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## Women's Empowerment and the Honey Production Projects in the Protected Areas of Usumacinta Canyon, Mexico

By Paola Selene Vera-Martínez<sup>1</sup> and Erika Guadalupe Ceballos-Falcón<sup>2</sup>

### Abstract

Beekeeping is an activity with positive effects for biodiversity and food security; furthermore, it is compatible with the conservation objectives of protected areas. Likewise, previous studies show that the participation of women in beekeeping projects gives them access to paid work and triggers the possibility of their empowerment. The aim of the article is to explore the process of women's empowerment as one of the social results that derives from the meliponic farmers and beekeepers' projects implemented in the protected area of the Usumacinta Canyon, Mexico. For this research project, visits were made to the places of honey production in the Usumacinta Canyon, notes were collected from participant observation and unstructured interviews were taken at the site. The findings indicate that the participation of women in these projects has given them access to material resources, such as earning income from their work, and they exhibited other dimensions of the empowerment process, in particular agency—the ability to define and achieve their goals.

*Keywords:* Women's empowerment, Beekeeping, Usumacinta Canyon, Mexican women, Participant observation, Women's agency, Protected areas.

### Introduction

Protected areas constitute a strategy in the conservation of biodiversity, the number and extension of which was promoted after the 1992 UN Conference on Environment and Development, mainly in developing countries (Naughton-Treves et al., 2005) because they are rich in biodiversity but suffer from acute social problems. Similarly, the publication of the Brundtland Commission report marked another milestone for protected areas, in the sense of broadening the purpose of these to include objectives related to alleviating poverty in the surrounding local communities (Naughton-Treves et al., 2005). However, the evaluation of the management of protected areas shows insufficient results; on the one hand, they give indications of their contribution to the conservation and recovery of vegetation (Lou et al., 2021); on the other, they show that this has been insufficient to halt the decline of global biodiversity (Laurence et al., 2012;

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Rodrigues et al., 2004). Neither do the expected social benefits regularly materialize in their results. Although there are cases of success in the management of protected areas (Jiang & Wu, 2021), in many of them there are often conservation conflicts (Badola & Hussain, 2003; Gillespie & Penny, 2022). Beekeeping is among the activities that contribute both to the conservation and to the development of communities (Altunel & Olmez, 2019; Jaffé et al., 2015); in particular, this type of project has opened the opportunity for the participation of women, bringing them not only a possibility of income but also potentially driving their empowerment (Belete & Ayele, 2020; Shackleton et al., 2011).

The aim of the article is to explore the elements that contribute to women's empowerment, as one of the social results derived from meliponic farming and beekeeping developed in the protected area of the Usumacinta Canyon, Tabasco, Mexico. To do this, visits were made to these communities to make field work notes and conduct unstructured interviews with staff from the Mexican government agency in charge of managing the protected area. Before discussing the results and conclusions, the paper offers a brief synthesis of the strategy and evolution of protected areas, followed by a review of the literature on women's empowerment.

### **Scope and Limitations of the Protected Areas Strategy**

Protected areas belong to the set of ecosystem-based approach strategies, which can be grouped within Nature-based Solutions (NbS)<sup>3</sup> (Cohen-Shacham et al., 2019). In general terms, NbS have been shown to be cost-effective long-term solutions; for example, Keesstra and associates (2018, p. 1006) found evidence that NbS, divided into soil solutions and landscape solutions, are effective in mitigating and restoring soils affected by degradation processes. While NbS is a relatively recent<sup>4</sup> type of intervention, protected areas are a strategy that has been in place for several decades, and they have also been shown to be effective in conserving biodiversity and providing essential ecosystem services (Watson et al., 2014, p. 67).

Protected areas have undergone qualitative and quantitative changes. The first of these changes is the purpose of the protected area, which expanded from biodiversity conservation to also be considered as an instrument for poverty reduction. Naughton-Treves and associates (2005, p. 227) describe this reorientation of protected areas towards people, which occurred between the World Parks Congress in 1982 and 1992, and they identify the Brundtland Commission report as the turning point in the management of protected areas to include benefits for the community. Likewise, Naughton-Treves and associates (2005, p. 228) point to the 1992 UN Conference on Environment and Development as one of the drivers in the implementation of protected areas.

The second element of change consists of the adoption of the term "area-based conservation," which includes protected areas<sup>5</sup> and other forms of conservation (Other Effective

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<sup>3</sup> Nature-based Solutions "are defined by [International Union for Conservation of Nature] IUCN as actions to protect, sustainably manage and restore natural or modified ecosystems, which address societal challenges (e.g. climate change, food and water security or natural disasters) effectively and adaptively, while simultaneously providing human well-being and biodiversity benefits" (Cohen-Shacham, et al., 2016, p. xii).

<sup>4</sup> Cohen-Shacham and associates (2016, pp. 2-4) find that the use of the term emerged in the 2000s, pointing to The World Bank report (2008), "Biodiversity, Climate Change and Adaptation: Nature-Based Solutions from the World," as one of the first publications to use it.

<sup>5</sup> A protected area is defined by the Convention on Biological Diversity (1992) as "a geographically defined area which is designated or regulated and managed to achieve specific conservation objectives" (cited in Kingston & Vorhies, 2019).

Area-Based Conservation, OECM<sup>6</sup>), which may be under the management of local communities, indigenous people, or private individuals; one example is the indigenous territory of the Amazon basin (Watson et al., 2014, p. 67). It should be noted that the shift towards area-based conservation also means broadening governance approaches (Kingston & Vorhies, 2019).

Finally, the area covered by land protected areas and OECM increased from 10,421,720 km<sup>2</sup> in 1990 to 22,454,710 km<sup>2</sup> in 2021, while marine protected areas and OECM increased from 1,788,639 km<sup>2</sup> to 28,054,196 km<sup>2</sup> in the same period (United Nations Environment Programme-World Conservation Monitoring Centre & International Union for Conservation of Nature [UNEP-WCMC & IUCN], 2021). However, these data are short of the goals proposed in the Convention on Biological Diversity for 2020: 16.64% reached from a terrestrial target of 17%, and 7.74% reached from a marine target of 10% (UNEP-WCMC & IUCN, 2021). Furthermore, although there are successful cases in the recovery of vegetation (Lou et al., 2021), it has been documented that the protected areas strategy has not been sufficient to stop the collapse of biodiversity in tropical forests (Laurence et al., 2012) and the general diversity of species (Rodrigues et al., 2004). Watson and associates (2014, p. 70) also noted a decline in the support of protected areas by some governments, reflected in budget cuts and staff reductions, among other elements.

Returning to the aspect of benefits to communities, Naughton-Treves and associates (2005, p. 241) point out that much of the expansion of protected areas occurred in developing countries, where a “phenomenon called the Rich Forests, Poor People” syndrome usually occurs, where high rural poverty is observed in places where biodiversity is great. Considering the above, the redirection of the purpose of the protected areas from the conservation of biodiversity towards a focus on people makes more sense. Watson and associates (2014, p. 68) emphasize that a well-managed protected area “can provide crucial ecosystem services, including water, food security, protection of wild relatives of crops, maintenance of wild fish stocks and carbon storage,” aspects that together could contribute to the well-being of communities.

However, when the effects upon communities derived from the management of protected areas are analyzed, heterogeneous impacts are found. For example, Jiang and Wu (2021) find that, in the case of the Mangkang National Nature Reserve on the Qinghai-Tibetan Plateau, although green jobs have been created that have allowed people to stay in their communities, the wages earned are low compared to responsibilities and workload. The authors found that people manifest a sense of identity with the place, which has a non-monetary compensation effect. Gillespie and Penny (2022) studied the case of Tonle Sap Lake basin, Cambodia. They found that while the protected area has the potential to alleviate poverty by offering various economic opportunities, it can also lead to disempowering local communities due to restrictions of use of protected areas. Badola and Hussain (2003, p. 235) agree in pointing out the emergence of conflicts between the management of protected areas and local communities, adding that these conflicts are more severe for local women, who need to source resources such as firewood and fodder from such areas.

The disempowerment seems a contradictory result, not only because it is expected that good management of protected areas will contribute to alleviating poverty, but the protected areas strategy is based on the premise that good management of ecosystems is associated with human well-being. However, as noted in the Millennium Ecosystem Assessment, the “[e]quitable and

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<sup>6</sup> OECM is defined by the Convention on Biological Diversity (2018) as “a geographically defined area other than a Protected Area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the in-situ conservation of biodiversity, with associated ecosystem functions and services and where applicable, cultural, spiritual, socio-economic, and other locally relevant value” (cited in Kingston & Vorhies, 2019).

sustainable well-being depends heavily on links with ecosystem services and on who gains and who loses over time from their use” (World Resources Institute [WRI], 2003, p. 76).

### **Women’s Empowerment**

If well-being and poverty represent the extreme points of a continuum (WRI, 2003, p. 74), then the focus could be on how the management of protected areas contribute to the alleviation, reduction, or eradication of poverty, or an improvement in well-being. Between one choice and the other, one would be choosing indirectly between a focus on the means or the ends for the study of poverty; the first approach is represented by methodologies oriented towards income and poverty, such as the poverty line, while the second approach employs methodologies that seek to capture well-being, for example, the Human Development Index (Kabeer, 1996).

In this regard, the criticism of Kabeer (1996) focuses on the fact that the analysis of poverty has been made by assuming an apparent gender neutrality; however, she points out that these analyses are carried out from the notions of male well-being and agency, which limits the analysis of the gender dimensions of poverty. Kabeer (1996, p. 13) adds that, although the indices can be disaggregated by gender, they do not reflect the cultural rules, norms, or values that tend to devalue the well-being of women. In other words, in the analysis of poverty, it is necessary to distinguish between the social forces that create poverty and those that promote discrimination. Kabeer writes: “Women are generally poorer than men because they lack the range of endowments and exchange entitlements which male members of their households tend to enjoy. They are less able than men to translate labour into income, income into choice and choice into personal well-being” (1996, p. 19).

The process that leads to the capacity of choice is what is called empowerment, Kabeer (1996) focused both on the empowerment of women and the empowerment of the community. In a later paper, Kabeer (1999) points out that the empowerment of women “is about the process by which those who have been denied the ability to make strategic life choices acquire such an ability” (p. 435). Likewise, she proposes three interrelated dimensions to conceptualize empowerment (1999, pp. 435-438):

- Resources: understood in a broad sense (material, and human and social resources), their access to current endowments, as well as their future claim or expectation of them, are considered.
- Agency: understood as the ability to define one’s goals and act upon them; considers the decision-making process and its different manifestations (negotiation, deception and manipulation, among others). Likewise, she considers non-explicit forms of agency, such as the norms and rules that regulate social behavior.
- Achievements: refers to well-being outcomes.

Kabeer (1999, p. 437) points out that the conditions of the choice, the choice itself, and its consequences must be considered. She distinguishes between first-order choices—those that are strategic life choices—and those of the second order, which are important for the quality of life but are not critical to define the life that you want to live. Furthermore, Kabeer underlines the interdependence between individual and structural change: “the criterion of alternatives relates to the structural conditions under which choices are made while the criterion of consequences relates to the extent to which the choices made have the potential for transforming these structural conditions” (1999, p. 461). Thus, from the perspective of Kabeer (1999, p. 462), although

empowerment has its essence in the capacity for self-determination of women, it also concerns a process of social change.

Kabeer's (1999) proposal is present in various studies. For example, Datta and Gailey (2012) conducted a study on the empowerment of women through social entrepreneurship, where they take the case of a cooperative in India, finding that women perceive their empowerment in three ways: economic security, development of entrepreneurial behavior, and increased contributions to the family. Datta and Gailey (2012) concluded that ultimately the measure of empowerment of women is manifested in "achievements gained from their own agency to choose what businesses to run and social causes to invest in" (p. 583).

In other research, however, Kabeer's (1999) proposal is diluted in the construction of alternative theoretical frameworks. In the context of protected areas and tourism, Panta and Thapa (2018) carried out a study in Bardia National Park, Nepal. Although the authors found that women entrepreneurs have achieved benefits such as self-confidence and personal skills, increased access to cash income, and decision-making roles in the family, the empowerment of women entrepreneurs was limited by socio-cultural norms related to the division of labor in the home and in business.

## **Methodology**

### *Study Area*

The Usumacinta Canyon protected area is part of the Mesoamerican Biological Corridor, which runs from Mexico to Central America and has been defined as protecting one of the richest regions in the world in biodiversity (Secretaría de Medio Ambiente y Recursos Naturales [SEMARNAT], 2015) and provides a wide range of ecosystem services (Gallardo-Cruz et al., 2021). It was established as a Flora and Fauna Protected Area through a presidential decree in 2008, with an area of 46,128.49 hectares, located in the municipality of Tenosique in Tabasco, Mexico (SEMARNAT, 2015).

**Table 1: Usumacinta Canyon Flora and Fauna Protected Area**

<b>Characteristics</b>	
Management category	Flora and Fauna Protected Area
IUCN category	VI (Managed resource protected area, managed mainly for sustainable use of natural resources)
Geographical location	17°14'00" to 17°28'00" N latitude and 91°32'00" to 90°56'00" E longitude
Location	Tenosique, Tabasco, Mexico
CONANP region	Coastal Plain and Gulf of Mexico
Ownership type	State
Governance type	Federal or national ministry or agency
Administering institution	Comisión Nacional de Áreas Naturales Protegidas, CONANP
Total area	46,128.49 ha
Estimated population	8,156 people*
Women	4,093*
Men	4,063*
Indigenous population	3,158 *
Vegetation types	Lower thorny jungle Evergreen high forest Hydrophilic vegetation
Representative species	<i>Flora:</i> Chicozapote (Manilkara zapota), Mamey sapote (Pouteria sapota), Ramon (Brosimum alicastrum), Palo de lacandón (Dialium guianense), Canshan (Terminalia amazonia) <i>Fauna:</i> White-tailed deer (Odocoileus virginianus), Ocelot, tigrillo (Leopardus pardalis), Tepezcuintle (Cuniculus paca), Collared peccary (Pecari tajacu), River otter (Lontra longicaudis), Manati (Trichechus manatus), Puma (Puma concolor), Scarlet Macaw (Ara macao), Toucan (Ramphastos sulfuratus), Sparrowhawk (Accipiter sp.), Parrot (Amazona sp.), Hocofoisán (Crax rubra), Swamp crocodile (Crocodylus moreletii), American crocodile (Crocodylus acutus), Green iguana (Iguana iguana), Pejelagarto (Atractosteus tropicus), Guao turtle (Staurotypus triporcatus)

Source: Comisión Nacional de Áreas Naturales Protegidas [CONANP] (2021); UNEP-WCMC and IUCN (2021).

(\*) The numbers correspond to the 2010 Population Census

One of the conservation indicators used to monitor forest areas is the transformation rate, which in the case of a negative sign is interpreted as deforestation. The Usumacinta Canyon protected area presented a deforestation rate of 1.3% in the period 2000-2010 (SEMARNAT, 2015, p. 52), and subsequent studies show the persistence of this trend. Gallardo-Cruz and associates (2021) estimated the deforestation rate at 1.3% for the period 2000-2018; it should be noted that this period comprises 10 years in which the area has already received the designation of protected area.

According to Gallardo-Cruz and associates (2021, p. 6), the Usumacinta Basin area located in Mexico presented an average deforestation rate in unprotected areas of 1.50%, while for protected areas the average was -0.44%. In this context, the rate observed for the Usumacinta Canyon protected area, although below the rate experienced in non-protected areas, is above the average for the protected areas of said basin. The SEMARNAT (2015) attributes that this is a sign of “strong disturbance and deforestation activity, with agricultural and livestock activities having the greatest impact, mainly on the high evergreen forest” (p. 52).

### *Observations Collected*

The researchers accompanied the Comisión Nacional de Áreas Naturales Protegidas (CONANP) team in their visits to the honey producers and observations were carried out in the field; in addition, an unstructured interview was conducted with the person in charge of visits to producers, within the framework of the third stage of the “Program for the strengthening of capacities of meliponic farmers and beekeepers of the APFFCU,” carried out during the second quarter of 2021.

### *Integrated Conservation and Development Projects*

Integrated Conservation and Development Projects (ICDP) represent the preferred method of linking conservation and development in the context of protected areas. Naughton-Treves and associates (2005, p. 239) point out that ICDPs vary in shape and size between sites, but that in general, project models coincide in presenting a core zone in which there are restrictions on use, and others called buffer zones where the development of economic activities compatible with the management objectives of protected areas are promoted.

Naughton-Treves and associates (2005, p. 240) warn that in the evaluation of the ICDP it is difficult to find evidence that they have managed to substantially improve the social welfare of communities; among the explanations is the weak involvement of communities in conservation activities, for what end up being considered as coercive forms of conservation, as observed in the studies carried out by Badola and Hussain (2003) and Gillespie and Penny (2022).

However, there are activities whose development is perceived as positive by local communities and that have the potential to create social benefits, and this is the case with beekeeping. Bees are an important species for the conservation of biodiversity (Mensah, et al., 2017), and the pollination function contributes to food security (Altunel & Olmez, 2019; Jaffé et al., 2015).

There is evidence that beekeeping has developed from civilizations as ancient as those dating from the Mesolithic period (Altunel & Olmez, 2019). Beekeeping is currently considered as a development alternative in rural communities compatible with forest conservation (Chanthayod et al., 2017), and it has enabled the integration of knowledge of indigenous communities (Coh-Martínez et al., 2019). Furthermore, it is presented as an empowerment option for women (Belete & Ayele, 2020; Shackleton et al., 2011). However, in developing countries the activity is characterized by its informality, low development of technical skills, and absence of standardized management practices (Jaffé et al., 2015).

## **Results**

During the field visits, it was identified that the honey producers are in 12 of the 29 communities that belong to the Usumacinta Canyon Flora and Fauna Protected Area (APFFCU) (Table 2). In addition, 21 honey production units were identified that are organized into 12 groups and nine people who participate individually. In total, the projects are made up of 54 people, of whom 20 are women and 34 are men.



**Table 2: APFFCU Honey Producers**

Land/Community	Number of Projects	Type of Project		Number of Members	Gender	
		Individual	Group		Female	Male
Álvaro Obregón	1	1		1		1
Corregidora Ortiz	2	2		2		2
Francisco I. Madero Cortázar	1		1	2	1	1
Luis Echeverría	1		1	4		4
Miguel Hidalgo	1		1	4	3	1
Nuevo Progreso	1		1	2	1	1
Rancho Grande	1	1		1		1
Redención del Campesino	6	3	3	9	4	5
Rieles de San José	1		1	7	5	2
San Francisco	1		1	13	1	12
San Marcos	4	1	3	8	5	3
Veteranos de la Revolución	1	1		1		1
<b>Total</b>	<b>21</b>	<b>9</b>	<b>12</b>	<b>54</b>	<b>20</b>	<b>34</b>

*Source: based on Belmont et al. (2021)*

Figure 1 shows the activities carried out during the visits. In these inspections, the instructor recorded the species under cultivation, the number of bee colonies, management modality (jobon, rustic hive, or technical hive), management activities, as well as the state of conservation of the species and some characteristics found in the field.

**Figure 1: Inspection of APFFCU Honey Producers**



Photographs: Luis Godínez and Erika Ceballos (2021).

In Table 3 the projects are organized by type: individual or group. As can be seen, of the nine individual projects only two are carried out by women. Most of the women participate in mixed group projects, and only one group project consisting of two women was identified.

**Table 3: APFFCU Honey Producers by Type of Project and Gender**

Type of Project	Number of Projects	Sex		Melipona (Jobones and/or Boxes)	Apis mellifera (Beehives)
		Female	Male		
Individual	7		7	15	7
	2	2		5	
Subtotal	9	2	7	20	7
Group	2		6	4	4
	1	2		10	6
	9	16	21	41	31
Subtotal	12	18	27	55	41
Total	21	20	34	75	48

Source: based on Belmont et al. (2021)

### *Meliponic Farmers and Beekeepers*

In the interview, the project inspector commented that “it is about managing the wealth that exists in the region under the pretext of bees. The more forest, the more bees, the more production and transformation with added value.” In addition, they are projects that require a minimum investment compared to the profits that are obtained, about which the inspector added that “it generates fast income” and “the producer is abridged only to taking care of the management of bees.” However, the inspector also noted, “the problem is that pollinators are not valued,” and these projects “are viewed as a complement to a primary activity and not as a possibility of generating a business.” The foregoing indicates that, although the production of honey is an activity with economic potential and that requires a minimum investment, it is seen by honey producers only as a complement to income and not as a business, which presumably limits the development of these projects. From the visits, it was observed that the producers require training for the management, harvest, and diversification of products, and that there is a demand for training focused on the design of strategies for their commercialization.

During this exercise, two profiles of men who are engaged in honey production were identified:

- Men who carry out economic activities related to cattle, as well as those who are involved in extensive cash crops. In these cases, it has been identified that in their

perception in relation to nature they show a detachment, so, for them the production of honey is an economic activity that does not generate the same interest. Their participation is mainly limited to the collection of beehives, while they delegate to women the operative part of the apiaries or Melipona apiaries.

- Men whose activity is agriculture such as the cornfield, the *chapay*,<sup>7</sup> or those who collect food from the jungle tend to be more sensitive and nature oriented.

In the case of projects where women participate, it was noted that:

- Some of the single mothers said that they felt motivated because of the honey production, which gave them a new relationship with their environment, made them more sensitive about ecological problems. They felt that their labor made them feel revalued, and they transmitted it to their family.
- In the case of married women, the husband carries the beehives, while the women participate in post-harvest activities, production of products, and some even in marketing with their own brand.
- Women oversee the organization, administration, and decision-making in the projects.
- The money generated from this productive activity usually remains with women; that is, it represents income.
- Bees are considered a family heritage that has been inherited by women.
- Only in one project was financing support identified through a government program, the resources of which were earmarked for a special warehouse for materials and equipment.

## Discussion

The ICDP of honey production carried out in the Usumacinta Canyon protected area coincides with that indicated by Jaffé and associates (2015) regarding the need for the development of technical and administrative capacities. However, the request for training on marketing aspects denotes an interest in climbing the value chain; furthermore, this type of activity is predominantly carried out by women, as was observed in the study by Shackleton and associates (2011, p. 145).

On the other hand, Coh-Martínez and associates (2019) observed that, in communities of Campeche, Mexico, the activity of beekeeping represents a complementary activity, which coincides with what was indicated by the ICDP inspector in the visit to the Usumacinta Canyon. In the observations of the study, the profile of men who are dedicated to agriculture and who manifest a sense of identity with nature stands out, a sense that is shared in other contexts such as those studied by Chanthayod and associates (2017) in the districts of Oudomxay Province, Lao PDR, and even in other types of activities such as the conservation of the Black Snub-nosed Monkey referred to by Jiang and Wu (2021), which acts as a non-monetary compensation.

In the research by Shackleton and associates (2011, p. 145), carried out in Zambia, it is possible to note that a factor that has allowed the incorporation of women in beekeeping is the use of boxes, “modern” hives, which can be in backyards or places near houses. Shackleton and associates (2011) point out benefits by women from beekeeping, including “money for education, economic independence, self-esteem and avoidance of risky activities” (p. 145). These features

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<sup>7</sup>*Chapay* is a species of cocosoid palm in the family *Arecaceae*, native to Mexico and Central America.

are compatible with what was observed in Ethiopia by Belete and Ayele (2020), who mention that this type of project has contributed significantly to increasing the income that women contribute to their households. However, Belete and Ayele (2020) mention that the results are moderate in terms of the improvement of self-esteem, personal autonomy, and individual capabilities.

In this regard, in the visits to the honey production ICDPs of the Usumacinta Canyon, the women stated that their participation in the projects allows them to obtain an income, and it was also observed that they are mainly in charge of post-harvest activities, such as packaging and processing of derived products. Likewise, they carry out activities that require the development of managerial skills, such as the commercialization of the product. The foregoing allows us to assume that the benefits observed in the cited research are present in the cases of Usumacinta Canyon's women beekeepers.

With the elements gathered in the study, it is possible to point out that the participation of women in honey production projects has expanded their possibilities of choice; on the one hand, it is a paid work option; on the other, when women indicate the need for training in marketing issues, they are expressing the expectation of being able to obtain/access this training as a resource. Then, it is feasible to point out the presence of the dimension that Kabeer (1999) calls resources.

It should be remembered that Kabeer (1999) conceives the dimensions of entrepreneurship as interrelated elements; however, their conceptualization is an end that escapes the exploratory phase of this study. Even so, indications of their presence were observed, as in the case of the woman beekeeper who managed the financial support for the acquisition of materials and equipment, which presumably would be a sign of agency. But there are still aspects related to the expansion of opportunities and the exercise of the choice whose analysis requires deepening, such as the fact that they are carrying out activities related to the development of managerial skills, since this could imply the presence of decision-making. However, the non-explicit aspects of agency mentioned by Kabeer (1999) should be considered: norms and rules. In the case of the Usumacinta Canyon, it would mean examining whether the expansion of women's decision-making has transformed into a change in roles among family members or in the community.

Finally, although the suggestions found in the study could be aligned with the development of the capacity for self-determination of women beekeepers, the results open the way to direct future research towards the conceptualization of women's empowerment. Future research could show if this type of intervention has been a catalyst—or failing that, noting what the obstacles have been—for the transformation of social structures in these communities, to show if women beekeepers have access to greater well-being.

## **Conclusions**

Beekeeping is an activity that contributes to conserving biodiversity and which, due to the pollination function of bees, has an impact on the benefit of agricultural fields, and in general, on human food security. In the visits to the honey production ICDPs of the Usumacinta Canyon, it is observed that this activity has also contributed to providing a decent livelihood using the area's natural resources (bees), as found by Chanthayod and associates (2017), and Jiang and Wu (2021) who find that the activities carried out in the protected areas provide both income and a sense of connection with nature.

In the case of women, it is observed that they have accessed productive projects, although to a lesser extent than men. For women beekeepers, their participation in the ICDP represents a paid work option, which is mainly located in post-production and marketing activities of honey, as well as derived products, in agreement with what was reported by Shackleton and associates

(2011, p. 145) in Zambia. Elements related to self-esteem, personal autonomy, and individual capabilities were also found, as in the study by Belete and Ayele (2020); however, the present study is limited to an exploration, so the degree to which these characteristics are present was not considered at this time.

Therefore, in the case of the Usumacinta Canyon, there are clear elements of the dimension that Kabeer (1999) calls resources and indications of agency. However, several edges remain open, for example knowing specific aspects of financing for the expansion of projects, as well as the upscaling in the honey value chain. More research would need to be conducted to explore if the projects have contributed to the empowerment of the communities, particularly of women.

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