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**From coca to butterflies: Managing Natural Resources for Post-  
Conflict Peacebuilding**

*A Case Study of Otanche Community, Colombia*

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## Abstract

Inspired by environmental peacebuilding literature, this research explores the peacebuilding potential of natural resources through a qualitative case study of a conflict-affected community's transition of livelihood strategies from coca cultivation to butterfly farming. The fieldwork was carried out with peasant families in rural Otanche - a biodiversity-rich area that, besides the Colombian conflict, has been affected by illegal logging, illicit crops, and violence associated with emerald mining. Based primarily on in-depth interviews and participant observation, the research examines the impact of natural resource exploitation on the community's livelihoods; sheds light on the influencing factors of the livelihood strategy transition; and explores how the current ways of natural resource management create synergies for peacebuilding. The main findings reveal, that in contrast to the destructive effects of eroded social capital on the environment during coca cultivation, sustainable butterfly farming contributes to the establishment of sustainable livelihoods for Otanche community. Moreover, it enhances social capital through the encouragement of cooperation, reciprocity and exchange; formation of relations of trust, and shared social identity. Social capital in turn improves natural resource management through increased ecological literacy, enhanced on-farm agrobiodiversity and reforestation activities that contribute to the long-term sustainability of the resource base.

**Keywords:** *peacebuilding, natural resource management, sustainable livelihoods, social capital, post-conflict, Colombia.*

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## Abbreviations

ASOMAPRIO.....	Butterfly Association – the Privilege of Otanche
ASOPAZ.....	Peace and Development Program of Western Boyacá
AUC.....	United Self-Defense Forces of Colombia ( <i>Autodefensas Unidas de Colombia</i> )
BA.....	Rural district of Buenos Aires
BV.....	Rural district of Bolivar
CR.....	Critical Realism
ELN.....	National Liberation Army ( <i>Ejército de Liberación Nacional</i> )
FARC-EP.....	Revolutionary Armed Forces of Colombia—People's Army ( <i>Fuerzas Armadas Revolucionarias de Colombia – Ejército del Pueblo</i> )
FWFP.....	Forest Warden Families Program
LQ.....	Rural district of Las Quinchas
M-19.....	19th of April Movement ( <i>Movimiento 19 de Abril</i> )
NRLQ.....	Natural Reserve of Las Quinchas
PPP.....	Productive Projects Program
PRA.....	Participatory Rural Appraisal
RDs.....	Rural districts ( <i>Veredas</i> )
SBF.....	Sustainable Butterfly Farming
SLF.....	Sustainable Livelihoods Framework

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## Chapter 1 - Introduction

*“Donde hay perseverancia y voluntad, hay capacidad. Y hoy somos capaces de cruzar obstáculos para alcanzar nuestros sueños... somos socios, somos comunidad, somos unidos y vamos para adelante”*

Mensaje de paz y reconciliación de las familias de la vereda Bolívar

*“When there is persistence and determination, capacity emerges. And today we are capable of overcoming obstacles to achieve our dreams... We are partners, we are community, we are united and we go forward!”*

Peace and reconciliation message of the Bolivar district families

### 1.1. Development context

Colombia, despite its ongoing internal armed conflict, is a middle-income country with third largest economy in Latin America (USAID, 2014). With an average growth rate of 4.4% during past five years, the country has experienced significant improvements. Compared to 2002, massacres have decreased by 71% and murders have fallen by half. Similarly, kidnappings have diminished by 90%, while forced displacement and coca cultivation have declined by 38% and 25%, respectively (Ibid.). The relatively improved security has been reflected in substantial increases in investments, a decrease in unemployment, and the growth of a middle class (Arnson, 2004). However, Colombia rates 19<sup>th</sup> among the world’s most unequal countries in terms of income, and displays one of the most unequal land ownership pattern in which 1.2% of population controls 52% of land (USAID, 2014; Jaramillo and Stork, 2015). Inequality is most evident in country’s rural regions, where 23% of population still lives in extreme poverty (USAID, 2014). The limitations of Colombian development are associated with over fifty years of internal armed conflict, and violence that stands accountable for the destruction of human, social, physical and natural capitals for decades (Arnson, 2004).

### 1.2. Internal armed conflict

The roots of inequality, later fueling the conflict, date back to 1930s, when the Colombian government incentivized by rising world coffee demand, initiated a series of unjust agrarian policies that promoted land accumulation by large landowners, resulting in mass displacements of peasants through violent land expropriation and in seeding sense of injustice

among rural communities (UNDP, 2003). Later, in 1948, the day of the assassination of Liberty party leader, Jorge Eliecer Gaitán, marked the beginning of *La Violencia* – ten years of civil war between Liberal and Conservative parties, which caused violent confrontation of their rural supporters, and turned peasants against each other (Meacham, 2014). Leaving behind 180,000 dead (UNDP, 2003), *La Violencia* was ended in 1958, when the two parties signed a treaty - National Front, agreeing on power sharing through four-year term rotation and in doing so, excluding any third party. While the two parties made peace, the presence of armed peasants remained overlooked (Meacham, 2014).

These small socialist peasant groups grew into different left-wing guerilla groups such as FARC-EP, ELN, M-19 (UCDP, 2015). The first and the most important of them was Revolutionary Armed Forces of Colombia-People's Army (FARC-EP), which emerged in 1964. FARC-EP kept expanding during the following two decades as peasants from all over the country joined until it reached the peak in the 1990s. By then, it had engaged in kidnappings, torture, drug trafficking and in the absence of the state, had gained control over large rural areas (Meacham, 2014). In the 1980s, driven by the aim of defeating socialist FARC, several conservative paramilitary groups were formed which joined forces in 1997 in Self-defense Forces of Colombia AUC (Meacham, 2014). However, AUC extended its mandate of fighting FARC to the protection of interests of large landowners and drug lords, and soon became associated with massacres, forced displacement of peasants, and appropriation of revenues from different natural resources, including coca cultivation (UCDP, 2016).

Revenues from drug trafficking further aggravated the violence by providing funds for weapons and military training both for FARC and AUC. Besides sustaining the activities of the two illegal groups, the higher returns of coca cultivation also encouraged many peasants to become a part of the coca industry. Peasant engagement was facilitated by the unjust agrarian policies, which kept them in poverty through offering extremely low prices for their production. Consequently, the coca industry led the country into further violence (Meacham, 2014).

The complex nature of this violence makes it difficult to measure human costs of the conflict, particularly because Colombia, since 1964, has experienced phases of intrastate, non-state, and one-sided violence (UCDP, 2016). The majority of civilian casualties is not a result of confrontation between FARC and AUC, neither among one of this two illegal armed groups

or drug cartels and government forces. Instead, it has occurred during one-sided violence when each of these groups has intentionally targeted civilians (Restrepo and Spagat, 2004). In this sense, 81.5 % of all deaths from 1958-2012 are civilian (GMH, 2013). Besides 220,000 deaths, Colombian conflict has left behind 4.5 million displaced, more than 20,000 disappearances, 10,610 killed or wounded by landmines, 27,000 confirmed cases of kidnapping, and 489,000 cases of sexual violence (Haugaard, 2014).

In the pursuit of decreasing these numbers, Colombian governments, during last 30 years have been favoring defense policies over development ones (Meacham, 2014). Thus, conflict has significantly hindered country's development, particularly in rural areas, where most of the important natural resources, including the arable land are located, and in the absence of the state, illegal groups have control (Arnson, 2004).

### 1.3. Peace Talks

Since 2012, the Colombian government and FARC have been engaged in Peace Talks with the aim to put an end to fifty-year internal armed conflict. A six-point-agenda for negotiations seeks to address the causes of conflict – *inequality* and *political exclusion*; its main aggravator - *illicit drugs*, and its consequences – over 7 million *victims* (Bedoya, 2014). Given that the conflict is largely land-induced, Rural Reform is the first point of the negotiation agenda, which aims to address the following elements: access and use of land; rural development; and subsidies, credit and commercialization (ibid.). While discussed separately, the point on illicit drugs also implies finding alternative development opportunities for 125 municipalities prioritized for post-conflict (re)development, which are currently responsible for 76% of coca production of Colombia (UNDP, 2014). The Peace Talks present a historic opportunity for Colombia to make a transition out of conflict, and by implementing the agreed terms in post-conflict period, lay foundation for a durable and sustainable peace (USAID, 2014).

However, in the absence of a holistic and integrated peacebuilding approach, empirical evidence shows that signing peace agreement can often be easier than its implementation (Ricigliano, 2003; Egeland, 2015). In order to overcome the historical neglect and achieve sustainable peace, political, structural and social aspects of peacebuilding have to be addressed in a balanced manner. While top down, political peacebuilding between the Colombian government and FARC is a precondition for signing the Peace Agreement, rebuilding underlying systems to address root causes (structural peacebuilding) and

transforming relations among groups to reconstruct social ties (social peacebuilding), are fundamental for durable peace (Ricigliano, 2003).

#### 1.4. Problem Statement

Municipalities prioritized for post-conflict (re)development are located in the country's most impoverished and economically stagnant regions, where the vast majority of locals depend on natural resources for their livelihoods. These territories host globally significant biodiversity which reveals an interesting paradox related to the environmental aspect of Colombian conflict: the conflict has caused enormous environmental damage to these territories through landmines, illicit crops, illegal mining and yet, some of the country's best preserved places are in these areas precisely because the conflict prevented their development (Alvarez, 2002; Hochschild, 2015). Once a peace agreement is reached, similarly to many cases worldwide, natural resources can become one of the main drivers of economic redevelopment of these regions, which besides benefits can pose increased pressures on the environment. These environmental issues coupled with weak institutions and segmented society could put vulnerable communities further at risk, placing additional stress on the pre-existing conditions and lead to instability (UN, 2008; USAID, 2014).

Due to the complexity of delivering development to these previously excluded territories, the implementation of Rural Reform as a peace term, seems even more challenging than the difficult task of signing the peace agreement. One of the primary tasks of post-conflict peacebuilding will be to find innovative ways of managing natural resources that will generate economic opportunities for rural communities without exploiting the environment. Even though conflicts with natural resource components are twice more likely to relapse into violence within the first five years of post-conflict period, only a quarter of all peace negotiations include natural resource management mechanisms (UN, 2008; UNEP, 2009). Keeping this in consideration, it has to be noted that Peace Talks agenda is not explicit regarding the use of natural resources in the prioritized municipalities. Thus, the ways in which peace agenda will be implemented during the post-conflict phase will largely define the sustainability of peace in Colombian.

#### 1.5. Research Aim and Questions

Recent field-based studies demonstrate that peacebuilding can begin at the local level even before the peace agreement is signed in order to address concerns and inform the process at

the national level (UN, 2010; Brady et al., 2015 Young and Goldman 2015; Goldman and Young, 2015). The aim of this research is to explore one such local peace initiative through analyzing the case of Otanche community's transition from livelihood strategies based on coca to sustainable butterfly farming. The research seeks to examine the impact of the dynamics of natural resource exploitation on the community; to shed light on the factors that affected the transition; and to explore the ways in which current natural resource management creates synergies for peacebuilding. In doing so, it aims to contribute to the relatively unexplored literature on the peacebuilding potential of natural resources; and secondly, to signal elements that can inform the environmental aspect of Colombian post-conflict peacebuilding.

Overarching question guiding the research is: *How can natural resource management contribute to peacebuilding through providing sustainable livelihoods for conflict-affected communities in rural Colombia?*

The subsidiary research questions are:

**SRQ1-** What was the role of natural resources in the conflict and how did this impact Otanche community?

**SRQ2-** How and why have livelihood strategies changed from being coca-driven towards sustainable butterfly farming?

**SRQ3-** What are the implications of sustainable butterfly farming on social capital?

**SRQ4-** What is the effect of sustainable butterfly farming on the environment?

## 1.6. Disposition

This research is organized in five chapters. The following chapter reviews the analytical framework constructed of three sections – the definition of key concepts, theoretical perceptions on the conflict and natural resource nexus, and the role of natural resources in peacebuilding. Chapter 3 continues with the methodology and discusses the research design and methods for data gathering and analysis. Consequently, Chapter 4 presents the analysis which follows a timeline of the main events and policies that have influenced natural resource management and the community's livelihoods. And finally, Chapter 6 concludes the research by summarizing the main points and by outlining policy implications.

## Chapter 2 - Analytical Framework

### 2.1. Definition of the concepts

Most definitions of *conflict* refer to a dispute or incompatibility in values or interests that lead to violence (UNEP, 2009). This research adopts one of the most cited definition of armed conflict developed by the Uppsala Conflict Data Program, according to which, conflict refers to the use of armed force between two parties, one of which is the state, and results at least in 25 annual deaths (UCDP, 2016). Armed conflict contains three, often non-linear phases: (i) before the outbreak, (ii) the conflict, and (iii) post-conflict (Paffernholz and Spurk, 2006).

While there is a consensus in literature regarding the definition of conflict, the term *peacebuilding* is rather debated. Generally, peacebuilding is preceded by a phase of *peacekeeping* (oriented at the immediate termination of violence) and *peacemaking* (peaceful resolution of conflicts through negotiations) (Chetail, 2009). UNEP (2009:7) defines peacebuilding as follows:

“Peacebuilding comprises the identification and support of measures needed for transformation toward more sustainable, peaceful relationships and structures of governance, in order to avoid a relapse into conflict. The four dimensions of peacebuilding are: socio-economic development, good governance, reform of justice and security institutions, and the culture of justice, truth and reconciliation”.

However, this definition is criticized for being too broad and impractical, and for not drawing a clear line between peacebuilding and development (Chetail, 2009). The term *post-conflict peacebuilding* is even more controversial and is often associated with the justification of Western interventionism (Ibid.). Since the ideological discussions regarding the concept are beyond the scope of this research, it adopts a more practical definition, which understands post-conflict peacebuilding as a phase of peacebuilding, that follows the signing of a peace agreement, and within a period of 1-5 years focuses on the successful implementation of the agreement, and in doing so, lays a foundation for development (Paffernholz and Spurk, 2006). Even though, the research is guided by this definition, it acknowledges peacebuilding efforts that have taken place before signing the peace agreement.

As for *sustainable livelihoods*, this research uses Chambers and Conway’s (1991:6) definition, which differentiates between environmental and social aspects of sustainability.

“a livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living: a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide

sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term.”

The research also employs an adapted version of Sustainable Rural Livelihoods Framework, which in Scoones’ (1998) explanation is concerned with the identification of the following elements: the context, the combination of resources, livelihood strategies, their outcomes and the institutional processes that influence both strategies and outcomes. For the definition of these elements, the research relies on the work of the Department for International Development (1999), which differentiates among the following five capitals. Human Capital refers to all skills, knowledge and health that enable labor; Social Capital represents social resources such as networks, connectedness, relationships of trust, reciprocity and exchange; Natural Capital exemplifies natural resources (land, forest, water, air, biodiversity) which provide services; Physical Capital implies infrastructure, electricity, water supply, sanitation, transport, producer goods/tools, telecommunication; and lastly, Financial Capital is reflected in income, savings, credit, and liquid assets (such as livestock and jewelry) (Ibid.).

The following section reviews the theoretical perspectives regarding the causes of conflict and establishes a relation between conflicts and natural resources. It is followed by section 2.3, which discusses a relatively new standpoint on the role of natural resources and introduces literature that advocates the potential of these resources to contribute to post-conflict peacebuilding.

## 2.2. Conflict and natural resources nexus

After the establishment of peace research as an academic field in 1960s, scholars have been concerned with the analysis of social, political, economic and cultural causes of conflicts. (Puffenholz and Spurk, 2006). Earlier literature on such causes is dominated by the *Greed vs Grievance* debate, in which authors in line with Collier and Hoeffler (2000; 2004) favor economic variables associated with the viability of rebellions over the weaker explanatory power of social and political variables related to grievances. Collier and Hoeffler (2000; 2004) use natural resources as a proxy for *opportunities* that facilitate rebellions, and argue that high dependence on primary commodity exports (agricultural and minerals) is correlated with the risk of civil war. Even though their work excludes illegal substances, more recent research shows that illegal resources, such as coca, are often crucial in financing greed-based conflicts (Murshed, 2006). On the other hand, authors who bring forward the importance of grievances, understood as horizontal inequalities in productive livelihood assets, criticize the greed argument based on its econometrics approach and the lack of human perspective

(Ibid.). Besides, conflicts, particularly intrastate ones, are too complex to be explained solely by one factor, thus, Greed and grievances can be intertwined and act simultaneously: appropriation of natural resource rents by one group can generate grievances among others; while grievances can turn into greed when conflict provides economic opportunities for the few (Ibid.).

While a large body of literature explores the conflict and natural resources nexus, there is no consensus regarding the role that natural resources play in conflict. Authors in line with Galtung (1982) and Homer-Dixon (1994) raise issues related to environmental degradation, population growth and resource scarcity directly leading to violence; others demonstrate the correlation between natural resources such as timber, gemstones and illegal crops with the duration of conflicts. They claim that natural resources, while rarely the reason of conflict onset, often perpetuate already existing conflicts by providing funds for rebel groups (Bruch, et al., 2015; Varisco, 2010). According to Varisco (2010) Natural resources can play a significant role in conflict only when certain geographical, political, economic and social characteristics are present. The most suitable combination of such characteristics is when a government, with high level of internal societal opposition, does not have complete control over its natural resources and these resources are *lootable, distant and diffusive*. Natural resources are considered lootable when their extraction is easy and the production and market entrance costs are low; distant – when they are far from administrative capital and government's control over them results costly; and diffusive – when they are widely spread and easily capturable by non-state actors. When the extraction of lootable, distant and diffusive natural resources is not industrial, government's capacity to generate revenues is low and the risk of reinforcing rebel groups is high (Ibid).

Besides reinforcing rebel groups, revenues from lootable natural resources are also associated with weakening social contract and state capacity through encouraging corruption, predation, and accumulation of resource rents and decision-making power over their expenditure in the hands of small elite groups (Acemoglu, et. al, 2000 sited in Murshed, 2006). As a result, lootable natural resources, coupled with broken social ties, inferior institutions and the absence of conflict resolution mechanisms not only raise risks of conflicts and further impede development, but also pose threats to peacebuilding (Murshed, 2006).

### 2.3. The role of natural resources in peacebuilding

While there is extensive research on the theoretical links between natural resources and conflict, the ways in which natural resources can affect peacebuilding remain less explored (Dabelko, 2006). Nonetheless, increasing number of recent field-based studies demonstrate how natural resources maintain their importance after peace agreements are reached, and how the ways of their management can be decisive for peacebuilding (UNEP, 2009).

In post-conflict peacebuilding natural resources provide the first, and sometimes, the only source of revenue for meeting immediate recovery needs. Economic redevelopment is often given a priority, while natural resource issues and their sustainability are postponed for a later stage (Ibid.). This approach is criticized by the advocates of integrating natural resource issues into peacebuilding activities, based on the following argument: Failing to address environmental aspects of conflicts and setting unsustainable extractive resource management mechanisms can undermine peacebuilding through a potential relapse into conflict or by creating new tensions over unequal access to natural resources and their revenues (Dabelko, 2006; UNEP, 2009; Young and Goldman, 2015). However, when managed sustainably, natural resources can play a significant role in making peace durable through contributing to conflict prevention and supporting stability and long-term development (Dabelko, 2006; UNEP, 2009).

This argument is based on three ways through which natural resources can be crucial for peacebuilding outcomes: (i) *supporting economic recovery*, (ii) *developing sustainable livelihoods*, and (iii) *contributing to a dialogue, cooperation and confidence-building* (UNEP, 2009:19). The first refers to the potential of natural resources to provide rapid financial returns and employment opportunities. The second one is based on the premise that for durable peace it is crucial to restore natural resource base on which livelihoods depend. Finally, the third way departs from the proposition that natural resources can be used as a platform for starting a dialogue between conflicting groups, which has a potential of engaging them in cooperation over shared environmental interests, ultimately leading to (re)building *social cohesion* and *trust*. Shared management of natural resources, often referred to as *environmental cooperation*, can transform insecurities among divided groups through the promotion of *interaction* and *communication* (Ibid).

Environmental cooperation is further explored by scholars of *environmental peacemaking*, who argue that environmental interdependence requires cooperative action, which can bring

different stakeholders together, start a dialogue, build trust, enhance cooperative efforts and even promote collective identity formation (Conca and Dabelko, 2002; Weinthal, 2004; Carius, 2006). While most environmental peacemaking initiatives such as peace parks and transboundary river basin cooperation focus on regional level, scholars claim that such cooperative opportunities may be present at all levels, and among different actors (Dabelko, 2006). Craig, (2013), for instance, explores the potential of community-based conservation as a means for restoring credibility and reconciling government with local communities. Carius (2006), on the other hand, examines the contribution of environmental cooperation to peacebuilding and reconciliation through opening a platform for dialogue at a community level. Likewise, Weinthal (2004) emphasizes the importance of conducting more research on the potential of environmental cooperation on an intrastate level and scales down environmental peacemaking to *environmental peacebuilding*.

In order to gain a deeper understanding of the role that natural resources can play in peacebuilding, Young and Goldman (2015) suggest employing livelihoods lens. Given that in most post-conflict regions the majority of the poorest population depends on natural resources for their livelihoods, the ways in which these resources are managed have strong impact on community resilience, local security and long-term sustainability of the resource base. Conflict-affected communities, in the absence of regulations, employ livelihood strategies based on natural resource exploitation, which can be often translated into illicit ways of earning a living, resulting in further degradation of the resource base and deepened social inequalities. This in turn, can lead to the continuation of conflict or to the emergence of new conflicts (Ibid; Goldman and Young, 2015).

Given the importance of resource base for the livelihoods of conflict-affected communities, natural resources can be used as local entry points for peacebuilding, even when national peace agreement is not yet reached (Brady et al., 2015). Natural resources can open opportunities for post-conflict peacebuilding through encouraging cooperation between opposing groups, creating income-generating sources and increasing resilience towards shocks and instability, and in doing so, promoting sustainable natural resource management. In this sense, natural resources, through their contribution to the reestablishment of livelihoods, can influence identity, social capital and personal fulfillment (Young and Goldman, 2015). Therefore, restoring livelihoods of conflict-affected communities increases their support to peacebuilding and reduces vulnerability towards getting engaged in illegal

activities, as well as being recruited by illegal armed groups (Ibid.; Jaramillo and Stork, 2015).

Besides the contribution to the reestablishment of sustainable livelihoods, engagement in joint natural resource management, such as habitat restoration, can foster community's emotional commitment to the landscape, develop a sense of ownership, and decrease the likelihood of their involvement in distractive practices (Leigh, 2005). Cooperative management of natural resources can also serve as a source of social-ecological resilience and restore social fabric in post-disaster and post-conflict settings (Tidball and Krasny, 2013). Social resilience, understood as an enabling component of social groups to adapt to change, increases community's capacity to handle environmental and conflict-related stresses (Adger, 2000).

However, cooperation on natural resource management can only have positive outcomes for peacebuilding when stakeholders at different governance level (family, community, local, regional and national) participate in joint planning and implementation of such initiatives (Young and Goldman, 2015; Weinthal, 2004). Cooperation at different levels of governance can also improve transparency and accountability (Brady et al., 2015). Moreover, institutionalization of environmental cooperation, referring to its recognition and legitimization through policy is a precondition of successful natural resource-based livelihood interventions (Conca and Dabelko, 2002; Carius, 2006; Young and Goldman, 2015).

### *2.3.1. Social Capital in Natural Resource Management*

Most abovementioned environmental peacebuilding scholars examine the following elements through which natural resource management contributes to peacebuilding: enhancing dialogue and cooperation; trust-building; promoting shared norms, identities, and sense of ownership; rebuilding social fabric and increase community resilience. While none of the authors explicitly refers to social capital, these elements fit within the four aspects of social capital identified by Pretty and Ward (2001): (i) relations of trust, (ii) reciprocity and exchange, (iii) common rules, norms and sanctions, (iv) connectedness, networks and groups. Thus, it can be claimed that cooperation over natural resources can have positive impact on social capital.

Pretty and Ward (2001) argue that enhancing social capital can in turn have positive biodiversity and livelihood outcomes. According to these authors, current agricultural development is focused on changing individual behavior, and in doing so has distractive

effect on the environment. In contrast, focusing on the development of social capital in communities can result in improved environmental outcomes at three levels: agrobiodiversity on farms, nearby nature in landscapes, and protected areas. Relations of trust can facilitate cooperation as they increase confidence in investing in collective activities. Reciprocity and exchange, in turn, enhance trust either through immediate or continuous exchange balanced over time. Common rules, norms and sanctions are mutually agreed terms which place group interests above individual ones and encourage their fulfilment. Lastly, connectedness, networks and groups can be manifested on micro or macro levels (Ibid.). Based on Woolcock's (2001) work, Pretty and Smith (2003) distinguish among three types of connectedness: *bonding*, *bridging*, and *linking* social capital, where the first refers to links at local level among groups with shared interests; the second demonstrates links across communities with varying views; and the third describes vertical links, often at policy level, among communities and external actors.

### 2.3.2. *Dark Side of Social Capital*

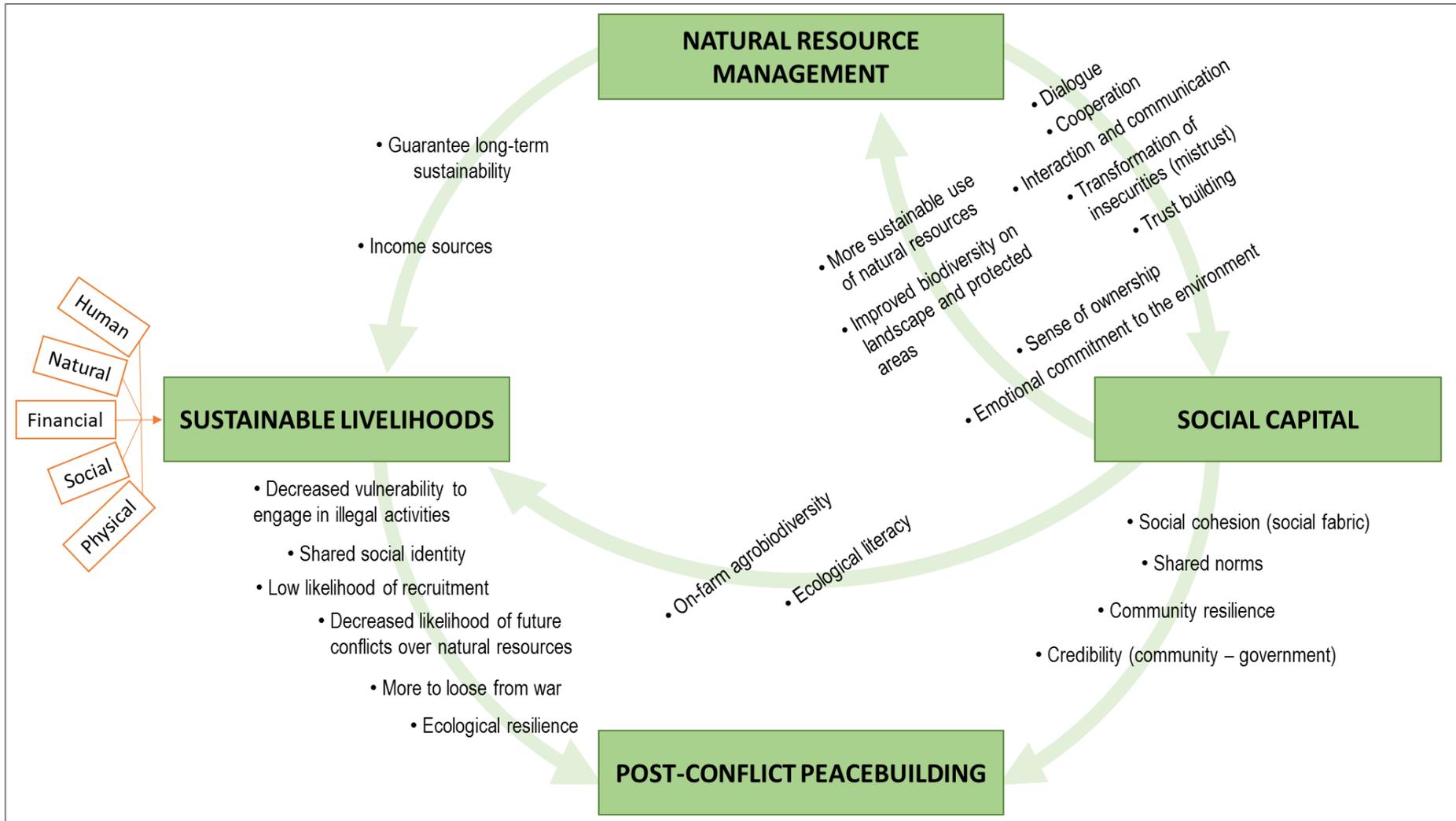
However, the prevalence of social capital does not automatically lead to either peaceful resolution of conflicts, or to the improved biodiversity outcomes (Pretty and Smith, 2003). When community's participation, instead of local interests is based on fear or power, and is managed by external regulations and control, the behavior of the community members can change while external control persists, but the attitudes remain the same (ibid). According to Pretty and Smith (2003), the effect of social capital on biodiversity outcomes depends on the type of participation. The authors distinguish among the following types of participation: *Passive* (limited to being informed on what has already been decided); *consultative* (providing insights without decision-making power); *bought* (based on material interest); *functional* (when goals are achieved through engagement with external agencies); *interactive* (which strengthens local groups); and *self-mobilization* (when participation results in independent decision-making over natural resource use) (Ibid.).

According to the dominant perception in the literature, community's engagement in violence and criminal behavior is associated with the lack of social capital. The argument departs from the premise that social capital enhances formal and informal control based on shared norms and makes engagement in criminal activity costly, and in doing so, reduces violence and crime (Rubio, 1997; Rosenfeld, Messner, and Baumer, 2001 as cited in Buonanno, Montolio, Vanin, 2009). Similarly, Lederman, Loayza, and Menendez, (2002) claim that social capital,

represented in behavioral pattern as *civic engagement* or *voluntary participation*, and in attitude pattern as *trust*, prevent violence and facilitate to the peaceful resolution of conflicts.

However, Cox (2009) discusses the second facade of social capital, through which trust and social networks can be used to initiate or perpetuate violence and conflict. Lederman, Loayza, and Menendez, (2002) argue, that social capital concentrated within particular groups (gangs or ethnic clans) can increase violence and crime using strong social ties, and promote a tendency of criminal activity. Taking advantage of social networks for promoting criminal activity is also explored in Rubio's (1997) work, where he introduces the concept of *perverse social capital* and argues that it can largely contribute to conflict and crime through taking control over existing social networks, information systems, and power relations. He names the activities of the guerilla movements and drug cartels of Colombia as an example of *perverse social capital* (Ibid.). Violent crime, in turn, influences social capital. It can diminish *productive social capital* by breaking down trust within communities; decrease mobility and social interactions and thus, prevent community members from expanding social networks Lederman, Loayza, and Menendez, (2002).

Figure 1 summarizes the theoretical perspectives regarding the contributing role of natural resources to post-conflict peacebuilding discussed in this chapter.



*Figure 1 - Analytical scheme*

## Chapter 3 – Methodology

### 3.1. The point of departure

This research is inspired by the philosophical approach of Critical Realism (CR), which seeks to overcome the polarization in social science by adopting a pragmatic standpoint (Prowse, 2010). On one hand, CR advocates the generalization of claims, and in doing so avoids the relativism associated with social constructivism. On the other hand, it dismisses the scientific objectivity of positivism by arguing that the subjective meanings assigned by individuals to their actions are key for understanding the external world (Ibid.).

In accordance with CR, this research follows a retroductive approach, which incorporates inductive and deductive elements. The process of retroduction is explored in Ragin's (1994) work, who claims that social research comprises of four components: *ideas, analytical frames, evidence, and images*. In a permanent dialogue, ideas facilitate the understanding of the evidence, and in turn, the evidence reshapes ideas. Analytical frames are then employed in order to make sense of the evidence and to construct images of social life. The interplay between these images and analytical frames is categorized as retroduction (Ibid.).

### 3.2. Research design

A case study was chosen as the most appropriate research strategy for answering the research questions, since according to Bryman's (2012), it allows an intensive examination of the selected case by employing mutually complementing methods of data gathering. This research presents the case of Otanche community's transition from livelihood strategies based on coca to sustainable butterfly farming, which qualifies as a holistic single-case in Creswell's (2007) classification. Its in-depth examination has permitted to analyze the theoretical perceptions regarding the role of natural resources in post-conflict peacebuilding in relation to what Noor, (2008:1602) refers to as a "contemporary phenomenon within its real life context using multiple sources of evidence."

The fieldwork carried out for this research fits within the general characteristics of qualitative research listed by Creswell (2009). Data was gathered during a two-month stay in the participants' homes, causing minimal disturbances to their daily activities (*natural setting*). Likewise, the fieldwork plan was adapted to the emerging needs for several times (*emergent design*). Almost all data was gathered from primary sources (*researcher as a key instrument*)

by a combination of methods (*multiple sources of data collection*). Moreover, the research attempts to capture the community members' perspectives on livelihood strategy transition (*participants' meaning*), and lastly, it seeks to demonstrate a complex picture of livelihood strategy transition and its implications for the peacebuilding process from multiple perspectives of the participant families, local environmental authority, and national policy level (*holistic account*).

### 3.3. Methods

#### 3.3.1. *Sampling*

In an attempt to capture the perspectives of each butterfly farmer family, at least one member of all 30 families engaged in sustainable butterfly farming participated in the research through the conducted group interviews and a focus group described in the next section. However, in order to gather more in-depth data in the limited fieldwork period, 6 most representative families (2 from each of the 3 rural districts of Otanche) were identified with the assistance of the gatekeepers from Zoonatura<sup>1</sup>. This can be considered as purposive sampling (Bernard, 2006). However, in order to eliminate the possibility of gatekeepers' bias and to meet the changing circumstances in the field, 2 families from 2 different rural districts were replaced, which can be attributed to convenience sampling (Ibid.).

#### 3.3.2. *Data gathering methods*

Given a qualitative nature of this research, a number of corresponding techniques were employed for data gathering. Following Ragin and Amoroso's (2011) proposition, a combination of methods of ethnographic study and in-depth interviewing were applied with the 6 participant families in a pursuit of constructing what Ragin (1994) calls an image of the community's social life. In particular, participant observation, in-depth interviews and 2 PRA tools – historic timeline and transect walks were used. During a two-month fieldwork, two visits were carried out to rural Otanche, during which I stayed with the participant families. Building rapport with the hosts was facilitated by the knowledge of Spanish and prior working experience in the rural development issues of Colombia. Staying with the participants opened an opportunity to observe and participate in their daily activities in a natural setting, which was complemented and enriched by engaging in long conversations with different family members. Nonetheless, as suggested by Ragin and Amoroso (2011), a

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<sup>1</sup> Zoonatura is a sustainable bio-commerce initiative based in Bogota, which in partnership with peasant families of Otanche, besides the production of butterfly handcrafts, is a supplier of butterfly pupae at the national level.

strong effort was made to maintain a position of an outsider in order to critically reflect on data.

Besides participant observation, in-depth interviews and PRA tools, a reduced version of Sustainable Livelihoods Framework (Scoones, 1998; DFID, 1999) was used as another tool for mapping participants' livelihoods. It primarily facilitated shedding light on the livelihood assets and their interaction during coca cultivation and current butterfly farming. It also revealed conflict as a main factor of vulnerability context and pointed out main structures and processes that influenced the transition. However, since SLF (see Appendix 2) was only employed as a guiding tool its sections are presented partially and not in sequence.

Furthermore, in order to capture the views of all families engaged in SBF, 3 group interviews (with 10 families of each rural district) and 1 focus group (with the representatives of all 30 families) were conducted. Moreover, semi-structured interviews were held with the representatives of the Regional Environmental Authority, the Ministry of Environment and Sustainable Development; an expert in Peace Negotiations from nongovernmental sector, and a former Mayor of Otanche. Appendix 1 summarizes the sources, employed methods and the type of obtained data. The fieldwork was finalized when participants' narratives started to become repetitive in light of previously gathered data and the point of saturation was reached during the second visit to the families (Ragin and Amoroso, 2011).

### *3.3.3. Data analysis*

Data analysis started with the preparation phase, which implied listening to the recordings, reading the field notes and summarizing and partially translating raw data. During this process single comments were assigned same importance as the narratives agreed by several participants as proposed by Fereday and Muir-Cochrane, 2006. Since not all data was transcribed, notes were made regarding the location of such comments in the recordings for enabling their quick identification at a later stage of the analysis.

Inspired by Fereday and Muir-Cochrane's (2006) work, thematic analysis was selected for data interpretation. Consequently, a thematic coding was employed which incorporated a hybrid approach of inductive and deductive coding (Ibid.). As a first step, descriptive coding was performed, following Saldana's (2013) recommendation for coding data obtained from multiple sources of ethnographic fieldwork. It proved to be useful for creating an initial inventory of data, and particularly for analyzing physical environments such as the participants' farms (Ibid.). Afterwards, sections of data were organized within the thematic

groups derived from the analytical framework. These included trust-building, cooperation, shared identity, sense of ownership, etc. Subsequent data interpretation was guided by these analytical themes, however, the codes that emerged from the participants' discussions and differed from the thematic ones, were paid equal attention and grouped under emerging categories, such as perverse social capital, issues affecting livelihoods, and hindering factors of SBF.

In accordance with the retroductive process, the images emerging from the data were analyzed in light of the analytical framework in an iterative manner (Ragin, 1994). The findings which were developed as a result of this process reveal the extent to which the case of Otanche community's transition of livelihood strategies fits within the theoretical perceptions on the peacebuilding potential of natural resources management. Additionally, several important aspects were derived, which can inform policies for post-conflict peacebuilding.

### **3.4. Presenting the area of study and participants**

Founded in 1960, Otanche Municipality is located in Boyacá Department, in the Eastern range of Colombian Andes (see Appendix 3). With 10 788 inhabitants, its total area of 512 km<sup>2</sup> is divided into urban part, occupying only 1 km<sup>2</sup>, and rural part comprising of 43 rural districts. Traditionally, municipality's economic activities have been emerald mining, agriculture and cattle-ranching. Vast part of Otanche is located within the Natural Reserve Las Quinchas, which holds fragile ecosystems of both tropical rainforest and sub-Andean cloud forest. Due to these environmental characteristics the area is of great importance for conservation and requires special regulations for natural resource management (Alcaldía de Otanche, 2016).

The participants of this research are 30 families, 10 from each of the following three rural districts (RDs): Buenos Aires (BA), Bolivar (BV), and Las Quinchas (LQ). The families have abandoned activities associated with deforestation and are currently engaged in sustainable butterfly farming (SBF), which provides income while conserving biodiversity and increasing environmental consciousness. SBF implies the cultivation of endemic species of butterflies, part of which is liberated and the rest is sold to a Bogota-based partner, Zoonatura. Habitat restoration of the liberated butterflies involves reforestation activities with native plants and trees, which not only transforms the farms of the participants but also has a small-scale impact on surrounding Natural Reserve.

While all families participated in the research through focus group and group interviews, only 6 (2 from each RDs) are considered as the principle sources of the gathered data. Each family comprises from 4-7 members and has titles for approximately 6-10h of land. Besides SBF, the livelihood strategies of these families are diversified according to the permitted activities and include the production (for self-consumption) of cocoa, coffee, fruits, plantain, cassava. Some of them also have chicken, guinea pigs and pigs; most men have a part-time job in a construction company; and at least one family member lives and works in nearby cities. Highest achieved education level among adult participants is high school, while the eldest participants (both men and women) have not attended school.

The case of Otanche was selected since it tells a story of a conflict-affected former coca-grower community that lives in a biodiverse rural area. In this sense it displays similarities with the prioritized municipalities for post-conflict (re)development. It already has gone through a local peacebuilding process and made a transition of livelihood strategies from coca-based to sustainable butterfly farming. Thus, analyzing the transition and the social and environmental impacts of current ways of natural resource management can contribute to drawing lessons for the upcoming post-conflict period.

### 3.5. Reliability and validity

According to Hesse-Biber and Leavy (2011), validity in qualitative research can be understood as a process of building up credibility throughout the entire research. Following this approach, a number of actions were taken in order to increase the validity of the findings. In the first place, the fieldwork was accurately documented using multiple means. Also, the second visit to the participant families was used as a space for clearing doubts from the previous visit and for sharing preliminary analysis and receiving feedback. Moreover, triangulation was employed as a tool for enhancing the validity of the findings (Ibid.). In particular, data triangulation consisted of comparison and combination of sources – among the families, families and representatives of environmental authority, peacebuilding expert, and participants and secondary sources such as legal documents and existing research; as well as different methods.

One of the main concerns of reliability in qualitative research is related to the issue of generalization (Hesse-Biber and Leavy, 2011). Even though, the findings of this research cannot be exactly replicated, they can signal what Karp (1997) labels as “underlying social forms” (Karp, 1997 as cited in Hesse-Biber and Leavy, 2011). These social forms, to an

extent, can be shared in similar social contexts of the prioritized municipalities for post-conflict (re)development in Colombia, and thus, can provide a moderate insight for peacebuilding policies. More importantly, the research allows analytical generalization in relation to the theory on the peacebuilding potential of natural resources, which can have a broader applicability than the single case of Otanche community.

### **3.6. Ethical considerations**

The principles of social research identified by Ragin and Amoroso (2011) guided the fieldwork. First of all, every participant took part in the research voluntarily and on the basis of a thorough explanation of the purpose and the procedures of the research. Moreover, given that the research involved minimal risk to the participants, verbal consent was obtained for indicating their family names in the list of the participant families (see Appendix 4). Nonetheless, direct quotes are not attributed to specific people in order to prevent any potential tensions among the community members or between them and local authorities. Taking into consideration the richness of gathered data, the issue of representation naturally arose. Decisions regarding the inclusion of data in the research were guided by the research questions in the most unbiased and undistorted manner possible.

## Chapter 4 - Analysis

### 4.1. Dynamics of natural resources exploitation in Western Boyacá

Before exploring the role that natural resources can play in peacebuilding, it is important to analyze their relation with Colombian internal armed conflict. Based on the authors supporting the *greed argument* (Collier and Hoeffler, 2000; 2004), FARC and AUC's interests in revenues from drug-trafficking and kidnappings can best explain the decades of violence in Colombia; while the advocates of grievances would claim that the emergence of FARC to fight against government's unjust agrarian policies and inequality is what caused the onset of the war (Arnson, 2003). The analysis of this multifaceted fifty-year conflict, during which greed and grievances generated and legitimized each other in a complex cycle, lies beyond the scope of this research. However, shedding light on the dynamics of natural resource exploitation in the region and its impact on local communities is essential for answering the research questions.

This chapter follows a timeline of main events and changes in policies (see Figure 2) that have impacted Otanche community's livelihoods through the introduction of changes in natural resource management. It starts with an analytical review of natural resource exploitation in Western Boyacá and links timber, emeralds and coca to the armed conflict (4.1.). In doing so, it contributes to answering SRQ1. The next section explains the emergence and the shortcomings of the peace process of the 1990s (4.2.), which is followed by the analysis of the impact of natural resource exploitation on the community's livelihoods, presented 5 livelihood assets (4.3.). Due to their importance for the research, social and natural capitals are analyzed thoroughly for the times of coca cultivation, while the other three capitals present a comparison during coca and SBF. Together these three sections provide answer to SRQ1. Consequent section (4.4.) examines the main factors and changes in policies that have influenced the transition of the community's livelihood strategies from coca to SBF and in doing so, answers SRQ2. It is followed by a thorough exploration of SBF as an alternative livelihood strategy which creates synergies for local peace and contributes most to answering the overarching research question (4.5.). Final two sections (4.6., 4.7.) analyze the impact of SBF on social capital and the environment and respond to SRQ3 and SRQ4, respectively.

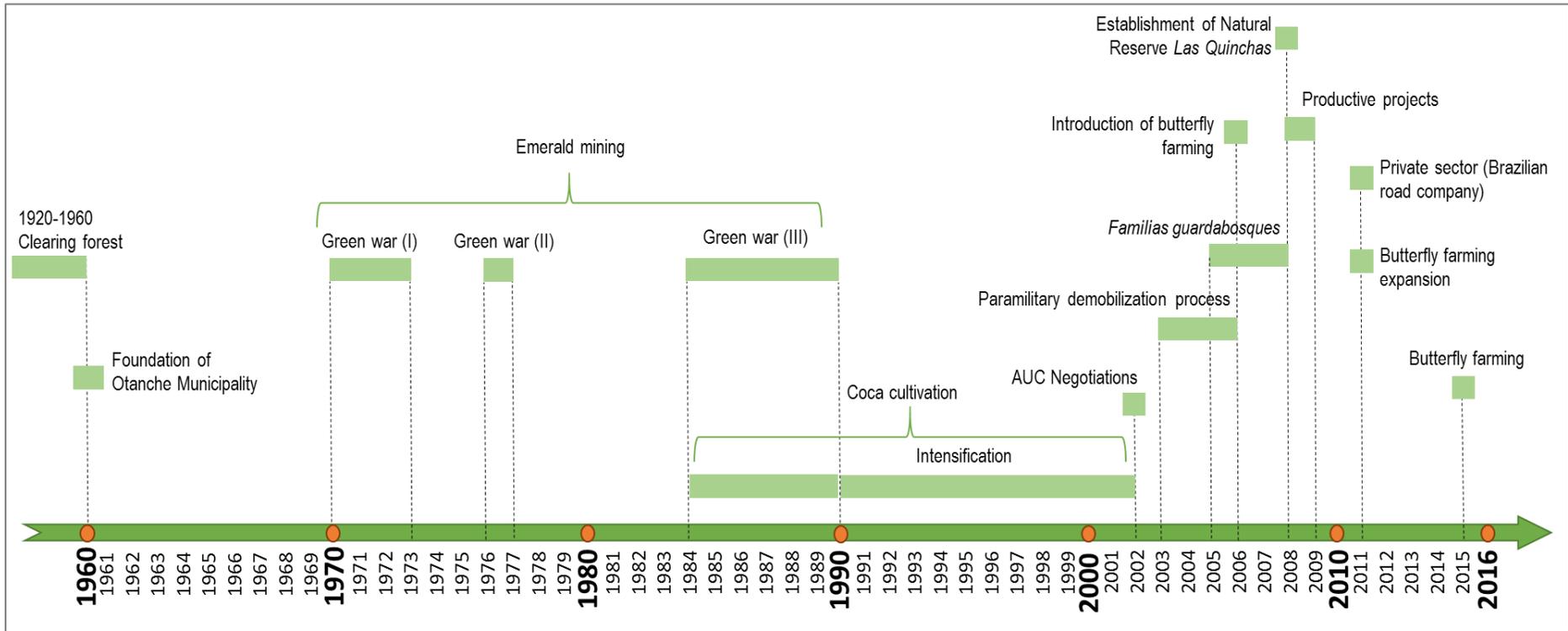


Figure 2 - Main events and changes in policies

In the early 1900s, when the current territory of Otanche was uninhabited and covered with forest, National Congress assigned its 100.000h to the Boyacá Department with the purpose of road construction. Incentivized by the upcoming land titling, peasants from the surrounding municipalities started arriving to the area with a sole mission of clearing as much forest as possible for the construction, in order to receive titles for a piece of forest in return. Land demarcation for the new municipality and corresponding land titling took place in 1960, when the municipality of Otanche was formally founded (Alcaldía de Otanche, 2016). The attitudes of peasants towards the forest is summarized in the words of a participant from LQ:

*“It was very simple, you would cut down 10 hectares of the forest for the construction, and later for coffee and cocoa plantations, and would receive 10 hectares for yourself on the other side of the forest. For our grandfathers, forest meant land and clearing it was a means of getting land.”*

Consequently, the first settlers of Otanche were mostly peasant families who brought to this area their ways of living and continued agricultural practices within their previous social relations. A participant from BV recalls:

*“When I was younger, I used to help my mother to cook for thirty men working in mingas<sup>2</sup> on each other’s land. In those times neighbors were working together, eating together, we used to share what we had.”*

These solidarity-base social relations started to shift with the intensification of emerald mining in the region in 1970s. While emerald extraction dates back to the original settlers of these territories<sup>3</sup>, for Otanche peasants mining with its associated income was something new. The prospect of fast and high economic returns encouraged many local peasants, especially the youth, to abandon crop cultivation and work in emerald mines. It also attracted thousands of people from different groups to migrate to the region (Castro, 2004). The newcomers with commercial mindset brought new social dynamics, an example of which is the emergence of social figures like *Patron*, who were privileged local community members with close ties to the mine-controlling families. They took decisions on who could work in the mines, and in the absence of wages, divided shares from extracted emeralds. In this sense, emerald mining introduced social marginalization based on occupational identities to the peasant communities who were already economically and politically marginalized due to the armed conflict (Ibid.)

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<sup>2</sup> Minga is an agricultural practice based on reciprocity during which community members work on each other’s lands.

<sup>3</sup> Indigenous Muzo - decedents of Caribbean family who lived on the territory of current Boyaca department and traded emeralds with Peru and Mexico before being completely exterminated by the Spanish conquerors.

The prospect of appropriation of emerald mine revenues, facilitated by the absence of state regulations, in Collier and Hoeffler's words (2000; 2004), served as an opportunity that facilitated the rebellion and resulted in greed-based conflict among several families with competing interests over the control of emerald mines. As a result, Otanche community went through three phases of so called Green War, the third phase of which was particularly violent due to its ties to drug-trafficking (Polo et al., 1996).

The eldest participants recalled their experiences from the third phase of green war and assigned the aggravation of violence to the arrival of paramilitary groups in the region. According to them, the mine-controlling families, besides having armed bands comprised of locals, often sought the protection of these paramilitaries and their "partners" from drug cartels. Green war deepened grievances as it further broke social ties and divided communities based on which mine-controlling family they belonged to. A participant from BV reflects:

*"Neighbors were turned into enemies, families were divided. If I worked for one family and my brother lived in a nearby municipality, we had to go on a six-hour drive to visit each other to avoid crossing a municipality controlled by a different mine-controlling family. Mobility was restricted, there were times when only women were allowed to pass through certain areas to buy food. Many were killed, many disappeared, you would not know who to trust."*

While the onset of green war can be attributed to the greed argument, in line with Murshed's (2006) argument, the appropriation of emerald revenues in the hands of few conflicting families did aggravate already existing inequalities among locals, and further marginalized peasants. Moreover, emeralds can be considered as lootable natural resources which are correlated with the duration of conflicts, since they fit within Varisco's (2010) characterization in the following manner: Firstly, in the midst of internal armed conflict Colombian government had no control over emerald mines. While not diffusive, emeralds were both lootable and distant given their easy extractability, low costs of entering the market, and their location in a rural area with almost no state presence; and lastly their extraction was artisanal. Thus, emeralds, in line with Bruch et al. (2015) and Varisco's (2010) argument, have contributed to the prolongation of green war and to a certain extent, to the internal armed conflict, since their revenues have provided financial incentives for mine-controlling families, their protector paramilitary groups and drug cartels, as well as their local bands.

## 4.2. Peace Process of 1990s

Despite their central role in green war, emeralds also opened a pathway to regional peace negotiations, in line with the authors advocating the peacebuilding potential of natural resources (Weinthal, 2004; Dabelko, 2006; Carius, 2006; Young and Goldman, 2015). When in 1990, Gabriel Parra<sup>4</sup>, supported by the church, initiated a dialogue with the conflicting families, emerald mining became an entry point for a local peacebuilding initiative while conflict at national level was reaching its peak (Brady et al., 2015). This is how Parra explains the process:

*“National government was so focused on fighting FARC that our region was completely abandoned, as if it never existed. There was so much corruption... Human rights were violated constantly – no right to health, to education, restriction of mobility, kidnappings, threats, disappearances, deaths... we had to do something ourselves, so we invited everyone involved in emerald mining, everyone without exception, and talked until all agreed on signing the peace agreement.”*

Inclusion of all involved actors emphasized in Parra’s interview, is perhaps what determined the success of the peace process and resulted in an agreement which ended the Green War. Among others, peace agreement included points on cease of fire, dismissal of armed bands, regulation of mining through addressing legal rights, opening access to all stakeholders, and adoption of wages (Gutierrez and Baron, 2008). According to Parra, conflicting families were committed to the agreement; however, national government’s compromise of delivering social development as the final point of the peace agreement remained unfulfilled.

Disregarding the importance of bringing development to the region soon posed a new and even stronger threat to local peacebuilding. In Parra’s words:

*“Regulation of emerald mining resulted in a significant decrease of the production, leaving thousands of workers unemployed. Many of them had already abandoned crop cultivation and in the absence of government’s support were left without livelihood options. Without livelihood security and community wellbeing there cannot be a durable peace. It is not surprising that after signing the peace agreement coca cultivation intensified in the region.”*

Otanche community’s increased coca cultivation fits within the Young and Goldman, (2015) and Jaramillo and Stork’s (2015) argument regarding the vulnerability of conflict-affected communities to engage in illegal ways of earning a living that have destructive outcomes for the environment and further deepen social inequalities. In the midst of internal armed conflict, the lack of the state presence and the rule of law provided a suitable ground for

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<sup>4</sup> Gabriel Parra, the first elected Mayor of Otanche, is currently the president of ASOPAZ - the peace and development program of Western Boyaca. ASOPAZ is one of the 25 members of REDPRODEPAZ – Network of Regional Peace and Development Programs of Colombia, which is present in 585 municipalities and is dedicated to peacebuilding through local and regional initiatives.

illegal groups to engage local communities, left without livelihood options, in coca cultivation. In Varisco's (2010) classification, coca crops are lootable (agricultural production with low costs and guaranteed market), distant (weak state presence in the rural region), and diffusive (cultivation in vast forest). Thus, they played a significant role in the prolongation of conflict through providing considerably higher funds than emeralds, to paramilitaries, FARC and a number of involved politicians, to an extent that coca is often referred to as "war fuel" (Gutierrez and Baron, 2008). The analysis now continues with the section 4.3, which discusses the impact of natural resource exploitation on the community's livelihood assets

### 4.3. Otanche community's livelihood assets

The analysis of data contrasting livelihood assets during coca cultivation and current butterfly farming revealed differences among the families in the three rural districts based on their location in relation to the forest, and according to the degree to which their livelihood strategy was dependent on coca. The families from Las Quinchas, being located inside the natural reserve, depended equally on timber and coca for livelihoods. The Bolivar families complemented coca with timber but still cultivated some subsistence crops. Lastly, families in Buenos Aires, located furthest from the forest, had a heavier dependency on coca cultivation. This section now runs through the livelihood assets of the participants comparing financial, physical and human capitals from coca period to SBF. Social and Natural capitals are analyzed in more detail only during coca cultivation, enabling their comparison with SBF's impact on social capital and the environment later in this chapter.

#### 4.3.1. *Financial Capital*

Families in all three RDs indicated higher access to financial capital, explaining that coca cultivation did not only provide them with income but it generated an entire economy around it. For example, those who cultivated coca on their own land hired labor. Moreover, there was more commerce and financial exchange both within the RDs and between rural and urban parts of the region. As a participant from BV reflects:

*"We had money for our families and for paying workers; we used to go to urban Otanche and buy food, clothes, drinks, things for our wives and children".*

Even though men and women were equally involved in coca cultivation, participants referred to male control of income from coca:

*"Payments were good in general; sometimes high enough to spend a weekend in another place, but this meant you had to leave your family alone, unprotected and that was dangerous" (Ibid.).*

Another source providing income and employment for local communities was turning forest into timber. Better-off households dominated the cutting down of trees. They hired labor for assisting the cutting process and for transporting the timber by mules. The timber trade, attracting large buyer companies from Bogota, had spill-over effects on the local economy. A participant from LQ contrasts this with current situation:

*“Many people have left our district after the prohibition of the timber trade. I used to run a small restaurant but now it does not make sense anymore, only 26 families remain.”*

Due to these two main activities, access to financial capital in terms of income, savings and liquid assets was higher during coca cultivation compared to SBF. However, based on the character of the activity, communities were excluded from financial services; and it was not until eradication of coca that they obtained access to credit and private sector funding.

#### **4.3.2. Physical Capital**

All participant families agreed that access to physical capital was lower during coca cultivation compared to the present-day. Due to the absence of paved roads during heavy rains it was impossible to use them; there was no public transport; no aqueduct or sanitation services, and no electricity, which further limited communication. The only producer goods they had access to, were chemicals for processing coca leaves into paste, which they bought from the paramilitary groups. It must be noted that while the condition of tertiary roads communicating families within RDs remains poor, the main and secondary roads connecting Otanche with other municipalities are being paved and maintained. All RDs count with public transportation (though scarce and costly), sanitation services and electricity. Aqueduct, however, is still lacking and no significant improvement in owning technology was observed.

#### **4.3.3. Human Capital**

The families rated access to human capital considerably lower in coca times compared to SBF. While education level of adult participants did not vary, there was an increase in the extension services for cultivation and training regarding human rights. However, according to the participants this is far from being sufficient. Perhaps a more significant improvement in access to human capital was reflected in relation to health. In a participant's words from BA:

*“There was no control over the use of chemicals for processing coca, everyone applied them as they wished. There was a water source in my farm, it used to wash down all the chemicals and affect even those neighbors who were not cultivating. Disposing chemical waste in holes in the ground also made us and our children breathe those chemicals. We had an increase in diseases: rheumatism, constant headaches, nausea. We are free from all that now.”*

#### 4.3.4. *Social Capital*

Analysis demonstrated that Bolivar families' answers differed from the other two RDs. Here, the participants recalled living without major conflicts between neighbors. The community members were organized based on the paramilitary group they were cultivating for. They often worked together in mingas, shared certain common rules regarding the cultivation process, and had accepted shared mechanisms through which they bought chemicals and sold coca to the paramilitaries.

In this sense, the Bolivar families' engagement in coca cultivation, built on social ties within their RD, displayed considerable social capital, which contradicts the generally accepted view relating a community's engagement in crime and illegal activity to the absence of social capital (Buonanno, Montolio, Vanin, (2009). However, their participation in a coca producer group was far from being voluntary; it was primarily based on fear and caused by the lack of alternative livelihood options, as argued by Pretty and Smith (2003); and Jaramillo and Stork (2015). The Bolivar families represented a small part of what Rubio (1997) calls perverse social capital, accumulated within drug network of the paramilitaries and drug cartels. By channeling existing social networks of the Bolivar families, they not only diminished the costs of criminal activity, but also motivated young community members to succeed in illegal "career" (Ibid., Lederman, Loayza, and Menendez, 2002).

While the cooperation of few families within Bolivar can be associated to a larger perverse social capital of drug-network, all participants agreed, that broader social ties among communities of different RDs were broken by the violence in the region. The productive social capital was consequently eroded in line with Lederman, Loayza, and Menendez's (2002) argument. This was reflected in social interactions of the community members. A participant from BA recalls:

*"If I sold to a different paramilitary group and my neighbor found out and denounced, my entire family would be in serious trouble. So with time we stopped talking to our neighbors because we did not trust each other anymore."*

In the absence of the rule of law, paramilitaries served as the only conflict resolution mechanism among families. However, they favored those who cultivated for them. This in turn, resulted in more confrontation and division of the community members. Minimizing communication with neighbors due to the breakdown of trust, decreased social interactions and mobility across RDs. The Families became more isolated within their own RDs,

however, soon conflicts occurred even there and often, inside the families. A participant from BV explains:

*“Families started to disintegrate; brothers were fighting over land, each one wanted to control cultivation and have more power by being close to the paramilitaries, often at an expense of denouncing others.”*

To conclude, while perverse social capital was employed to facilitate coca cultivation of Bolivar families as a producer group, productive social capital decreased significantly across wider rural communities of Otanche. The participants explicitly recalled the breakdown of trust, constant feeling of insecurity and fear both of paramilitaries and of being caught by the national army. Finally, conflict and violence in the region also affected the identity of families: A participant from BA best sums up this section:

*“Yes, we had more money but we also had the name of criminals who had to live in fear.”*

#### **4.3.5. Natural Capital**

Higher access to natural capital during coca times is communicated best by a participant from LQ:

*“Nobody controlled our access to the natural resource; both land and forest resources were free. Because of that we almost lost the forest and now, with the establishment of the reserve everything has changed, our agricultural practices are restricted.”*

Since all the participants hold land titles, they used to cultivate coca within their farms, but this was only a small piece of the picture; hundreds of landless workers hired by the paramilitaries to clear large portions of the forest for coca crops were arriving each year. The forest was under double pressure – on one hand, it was cleared for coca, leaving behind abandoned chunks due to the decreased fertility; and on the other hand, it was turned into timber. High rates of deforestation were reflected in the habitat destruction and its consequent biodiversity loss. A Participant from BV recalls:

*“This mountain (pointing at a mountain with few bushes) was completely covered by forest. In my childhood, I used to see Andean bears and even ocelots. My children don’t know what ocelots look like. My grandchildren have not seen even half of the birds that used to come here. With the increase of cutting, animals moved further out of the forest, making it easier to hunt them. Most of native plants, their insects and butterflies were lost during coca years.”*

Deforestation was not the only damage to the environment; equally negative impact was caused by the chemicals used for processing raw coca leaves. Their unregulated application, and more importantly, the absence of chemical waste management reflected in discarding

chemical waste in water sources had devastating impact on the quality of water and the life it contained.

#### 4.4. Natural Resources as entry points for local peace

After a decade of intense coca cultivation in the region, when national government's fight against FARC was reaching its peak, natural resources, this time coca crops, once again served as entry points for local peace initiative (Brady et al., 2015). The first step that prepared ground for Otanche community's transition of livelihood strategies was President Uribe's negotiations with AUC. The four-year process resulted in the demobilization of more than 32,000 paramilitaries (USOC, 2008). However, the process was largely criticized for being too tolerant and incomplete, since not all paramilitary groups demobilized and many who did, continued coca-related activities from prison (Ibid).

Despite these challenges, in the early 2000s, the Colombian government reached out to the rural communities of Otanche for the first time. In line with the argument of environmental peacebuilding scholars, the shared interest in coca eradication and the consequent improvement of the quality of life served as a platform for the cooperation among the national government and the communities. When in 2005, the government introduced the *Forest Warden Families Program (FWFP)* as an innovative strategy for Alternative Development, it initiated a dialogue which enhanced the interaction between the government and the communities, leading to the transformation of the accumulated mistrust. The program targeted the families engaged in coca cultivation in strategic ecosystems and offered monthly payments for a three-year-period in the exchange for voluntary manual eradication (UNODC, 2016a). All the participant families took part in the program and here is how one of them recounts the process:

*“Forest Warden Families was a big change. It was difficult in the beginning because during coca we were buying all our food, and after the eradication we had to relearn to cultivate plantain and cassava; and money was not the same as what we used to get from coca, but we stopped living in fear, we started talking with our neighbors again, and above all, we were not called criminals anymore, we were the protectors of the forest.”*

FWFP was followed by another alternative development strategy - the Productive Projects Program (PPP) (UNODC, 2016b). Based on families' choice, PPP supported the production of coffee, cocoa, plantain, and livestock. It also aimed to strengthen the value chains and to address the processing and commercialization process (ibid.). However, the participants

claim that the extension services for the production were insufficient and the plan for processing and commercialization was never delivered. This has been reflected in an inefficient production of coffee and cocoa which are being affected by various bio-physical factors that the participants have no means to improve. Furthermore, the families have been encouraged to take credit for expanding their PPPs, which has led to frustrating outcomes. In a participant's words from LQ:

*“We took the credit for coffee six years ago and are still struggling to pay the interest. Our coffee plants are attacked by pest and diseases, the leaves turn yellow and die. The production is decreased each time and the prices we receive in the market are low because everybody here is selling coffee.”*

Another Participant from BV says:

*“The roads leading to the highway are in terrible conditions, transport cannot pass here, so we need to walk and carry our production for 2 hours to reach the highway and then take it to the market. Before, you could carry 3 kilos of coca leaves in your pockets, it would not ruin and you would earn more than in months with plantain. Even if we manage to take it to the market, we almost have to give it for free because it will get ruined if not sold immediately”.*

Based on the narratives of the participants, it can be argued that while addressing the natural resource management issue opened a dialogue between the government and the community, not delivering the agreed terms put government's credibility under question. Another important interaction between the government and the community, which influenced the livelihood strategies took place in 2008, when the local environmental authority CORPOBOYACA<sup>5</sup> established the Natural Reserve Las Quinchas. Once again, the local environmental authority reached out to the community members in an attempt to engage them in a cooperation for conserving the forest. Heavy deforestation issue was a point of departure for negotiating restricted activities in the influence zone of the reserve and for including the community in the decision-making process that impacted their livelihoods.

The issue of deforestation and the meetings organized for finding solutions were good starting points for restoring credibility between CORPOBOYACA and the community, as argued by Craig, (2013). However, the participants identified several hindering aspects: the foundation of the reserve limited their livelihood options by imposing restrictions not only on the access to the forest resources, but also on the cultivation on their own land. While the participants were committed to the fulfilment of newly established regulations,

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<sup>5</sup> CORPOBOYACA is the regional environmental authority, responsible for the protection and management of the natural resources of Boyaca Department.

CORPOBOYACA did not offer alternatives besides the occasional payments for the reforestation activities and several purchases of property in the strategic parts of the reserve. In the interviews, the representatives of CORPOBOYACA's division of ecosystems and environmental management have also named various challenges. The most important ones concerned the lack of funds, the dependency on the national regulations that limit local environmental authority's decision-making power and the lack of continuity in the contracts of public servants. One of the representatives reflects:

*"First of all, there is no continuity in the processes, whatever cannot be finished within one administration remains unfulfilled, since the next administration always introduces something new. Furthermore, there is an incompatibility between national and regional regulations. For example, we, at the regional level, restrict peasants' agricultural activities in the influence zone of the reserve while Ecopetrol and TGI<sup>6</sup> get licenses from national government to place their tubes in the strategic parts of the reserve. This generates the feeling of injustice and mistrust in the community towards us."*

Overall, analysis reveals that natural resources have indeed been employed as a source for the initiation of a dialogue between the governmental institutions and the previously excluded community. As a result, a number of important positive changes have occurred in relation to the livelihood strategies of Otanche community. However, it is also apparent that the shortcomings discussed above, can pose threats to the maintenance of these achievements. The community members' participation in the reserve management can be classified as *consultative* based on Pretty and Smith's (2003) definition, since they provide insights in monthly meetings with CORPOBOYACA but have no decision-making power. Under such circumstances, as argued by these authors, the community members' behavior can change under the control of CORPOBOYACA, but their attitude will remain the same. This is confirmed by the participants' narratives from the three RDs, claiming that they stopped cutting trees after the reserve was established because the fines were introduced, but they still perceived the forest as timber – their tradition source of income. The following sections explore another entry point to local peace through sustainable butterfly farming and new ways of natural resource management associated with it.

#### **4.5. Butterfly farming for Sustainable Livelihoods**

In parallel to the governmental alternative development programs, a small private initiative of sustainable butterfly farming was introduced to Otanche community as an alternative for the substitution of illicit crops and the forest clearing. SBF aimed to contribute to the

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<sup>6</sup> Transportadora de Gas Internacional provides natural gas transportation services in Colombia.

reforestation of NRLQ through habitat-restoration of almost extinct native butterfly species, and in doing so, increase environmental awareness and generate alternative income for the conflict-affected families. Initially it only involved few families from Buenos Aires, but over years more families from Bolivar and Las Quinchas joined, and currently SBF is a leading livelihood strategy for the majority of the 30 involved families.

SBF largely contributes to the establishment of sustainable livelihoods and reveals elements of both social and environmental dimensions from (Chambers and Conway's (1991) definition. Social sustainability can be attributed to SBF's contribution to the enhancement of social capital – a building block for community resilience (discusses in section 4.6.), while environmental sustainability is reflected in the positive changes in natural resource management associated with SBF (discusses in section 4.7.). By combining social and environmental dimensions, SBF in line with Tidball and Krasny's (2013) argument, contributes to the restoration of social fabric in the conflict-affected community and creates synergies for social-ecological resilience.

Analysis identified the following features of SBF as most contributive to the improvement of the quality of life – one of the most desired livelihood outcome by the participants. The first one refers to the low production costs of SBF. Butterfly pavilions can be constructed from locally available materials following a simple structure. After the initial instalments are made, the production costs are diminished to the minimum since almost no production goods or tools are needed. Additionally, unlike in the case of raising cattle, pigs or chicken, there is no need of buying the feed, as butterflies consume the leaves of the native plants and trees planted as part of the SBF.

Furthermore, SBF is not very time-consuming, which makes it convenient to combine with other livelihood strategies. While both men and women are involved in SBF, its low labor intensity facilitates women's engagement, who are often assisted by their children. Children's participation in SBF-related activities influences their ecological literacy through broadening their understanding of the importance of the forest and its resources. Another group that highlighted the importance of low labor intensity of SBF consists of the elderly participants who are unable to conduct hard physical work required for coffee and cocoa cultivation. Similarly, participants with special needs emphasize how, unlike other alternative

development initiatives, SBF gives them an opportunity to have their own income, which on average varies from 200.000 to 400,000COP depending on the production<sup>7</sup>.

Restoring the livelihoods of conflict-affected communities and providing an alternative source of income are the primary elements emphasized by the scholars who advocate the contributing role of natural resources to peacebuilding (UNEP, 2009; Young and Goldman, 2015; Jaramillo and Stork, 2015). In line with this argument, SBF offers a feasible livelihood strategy with reliable income as an alternative to illicit crop cultivation. This in turn diminishes the participants' need to get engaged in illegal ways of earning a living associated with illegal armed groups. Through its contribution to the establishment of sustainable livelihoods, SBF increases the participants' support to peacebuilding since now they have more to lose from war. Moreover, the ways in which natural resources are managed under SBF contribute to their long-term sustainability and in doing so, decrease the risks of the emergence of new resource-related conflicts.

The previous sections discussed two main points: Firstly, how the shared interest in addressing natural resource-related issues established a platform for cooperation between the government and Otanche community; and secondly, how SBF as an alternative livelihood strategy to illicit crops has contributed to the establishment of sustainable livelihoods for the participant families. Consequently, the next section reviews the impact of SBF and its associated ways of natural resource management on social capital.

#### **4.6. Effect of sustainable butterfly farming on social capital**

SBF built on the newly reestablished interaction among the families that came with the governmental alternative development programs. Through repetitively bringing the participants from different RDs to the meetings and engaging them in cooperative actions related to butterfly production, SBF opened an opportunity to transform insecurities among the divided members of the community (Conca, 2002; UNEP, 2009). Claiming direct causality between the community's engagement in SBF and trust-building would be inaccurate, especially keeping in mind the complexity of measuring trust and the time required for its formation. However, it is important to recognize SBF's role in intensifying communication and encouraging cooperation among the families, which over time leads to trust-building – the first aspect of social capital in Pretty and Ward's (2001) definition. Elements of trust, revealed through retrospective questions, indicate that now there is

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<sup>7</sup> Minimal wage in Colombia is 644,000 COP (2015).

considerably more feeling of security and transformed relations among community members.

A Participant from BA explains:

*“When we started butterfly farming we had to go to each other’s farms to see other participant families’ instalments. Before that I had not been in Las Quinchas... In these meetings we did not only learn about production process but we got to know our neighbors. We realized we are not so different and there is no reason to avoid each other; now we sleep without locking the doors and know that nothing will happen.”*

Transformed relations among neighbors, in turn have influenced the second aspect of social capital. While reciprocity and exchange remain scarce among the three RDs, SBF is contributing to their reestablishment within the districts. Knowledge regarding butterfly breeding and their respective plants is the main exchangeable among the families. It often serves as a reason for the neighbors to meet and discuss their challenges and achievements in the production process. These meetings in certain occasions lead to joint work sessions, butterfly and pupae exchange, and occasionally, seed exchange. The participants’ explanation for the lack of reciprocity and exchange beyond SBF fits within Pretty and Smith’s (2003) argument on modern agricultural policies prioritizing individuals over communities, and resulting in unfavorable outcomes for the environment. As a Participant from LQ reflects:

*“All the families were offered different productive projects from the government. Some have coffee, cocoa, others cattle, and the work is not the same. Apart from butterflies it is difficult to do something together.”*

Perhaps the most important prevalence of SBF’s impact on social capital is reflected in the aspect of connectedness, networks and groups. Years of SBF have led to the foundation of the Butterfly Association – the Privilege of Otanche, ASOMAPRIO. The main reason of becoming the founding members of ASOMAPRIO, according to the participants, lies in their objective to have a stronger voice in the process of SBF and further improve the quality of life by becoming independent butterfly farmers of Otanche instead of being Zoonatura’s partners. Besides the practical short-term goals of negotiating prices with Zoonatura, and obtaining technical support for improving and expanding production, ASOMAPRIO members’ future plans include having a registered trademark, processing butterflies into crafts, and obtaining an added value to their activity.

Since ASOMAPRIO members have mobilized based on the shared interest in improved livelihood and biodiversity outcomes, their action can be attributed to *bonding* social capital (Pretty and Smith, 2003). Although the elements of *bridging social capital* are absent, vertical links in terms of *linking social capital* to external groups of the community have been established on several occasions. For example, the association has already facilitated

obtaining funds for expanding butterfly production from the corporate social responsibility of a Brazilian road construction company. It has also served as a legal instrument for holding the local environmental authority accountable in its decisions regarding the reserve management. However, beyond SBF, the participants do not recall achieving significant outcomes in relation to their collective claims to the mayor's office regarding general issues of the community. Moreover, the association members lack both governmental and NGO support for accessing the necessary training for fulfilling their long-term plans.

Lastly, SBF and ASOMAPRIO membership have significantly reinforced the shared rules regarding butterfly production and conservation of the forest resources. This is particularly evident through the community's efforts in habitat restoration discussed in section 4.7. Common rules are respected and monitored by the community members and primarily consist of monthly liberalization of the 10% of butterflies and planting 20 trees or native plants for each cultivated species. Since these rules are not externally imposed, putting them to practice influences not only the families' behavior in relation to cutting trees, but also their attitudes towards the forest. The transformation of the attitudes points towards the formation of a new shared identity, which is best communicated in a participant's words from BV:

*"We are butterfly farmers now; we are conserving the forest for future generations and we are proud of it."*

The research demonstrated that the community-based habitat restoration that comes with SBF indeed encourages the formation of certain amount of emotional commitment or the sense of ownership as argued by Leigh (2005). This was observed mostly in younger participants and their children, who often take part in butterfly farming. The participants' children show extensive knowledge of butterfly species, their life cycles and respective plants. As a participant from LQ puts it:

*"I learned from my father that forest was timber, but I want my children to grow in a healthy environment and to learn about the importance of the forest. I planted these trees when my daughter was born, if I cut them down now she will not understand why I did it."*

The attitudes of the participants' children towards the forest differs from their parents' and even more so from their grandparents. While claiming that none of the participant families will clear the forest in future will be inaccurate, it has to be acknowledged, that after planting and taking care of native trees, they are less likely to do so. The following section addresses the final research question.

#### 4.7. Effect of sustainable butterfly farming on the environment

Relation between natural resource management and social capital runs both ways according to Young and Goldman, (2015). Having already discussed the impact of SBF on social capital, the following section supports this argument and demonstrates how social capital in turn influences biodiversity outcomes in Otanche community.

Perhaps the most important influence of SBF on the environment is reflected in the abandonment of clearing the forest by the participants. Furthermore, an important part of SBF involves habitat restoration of endangered butterfly species, such as *morpho peleides*. Given that each species feeds on diverse plants or tree leaves during different stages of life, habitat restoration includes planting and looking after a number of respective trees. Among these is *bauhinia forficata*, commonly known as *pata de vaca*, which, despite its important medical properties of blood sugar stabilization and curing snake bites, was almost lost before the introduction of SBF. Although, the participants are responsible to plant and maintain 20 trees for each cultivated species<sup>8</sup>, this number is considerably higher since most native trees grow over 9 meters, making it impossible to hang pupae nets for feeding or to collect eggs from the leaves. Thus, each time a tree reaches this height the participants plant another.

Habitat restoration takes place in the participants' farms and the surrounding areas. However, since these farms are located in the influence zone of the natural reserve, it can be claimed that the participant families, though on a small scale, contribute to the improvement of biodiversity outcomes at all three levels discussed in Pretty and Smith's (2003) work (on farms, nearby landscape, and protected areas). Besides reforestation, SBF has established new ways of natural resource management, primarily reflected in the changes in land use, adopting agroforestry practices and protecting water sources through limiting harmful practices such as the application of chemicals and cattle ranching. This has visible positive impact on the agrobiodiversity at the farm level. The families recall that before SBF their farms were paddocks without a single tree and now one can observe how each participant's farm looks like a "mini jungle." This is how a participant from BA describes the change:

*"10 years ago you could see this farm from 10km. Now, from the road, you cannot even realize there is a farm or a house down here. It looks like another part of the forest."*

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<sup>8</sup> Besides Morpho Peleides, butterfly species include Caligo, Morpho Cypris, Prepona, Laparus Doris, Heliconius, Heliconius Hecale.

To sum up, this chapter has demonstrated the central role of natural resources for the livelihoods of Otanche community both during coca cultivation and the present-day SBF. In the years of violence, perverse social capital dominated, while productive social capital was depleted and had destructive impact on the environment through unsustainable use of natural resources. Despite having more income, social interaction among neighbors, relations of trust and collective actions were absent. Analysis also shed light on how emeralds, coca and timber, besides conflicts, generated processes with a peacebuilding potential, such as bringing together the divided community, the encouragement of a dialogue and the inclusion of the community in social policy for the first time. Furthermore, the chapter discussed SBF as a new livelihood strategy and revealed its contribution to peacebuilding through SBF's role in the establishment of sustainable livelihoods for the community, its impact of the enhancement of social capital and lastly, the effect of the new ways of natural resource management on the environment.

## Chapter 5 - Conclusion

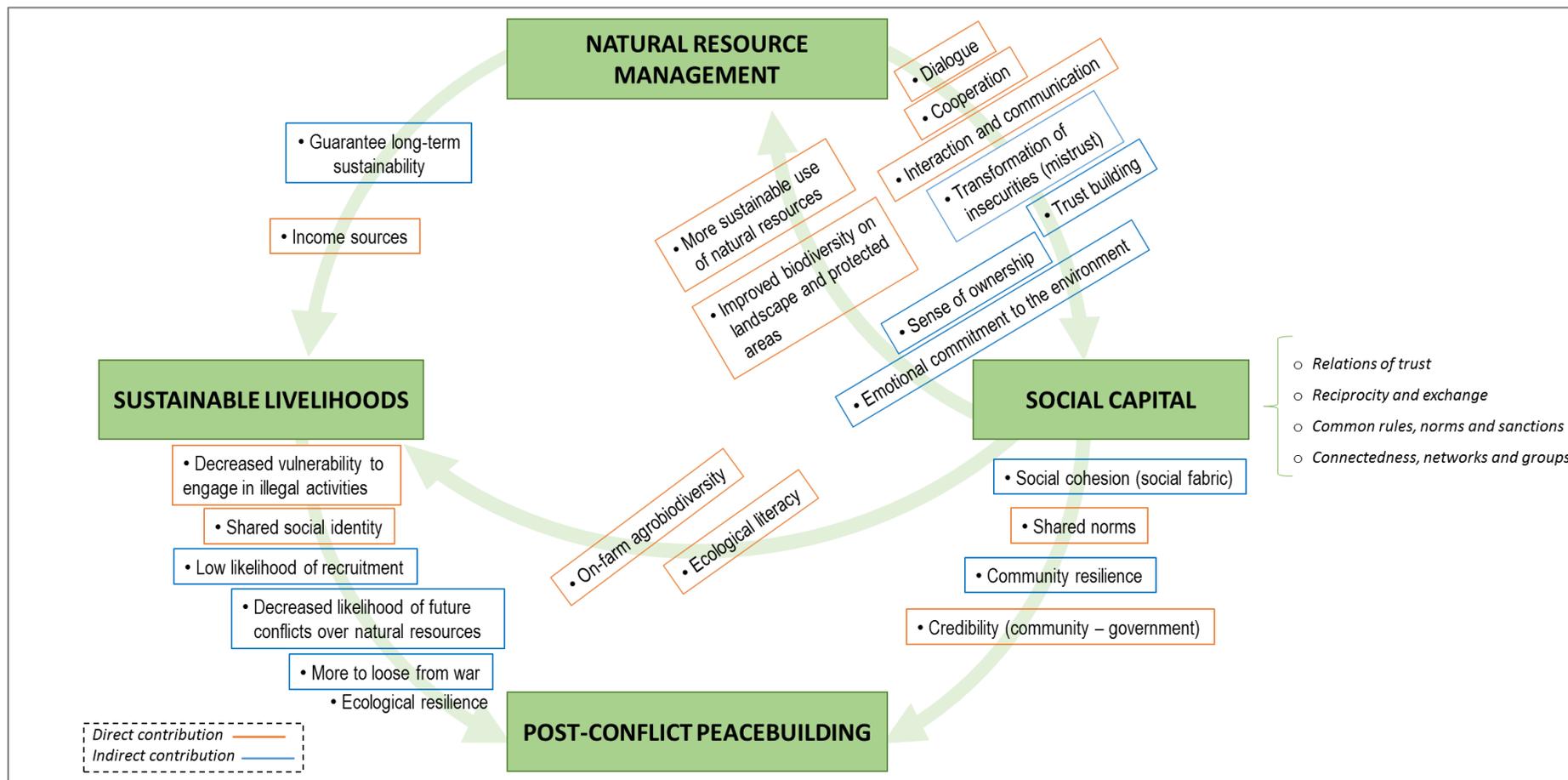
### 5.1. Concluding remarks

This research analyzed the case of Otanche community's transition from livelihood strategies based on coca to sustainable butterfly farming in an attempt to capture the peacebuilding potential of natural resources. By examining the dynamics of natural resource exploitation and its impact on the community's livelihoods, it demonstrated the presence of social capital eroded by violence and conflict, and its effects on the destructive environmental practices. Consequently, through the review of the main events and changes in policies, the research shed light on the factors that influenced the transition. In doing so, it found that natural resources on multiple occasions had been employed as entry points for local peace since they had generated a dialogue and cooperation both among community members and between them and the government. On the other hand, it identified the shortcomings associated with this cooperation that can pose risks to the emerging relations of trust and credibility among government and the conflict-affected community. Lastly, the research analyzed sustainable butterfly farming as an alternative livelihood strategy, as well as its impact on social capital and environment. By doing this, it demonstrated the elements through which SBF creates synergies for peacebuilding. These elements are brought together in Figure 3.

The findings, derived from the analysis of this case support several main claims of the environmental peacebuilding scholars. The first one is related to the emergence of local peacebuilding initiatives before reaching a peace agreement at a national level. The need to address natural resource-related issues, such as emerald mining, illicit crop cultivation and deforestation, presented opportunities for initiating a dialogue for finding solutions during an on-going conflict. Moreover, a shared interest in resolving these issues enhanced interaction and communication among the community members, as well as between them and the different levels of the government, preparing ground for restoring credibility and transforming accumulated mistrust.

The findings from the analysis of SBF *per se*, also endorse the literature on the peacebuilding potential of natural resources. The ways in which natural resources are managed under SBF create synergies for post-conflict peacebuilding through enhancing social capital by their direct contribution to the establishment of reciprocity and exchange among community members; the formation of shared rules and norms; and the encouragement of the emergence of social groups, networks and their cooperation. These serve as building blocks for

constructing relations of trust, restoring social fabric and increase community resilience. The findings regarding the reforestation aspect of SBF, particularly among younger participants, also support the arguments on habitat restoration's effects on the development of emotional commitment and the sense of ownership to the environment. In turn, social capital's contribution to a more sustainable use of natural resources has been reflected in the community's increased ecological literacy, in the abandonment of cutting down the forest, and in the significant enhancement of on-farm biodiversity. Improved natural resource management contributes to the long-term sustainability of the resource base, which decreases the risks of the emergence of new resource-related conflicts. Above all, SBF creates synergies for post-conflict peacebuilding through its direct contribution to the establishment of sustainable livelihoods for the conflict-affected community. By providing alternative income sources to illicit crop cultivation, it decreases the vulnerability of the community members to get engaged in illegal activities associated with the armed groups. Finally, it encourages the formation of a shared social identity of butterfly farmers of Otanche. Similarly to a growing number of field-based studies in environmental peacebuilding, this case endorses the theoretical perspectives on the peacebuilding potential of natural resources. Moreover, it demonstrates several practical aspects that can inform post-conflict peacebuilding policies, which are briefly discussed in the following section.



**Figure 3 – Illustration of findings on the analytical scheme**

## 5.2. Policy implications

More than 90% of the prioritized municipalities for post-conflict (re)development, due to their biophysical characteristics, constitute areas under some form of environmental protection or regulation of natural resource use (UNDP, 2014). This highlights the importance of the environmental aspect of Colombia's peacebuilding and requires particular consideration of the implementation of Rural Reform as a peace term. According to an official from the Ministry of Environment and Sustainable Development, in the post-conflict period most issues will be of an environmental character instead of social. Thus, the development programs that will be brought to the prioritized municipalities, in many cases as alternatives to coca cultivation, will influence the sustainability of peace in Colombia. Several general considerations have to be taken into account prior to the design of these development programs. Firstly, a transparent assessment of the state and the capacity of natural resources has to be conducted in order to minimize the risk of the emergence of new resource-related conflicts. Similarly, impartial strategies for their extraction have to be developed together with the adoption of clear regulations regarding permitted activities, legal rights, access, permits and licenses.

The case of Otanche community's livelihood strategy transition has revealed the following challenges associated with the substitution of coca cultivation by alternative productive projects:

- Local community's consultative participation in the development plans;
- Low awareness of legal mechanisms and rights;
- Conflicting environmental regulations on regional and national;
- Impositions of restrictions on traditional activities without offering sustainable alternatives;
- The lack of adequate infrastructure, and most importantly, the absence of commercialization strategies and guaranteed markets.

In order to ensure that alternative development programs in the post-conflict period are sustainable and at the same time contribute to the improvement of the quality of life of conflict-affected communities, the participation of local communities has to go beyond consultation and the government has to ensure their active engagement in the design and implementation of the interventions. Moreover, keeping environmental sustainability at the core of the programs, the government has to build on local interests and capacities, and

support initiatives with a peacebuilding potential, similar to sustainable butterfly farming, which already exist but need to be strengthened.

Lastly, efficient commercialization strategies have to be developed, which will add value to the products of the conflict-affected communities based on social and environmental certification. However, as emphasized by Gonzalo Murillo in an interview, alternative development programs can be sustainable and genuinely contributive to peacebuilding, if social sustainability is ensured. In this sense, it is of utmost importance to strengthen public entities, to increase their awareness of rights and legal mechanisms, to invest in local conflict-resolution mechanisms and in doing so, to reconstruct the social fabric.

### 5.3. Limitations and further research

This section discusses the main limitations of the research and outlines several suggestions for further research. The first limitation is related to the absence of an opportunity to engage families from the neighboring rural districts in the research. Documenting the perceptions of those families who are not engaged in sustainable butterfly farming would have been valuable for identifying how, if at all, their views differ from the narratives of the participants. Another shortcoming was caused due to insufficient time and resources for employing quantitative methods as a complementary means for enriching the data. The use of quantitative methods would have reinforced the findings by establishing the relation among main variables, such as changes in natural resource management and the increase in trust.

Furthermore, the research found that in contrast to coca cultivation, during which men and women worked equally but the income was mainly controlled by men, SBF is predominantly women-led. It provides income for women participants and perhaps more importantly, increases their decision-making role in natural resource use. However, due to the scope of the research, it was not possible to explore this aspect in more detail. Further research on the relationship between women and natural resources in post-conflict settings, can add to the understanding on how natural resource management increases women's participation in peacebuilding processes. Exploring this relation can be particularly valuable given the increasing recognition of women's potential to contribute to peacebuilding outcomes (UNEP, UN Women, PBSO & UNDP, 2013).

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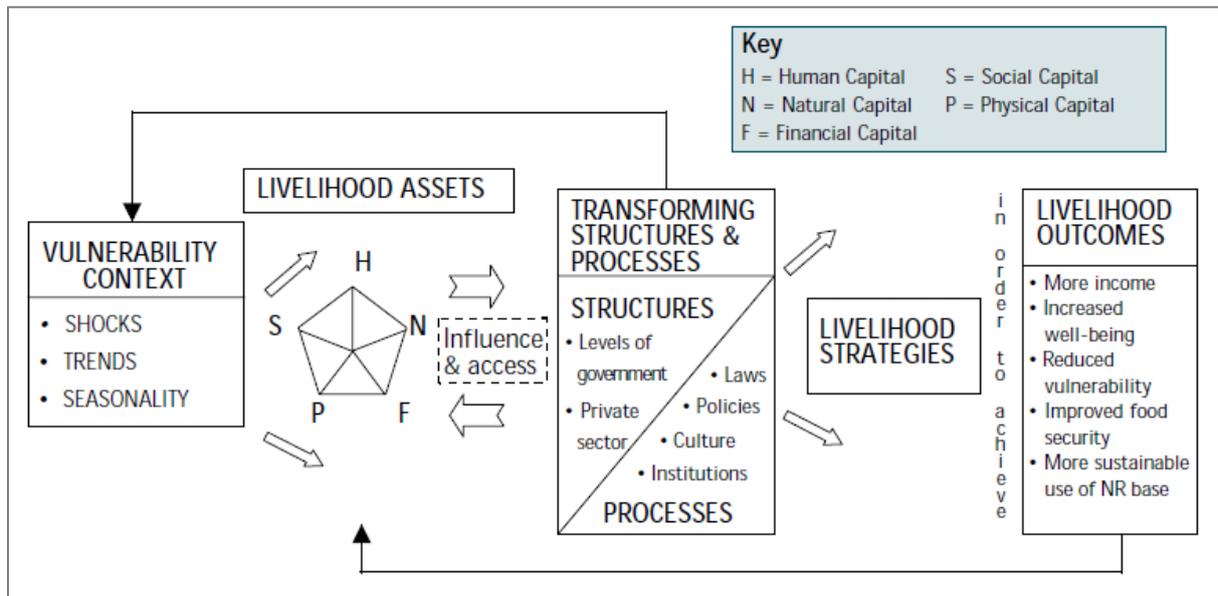
# Appendices

## Appendix 1. Fieldwork summary

Description of the activity	Employed methods	Obtained data	Participants and Sources
2 visits to the participant families in Otanche	<ul style="list-style-type: none"> <li>* In-depth interviews.</li> <li>* Participatory timeline.</li> <li>* Transect walks.</li> <li>* Participant observation.</li> </ul>	<ul style="list-style-type: none"> <li>• Description of families and their farms.</li> <li>• Vulnerability context with a focus on conflict.</li> <li>• Livelihood assets (pentagons for comparison during coca and SBF).</li> <li>• Transforming structures and processes affecting the transition.</li> <li>• Current Livelihood strategies.</li> <li>• Timeline of main events influencing livelihoods.</li> <li>• Impact of coca cultivation on social capital and environment.</li> <li>• Impact of SBF on social capital and environment.</li> </ul>	<p>6 host families from 3 rural districts – 2 families from Buenos Aires, 2 from Bolivar, and 2 from Las Quinchas.</p> <p><i>(permission to cite)</i></p>
1 workshop with all 30 participant families.	<ul style="list-style-type: none"> <li>* Focus group.</li> </ul>	<ul style="list-style-type: none"> <li>• Complementary data on Timeline of main events and Vulnerability context.</li> <li>• Comparison of perceptions of the families from 3 RDs on changes in social capital during two livelihood strategies.</li> </ul>	<p>Up to 2 members of 30 participant families engaged in SBF.</p> <p><i>(permission to cite)</i></p>
3 group interviews, each one with a group of 10 participants from each rural district.	<ul style="list-style-type: none"> <li>* Semi-structured interview.</li> <li>* Participatory timeline.</li> </ul>	<ul style="list-style-type: none"> <li>• Precision of the data gathered from the focus group.</li> </ul>	<p>30 participant families (10 in each RD).</p> <p><i>(permission to cite)</i></p>
Interview with the founder of <i>Zoonatura</i> .	<ul style="list-style-type: none"> <li>* Semi-structured interview.</li> </ul>	<ul style="list-style-type: none"> <li>• Better understanding the context in which the process started.</li> <li>• Details of how <i>Zoonatura</i> cooperates with the families.</li> <li>• Challenges that exist in the process.</li> </ul>	<p>Luis Jairo Silva</p> <p><i>(permission to cite)</i></p>
Interview with an expert from the Ministry of Environment and Sustainable Development of Colombia.	<ul style="list-style-type: none"> <li>* Semi-structured interview.</li> </ul>	<ul style="list-style-type: none"> <li>• Official position of a representative of national government on natural resource management and post-conflict peacebuilding</li> </ul>	<p>Official from the Ministry</p> <p><i>(permission to cite without name)</i></p>
Interview with an expert in development and peacebuilding, former coordinator of	<ul style="list-style-type: none"> <li>* Semi-structured interview.</li> </ul>	<ul style="list-style-type: none"> <li>• Possible scenarios of development in conflict-affected areas in postconflict, importance and potential role</li> </ul>	<p>Gonzalo Murillo</p>

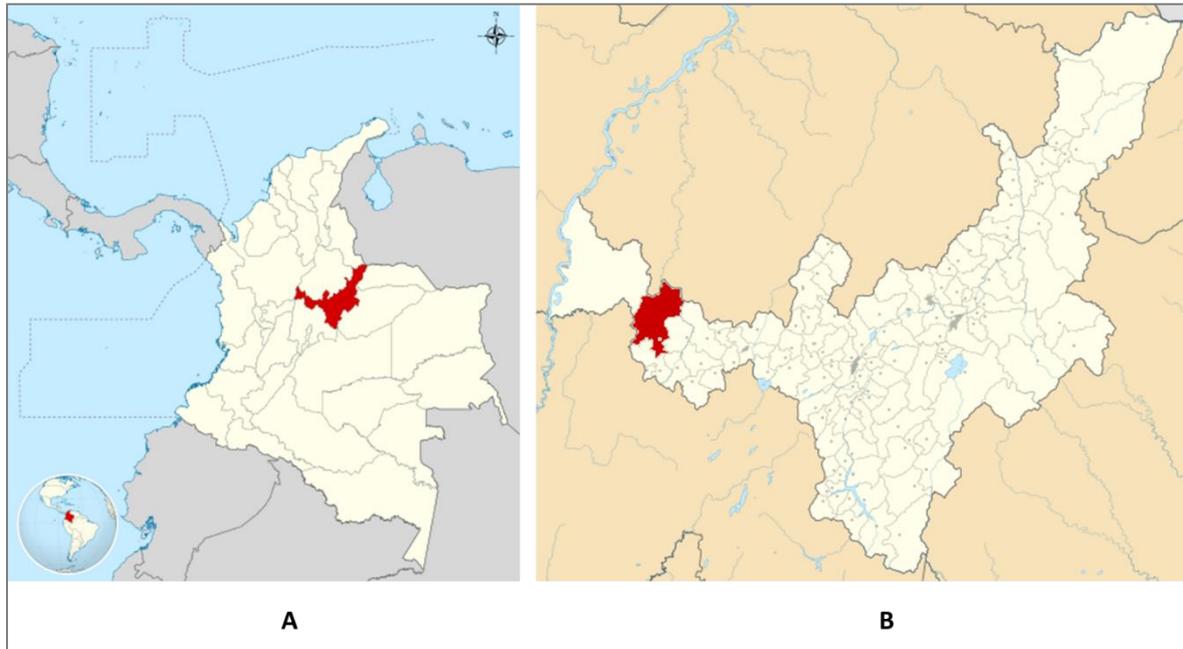
Redprodepaz.		of natural resources, challenges of peace and possible solutions.	<i>(permission to cite)</i>
Two interviews with experts from the local Environmental Agency of Boyacá (CORPOBOYACÁ).	* Semi-structured interview.	<ul style="list-style-type: none"> <li>• Establishment of the national reserve and its implications on agricultural activities in the influence zone.</li> <li>• Current projects and future cooperation with the community</li> </ul>	2 officials of CORPOBOYACA's division of ecosystems and environmental management <i>(permission to cite without name)</i>
Interview with a former mayor of Otanche, who started a regional peace and development program in the area.	* Semi-structured interview.	<ul style="list-style-type: none"> <li>• Detailed conflict context of Otanche, coca cultivation to broad conflict, local conflict on emeralds, and peace process initiated in the region 20 years ago.</li> </ul>	Gabriel Parra <i>(permission to cite)</i>
Collection of relevant documentation.	* Desk review of the secondary sources.	<ul style="list-style-type: none"> <li>• A better understanding of Colombian conflict, green war, and Peace Talks.</li> <li>• Natural resource management regulation in the Protected Areas of Colombia.</li> </ul>	Governmental reports, newspapers, web portals, management plans and existing research.
<i>The fieldwork was carried out during the months of December 2015 and January 2016</i>			

## Appendix 2. Sustainable Livelihoods Framework



Source: DFID (1999)

### Appendix 3. Map of Colombia, Boyacá and Otanche



*Source: (A) By Shadowxfox (Own work) CC BY-SA 3.0, via Wikimedia Commons. (B) By Shadowxfox (Own work) CC BY-SA 4.0, via Wikimedia Commons.*

## Appendix 4. Participant families

Family	Number of members	Composition (age in brackets)
Pinilla family	7	Husband (36), Wife (28) Two children (6 & 5) Wife's sister (32) and her child (11) Wife's grandmother (78)
Saavedra family	5	Husband (55), Wife deceased Daughter (29) Three children (5, 7 & 13)
Zuñiga family	7	Husband (57), Wife (45) Three sons (16, 21 & 26), the oldest is married Three grandchildren Wife's mother (90)
Molano family	7	Husband (56), Wife (50) Son (25) Daughter (19) with a baby Son (13) Wife's mother (81)
Anzola family	6	Husband (71), Wife (61) Daughter (30) Son (40) Son's daughters (13 & 15)
Cortez family	5	Husband (57), Wife (48) Son (16) <i>Daughter works in a city</i> Granddaughter (7)

## Appendix 5. Pictures from the fieldwork



Picture 1. Butterfly pavilion  
Photo: Ani Mosulishvili



Picture 2. Collecting butterfly eggs, Las Quinchas  
Photo: Ani Mosulishvili



Picture 3. Road communicating families within rural districts  
Photo: Ani Mosulishvili



Picture 4. Participant's farm that used to be a paddock  
Photo: Ani Mosulishvili





Picture 7. Butterfly farmers of Otanche  
Photo: Ani Mosulishvili



Picture 8. Butterflies feeding on cocoa  
Photo: Ani Mosulishvili



Picture 9. Valentina helping her father  
Photo: Ani Mosulishvili



Picture 10. Newborn larva  
Photo: Ani Mosulishvili



Picture 11. Bolivar families  
Photo: Ani Mosulishvili



Picture 12. Butterfly farming outside the farms (larva feeding on the leaves)  
Photo: Ani Mosulishvili



Picture 13. Road construction in Buenos Aires rural district  
Photo: Ani Mosulishvili