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**UAB**

**Universitat Autònoma  
de Barcelona**



**Justice in collective payments for ecosystem services:**

**A qualitative meta-analysis**

*Master's Degree in Interdisciplinary Studies in Environmental, Economic  
and Social Sustainability*

*Ecological Economics*

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- *Description of how this project fits within the research group*

This Master thesis aims to contribute to the work of the Social-Ecological Systems in a Globalised world (LASEG) and Ecological Economics (EcoEco) groups, at Universitat Autònoma de Barcelona (ICTA-UAB). These groups jointly host a project to assess the long-term effectiveness and motivations for the conservation of forest ecosystems (PES-EMOTIVE). The project includes research on how Payments for Ecosystem Services (PES) affect conservation motivation and local institutional contexts of communities and landowners in tropical and subtropical countries, and vice versa. By looking at a special type of PES, namely, community-based PES, the following interdisciplinary study could contribute to the PES-MOTIVE research group by providing a systematic comparative review of different case studies across several Latin American regions. The long-term effects of PES on society and the environment are assessed in this study by focusing especially on the impacts such programs have on justice. Regarding control for contextual variables, another specific target of the research group, this study specifically analyses the influence several community and market-based factors had or could have had on social justice and other recorded outcomes of the studied CB-PES programs. These factors include internal attributes of the community and its local institutions, external factors that impact the community, specific details about the design and implementation of the CB-PES programs, and market aspects of PES. Through this analysis, this research aims to shed light on the interdependencies between social, ecological, and economic aspects of market-community conservation instruments such as CB-PES. These research insights are critical to assess the risks and opportunities posed by the integration of market-oriented conservation mechanisms in community-based resource management systems.

## **Abstract**

CB-PES programs are often portrayed as an innovative mechanism incentivizing more sustainable land use practice, while contributing to social and economic development of communities. However, there is very lacking or mixed evidence and theory about the long-term impacts of CB-PES, and the contextual factors which may affect these outcomes (Brownson et al 2019). This research contributes to the literature on long-term impacts of CB-PES by carrying out a qualitative meta-analysis of empirical studies that report on distributive, procedural and recognition justice outcomes of such programs. Additionally, this research examines how specific attributes of community and market-based governance forms for conservation, both present in CB-PES, may have contributed to social justice outcomes. Although results show outcomes were significantly different between communities and programs, this study's analysis outlines explicit tensions and synergies between justice outcomes and specific community or market features of CB-PES programs.

**Keywords:** Payments for Ecosystem Services, community-based conservation, environmental justice, environmental governance, qualitative meta-analysis, Latin America, distributive, procedural, recognition.

## **1. Introduction**

Payments for ecosystem services (PES) are one of the most widely used market-based instruments for providing and expanding ecosystem services. From a conventional economics framework, PES are intended to cover for the under- or unvalued services provided by ecosystems to humans in “business as usual conditions”. Specifically, economic payments are exchanged for maintaining or enhancing the flow of a certain ecosystem “service” such as biodiversity, habitats, clean water, or carbon sequestration. In the last decades, an increasing number of PES programs are emerging for land that is managed, either formal or informally, by communities, namely, collective or community-based PES (CB-PES). The combination of community-based management and markets for conservation raises questions on whether these two major forms of environmental governance may strengthen each other, compensate for each other’s limitations, or if they will aggregate or create new challenges, for example, regarding justice outcomes.

There is pressing evidence that social justice issues lay at the core of nature conservation projects, not only as an ethical requirement, but also for the effectiveness of such projects (Calvet et al 2015; Pascual et al 2014). CB-PES programs are often portrayed as an innovative mechanism incentivizing more sustainable land use practice, while contributing to social and economic development of communities. However, there is very lacking or mixed evidence and theory about the long term environmental, social and economic impacts of CB-PES, and the contextual factors which may affect these outcomes (Brownson et al 2019). This research contributes to the literature on long-term impacts of CB-PES by carrying out a qualitative meta-analysis of empirical studies that report on distributive, procedural and recognition justice outcomes of such programs. Additionally, based on theory about community and market-based governance forms for environmental management, the purpose of this research is to examine

how specific attributes of each of these governance types may have contributed to the justice outcomes of CB-PES.

The study focuses on Latin American regions, for their pioneering tradition with PES, profusion of internationally renowned or (sub)national PES programs, and the abundance of complex collective tenure systems, where land is often formally or informally collectively owned or managed (Brownson et al 2019). Moreover, the continent faces high levels of poverty and dependence on resources and encompasses a high concentration of biodiversity, a lot of which is experiencing rapid degradation due to increasing market pressures. The paper begins by introducing and exploring main aspects of market-oriented and community-based conservation instruments, and how these can merge to form hybrid forms of governance such as CB-PES. Then, the theoretical framework on social justice applied for this study is introduced, followed by an overview of justice findings in traditional PES. The method section presents the work process behind the qualitative meta-analysis, with which the results are obtained for social justice and other outcomes of CB-PES. Finally, the last section explores how specific community and market features of CB-PES have or could have influenced the social justice outcomes.

## **2. Environmental governance**

Despite consensus over the importance of institutions in effective management of resources, there are great discrepancies between theories which have focused on the trichotomy between private property, centralized government control, and decentralized local forms of management. One can find extensive theory on the advantages and limitations of each of these forms. However, our understanding of the conditions under which institutions fail is yet ambiguous and incomplete (Acheson 2006). A large range of interdependent factors may contribute to undesirable environmental and social outcomes for each type of governance. The next two subsections introduce and outline main aspects of market-oriented and community-

based natural resource management. Some of these aspects laid the foundations for the coding scheme of this qualitative meta-analysis and are discussed in the final section on “*Factors influencing social justice*”.

### ***2.1 Market-based conservation instruments***

Market-based instruments (MBIs) are a popular form of resource regulation which aim to deploy market exchange incentives to boost environmental compliance while focusing on efficiency and economic growth (Bakker 2007; Vatn 2014). Their popularity can be attributed to the apparent ineffectiveness and inefficiency of command-and-control instruments, the spreading of neoliberal institutionalism and free trade, and the need for national innovation that keeps state economies competitive in a globalizing world (Lemos and Agrawal 2006). The instruments encompass a wide variety of forms, from cap-and-trade markets and certifications to ecotaxes and subsidies. Proponents of such instruments claim that, under the right circumstances, MBIs can enhance environmental management and equity, rationalize markets, reduce social costs, and increase institutional revenues (Huber et al 1998; Keohana-Olmstead 2016).

MBI's are often characterized by a focus on efficiency and, in turn, a lack of consideration of environmental and social justice issues. Consequently, many environmental and social policy actors and scholars have raised concerns about the unequal power relations that such market systems can preserve or exacerbate, and the potential for increased democratic deficit and equity in allocation of natural resources (Lemos and Agrawal 2006). They also express the risks of commodifying nature and reducing complexity of ecosystems, and the threat to intergenerational equity due to the subsequent higher rates of extraction (Gomez and Muradian 2015). Moreover, the success of MBIs is largely dependent on a wide range of factors including adequate legislation and financing, capable institutions, effective monitoring and enforcement, and appropriate tailoring to local needs and conditions (Huber et al 1998). While MBIs can

improve environmental management, the high administrative demands (i.e. funding and monitoring) and uncertainty costs cannot generally be covered by private entities, especially in the case of developing countries. Hence, most MBIs require active intervention by states and command-and-control mechanisms, such as legal definition of rights, regulation, and covering high transaction costs (Vatn 2014).

## ***2.2 Community-based natural resource management***

The market-state dichotomy for environmental governance was transcended by authors such as Ostrom (1990), one of the main individuals to actively promote community-based natural resource management (CBNRM). CBNRM sparked the interest of a now significantly large theoretical school on commons and is especially encouraged in the Global South, where natural resource degradation has a direct impact on rural livelihoods (Matta and Alavalapati 2006). However, common property regimes are not always a feasible option. Even when the users are dependent on the resource in the long term for their personal and family's economic well-being it is not certain that users of an open-access good will engage in collective action (Ostrom 2001; Matta and Alavalapati 2006). Ostrom was the first to develop a set of criteria, or "design principles", that could allow for the successful emergence and management of common property regimes (Ostrom 1990). The principles have been shown to be well supported empirically but there are several issues under discussion. Cox et al (2010) identified some of the main critiques which include that the criteria are incomplete, especially when concerning the *sustainable* management of resources; the principles cannot be generalized to large-scale cases; and the principles are biased towards formal rules and strategies which often abstract from the complex environmental, historical, and social contexts.

While there is disagreement on specific variables that influence the success of common property regimes, we can identify a consensus on set of factors, with possible interdependencies, namely: attributes of the resource, attributes of the group, characteristics



of the institutional arrangements and external influences (Agrawal 2001; Matta and Alavalapati 2006). In addition to Ostrom's design principles (Ostrom 2009), other important internal group factors include size, social heterogeneity, leadership, and level of poverty and dependence on resource (Agrawal 2001). Regarding external factors, first, the role of the state is central since it is the ultimate recogniser of property rights arrangements and may be critical in resolving major disputes between groups. Second, national and international markets often permeate CBNRM and the rural economy, together with technological demands and pressures. These can largely alter the management of common property regimes by triggering inequalities and divergence of interests and are often associated with a decline in resource conditions (Ostrom and Varughese 2001; Agrawal 2001; Cox et al 2010).

### ***2.3 Alternative solutions: hybrids and polycentric forms of management***

The increasingly acknowledged complexity and uncertainty surrounding socioenvironmental systems have prompted researchers and policymakers to investigate with combinations of elements of different governance modes, leading to hybrid and polycentric forms of management (Lemos and Agrawal 2006; Acheson 2006; Ostrom 2010). Polycentricity promotes the co-existence and cooperation between many independent government units that act at multiple scales so that maximum authority is given to the lowest unit in the hierarchy, if possible, the local level (Acheson 2006). Such approaches are based on adaptation, trust, cooperation and learning from experimentation (Ostrom 2010). Hybrid forms of management can emerge across state-market-community divisions, such as comanagement, public-private or social-private partnerships.

### **3. Collective or community-based payments for ecosystem services**

Collective or community-based payments for ecosystem services are an example of a private-social hybrid for it attempts to combine local-level governance and market mechanisms for ensuring and expanding the provision of ecosystem services. An increasing number of CB-

PES programs are emerging in Global South countries. Policy makers and PES managers are attracted by these contracts for they could reduce transaction costs since most property rights are managed collectively by indigenous and local populations (Hayes et al 2019). Contrary to PES programs that are generally top-down initiatives where providers of ecosystem services are individuals or groups of coordinated landowners, community-based PES (CB-PES) are local initiatives that incorporate communities, resource users and institutions in program design, implementation, and/or monitoring (Brownson et al 2019). However, CB-PES programs still rely on the economic component contributing to neoliberalization of conservation (Gomez and Muradian 2015).

CB-PES presents distinct challenges from conventional PES since there is no longer a direct relationship between an individual's economic incentive and conservation behaviour (Sommerville et al 2010). The success of CB-PES not only relies on program design, but also crucially on group governance capacities, creating a second order collective action problem (Hayes et al 2019). For example, local participatory mechanisms required for CB-PES may contribute to improving social capital, community assets and legitimacy of PES (Brownson et al 2019). However, elite capture or intracommunity inequities often present in community institutions raise concerns about the fair distribution of benefits and informed or voluntary participation (Hayes et al 2019). Overall, there are limited studies with mixed evidence regarding the conditions under which CB-PES will have positive social impacts (Brownson et al 2019). The next section introduces the theoretical framework used to carry out this study's analysis of social justice in CB-PES, followed by an overview of justice findings in traditional PES outcomes.

#### **4. Social justice in natural resource management**

The generally established framework to analyse environmental justice issues considers three core dimensions, namely distributive, procedural, and recognition-based justice (Schlosberg

2007). Distributive justice looks at the allocation of benefits, costs, and risk (McDermott et al 2013). Procedural justice focuses on the inclusion, representation, or participation of stakeholders in decision-making procedures (Pascual et al 2014), while recognition considers respect for the cultures, values, and knowledge of those involved. Empirical research on social justice in conservation is claimed to be disproportionately focused on distributive aspects that tend to represent the economic dimension, giving less attention to the political and cultural dimensions (Schlosberg 2007; Friedman et al 2018). Authors such as Martin et al (2016) and McDermott et al (2013) emphasize the importance of recognition of local knowledge and cultures in conservation to avoid the reflection of dominant discourses and reproducing of power relations that restrict the possibilities to progressively transform inequitable processes.

#### ***4.1 The role of social justice in PES***

Traditional PES programs have resulted in more positive environmental outcomes than justice outcomes, with the majority of schemes being judged unfair at the procedural and/or distributional levels (Calvet et al 2015). Until recently there was a persistent debate regarding whether, or to what extent, PES should consider non-environmental concerns such as social justice and poverty. As a market-based instruments, PES were characterized by a prevailing focus on economic efficiency, or cost effectiveness. This perspective considers social matters should be left to other better suited policy instruments, and that a focus on justice may imply trade-offs which can reduce environmental effectiveness (Lliso et al 2021). However, scholars have questioned the appropriateness of such notions in contexts like the Global South because of the lack of certain preconditions such as a levelled economic and power relation between stakeholders, and stakeholder's consent to such notions of justice (Sikor et al 2014). Potential long-term implications of PES for local communities include loss of property and management rights, loss of employment, increased democratic deficit and inequality in allocation of natural resources (Lemos and Agrawal 2006; Bakker 2007; Gomez and Muradian 2015). Overall,

mounting empirical evidence of equity-efficiency interdependence is leading to the convergence of views that, especially in the low-income tropics, social justice is not just a moral but necessary component for the effectiveness of PES (Lliso et al 2021).

## **5. Method**

### ***5.1 Selection criteria***

To begin the data collection, I compiled a database of 601 documents from applying the following Boolean search strategy on Scopus as of May 2021: *TITLE-ABS-KEY ("payment for ecosystem services" OR "conservation payments" OR "market for ecosystem service" OR "payment for environmental services" AND "common pool resource" OR "community-based" OR "common property regime" OR commons OR community OR collective AND social OR equity OR justice)*. The first screening was applied to titles and abstracts to exclude: (1) modelling or choice experiments, (2) propositions of PES programs, (3) systematic literature reviews, and (4) other articles which were not empirical case studies. I then applied a second screening of the full article, filtering out studies which did not meet the following inclusion criteria: (1) cases that involve local or indigenous communities in Latin America and (2) articles that provide data on at least one of the three social goals, namely distributive, procedural or recognition justice. The reviewed articles presented case studies of one or more communities that had implemented CB-PES programs. Articles that analysed more than one community but did not contain sufficient specific information about each were assessed together as one case. Conversely, if the articles reviewed one or more communities extensively, each community was treated as one case. The final sample included 26 case studies from 21 articles published between 2007 and 2020.

### ***5.2 Coding scheme for qualitative meta-analysis***

A coding scheme was used to analyse the 26 case studies. The initial list of contextual variables and their respective values can be found in the Appendix, Table A.1. The variables are grouped

into 7 categories (see Table 1): the first covers general data on the case study and PES program (1,2), the following indicate internal and external attributes of the communities (3,4,5), and the final two show community-based (6) and market (7) features of the CB-PES program. The variables for each category were founded on theory discussed in the previous sections. Specifically, categories 3-5 about contextual factors of communities are based on CBNRM theory, category 6 is based on CB-PES theory, and category 7 on specific market features of PES.

For each category (except 1 and 2) I created a variable to code specific data about the influence such category could have had on social justice of CB-PES. These variables can be identified in Table A.1 as those marked in bold in the “variables” column, and are classified as overall “positive”, “negative”, or “mixed”, depending on whether certain features of the category could have potentially enhanced or weakened social justice and other outcomes of CB-PES. Furthermore, the indicators to assess the social justice outcomes (distributive, procedural and recognition justice) are portrayed in Table A.2 (Appendix), together with general ecological, income and poverty alleviation and social capital outcomes. The different dimensions of justice are evaluated as “positive”, “negative”, based on the author’s claims and whether the data hinted at the satisfaction or dissatisfaction of the community or communities, or “mixed” in case of mixed opinions or evidence. Similarly, I classified ecological, income and poverty alleviation, and social outcomes as “positive”, “negative” or “mixed”, based on the community’s perceptions and author’s observations and evaluations.

### ***5.3 Limitations***

Qualitative meta-analyses compare and re-analyse data from case studies with the aim of answering specific research questions which may not coincide with those of the original authors (Newig and Fritsch 2009). Case study data were often not straightforwardly comparable, had limited scope and scale, or were collected based on disparate underlying frameworks. Hence,

to increase analytic rigour, this study followed the recommendations of Ratajczyk et al (2016), including being explicit about inclusion criteria, variable definitions, and coding schema, as well as sharing of coding experiences and protocols to foment transparency norms.

## 6. Results

### 6.1 Scope and context

All articles carried out qualitative methods to collect and analyse data, with only 5 incorporating quantitative measures into the analysis. The programs recorded were implemented between 1991 and 2011, targeting areas of forest, agricultural lands, pastures or paramos. Most of these programs were public, financed by governments and often working

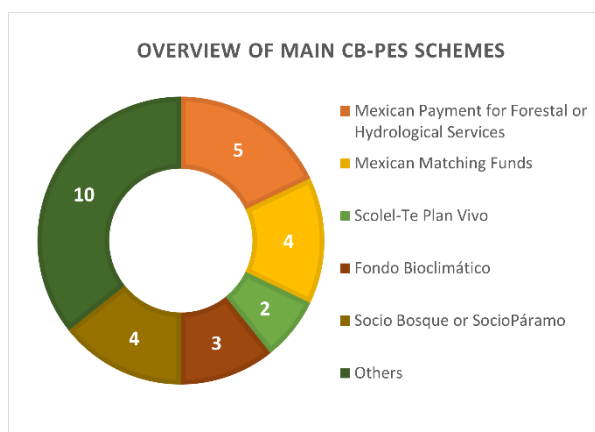


Figure 1: No. of cases for each CB-PES scheme analysed.

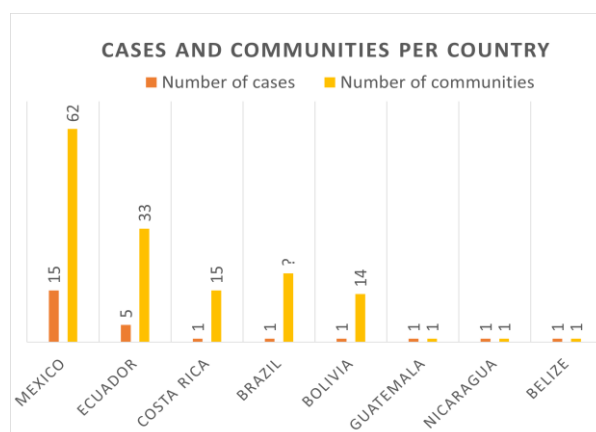


Figure 2: No. of cases and communities analysed per country.

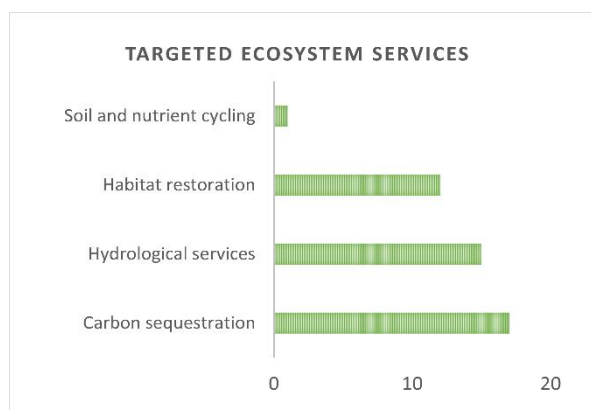


Figure 3: No. of cases were CB-PES program targeted each ecosystem service.

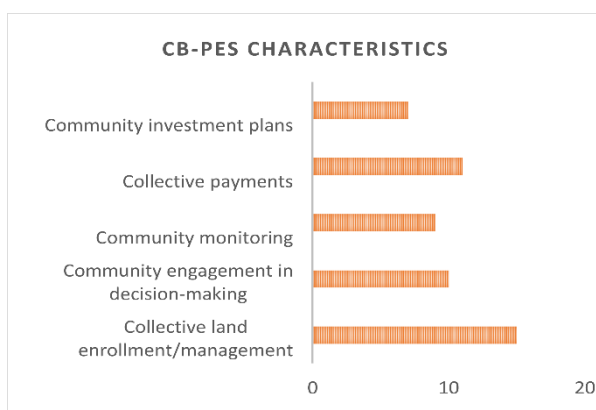


Figure 4: No. of cases that experience different CB-PES characteristics.

together with NGOs. National payments for forest or hydrological services, Matching Funds, and Plan Vivo programs were most popular in Mexico, while SocioBosque and SocioPáramo were common in Ecuador. An overview of the main CB-PES schemes analysed is shown in Figure 1.

Most schemes (15 out of 26 cases) were located in Mexico and 5 in Ecuador. The Mexican CB-PES cases were located in the southern region of the country: 8 in Chiapas, 4 in Oaxaca, and 2 in Veracruz. Most of Ecuador's cases were in the Amazon region or Andean grasslands. An overview of countries and communities studied is presented in Figure 2<sup>1</sup>. Although the degradation of the targeted resource prior to program implementation was often undefined, the data recorded shows that in 9 cases the degradation was considerable and in 5 cases not critical. This aspect was considered relevant since, according to Forest Trends (2008), the more degraded or scarce the ecosystem service is, the higher additionality potential for the PES program. Regarding targeted ecosystem services, 65% of the programs targeted carbon sequestration, 58% hydrological services, 46% habitat restoration and 4% soil and nutrient cycling (see Figure 3).

CB-PES fosters collaborative management of local natural resources and often is aligned with community development programs (Brownson et al 2019). However, not all CB-PES programs follow the same norms and strategies: some may only require collective payments or collective land enrolment, while others may intend to explicitly integrate communities, resource users and institutions in the program design, implementation, and monitoring (Brownson et al 2019). Figure 4 show the number of cases that implemented different CB-PES strategies, based on what was described in the studies. Collective land enrolment and management and collective

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<sup>1</sup> The reason why there are more communities than cases in some countries is explained in the Method (see Selection Criteria).

payments were common characteristics, whereas community investment plans and monitoring were not specified in many cases.

## 6.2 Social justice outcomes

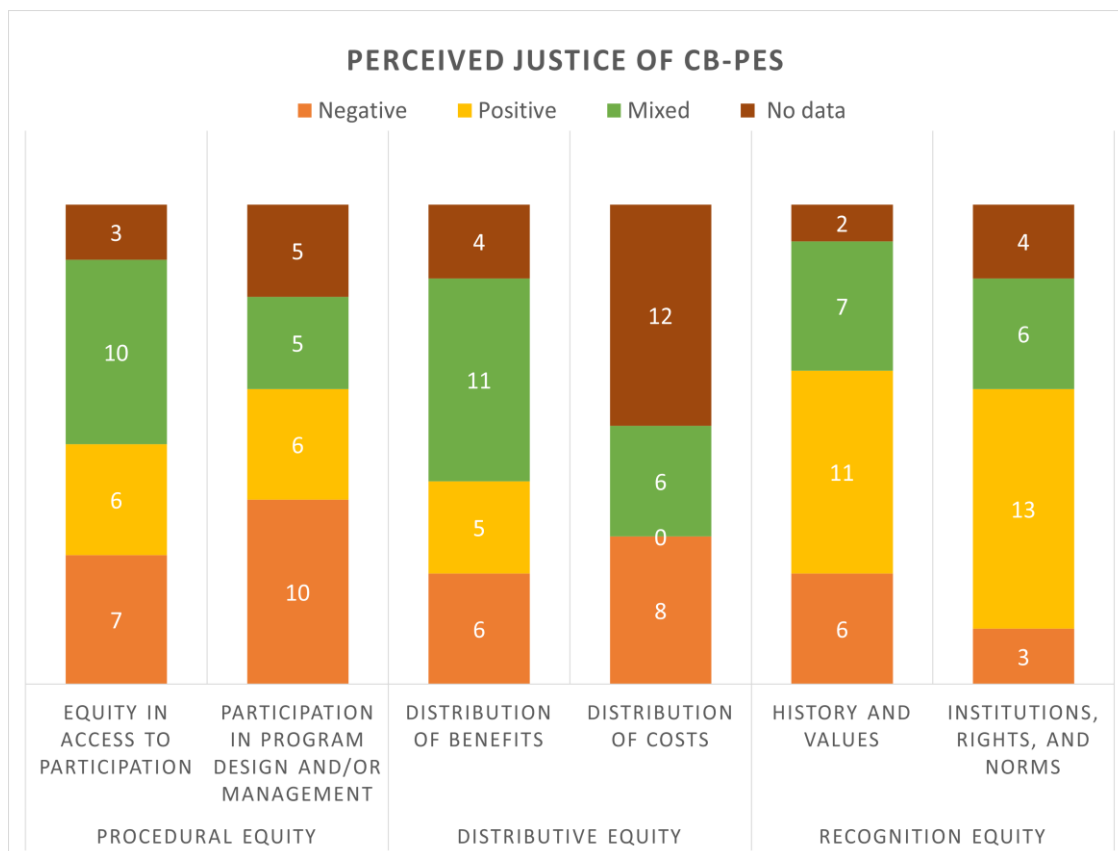


Figure 5: For each dimension of equity, no. of cases where justice of CB-PES program was evaluated as “positive”, “negative”, or “mixed”.

### a) Procedural justice

#### i) Equity in access to program

The results for procedural justice are inconclusive, presenting a mixed range of outcomes (see Figure 5). CB-PES allow for communities to participate collectively by enrolling communal plots of land. Results show that executive bodies formed by community members usually decide if they want to participate in PES through collective decision processes following the majority principle (Krause et al 2013; Nieratka et al 2015; Almeida-Leñero et al 2017; Hayes and Murtinho 2018; Rodriguez-Robayo et al 2019; Joslin 2019). Hence, those who vote against also have to participate and comply with the rules. This created conflicts about the need for and



purpose of establishing conservation and forest management areas (Corbera et al 2007 (a)). Some programs allowed individuals and groups to enrol independently. However, this still requires for the community assembly to approve which in some communities led to reinforcement of local social inequities (Corbera et al 2007 (a), (b)). For example, in an ejido in Mexico the community excluded new incomers and one *poblador* from participation for complaining about the little money received from the PES program (García-Amado et al 2011).

While some programs facilitated enrolment of individuals with lower income, education and property size (Bremer et al 2014; Hayes and Murtinho 2018; Otto 2019; Brownson et al 2020), other projects lacked sensitivity to pre-existing inequalities in access to land and forest resources by accepting contract agreements without accounting for marginalized groups (Corbera et al 2007 (a), (b)). In some cases, land tenure was a requirement for being accepted into the program and/or allowed to participate in deliberative assemblies (Corbera et al 2007 (b); Bremer et al 2014; Betrisey et al 2018). In addition, participants or communities with limited social networks, limited community organization and social capital were also constrained to participate in CB-PES programs (Bremer et al 2014; Jones et al 2019; Brownson et al 2020; Corbera et al 2020).

## *ii) Equity in program design and management*

In assessing equity and participation in program design and management, one can both analyse the community's power to decide relative to the program managers (e.g., NGO, Independent PES organization, government), and assess the power inequalities within the community. Common decisions to be made include contract conditions, use and allocation of financial resources, or implementation of associated land-use restrictions. In CB-PES programs that functioned through top-down processes, power to decide was concentrated in the hands of NGO's, private buyers, or governments and communities were excluded from program design and management (Corbera et al 2007 (a), (b); Osborne et al 2018; Otto 2019). Conversely, in

communities that have significant power to decide, community decision-making power was either distributed among the community or concentrated in the hands of leaders or executive bodies.

In some communities, transparent decisions were made collectively in community assemblies, often with a group leader or leaders, where members understand and agree to projects and coordinate tasks (Nieratka et al 2015; Denham 2017; Almeida-Leñero et al 2017; Hayes and Murtinho 2018; Osborne et al 2018; Rodriguez-Robayo et al 2019; Cordoba et al 2020). Tasks such as collective monitoring sometimes served to empower locals and improve transparency and accountability (Nieratka et al 2015; Cordoba et al 2020). Conversely, in less organized or more conflictive communities, community authorities had greater access to information and possibilities of action within PES operational settings, and they often decided not to share information with community or invest time in collective planning (Almeida-Leñero et al 2017; Corbera et al 2020). As a result, less powerful community members and minority groups tend to be excluded from decision making and are unaware or uneducated about overall terms of conservation agreement (Corbera et al 2007 (b); García-Amado et al 2011; Krause et al 2013). This was especially the case for women or non-formal land holders (Corbera et al 2007 (a), (b); Nieratka et al 2015; Denham 2017; Almeida-Leñero et al 2017; Jones et al 2018).

***b) Distributive justice***

***i) Distribution of benefits***

According to Forest Trends (2008), compensation for CB-PES can be in the form of direct financial payments, financial support for specific community development projects, in-kind payments and, in some cases, increased recognition of rights. Direct financial payments can be individual or collective, or both. The results show that individual payments were often proportional to amount of land each participant enrolls, favouring households which were able to allocate land for conservation purposes while maintaining other plots for more profitable

cultivation and grazing activities (Corbera et al 2007 (a) and (b), Corbera et al 2020; Cordoba et al 2020; Verde Selva et al 2020).

Collective payments, on the other hand, can be distributed by the communities themselves and often are allocated into community development projects. In cases where distributional policies were democratically decided by the community, participants generally claimed they benefitted from the program or considered it an important component of their livelihoods (Corbera et al 2007 (a), Denham 2017; Joslin 2019). Payments were more likely to have a positive impact when they were equally distributed or purposely benefitted small landowners by decreasing the amount as area enrolled increases (Bremer et al 2014 (a), (b)). However, when leaders decided without consulting the community, households, especially the most marginalized, reported negligible benefits or no significant impact on their livelihoods (Corbera et al 2007 (b); Joslin 2019). Communities with recurrent social conflicts or questioned leadership perceived that leaders or local elites were directing community funds CB-PES activities for their own benefit (Corbera et al 2020; Verde Selva et al 2020). For example, in a community in Ecuador, community leaders decided collective payments should be invested in a sports facility, which was not beneficial for all the community (Hayes and Murtinho 2018). To avoid conflicts arising from some members benefiting more than others, instead of investing in community development projects, some collective payments were distributed individually (Hayes and Murtinho 2018).

#### *ii) Distribution of costs*

Distribution of costs was undefined for most cases, and not positive for any (see Figure 5). Participant dissatisfaction was declared in cases where compensation was not proportional to costs or participation in conservation activities (Krause et al 2013; Almeida-Leñero et al 2017; Joslin 2019). Non-right holders such as new incomers (*pobladores*) or other marginalized groups (e.g., women) were shown to be disproportional cost bearers while not receiving (as

many) benefits or not allowed to participate in PES or procedural processes that require land tenure (García-Amado et al 2011; Krause et al 2013; Nieratka et al 2015; Almeida-Leñero 2017; Hayes and Murtinho 2018; Osborne and Shapiro-Garza 2018). Moreover, smaller landowners beared higher opportunity costs because of required change in land use upon participation, more time invested to comply with programme obligations, restrictions in hunting, and cultivation of some food plants (Rodriguez-Robayo et al 2019). Poorer landowners were also the most affected by changes in market demand of ecosystem services when programs are self-organized or based on formal markets (Otto 2019). Lastly, in cases where community did not enrol collectively, those who decided not to participate were often shown to be disproportionately affected by rules (e.g., refused grazing or logging permits, banned traditional or cultural activities) (Bremer et al 2014 (a),(b); Joslin 2019; Corbera et al 2020).

*c) Recognition justice*

*i) Recognition of history, values, and perceptions*

Recognition is the least often explored dimension of justice (Friedman et al 2018). In this study, the results for this dimension of justice are overall positive (see Figure 5). Some CB-PES projects aligned or were compatible with local livelihood strategies, as well as social and cultural values (Corbera et al 2007 (b); Denham 2017; Osborne et al 2018; Corbera et al 2020; Verde Selva et al 2020; Brownson et al 2020). For example, some projects considered social and political divisions, or past social conflicts, in the design plans by allowing communities to apply in groups (not necessarily involving the whole community) (Corbera et al 2020). Other programs allowed participants to select native tree species and choose land use transformation from broad range of forest management types (e.g., afforestation of former agricultural fields, reforestation, timber production, management of natural regeneration, improvements of degraded forests) (Osborne et al 2018; Brownson et al 2020). However, in some cases land use

practices were imposed that threatened local management strategies and traditions which are an important component of community identity (Joslin 2019). For example, by implementing new land strategies that prioritized exchange value over use value (e.g., focusing on timber species instead of a variety of fruit species), a program in Chiapas undermined local knowledge and reduced the biocultural diversity present in such systems (Osborne et al 2018 (a)).

Plenty of programs successfully transmitted goals and values of PES and contributed to strengthening community relations and pride arising from recognition of conservation practices (Corbera et al 2007 (b); García-Amado et al 2011; Krause et al 2013; Almeida-Leñero et al 2017; Osborne et al 2018). However, other programs have lacked effort or resources to successfully inform locals about the importance of the program for the community and the environment (Krause et al 2013; Corbera et al 2007 (a), (b)). Hence, in many communities the participants misinterpreted the program's goals and values (Joslin 2019). Women especially lacked information about the projects since, due to local traditional social structures, they were often marginalized from program benefits and deliberative processes (Corbera et al 2007 (a), (b)). In a Mexican program with strong market fluctuations, the lack of education about the market risk related to carbon credits (together with past experiences with corrupt or unsuccessful conservation programs) led locals to misunderstand the reasons why they were not paid, creating mistrust in the program (Otto 2019). Moreover, in some communities, accepting payments for conservation practices clashed with local values since these undermined intrinsic values of the forest or traditional life-sustaining voluntary work (Denham 2017; Jones et al 2019). Some sceptical communities expressed that these programs exploited the rural poor for the benefit of transnational global capitalism (Corbera et al 2007 (a)).

*ii) Recognition of institutions, rights, and norms*

Many local communities have easily adapted carbon markets to their local institutions, governance, and development strategies (see Figure 5). This occurred in some cases where the

CB-PES programs relied on existing community governance structures (García-Amado et al 2011; Denham 2017; Almeida-Leñero et al 2017; Osborne et al 2018), or in those that promoted the creation of new rules, practices, standards, and values while conserving pre-existent ideational and institutional elements (e.g., local logics of redistribution and reciprocity) (Betrisey et al 2018). For example, some communities established specific intra or inter-community organisations to better manage PES and other conservation or development projects (Nieratka et al 2015; Corbera et al 2020). Through training sessions and space for dialogue among project managers, rural organizations, and communities, CB-PES programs show to enhance community organization, transparency, and participation in community projects (Corbera et al 2007 (b); Bremer et al 2014; Nieratka et al 2015 Jones et al 2018; Brownson et al 2020). This local empowerment led to higher engagement with governmental and institutional actors and access to power arenas to reiterate political requests (Betrisey et al 2018).

On the other hand, some projects undermined traditional (more community-oriented) governance practices (Osborne et al 2018) and/or placed significant administrative and organizational demands on communities (Hayes and Murtinho 2018). This led to lack of widespread participation and triggered local conflicts due to competing interests about, for example, rules and sanctions of CB-PES or distribution of payments (Corbera et al 2007 (b); Hayes and Murtinho 2018; Rodriguez-Robayo et al 2019; Joslin 2019). Moreover, in cases where participants were ill informed, or where there was a lack of ecological additionality, some participants interpreted PES as a recognition for stewardship rather than an attempt to implement conservation practices (Joslin 2019). Indeed, CB-PES is a means to get land and political rights recognized or secured (even for non-participants), to extend land endowments, or to control what was previously collective land (Corbera et al 2007 (a); Bremer et al 2014; Corbera et al 2020). Such mechanisms to access de facto land rights have created incentives

for illegal encroachments, and some community members can be negatively affected and ideologically against the privatization of collective land (Corbera et al 2007 (a), (b)).

### 6.3 Other outcomes

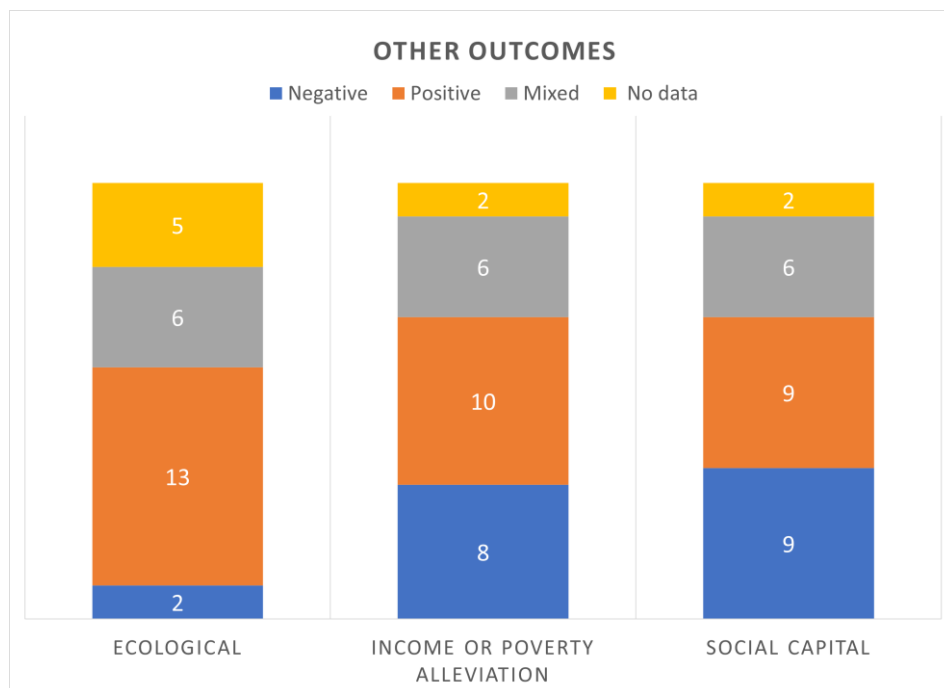


Figure 6: For each type of outcome, no. of cases that evaluated the impact of CB-PES as “positive”, “negative”, or “mixed”.

#### a) Ecological outcomes

Ecological outcomes were measured in terms of perceived changes in ecosystem (service) during and after the program, and mostly gave positive results, with only 2 cases declaring negative outcomes (see Figure 6). Interpretations of success could differ among communities and program developers. For instance, in once case program developers claimed ecological success of program while communities stated that the watershed had continued deteriorating or perceived no additionality (Joslin 2019). However, most communities declared improved ecosystem services and perceived the level of forest conservation was good (i.e., cleaner, more abundant water, return of animal species, improved air quality, reduced forest fires, hunting and promoted sustainable land uses) (Corbera et al 2007 (b); Bremer et al 2014; Denham 2017; Hayes and Murtinho 2018; Osborne et al 2018 (b); Rodriguez-Robayo et al 2019; Jones et al 2019; Brownson et al 2020; Corbera et al 2020). Some communities declared low additionality

with marginal or no ecological benefits (Corbera et al 2007 (b)). This often was attributed to the fact that land enrolled in program was already a part of a conservation program or protected area (Cordoba et al 2020), or because communities had already implemented conservation practices themselves (Joslin 2019). Limited ecological benefits were also related to unfavourable conservation practices imposed by program (e.g., timber monoculture) that in the long term weakened ecological health of ecosystems, or to leakage (e.g., increased chemical use outside protected reserve) (Bremer et al 2014; Osborne et al 2018 (a); Corbera et al 2020).

### ***b) Income and poverty alleviation outcomes***

Income and poverty alleviation outcomes were generally assessed in the short term and most articles claimed modest positive tendencies. CB-PES often provided a small but secure source of income and the possibility of temporary employment in forest management activities, which reduced the need to migrate to find employment (Corbera et al 2007 (a); Nieratka et al 2015; Osborne et al 2018 (b); Jones et al 2018; Jones et al 2019). In some cases, CB-PES became one of the largest contributors to family and community income. However, payments were often insufficient if they were to adequately compensate opportunity costs of conservation or result in significant changes in material or subjective well-being (Corbera et al 2007 (b); Bremer et al 2014; Denham 2017; Hayes and Murtinho 2018; Betrisey et al 2018; Jones et al 2018). Moreover, PES can disable farmers from performing other (sustainable) economic activities that could be more productive or profitable. This especially affects the most economically vulnerable communities and participants who are highly dependent on resource for subsistence agriculture (García-Amado et al 2011; Verde Selva et al 2020).

### ***c) Social capital outcomes***

Social outcomes here refer to whether the program had a negative effect on the community's social networks, shared values and understandings (e.g., creating or exacerbating conflicts) or a positive effect (e.g., strengthening social relations). The results are mixed, with equal number



of positive and negative results (see Figure 6). Positive outcomes reported by communities include increased collective action and community development (Nieratka et al 2015; Denham 2017; Osborne et al 2018 (b)); strengthened community relations and trust within and between communities (Bremer et al 2014; Jones et al 2019; Rodriguez-Robayo et al 2019); and improved emotional and physical health (Betrisey et al 2018; Brownson et al 2020). Participation in CB-PES could act as a mechanism to empower local communities by taking control of public services, increasing transparency of community institutions and local participation (Corbera et al 2007 (b)). Moreover, collective action often led to institutional innovations and development projects for basic services such as potable water systems, pharmacies, social security, and health savings (Corbera et al 2007 (a); Bremer et al 2014; Nieratka et al 2015; Denham 2017).

Negative social capital outcomes were reported when PES programs directly or indirectly recreated or legitimized existing power imbalances (Betrisey et al 2018), leading to weakening of existing collective agreements and rules (Corbera et al 2007 (b); Krause et al 2013; Cordoba et al 2020), or erosion of social relations within and between communities (García-Amado et al 2011; Almeida-Leñero et al 2017; Otto 2019). Payments also triggered conflicts over distribution which often led to weakened social capital (Jones et al 2018; Joslin 2019).

## 7. Factors influencing social justice and other outcomes

### 7.1 Influence of internal community factors

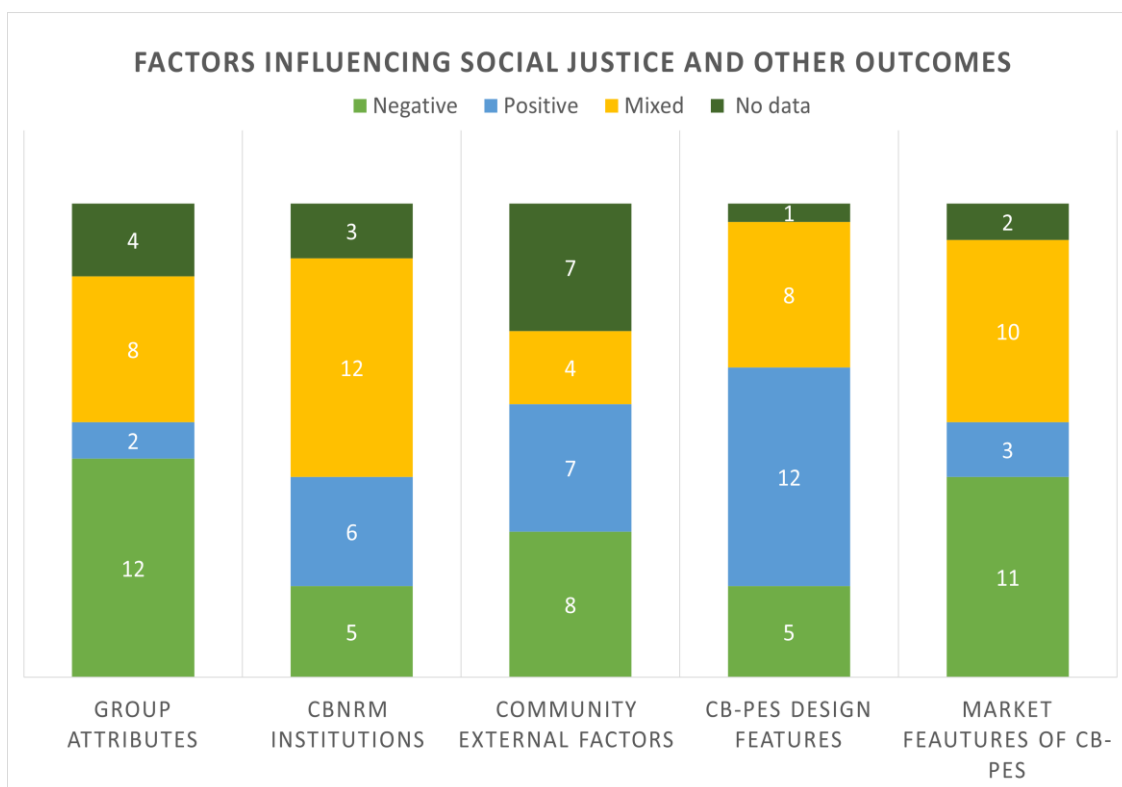


Figure 7: For each category, no. of cases that considered the influence of such category on social justice and other outcomes of CB-PES as “positive”, “negative”, or “mixed”.

#### a) *Level of poverty and dependence on resource*

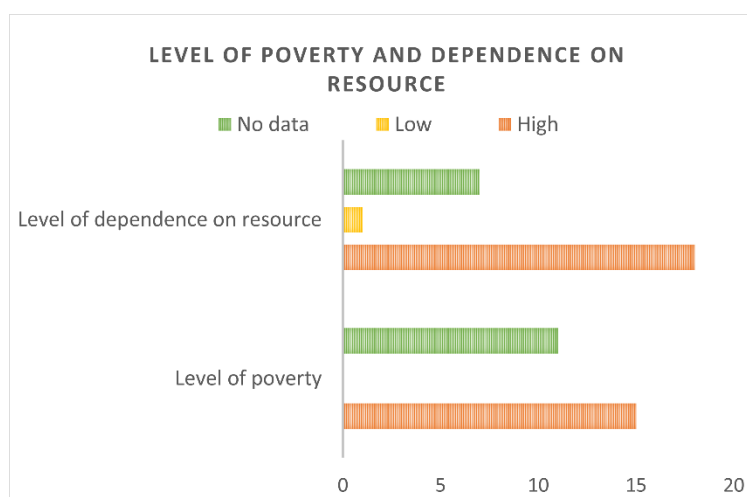
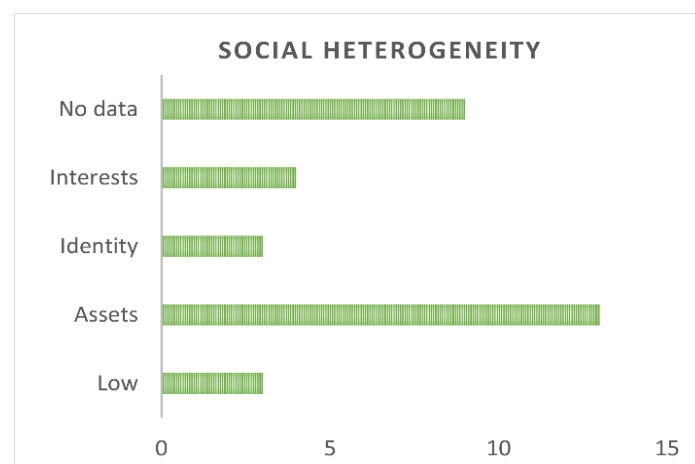


Figure 8: No. of cases where level of poverty or dependence on resource was considered “high” or “low”.

Level of poverty and dependence on resource was shown to be considerable for all cases where it was described except one (see Figure 8). Agrawal (2001) argues that, while there is a direct

relationship between poverty of users and their dependence on resource, the relationship between the poverty of users and their levels of exploitation of resource is unclear. Some reviewed cases studies show how high levels of poverty made some communities and participants very vulnerable and dependent on income from PES program (Rodriguez-Robayo et al 2019; Verde Selva et al 2020). PES program evaluators may interpret guaranteed compliance and participation as a positive sign. However, this dependency raises concerns about justice and exploitation of farmers who, due to their vulnerability, may be forced to accept too low payments and are deeply affected by fluctuations in the market for ecosystem services for non-public programs (Otto 2019). Moreover, the results in the previous section show that poorer and marginalized communities or participants are more likely to receive less benefits, endure higher costs and to be excluded from participating or deliberative processes.

***b) Heterogeneity***



*Figure 9: No. of cases that experienced each type of social heterogeneity.*

Rural communities are characterized by marked structural differences expressed through identity (e.g., ethnicity, gender, religion), interests (e.g., economic, social, environmental) and assets (e.g., wealth, class, property, resources) (Ostrom 2001; Agrawal 2001). The results of this study show heterogeneity can directly affect equity in PES. Firstly, marked social classes, asymmetrical power relations and differential access to assets, education, and social relations hinder participation and agency of marginalized groups in CB-PES programs (Corbera et al

2007 (a), (b); Jones et al 2019). Assessments of gender equity in communities revealed that women, as a marginalized group, did not receive as many benefits, were disproportionately major cost bearers, and were excluded from decision making processes. Moreover, because of not having access to land or property titles, marginalized groups are often “unintentionally” excluded by CB-PES developers from participation and decision making in program. Concentration of CB-PES knowledge and decision power on community members with more power or wealth showed to favour “elite capture” (distributive justice) and harm internal decision-making processes of local governance (procedural justice) (García-Amado et al 2011; Krause et al 2013; Almeida-Leñero et al 2017; Cordoba et al 2020).

Regarding heterogeneity of interests, pre-existent social capital, egalitarian principles, and communal pro-conservation attitudes were an important determinant of program outcomes and social justice, often reinforcing collective practices (Bremer et al 2014; Rodriguez-Robayo et al 2017; Cordoba et al 2020). This aligns with Ostrom’s (2001) or Matta and Alavalapati’s (2006) theory that participants must have relatively similar economic and social background (e.g. favouring conservation behaviour) for successful collective action. However, these conditions are quite rare and, in many cases, economic background disparately influences participant’s preferences of CB-PES funding allocation and land use (García-Amado et al 2011). Lastly, religion could either lead to weak collective action but could also act as a cohesive factor (Corbera et al 2007 (a), (b)).

### *c) Leadership*

Similarly, legitimate and supported leadership can directly influence CB-PES outcomes. Leaders sometimes took advantage of their economic and political status to broaden control over land use and misuse PES community funds (Krause et al 2013; Corbera et al 2020). Manipulative techniques and powers of persuasion were also employed to make unilateral decisions, exacerbating power asymmetries which in turn influenced program performance by

diminishing distributive and procedural equity within community, thereby increasing community distrust and conflicts, and demotivating participants (Almeida-Leñero et al 2017; Hayes and Murinho 2018). Nevertheless, sometimes it is hard to distinguish between intentional corruption and poor management capacities (Verde Selva et al 2020). When there are high skilled local authorities or when leaders are accountable for corruption (e.g., through economic and social sanctions), there is higher chance for trust and absence of conflicts, which favour CB-PES development and social justice outcomes (Rodriguez-Robayo et al 2019).

#### *d) CBNRM institutions*

Lastly, the pre-existent institutional arrangements and management regimes for community-based natural resource management have a strong influence on justice and effectiveness of CB-PES. The community's institutional factors that were assessed for this study were based on design principles and critical enabling conditions for sustainable commons governance (Ostrom 2001, Agrawal 2001; Cox et al 2010). These include definition of boundaries and land rights, collective choice arrangements, recognition and effectiveness of rules for resource access and management, monitoring, graduated sanctions, and accountability, and conflict resolution mechanisms.

Community internal organization and collective choice arrangements strongly influenced the perception of programs as fair, beneficial, or effective (Jones et al 2018; Rodriguez-Robayo et al 2019; Jones et al 2019). More organized or egalitarian communities that facilitate deliberative processes were more likely to report benefits and perceived equity of program. Communities with solid pre-existent prosocial norms significantly reduced chances of free riding and corruption, enhancing community's ability to equitably allocate CB-PES restrictions and funds (Nieratka et al 2015; Denham 2017). In particular, communities that had already established rules related to conservation and effective monitoring or sanctioning practices (including accountability of leaders) were more likely to successfully incorporate CB-PES

restrictions (Corbera et al 2007 (a), (b); Bremer et al 2014; Nieratka et al 2015; Almeida-Leñero et al 2017; Rodriguez-Robayo et al 2019; Joslin 2019; Jones et al 2019). Conversely, in less organized or more conflictive communities, more power is concentrated in leaders and some community members were excluded from decisions (procedural justice), raising concerns about elite capture (distributive justice) and future conflicts (Krause et al 2013; Bremer et al 2014; Hayes and Murtinho 2018; Osborne et al 2018; Verde Selva et al 2020).

Bottom-up conservation instruments that operate within complex local governance structures pose critical challenges. Social capital and collective action have been argued by many researchers to be a necessary precondition for CB-PES success. Hence, if decision making power is left to communities and these characteristics are not present, CBNRM institutions may impede the effective and equitable implementation of the programs. On the other hand, interfering or imposing rules may violate indigenous people's rights to self-determination (Krause et al 2013).

## ***7.2 Influence of external community factors***

### ***a) Market integration***

Ostrom (2001) argues that local inequalities and polarization of interests can increase as market institutions are integrated in CBNRM. Cox et al (2010) present other claims from different authors about the impacts of market integration in rural communities, including a potential decline in resource conditions and cooperative behaviour, and the destabilization of common property regimes. Of the case studies analysed, although there was no clear relation between market integration and social justice outcomes, some factors did influence other social and economic impacts of CB-PES on the communities. Most communities carried out income earning activities which revolved around limited production and sale of timber, farm, and agricultural products. In some cases, these activities were not cost-efficient or generated little income because of large distances to markets and urban centres and restrictions in commercial

logging or hunting. Moreover, neoliberal agrarian reforms of the late 1980's and 90's led to severe crises in the grain and coffee sectors which experienced low and unstable prices (Nieratka et al 2015; Osborne et al 2018 (a), (b); Rodriguez-Robayo et al 2019). In such cases, implementing CB-PES was a favourable option with low opportunity costs for the economically struggling communities. If communities had already implemented other successful market-based instruments of conservation such as community forestry, ecotourism and green certifications, these activities could be easily enhanced and expanded with PES (García-Amado et al 2011; Joslin 2019; Brownson et al 2020).

However, some communities had past experiences with corrupt or unsuccessful market-oriented development program which led them to distrust the CB-PES program (Otto 2019). Furthermore, in many cases, not all community members were willing to give up productive land uses which could generate larger profits than conservation activities required for PES programs. The rejection of some community members to participate in PES due to alternative market options has occasionally led to conflicts (Corbera et al 2020).

#### ***b) Broader political context***

Social and political inequalities, distribution of land, and recognition of rights have been historical sources of conflict in Latin America which have been shown to influence social justice and other outcomes of CB-PES. Neoliberal policies in the 1980's encouraged or forced some communities to divide and privatize formerly communal properties (Corbera et al 2020). Some governments, such as the Mexican, also enforced protected areas without consultation and accounting for communities' beliefs or social conditions (Krause et al 2013; Cordoba et al 2020). Such national-level reform processes resulted in the dysfunctional coexistence of old and new institutional frameworks which harmed participatory local politics and prevented the creation of inclusive governance structures (Betrisey et al 2018). Many communities suffer from social and political misrecognition or repression, and experience conflicts between

community members that demanded autonomy from the state and state-aligned community leaders (Osborne et al 2018 (a)). These contexts affect CB-PES outcomes by weakening community level institutions, which are necessary to ensure justice in PES programs. Moreover, lack of political accountability and transparency have led to general lack of trust in national government agencies, which negatively influence communities' decision to participate in public PES programs run by the state (Verde Selva et al 2020; Corbera et al 2020).

Insecure land tenure and conflicts over property rights can also affect decision to enrol in PES (e.g., some perceived PES would alienate their land rights) and procedural justice through participation in design of projects (e.g., communities not holding property rights were excluded) (Corbera et al 2007 (b)). These issues were reduced in countries like Mexico were indigenous peoples' uprising, such as the Zapatista in Chiapas in 1994, led to constitutional reforms that clarified and legally secured collective land tenure rights of indigenous communities (Nieratka et al 2015; Denham 2017).

### ***7.3 Influence of market features of CB- PES***

Forest Trends (2008) identifies three types of contracts: public payment schemes which commonly involve direct payments from a government agency or public institutions to landowners and managers; formal markets with open trading between buyers and sellers, either under a regulatory cap or floor on the level of ecosystem services provided, or voluntarily; and self-organized voluntary private deals between individual beneficiaries of ecosystem services and providers. Of the cases studied, 54% were public, 34% were self-organized and 8% based on formal markets, with the remaining 4% undefined (see Figure 10.1). This supports the claims of academics, presented in the Theory section, that the majority of PES schemes in developing countries are run by states under public policy regulation and funding (Gomez and Muradian 2015).



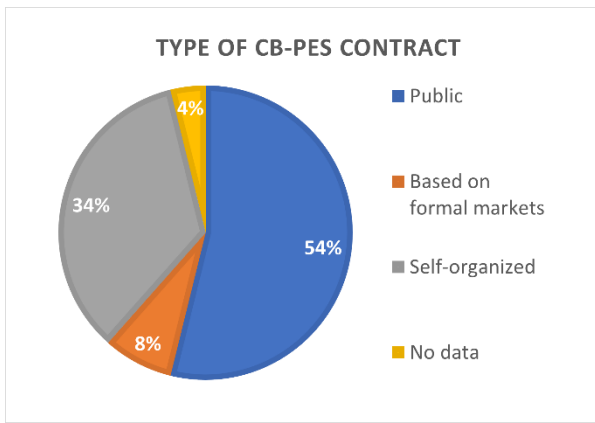


Figure 10.1: Percentage of cases with each type of CB-PES contract.

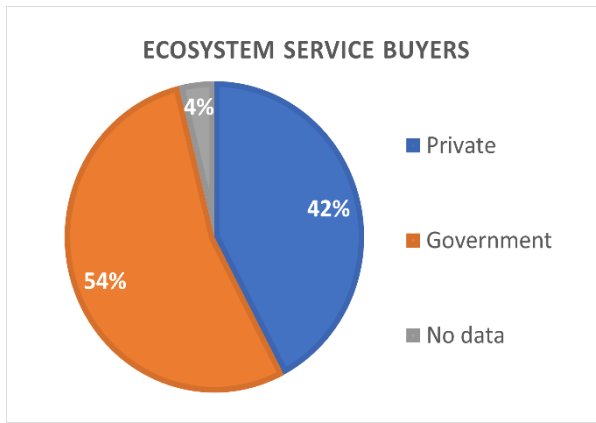


Figure 10.2: Percentage of each type of ecosystem service buyer (overall of cases).

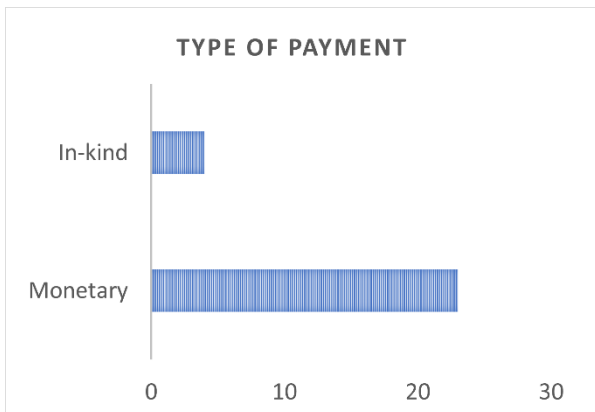


Figure 10.3: No. of cases with each type of payment form.

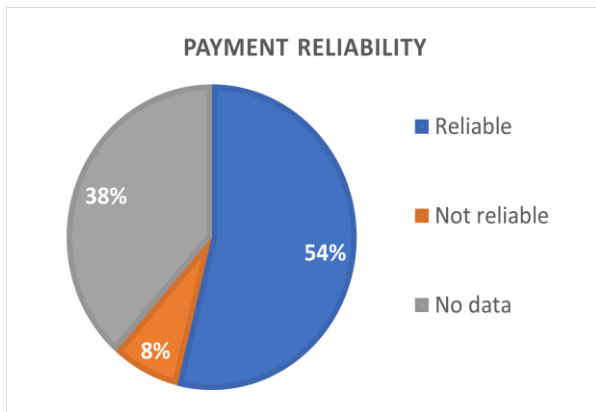


Figure 10.4: Percentage of cases with reliable and not reliable payment forms (overall of cases).

The analysed studies offer a variety of perspectives about different types of PES schemes. Promoters of public schemes argue these are stable and equitable since they incur little cost, eliminate problems of shifting demand, and avoid reinforcing inequity in that they do not target private landowners (Nieratka et al 2015; Cordoba et al 2020). However, federal budget was shown not to be enough to cover all interested and eligible communities (Brownson et al 2020). Also, in one case the Mexican government placed the burden of financial compensation on the communities and NGOs which had to spend a lot of time and resources on fundraising campaigns to attempt to convince business owners and residents of nearby cities to voluntarily donate money (Garcia-Amado et al 2011; Denham 2017).

In contrast, contracts based on formal markets suffer from constantly changing standard of international carbon market (Osborne et al 2018 (a), (b)) and uncertainty in the carbon credit

economy (Otto 2019). For example, market uncertainty related to the 2008 global financial crisis and shifting carbon credit buyer interests directly affected locals who were most vulnerable as they were largely dependent on PES income (Otto 2019). By analysing various communities in Chiapas, Otto (2019) discusses the power inequalities within the carbon credit commodity chain which limit the attainment of positive environmental and social outcomes of PES. For example, locals are comparatively less familiar to international buyers and, if asymmetries of information or power are present between buyers and providers in contract signing, this can result in acceptance of payments that are less than seller's opportunity costs. Of the analysed cases, 42% of buyers were private, while 54% were governments funds in public schemes (see Figure 10.2).

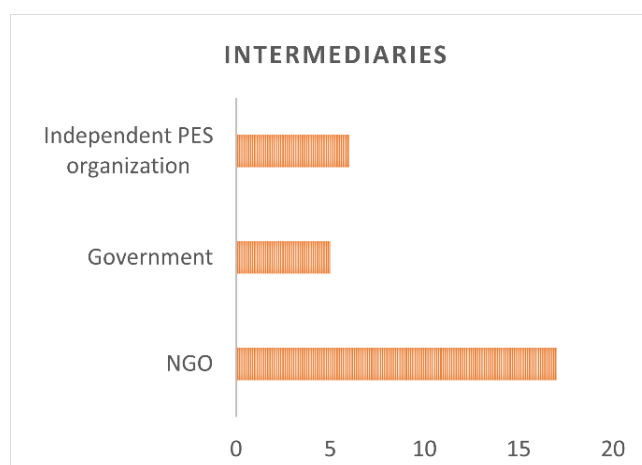
Regarding type of compensation, in 23 of the cases payments were monetary, while in only 4 cases programs offered alternative in-kind incentives (see Figure 10.3). In kind incentives such as funding or support for community development projects often provide long-term productive benefits (Krause et al 2013; Bremer et al 2014; Almeida-Leñero et al 2017; Osborne et al 2018 (b); Brownson et al 2020; Corbera et al 2020). Others, such as food baskets, raised questions of equity in a case in Brazil, since they did not contribute to financial autonomy and collective agency of women (Verde Selva et al 2020). Monetary rewards, on the other hand, often become a key source of income in the short-term, but it is unclear whether heavily relying on CB-PES payments is a sustainable or fair long-term strategy for rural communities due to arising conflicts (Corbera et al 2020), economic dependence on program (Rodriguez-Robayo et al 2019), and market risk in non-public programs (Otto 2019). Moreover, payments are often insufficient to encourage farmers to design long term forest management plans or development activities, hence unable to transform unequal power relations into cooperative collective action (Corbera et al 2007 (a)). The previous results of social justice outcomes showed that the amount and allocation of payments can reinforce distributive and procedural injustices. Recognition issues, such as incommensurability of values, can also arise in determining the

type of benefits provided by PES programs (Sikor et al 2014). In particular, financial reductionism can lead to the undermining of intrinsic cultural values since many communities reported environmental benefits and technical support were a larger incentivizing factor to participate in CB-PES (Corbera et al 2007 (b); Krause et al 2013; Jones et al 2018; Jones et al 2019).

Other factors included in our analysis of market features of CB-PES were payment reliability and contract conditionality. For the first, Forest Trends (2008) claims that if payments are not secure, reliable, or regular, they may affect the participant's perception of the reliability of the program and the effectiveness of the program in terms of compliance, potentially exacerbating or creating social conflicts. The results show that in 54% of cases payments were reliable, and only in 8% of the cases not reliable (see Figure 10.4). Regarding contract or payment conditionality, although strict conservation conditions can positively influence CB-PES ecological outcomes, in several communities participants considered conservation conditions and sanctions to be too strict and, in combination with insufficient compensation, did not justify participation (Hayes and Murtinho 2018; Rodriguez-Robayo et al 2019; Verde Selva et al 2020).

#### ***7.4 Influence of CB-PES design and management features***

##### ***a) Intermediaries***



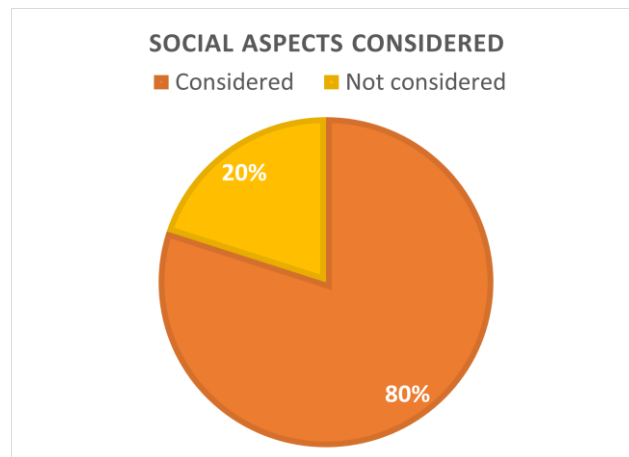
*Figure 11: No. of cases where different types of intermediaries were present.*

According to Forest Trends (2008), intermediaries may contribute to the effectiveness of PES programs by, for example, reducing transaction costs along the value chain to buyers, identifying specific resource management alternatives, and offer support in any other activities related to implementation (including monitoring, certification, verification, etc.). However, regarding social benefits and justice, some academics argue that shifting global investments to local communities often serves the interests of elites and intermediary organizations such as governments and NGOs, while providing no significant benefits or power to local actors which may lose access to significant livelihood resources (McDermott 2013). Figure 11 shows the number of cases where CB-PES programs included intermediaries and what kind. The most common intermediaries of this study were NGOs, with a few being independent PES organizations or governments. In the cases studied, most communities had a positive experience with CB-PES intermediaries. Many NGOs enabled empowerment of communities through facilitating participatory bottom-up processes and negotiations about PES contract conditions (Corbera et al 2007 (b); Krause et al 2013; Denham 2017; Osborne et al 2018; Cordoba et al 2020). Intermediaries were also crucial to promote community enrolment in CB-PES and offered technical assistance and support (Bremer et al 2014; Osborne et al, 2018 (b); Jones et al 2019).

However, intermediaries carry the risk that, if they hold too much power, they may impose themselves or undermine communal autonomy and institutions (Krause et al 2013). Specifically, projects that focus on techno-economic dimensions of PES projects will inevitably shift control and power from communities to expert intermediary organizations, weakening procedural justice. These organizations are often distant to communities and their real experiences with PES (Osborne et al 2018 (a)). When intermediaries take decisions independently from communities, their decisions may clash with local norms and institutions, and community members may perceive this as an act of misrecognition and disrespect (recognition justice) (Betrisey et al 2018). Additionally, in communities where leaders take

control over CB-PES program management, intermediaries may contribute to reinforcing power asymmetries by only informing local authorities or leaders about functioning and impacts of PES (procedural and distributive justice) (Almeida-Leñero et al 2017).

***b) Program consideration of social aspects***



*Figure 12: Percentage of cases which considered or did not consider social aspects in CB-PES design and implementation.*

In 80% of the analysed cases, the studies mentioned social aspects that were considered by the CB-PES programs and their impacts on social justice (see Figure 12). For example, CB-PES programs that implemented mechanisms to empower or include minority groups in decision-making processes contributed to balancing the concentration of power in the hands of local elites (Verde Selva et al 2020). Forms of community engagement included farmer outreach, technical assistance and consultations, educational meetings, monitoring, and accountability (Osborne et al 2018; Brownson et al 2020; Cordoba et al 2020). These mechanisms also contributed to raising environmental awareness and strengthening local community institutions while embedding them into the carbon market (Osborne et al 2018 (b); Brownson et al 2020). Moreover, programs that adapted to local resource use cultures and management institutions (e.g., recognizing the role of rural communities in protecting valuable ecosystems) and offering flexibility in developing conservation plans, did a better job at developing projects that were aligned with the interests and values of local communities (Bremer et al 2014; Denham 2017; Betrisey et al 2018). On the other hand, programs that did not consider social aspects prevented

some community members to participate or benefit from projects, contributing to reproduction of unequal hierarchical social structures (Almeida-Leñero et al 2017; Joslin 2019). Furthermore, programs that circumvented traditional community governance structures or focused on market rationale were more likely to trigger local conflicts over distribution of benefits and costs (Corbera et al 2007 (a); Osborne et al 2018 (a)).

In general, growing evidence shows that PES programs that explicitly recognize justice in design and implementation are more likely to enhance project legitimacy, accountability and compliance, while programs that did not consider justice are more likely lead to negative social impacts (Pascual et al 2014). Nevertheless, some authors detect a critical balance between program's visions about cooperation and development and local ideas. As seen in the previous section, some PES programs intervene in communities' social structure by, for instance, implementing mechanisms to empower and facilitating inclusion of isolated community members (e.g., women and youth). However, the values of PES promoters about what is fair or desired may differ from traditional local norms, which can result in internal conflicts or resistance to participate (Corbera et al 2007 (a), (b); Hayes and Murtinho 2018; Cordoba et al 2020). For example, in one case community's allocation principles conflicted with program justice goals (Hayes and Murtinho 2018) and, in another, the program's aim to collectivize land was against the interest of many households (Corbera et al 2007 (a)). Moreover, narratives of success of CB-PES may differ between program developers and locals and lead to recognition justice issues. Some communities already carried pro-conservation attitudes and practices for generations, hence, by claiming "coincident" pre-existing land management practices as their own, programs can misrepresent original conservation labour of rural communities and contribute to erasing local knowledge (Joslin 2019).

## **8. Conclusion**

The goal of this paper is to provide a comparative overview of existing cases that report on social justice outcomes of CB-PES in Latin America. For this, a qualitative meta-analysis was performed where procedural, distributive and recognition outcomes are coded, as well as ecological, social and income or poverty alleviation outcomes. In addition, this study aims to frame these impacts within the hybrid institutional nature of CB-PES programs. Specifically, this research examines how specific attributes of market and community-based institutions for environmental management have or may have contributed to the impacts of CB-PES on social justice.

Social justice outcomes were significantly different between communities and programs. Nevertheless, this study's analysis shows that there exist tensions and synergies between social justice outcomes and community or market features of CB-PES programs. While some of these features may combine to provide excellent outcomes, others can reinforce social injustices, trigger internal conflicts, and impede positive ecological or economic results. First, regarding internal and external features of communities, the analysed cases have shown that internal organization capacities and collective action of communities, as well as support and legitimacy of leaders, and their willingness to promote collective action, notably influence the distributive and procedural justice of CB-PES programs. This is to the extent that community institutional capacities and social capital are considered to be a precondition for PES success (Nieratka et al 2015; Rodriguez-Robayo et al 2019). Previous market integration of communities was not recorded to have a specific impact on social justice but, nevertheless, could have a critical influence in the success of PES. Lastly, structural injustices, insecure land tenure, and lack of trust in national government agencies negatively influence distributive and procedural justice of CB-PES.

Concerning market and other characteristics of the CB-PES programs, the results show that programs that are less dependent on market demand or price fluctuations are more likely to report positive social justice outcomes. The same applies to programs that ensure reliable payments or incorporate trust mechanisms instead of strict sanctions and conditions. However, the amount and type of payments raises concern for the distributive and recognition justice. Preference over in-kind or monetary payments, or the willingness of communities to accept compensation at all in exchange for conservation practices, depends strongly on each community context. Moreover, programs that include locally rooted intermediaries and capacity building, or actively consider and question social justice in the design and implementation of projects are more likely to achieve positive justice outcomes and sustainable long-term benefits. Nevertheless, to avoid recognition injustices, while operating within communities, programs should account for local norms and institutions, and different views of development and justice (Krause et al 2013).

In a globalizing world, hybrid programs such as CB-PES that merge market and community institutions to govern socio-ecological systems are becoming especially popular since they have the potential to shift control towards historically discriminated and overseen poor rural communities, while fitting well inside the generally established market logic. To enhance and expand the theoretical framing of market-community conservation programs, this study promotes additional in-the-field or systematic case study research on the interdependencies between social, ecological, and economic aspects of market-community conservation instruments such as CB-PES. These research insights are critical to assess the risks and opportunities posed by the integration of market-oriented conservation mechanisms in community-based resource management systems and contribute to finding effective and just solutions to global environmental problems.



## Appendix

**Table A.1: List of variables and their respective description and values. Variables with values that include “explained” were supported with proof and explanation (from the respective articles) regarding the outcome.**

	Variables	Description	Values
<b>(1) General case study information</b>	Country		
	Region		
	Data collection		
	No. of communities studied		
<b>(2) General data on CB-PES program</b>	Name of CB-PES program(s)		
	Year implemented		
	Targeted ecosystem service	Types of ecosystem services that were targeted by PES	<i>“carbon sequestration”, “habitat restoration”, “hydrological services”, “soil and nutrient cycling”, other.</i>
	Degradation of ecosystem	Level of degradation of targeted ecosystem before and during program implementation	<i>“high”, “low”</i>
	Collective characteristics	Collective or community-based characteristics of program	<i>“collective land enrolment/management”, “community engagement in decision making”, “collective distribution of payments”, “community investment plans”, “community monitoring”</i>
<b>(3) Attributes of the group</b>	Social heterogeneity	Are there any marked structural differences expressed of identity (e.g., ethnicity, gender, religion), interests (e.g., economic, social, environmental) and/or assets (wealth, class, property, resources)?	<i>“yes”: “wealth”, “interests”, “identity”; or “no”.</i>
	Level of poverty	Average economic status of the community before and during program implementation	<i>“high”, “low”</i>

	Level of dependence on resource	Average economic dependence on ecosystem resources for sustaining livelihoods of the community	<i>“high”</i> , <i>“low”</i>
	Leadership	Is there leadership and is it legitimate and/or supported by community members?	<i>“supported”</i> , <i>“not supported”</i> , <i>“not always supported”</i> , <i>“no leadership”</i>
	<b>Group attribute’s influence on CB-PES performance</b>	Does the author connect any of the group attributes to any of the social outcomes of PES?	<i>“positive”</i> , <i>“negative”</i> , <i>“mixed”</i> (explained)
<b>(4) Attributes of CBNRM institutions</b>	CBNRM characteristics	Which attributes of CBNRM institutions does the author mention?	Open-ended
	<b>CBNRM attribute’s influence on CB-PES performance</b>	Does the author connect any of the CBNRM attributes to any of the social outcomes of PES?	<i>“positive”</i> , <i>“negative”</i> , <i>“mixed”</i> (explained)
<b>(5) External factors</b>	<b>Market integration influence on CB-PES performance</b>	Were market mechanisms integrated in the community before the program was implemented? If yes, did it have a positive or negative influence on social outcomes of PES?	If yes, <i>“positive”</i> , <i>“negative”</i> , <i>“mixed”</i> (explained)
	<b>Broader political context influence on CB-PES performance</b>	Does the broader political context (e.g. social conflicts before or during program) have a positive or negative influence on social outcomes of PES?	<i>“positive”</i> , <i>“negative”</i> , <i>“mixed”</i> (explained)
<b>(6) Design and management features of CB-PES</b>	Intermediaries	Were there any intermediaries present in the program implementation and management other than the direct buyers and sellers?	If “yes”: <i>“NGO”</i> , <i>“government”</i> , <i>“independent PES organization”</i>
	Social aspects considered	Does the PES program account for social impacts or does it incorporate social goals?	<i>“considered”</i> , <i>“not considered”</i>
	<b>CB-PES design and management features’ influence on CB-PES performance</b>	Does the author connect CB-PES design and management features to social outcomes of PES?	<i>“positive”</i> , <i>“negative”</i> , <i>“mixed”</i> (explained)

<b>(7) Market features of CB-PES</b>	Type of market	See Section on “Influence of market features of CB-PES”	“ <i>public</i> ”, “ <i>based on formal markets</i> ”, “ <i>self-organized</i> ”
	Buyers of ecosystem services	What was the nature of the buyers of credits assigned to the ecosystem services?	“ <i>private</i> ”, “ <i>NGO</i> ”, “ <i>government</i> ”
	Type of payment	Type of compensation received by ecosystem service sellers (i.e., the communities)?	“ <i>monetary</i> ”, “ <i>in-kind</i> ”
	Payment reliability	Are payments reliable (i.e., regular or in accordance with contract)?	“ <i>reliable</i> ”, “ <i>not reliable</i> ”
	Payment conditionality	Are payments conditional to outcomes? If so, are conditions strict or flexible.	“ <i>strict</i> ”, “ <i>flexible</i> ”, “ <i>not conditional</i> ”
	<b>Market influence on CB-PES performance</b>	Does the author connect CB-PES market characteristics to social outcomes of PES?	“ <i>positive</i> ”, “ <i>negative</i> ”, “ <i>mixed</i> ” (explained)

**Table A.2: List of variables on social justice and general outcomes, necessary descriptions, and respective values.**

<b>Outcomes</b>	<b>Indicators</b>	<b>Description</b>	<b>Values (all incl. explanation)</b>
<b>Procedural justice of CB-PES</b>	Equity in access to participation	Evaluation of whether all community members, accounting for differences in assets and identity, were equally capable to apply and be accepted in the program.	“ <i>positive</i> ”, “ <i>negative</i> ”, “ <i>mixed</i> ” (explained)
	Equity in participation in program design and/or management	Evaluation of democratic proceedings regarding program design and implementation (e.g., if community members were equally capable of participating, or had equal decision power).	
<b>Distributive justice of CB-PES</b>	Distribution of benefits	Evaluation of equity in distribution of benefits and costs of PES. These could be monetary (e.g., cash transfers), or non-monetary (e.g., investment in local development plans such as transportation or building infrastructure, education, health, in-kind payments).	
	Distribution of costs		
<b>Recognition justice of CB-PES</b>	Program recognition of community history and values	If and how well the PES program has considered the local community history and values and if or how well community culture and values have adapted to PES values.	
	Program recognition of	If and how well the program has recognized local rules and institutions	

	community institutions, rights, and norms	and if and how well the local institutions have adapted to PES program.	
<b>Other outcomes</b>	Ecological outcomes	Perceived changes in ecosystem (service) after or during PES program.	“positive”, “negative”, “mixed” (explained)
	Income or poverty alleviation outcomes	PES program impact on average community income, poverty alleviation goals, and community development.	
	Social capital outcomes	PES program influence on community social networks and shared values (e.g., strengthening social relations, or creating or exacerbating conflicts)	

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