suggest to coordinate with local authorities the organized organic waste collection and present it as a program of reincorporation.

6.2.3 Organizational conditions

Attendants expressed their organizational conditions based on recurrent appeals for more involvement of communities in reincorporation in the projects they are involved as beneficiaries. On the one hand, they request for the socialization of the details of an eventual BSF-farming project with communities in

order to be knowledgeable of the possible impacts of the project and, on the other hand, they ask for being involved in decision-making process and not to take the traditional top-down approach in which beneficiaries are just passive actors of cooperation. An additional suggestion regarding organization of communities to face the challenges of the project, ECOMUN representatives is to create a network or association of BSF producers and to start with the WhatsApp group that was created for the workshop.

6.2.4 Learning conditions

As one of the necessities of the productive initiatives of ex-insurgents, education also appears as one of the major requirements. Regarding a BSF-farming project, they ask for basic training in BSF production and an adequate design based on previous experiences which can be learnt "by doing". Finally, they ask to strengthen the process of legislation and to monitor it in order to be involved in this project under legal conditions and avoiding any trouble with local and national authorities.

6.3 Additional elements to improve ex-insurgents' reincorporation process

Workshop attendants also formulated additional elements to the question: *How can we (ex-insurgents) improve our current reincorporation situation?* The following reflections, relevant for this report, are meaningful since an eventual implementation of a BSF farming project needs to consider these aspects which are lacking in other cooperative projects. These elements are divided into three fields: education and training, organization and productive projects.

6.3.1 Education and training

Here again, the group of attendants highlights the need of learning scenarios to build capacities. They observe difficulties in leadership, especially because of the lack of knowledge in specific skills (such as management, commercial, marketing, accountancy, and so on) and ask for technical assistance. They also ask for learning strategies to achieve goals and objectives, it means strategies of planning and implementation which at a certain stage of any project can be very useful to assume the responsibility and to achieve the sustainability of productive projects and to be autonomous from foreign cooperation. Finally, training must include leadership and participative democracy in order to strengthening the local governance process in municipalities and regions where the cooperatives are located.

6.3.2 Organization

Regarding organizational aspects, first, they feel there is a need to focus on strengthening and concluding current productive projects and learning processes and on trying to solve current problems. This is a claim which is based on the tiredness generated by the lack of implementation which, as said before, delays the concrete implementation of productive projects. As a second challenge, attendants request to increase the capacity of incidence and negotiation with national and international actors and demand for more participation in planning and implementation of international cooperation projects. Communities in reincorporation frequently express the need for more sovereignty in their projects and more skills to face scenarios of negotiation in which they can take advantage of their protagonist role in the implementation of the peace accords. Third, communicational processes need to be improved since the participants experience difficulties in effective communication between the direction of ECOMUN and their associated territorial cooperatives. Fourth, a frequent request is for improving the process of designation of delegates and representatives which should not be based on former alliances among rank and file ex-insurgents and cadres, but rather on personal capacities and motivation. Fifth, ex-insurgents request for support of the process of autonomy in which cooperatives can develop their own route, perhaps in a better scenario, without depending on foreign investments and cooperation. As a sixth need, ex-insurgents ask for improving the community building process by generating reflection spaces and increasing the commitment of cooperative associates with their common project. Seventh, they request for the consolidation of the cooperatives federation which would allow them to negotiate with local authorities in a stronger manner.

6.3.3 Productive projects

Ex-insurgents worry about their productive projects in terms of their sustainability and thus, they ask to explore formulas and strategies to generate that sustainability. It is needed to explore financing opportunities such as loans, savings, solidarity economy, local markets, circular economy and so on, especially because, as mentioned before, they feel abandoned by the State. For them there are two important elements: to solve the problem of the access to land and to focus on generating value to the products and services they are currently working on. They also suggest that ECOMUN should, in the near future, consolidate funds to support territorial cooperatives to avoid dependence on state or private funding sources. A final element to support productive initiatives is to supply transport solutions for the trading of the products.

6.3.4 Human rights

Attendants were seriously worried about the killings of social leaders and ex-insurgents and appeal for protection by the state and accompaniment of international institutions. The right of a good name and to not be stigmatized is also a common claim among the population in process of reincorporation.

7 Conclusions and recommendations

7.1 Conclusions

1. SDG16 calls for promoting just, peaceful and inclusive societies, and SDG2 aims for food security for all. Both are important elements to integrating insect farming in the frame of the current reincorporation process which may promote rural change, contribute to well-being, sustainability and organizational, institutional and commercial strengthening of peasant farmers.
2. BSF farming as an innovative and low-cost alternative to expensive imported feed can become an important driver of reincorporation of ex-insurgents by providing access to local economy. Providing peasant farmers with a means to become independent of external inputs for feed and fertilizers may yield a local circular economy in which inhabitants of rural areas engage in an economic value chain with good return on investment. Such rural change is vital for the support of the peace process. BSF farming thus, can become an important contributor to peace in Colombia, just like it provides a valuable option for smallholder and medium-holder farmers in Kenya and Thailand to improve their livelihood and contribute to food security and a circular economy. The use of the BSF as an alternative feed component may not only reduce costs but also improve the quality of life of ex-insurgents in the process of reincorporation. The current experience at Icononzo, together with experiences in Kenya, provide directions for the best way to make that protein transition and incorporating the concept of circular economy in Colombia.
3. Challenges for introducing insects as replacement of traditional protein sources for feed include the development of a full value chain, including regulation, farmer acceptance, and feed miller involvement. For instance, to be able to supply BSF meal to feed millers, a stable supply of sufficient volume and stable quality is needed. This may require the development of farmer cooperatives which would contribute to social integration. Therefore, producing insects as feed may provide important opportunities for smallholder and medium holder farmers to improve their livelihood and to be included in the economic value chain.
4. The production of insects might include multiple approaches: a traditional peasant farming approach where insects are produced for feed for the livestock on-farm, and a commercial farm approach where farmers produce insects to sell to companies that produce animal feed. These approaches would be based on the experiences gained in Kenya, and how a transition can be realized considering the concrete conditions in Colombia.
5. There are some conditions shared between Kenyan and Colombian farmers that support the use of the Kenyan experience in Colombia. Icononzo's project, Insects for Peace and the Seed Money Project (Dicke et al. 2020) have allowed to identify these shared elements: 1. The need to develop legislation (which in the Colombian case has to be profoundly studied considering the economic context of the country), 2. Scientific research in academia, 3. The development of an enabling training environment by making workshops of trainers of trainers or by using the "peasant to peasant" methodology, 4. Improving business development in different scales, (e.g. small or medium scale BSF production), 5. developing (micro) financing. Indeed, there are national conditions that can be addressed in a similar way to Kenya, such as identifying the most suitable substrates available, climatic conditions, and infrastructure needed for optimal BSF production. However, Colombian specific circumstances such as its economic situation, attitude of farmers and the general public towards insects as food and feed, and mainly the armed conflict differ from Kenya, and need to be addressed in a different way.
6. These elements found in the Colombian case can be applied in other Latin American countries as well but they have to be adapted to the conditions of each country's rurality.

7.2 Recommendations (Figure 6)

1. According to the outcomes of the Seed Money Project mentioned above (Dicke et al. 2020) there are some elements, adapted to the Colombian situation, that need to be addressed first in order to implement BSF as animal feed from a general perspective (not only peasants and ex-insurgents):
 1. legislation in Colombia to provide a clear framework in which insects as feed can be developed,
 2. research on BSF production in Colombia based on the available organic side streams, including an analysis of their composition, reliability of supply and stability of their quality, and
 3. research on the formulation of animal feed that includes BSF. These elements may be developed in parallel to generate opportunities to learn by doing.
2. The particularity of the armed conflict in Colombia has generated specific dynamics and other types of rural communities. It has been clear, that ex-insurgent rural communities are organized and have collective processes that could facilitate the incorporation of new technologies and agricultural production processes such as those of the BSF farming. The ex-insurgents' decisions and incorporation of new technologies tend to be made by collectives rather than by individuals. In this way, the incorporation of insects as feed can be coordinated from the node leaders and through workshops within the community. The associations and cooperatives will be decisive in this process.
3. Current processes of agricultural production among the ex-insurgent population need to be strengthened as there is a dependence on the supplies provided by the external market which can well be solved as the processes become more technical and by optimizing local resources, among others. Insects as feed can be an excellent alternative to imported protein sources such as soymeal and maize meal because there are experiences in Kenya that have shown to provide an innovative solution with a circular economy concept that contribute to a socioeconomic reincorporation of peasant farmers.
4. An insect farming project should strengthen current productive initiatives where animal production systems are already set up and represent a significative opportunity for income generation. In doing so, it could supply a substitution of animal feed and might reduce costs of production.
5. The sustainability of an insect farming system should be based on solidarity economy and strengthening current organizational forms.
6. Considering current communitarian efforts to implement agroecological or integral farms and to return to local markets, it is important to prioritize their support and to reinforce the circularity of these experiences by introducing insect farming as part of their agroecological productive processes. In doing so, it is important to reinforce current endeavours to link the ETCRs and the NARs with the surrounding communities and local markets.
7. To implement insect farming it is important to characterize in detail the current production systems developed by ex-insurgent population.
8. There could be different strategies to consolidate a communicational and educational strategy of a future insect farming project: to establish process of education in sustainable food, to develop an strategy of learning by doing which considers the diversity and the traditional ways of learning of peasants and ex-insurgent communities, to strengthen knowledge dialogues among peasants, ex-insurgents, practitioners and academics, to socialize the current experience of Icononzo and to receive feedback from the cooperative already involved in this project, to use communicational services adapted to the peasant culture and current technologies (e.g. videos and podcasts), and to create a network of insect producers that can frequently meet in a virtual or face-to-face way.
9. Based on the continuous complaints evidenced in the workshop about the lack of participation of ex-insurgents in the process of planning, management and decision making in projects of development, a BSF farming project would need to create spaces of dialogue and involvement of communities from the start onwards. Thus, considering the holistic view of the local communities by ex-insurgent population, any foreign endeavour to introduce new productive initiatives should involve them in the planning and execution of these projects.
10. An insect farming project that involves a human rights component helps beneficiaries to deal with local threats which will positively impact the development of such a project.
11. Considering the importance of empowering women among Colombian rural communities and the protagonist role they are having nowadays, a replication of an insect farming project should start with those organizational forms that are led by women and has to guarantee the participation of rural women.

12. Considering the important issue regarding the lack of access to land for productive initiatives, foreign support to insect farming should involve concrete strategies to guaranteeing access to land for the beneficiaries.

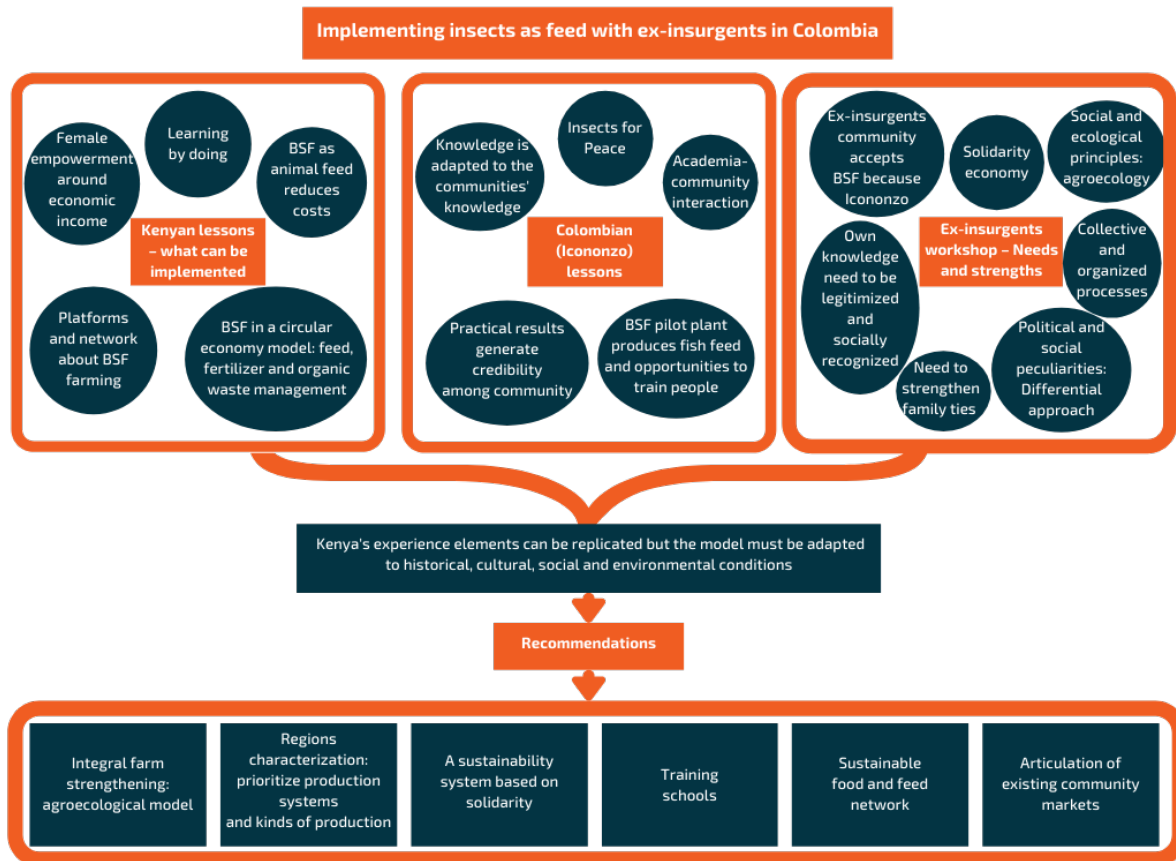


Figure 6 Summary of lessons learnt and recommendations. Source: own elaboration

8 Acknowledgements

The authors of this report thank Wageningen University and Wageningen Livestock Research, especially Dr. Teun Veldkamp for supporting this research project. The Universidad Nacional de Colombia is thanked for contributing in the execution of this research project. We also appreciate the participation of the nodes' representatives who were really interested and motivated in the topic of the workshop and spend their time with us for three sessions. We also would like to thank ECOMUN's board president, Ubaldo Zuñiga; the secretary, Juan Camilo Londoño; the manager of ECOMUN, Eloisa Rivera, and the Manager of the *Piscicultura del Común* project, Gustavo Royá who helped us in the logistics of the project and attended the workshop providing us with important insights about the reincorporation process. Finally, we thank the participation of two students of the social work faculty: Julieth Prieto and Sebastián Chaparro as facilitators who were co-responsible for the important job of promoting discussions, reflections and debates within the workshop.

References

- Babarinde, S.A., Mvumi, B.M., Babarinde, G.O. 2020. Insects in food and feed systems in sub-Saharan Africa: the untapped potentials. *International Journal of Tropical Insect Science* <https://doi.org/10.1007/s42690-020-00305-6>
- Barragán-Fonseca, K. Y., Barragán-Fonseca, K. B., Verschoor, G., van Loon, J. J., & Dicke, M. (2020). Insects for peace. *Current Opinion in Insect Science*, 40, 85-93.
- Barragan-Fonseca, K.B., Dicke, M., & van Loon, J.J.A. (2017). Nutritional value of the black soldier fly (*Hermetia illucens* L.) and its suitability as animal feed—a review. *Journal of Insects as Food and Feed*, 3(2), 105-120.
- Beesigamukama, D., Mochoge, B., Korir, N., Musyoka, M.W., Fiaboe, K.K.M., Nakimbugwe, D., Khamis, F.M., Subramanian, S., Dubois, T., Ekesi, S., & Tanga, C.M. (2020) Nitrogen fertilizer equivalence of Black Soldier Fly frass fertilizer and synchrony of nitrogen mineralization for maize production. *Agronomy*, 10 (9), 1395.
- Bosch G, Zhang S, Oonincx DG, Hendriks WH. (2014). Protein quality of insects as potential ingredients for dog and cat foods. *Journal of Nutritional Science*, 3, e29.
- CEPDIPO. (2020). Proyecto de presupuesto 2021: el acuerdo de paz entre la desfinanciación y la continuidad de la simulación. Bogotá, Colombia.
- CSIVI-FARC. Centro de Pensamiento y diálogo político. (2020). Estado general de la implementación del acuerdo de paz en Colombia. Bogotá.
- Chia, S.Y., Tanga, C.M., Khamis, F.M., Mohamed, S.A., Salifu, D., Sevgan, S., Fiaboe, K.K.M., Niassy, S., van Loon, J.J.A., Dicke, M., & Ekesi, S. (2018a) Threshold temperatures and thermal requirements of black soldier fly *Hermetia illucens*: Implications for mass production. *Plos One*, 13, e0206097.
- Chia, S.Y., Tanga, C.M., Osuga, I.M., Mohamed, S.A., Khamis, F.M., Salifu, D., Sevgan, S., Fiaboe, K.K.M., Niassy, S., van Loon, J.J.A., Dicke, M., & Ekesi, S. (2018b) Effects of waste stream combinations from brewing industry on performance of Black Soldier Fly, *Hermetia illucens* (Diptera: Stratiomyidae). *Peer J*, 6, e5885.
- Chia, S.Y., Tanga, C.M., Osuga, I.M., Alaru, A.O., Mwangi, D.M., Githinji, M., Subramanian, S., Fiaboe, K.K.M., Ekesi, S., van Loon, J.J.A., & Dicke, M. (2019a) Effect of dietary replacement of fishmeal by insect meal on growth performance, blood profiles and economics of growing pigs in Kenya. *Animals*, 9, 705.
- Chia, S.Y., Tanga, C.M., van Loon, J.J.A., & Dicke, M. (2019b) Insects for sustainable animal feed: inclusive business models involving smallholder farmers. *Current Opinion in Environmental Sustainability*, 41, 23-30.
- Chia, S.Y., Macharia, J., Diiro, G.M., Kassie, M., Ekesi, S., van Loon, J.J.A., Dicke, M., & Tanga, C.M. (2020a) Smallholder farmers' knowledge and willingness to pay for insect-based feeds in Kenya. *Plos One*, 15, e0230552.
- Chia, S.Y., Tanga, C.M., Osuga, I.M., Cheseto, X., Ekesi, S., Dicke, M., & van Loon, J.J.A. (2020b) Nutritional composition of black soldier fly larvae feeding on agro-industrial by-products. *Entomologia Experimentalis et Applicata*, 168, 472-481.
- Comisión Histórica del Conflicto y sus Víctimas. (2015). Contribución al entendimiento del conflicto armado en Colombia. Ediciones Desde Abajo, 868 pp.
- CONPES, D. (2018). Estrategia para la implementación de los Objetivos de Desarrollo Sostenible (ODS) en Colombia. Documento CONPES, vol. 3918, p. 1-73.
- DeFoliart GR. (1992). Insects as human food: Gene DeFoliart discusses some nutritional and economic aspects. *Crop Protection* 11 (5):395-399.
- DeFoliart GR. (1989). The human use of insects as food and as animal feed. *Bulletin of the Entomological Society of America*, 35, 22-35.
- Dicke, M. (2019). Improving livelihood by increasing livestock production in Africa: An agribusiness model to commercially produce high quality insect-based protein ingredients for chicken, fish and pig industries. Food and Business Global Challenges Programme. Final report. Netherlands Organisation For Scientific Research – NWO.

- Dicke, M. Aartsma, Y. & K.B. Barragán-Fonseca. (2020). Protein transition in Colombia: Insects as feed in a circular agriculture. Report of Seed Money Project.
- Domingues, C. H. D. F., Borges, J. A. R., Ruviano, C. F., Gomes Freire Guidolin, D., & Rosa Mauad Carrijo, J. (2020). Understanding the factors influencing consumer willingness to accept the use of insects to feed poultry, cattle, pigs and fish in Brazil. *PloS one*, 15(4), e0224059.
- Escobar, A. (1999). *El final del Salvaje. Naturaleza, cultura y política en la antropología contemporánea*. CEREC, ICAN. Bogotá, Colombia.
- Estrada-Álvarez, J. (2020). Trayectorias cruzadas e inciertas de la reincorporación integral. CEPDIPO. Bogotá, Colombia.
- FAO. (2013). *Edible insects - Future prospects for food and feed security*. FAO Forestry Paper 171. Food and Agriculture Organization of the United Nations, Rome, Italy.
- Giraldo, O. F. (2019). *Political Ecology of Agriculture. Agroecology and Post-development*. Springer Nature. Switzerland.
- Hanboonsong, Y., Jamjanya, T., & Durst, P. B. (2013). Six-legged livestock: edible insect farming, collection and marketing in Thailand. RAP publication, 3.
- Hawkey, K. J., Lopez-Viso, C., Brameld, J. M., Parr, T., & Salter, A. M. (2020). Insects: A Potential Source of Protein and Other Nutrients for Feed and Food. *Annual Review of Animal Biosciences*, 9., 8.1-8.22
- Instituto Kroc. (2020). Cuarto informe: Tres años después de la firma del Acuerdo Final de Colombia.
- Kim, W., Bae, S., Kim, A., Park, K., Lee, S., Choi, Y., Han, S., Park, Y., Koh, Y., 2011. Characterization of the molecular features and expression patterns of two serine proteases in *Hermetia illucens* (Diptera: Stratiomyidae) larvae. *BMB reports* 44, 387.
- Leff, E. (2003). La ecología política en América Latina. Un campo en construcción. Ponencia presentada en Encuentro Grupo de Ecología Política de CLACSO celebrada los días 17-19 de marzo. Red de Formación Ambiental PNUMA. Panamá.
- Memorias del taller realizado con representantes de los siete nodos de las Nuevas Áreas de Reincorporación –NAR-. Bogotá, días 19, 20 y 21 de noviembre 2020.
- Mesa de Conversaciones en La Habana. (2016). *Acuerdo Final para la Terminación del Conflicto y la Construcción de una Paz Estable y Duradera*. Bogotá: Imprenta Nacional de Colombia. Retrieved 3 July 2017, from <http://www.altocomisionadoparalapaz.gov.co/procesos-y-conversaciones/Documentos%20compartidos/24-11-2016NuevoAcuerdoFinal.pdf>
- Miller, E (2010). *Solidarity Economy: Key Concepts and Issues*. in Kawano, E., Masterson, T., & Teller-Elsberg, J. (2010). *Solidarity economy I*. Amherst, MA: Center for Popular Economics. Retrieved 3 October 2017, from: http://www.communityeconomies.org/site/assets/media/Ethan_Miller/Miller_Solidarity_Economy_Key_Issues_2010.pdf
- Minagricultura (2016, 10, 28). El 83.5% de los alimentos que consumen los colombianos son producidos por nuestros campesinos. Ministerio de Agricultura y Desarrollo Rural. <https://www.minagricultura.gov.co/noticias/Paginas/El-83-de-los-alimentos-que-consumen-los-colombianos-son-producidos-por-nuestros-campesinos.aspx>
- Moragues-Faus, A. & Marsden, T. (2017). The political ecology of food. Carving 's spaces of possibility in a new research agenda. *Journal of Rural Studies*. No. 55. Pág. 275-288.
- Onsongo, V.O., Osuga, I.M., Gachiri, C.K., Wachira, A.M., Miano, D.M., Tanga, C.M., Ekesi, S., Nakimbugwe, D., & Fiaboe, K.K.M. (2018) Insects for income generation through animal feed: Effect of dietary replacement of soybean and fish meal with black soldier fly meal on broiler growth and economic performance. *Journal of Economic Entomology*, 111, 1966-1973.
- Padilla-Rivera, A., do Carmo, B. B. T., Arcese, G., & Merveille, N. Social circular economy indicators: Selection through fuzzy delphi method. *Sustainable Production and Consumption*, 26, 101-110.
- Plan Marco de Implementación. (2018). Retrieved from <https://portalterritorial.dnp.gov.co/PlanMarcoImplementacion/>
- Quintana Ramírez, A.P. (2005). *Texto-guía Desarrollo, comunidad y gestión ambiental. Teoría y Metodologías de intervención*. Universidad Tecnológica de Pereira. Colombia.
- Ramos-Elorduy, J., & Viejo, J. L. (2007). Los insectos como alimento humano: Breve ensayo sobre la entomofagia, con especial referencia a México. *Boletín Real Sociedad Española de Historia Natural. Sección Biología*, 102(1-4), 61-84.

-
- Restrepo, L.A. (1994). El potencial democrático de los movimientos sociales y de la sociedad civil en Colombia. En: Escuela de Liderazgo Democrático. Fundación social, Viva la Ciudadanía y Universidad Pedagógica nacional. Bogotá, Colombia.
- Rodriguez-Anton, J. M., Rubio-Andrada, L., Celemín-Pedroche, M. S. & M. Alonso-Almeida, M. D. (2019) Analysis of the relations between circular economy and sustainable development goals, *International Journal of Sustainable Development & World Ecology*, 26:8, 708-720, DOI: 10.1080/13504509.2019.1666754
- Santamarina Campos, B. (2008). Antropología y Medio Ambiente. Revisión de una Tradición y Nuevas Perspectivas de análisis en la problemática ecológica. AIBR. *Revista de Antropología Iberoamericana*, 3(2):144-184. <http://www.aibr.org/antropologia/03v02/criticos/030202.pdf>.
- Sheppard, C.D., Larry Newton, G., Thompson, S.A., Savage, S., 1994. A value added manure management system using the black soldier fly. *Bioresource Technology* 50, 275-279.
- Smetana, S., Palanisamy, M., Mathys, A., Heinz, V. (2016). Sustainability of insect use for feed and food: life cycle assessment perspective. *Journal of Cleaner Production*, 137, 741-751.
- Touraine, A. (1969). *Sociología de la acción social*. Colección Demos, Ediciones Ariel. Barcelona, España.
- Vaccaro, I. & Beltrán, O. (eds). (2007). *Ecología Política de los Pirineos, Estado, Historia y Paisaje*. Garsineu Editions, Tremp, España.
- Van Huis, A. (2013). Potential of insects as food and feed in assuring food security. *Annual Review of Entomology*, 58, 563-583.
- Van Huis, A. (2020) Insects as food and feed, a new emerging agricultural sector: a review. *Journal of Insects as Food and Feed*, 6, 27-44.
- Van Huis, A., Oonincx, D. G. A. B., Rojo, S., & Tomberlin, J. K. (2020). Insects as feed: house fly or black soldier fly? *Journal of Insects as Food and Feed*, 6(3), 221-229.
- Veldkamp, T, Van Duinkerken, G, Van Huis, A, Lakemond, CMM, Ottevanger, E, Boekel, MaJS. (2012). Insects as a sustainable feed ingredient in pig and poultry diets - a feasibility study, Wageningen UR Livestock Research, Report 638, The Netherlands.
- Vernooij, A. G., Veldkamp, T., & Ndambi, A. (2019). Insects for Africa: developing business opportunities for insects in animal feed in Eastern Africa (No. 1150). Wageningen Livestock Research.
- Xiao X, Mazza L, Yu Y, Cai M, Zheng L, Tomberlin JK, Yu J, Van Huis A, Yu Z, Fasulo S, Zhang J. (2018). Efficient co-conversion process of chicken manure into protein feed and organic fertilizer by *Hermetia illucens* L. (Diptera: Stratiomyidae) larvae and functional bacteria. *Journal of Environmental Management* 217:668-676

Appendix 1 Infographic on the ex-insurgent` organization



Appendix 2 Infographic on the Peace Agreement

THE AGREEMENT

In November 2016, the Colombian government and the Revolutionary Armed Forces of Colombia (FARC-EP) signed the **Final Agreement to End the Armed Conflict and Build a Stable and Lasting Peace**



Points of the agreement



1. Comprehensive Rural Reform
2. Political Participation
3. End of the Conflict
4. Solution to Illicit Drugs Problem
5. Victims of the Conflict
6. Implementation, Verification, and Public Endorsement

Point 3: End of the Conflict

Political + Socioeconomic reincorporation
 its implementation is done through

1. Creation or modification of institutions and instances



Reincorporation and Normalization Agency (ARN)



National Reincorporation Council (CNR)

2. Making state laws



Implementation Framework Plan (PMI)
 as a guide for policy making of the political and socio economic reincorporation.



National Policy for Social and Economic Reincorporation of Former Members of the FARC-EP

3. Implementation of reincorporation strategies



Vocational training



Capital seed of 8 million COP for productive projects




Monthly allowance per excombatant

Appendix 3 Infographic on the current situation of the reincorporation

CURRENT SITUATION OF THE REINCORPORATION


With the signing of the agreement, ex-insurgents dreamed of **having a better future for themselves, their families and for Colombia**




However,

The implementation of the agreement and more specifically the reincorporation **have been processes with** contradictions and conflicts


Because of




Attempts to instrumentalize the process




Persistence of political violence



Lack of comprehensiveness and systematicity

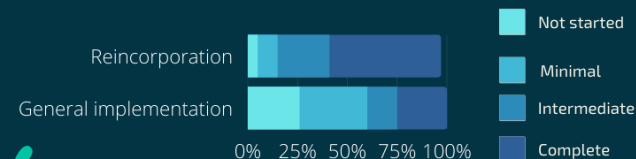


Financing problems



Conflicting visions of peace

These elements have generated delays and breaches in the implementation process




Reincorporation: ~10% Not started, ~10% Minimal, ~80% Intermediate, ~10% Complete

General implementation: ~25% Not started, ~25% Minimal, ~25% Intermediate, ~25% Complete


0% 25% 50% 75% 100%

Implementation levels by November 2019
according to the KROC Institute


Lack of implementation of specific points affect the reincorporation process
an example of this is



Historical obstacles to access to land



Comprehensive Rural Reform is not fully implemented



Obstacles in the development of ex-insurgents' productive projects

Appendix 4 Infographic on enabling conditions for insect farming among ex-insurgents

CONDITIONS TO ENABLE INSECT FARMING AMONG EX-INSURGENTS

Despite the difficulties, there are some **social conditions around the reincorporation process** that can be understood as **potential to implement insect-based animal feeding projects**.

Main strengths of ex-insurgents communities

1. Existence of a significant organizational capacity

Broad commitment towards their reincorporation process through the development of numerous community projects and initiatives e.g.

the New Reincorporation Area (NAR) San José de León in Mutatá, Antioquia





Due to the institutional non-compliance and lack of optimal conditions



Ex-insurgents had to leave the ETCR



Through organization and self-management, they bought some collective land where they settled: NAR

2. Participation and local democracy

The reincorporation process has established several strengths such as



Democratic, regional and female leaderships



Autonomy and teamwork skills in the management of the initiatives



Recognition of access to land as an aspect that requires the support of various actors

It is important to continue promoting these aspects

through



Educational and participatory strategies

3. Cultural tradition



Prevalence of family farming and rebuilding family ties

represents



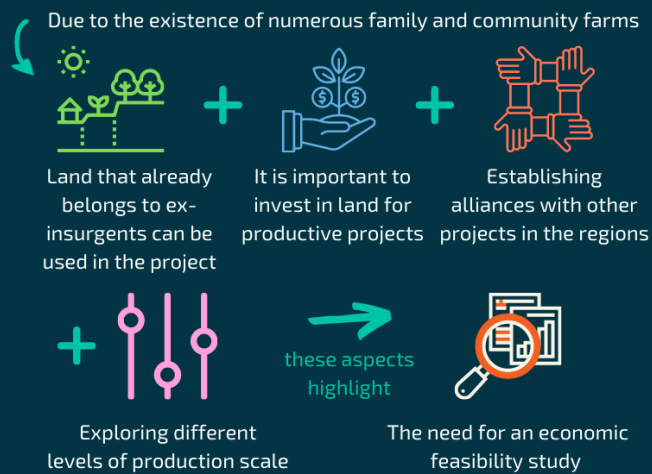
a solid basis to introduce insect production



providing former knowledge to apply

CONDITIONS TO ENABLE INSECT FARMING AMONG EX-INSURGENTS

Economic conditions



Material conditions



Learning conditions



Insect farming in the frame of the current reincorporation process may contribute to SDG 16 calls for promoting just, peaceful and inclusive societies, and SDG 2 demands for food security

Appendix 5 Infographic on lessons learnt

LESSONS LEARNT IN PRODUCING INSECTS FOR FEED

Experience in Kenya

The project *Improving livelihood by Increasing Livestock Production in Africa (ILIPA)* showed how



Inclusive business models can contribute to solve socio-economic and environmental problems



Smallholder insect farmers have good opportunities to improve their livelihood

The ILIPA project identified some elements to focus on



Developing legislation



Scientific research on Black Soldier Fly



Developing an enabling environment for initiative



Business development, e.g. small or medium scale BSF production



Developing (micro) financing

From a social perspective, ILIPA found that for the success of this kind of projects, it is important to be aware of



The importance of smallholder farmer's cooperatives



The development of the full value chain

including

- Regulation
- Farmer acceptance
- Feed miller involvement

Current experience in Colombia

The project *Use of the Black Soldier Fly as an alternative feed to reduce costs and improve livelihood of ex-combatants in reintegration process of Icononzo-Tolima*

has shown the importance of



Linking community



Academy-community interaction



Practical results

To explore
the potential
of nature to
improve the
quality of life



Wageningen Livestock Research
P.O. Box 338
6700 AH Wageningen
The Netherlands
T +31 (0)317 48 39 53
E info.livestockresearch@wur.nl
www.wur.nl/livestock-research

Together with our clients, we integrate scientific know-how and practical experience to develop livestock concepts for the 21st century. With our expertise on innovative livestock systems, nutrition, welfare, genetics and environmental impact of livestock farming and our state-of-the art research facilities, such as Dairy Campus and Swine Innovation Centre Sterksel, we support our customers to find solutions for current and future challenges.

The mission of Wageningen University & Research is 'To explore the potential of nature to improve the quality of life'. Within Wageningen University, nine specialised research institutes of the DLO Foundation have joined forces with Wageningen University to help answer the most important questions in the domain of healthy food and living environment. With approximately 30 locations, 6,000 members of staff and 10,000 students, Wageningen UR is one of the leading organisations in its domain worldwide. The integral approach to problems and the cooperation between the various disciplines are at the heart of the unique Wageningen Approach.

