

## PARTICIPATION OF MAYA WOMEN IN FOREST USE AND BIOCULTURAL HERITAGE

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### ABSTRACT

The tendency to include the gender perspective in the management of natural resources is increasing globally. Thus, contributing studies that account for the ways in which women appropriate and reproduce productive practices is important, particularly in rural environments where challenges persist in sociocultural and economic matters. The study's objective was to identify how opportunities are created for the access and participation of women around the diversification of productive forestry activities, to contribute to the conservation of the biocultural heritage based on their knowledge and their needs. Such an incursion develops in the midst of transformations in the commercial exploitation of tropical forests and the social reproduction of their biocultural heritage. The information was gathered by using anthropological techniques (ethnography, in-depth interviews, and a workshop on Strengths, Weaknesses, Opportunities and Threats), which allowed characterizing the role of women in productive forestry activities and their biased intervention in decision making in this regard, which extends to other dimensions of family and community life. It was found that the coexistence between commercial forest use and the prevalent traditional use places women in the low-impact use of natural resources such as the dominant scale of the extraction practices of non-timber products and those related to household care. Although some of them have participation in the timber-yielding commercial activity, their work is still not recognized.

**Keywords:** Forest communities, gender, traditional management, Quintana Roo, tropical forests.

### INTRODUCTION

In recent decades, the importance of forest resources and the relevant role of women in this economic sector have emerged in the agendas of international organizations. For example, the Food and Agriculture Organization of the United Nations (FAO) and the United Nations (UN) have highlighted women's participation as necessary for food security and, in general, to fulfill the objectives of the 2030 agenda in relation to the Sustainable Development Goals (SDGs), highlighting three of the 17 SDGs: number two, linked to food security; five, which refers to gender equality and empowerment of women and girls; and 15, which establishes the protection and sustainable use of land ecosystems, the sustainable management of forests, the fight against desertification and to stop and revert degradation (CEPAL, 2016).

Although the importance of the topic of gender equality has been recognized, and that it is in the development agendas from international leadership of the UN, there are still disadvantages in opportunities for women's access to natural resources, which is still a

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group with deficits regarding equity and social justice in the world of productive sectors. Globally, feminine labor in agricultural activities constitutes 43%, mainly in developing countries (FAO, 2011; Secretaría de Agricultura y Desarrollo Rural, 2016). However, their labor is still not entirely recognized and, therefore, their work, opinions and actions are slightly valued, since there is a social hierarchy that is founded on the idea of a legitimate masculine domination and sexual difference, giving preference to masculinity as the first link to which the official sphere, the public arena and the law correspond (Rosales-Pérez, 2020).

The role of women has been of utmost importance in the management, conservation, domestication and defense of natural resources and their territories, making their participation something crucial for the conservation of forests (Suárez, 2018). However, in many cases, this valuable work has been made invisible by cultural issues and structures of patriarchal organization (Lamas, 2000). In addition, this has been driven by public policies when gender breaches are disregarded, which causes for women's participation in the workforce to generally be under different conditions than men's. This difference is most notorious in primary sectors such as agriculture and forestry, since they have always been considered primarily masculine activities where differences in the work performed, the procurement of economic income, and the way in which resources are used are frequently marked by differences in the egalitarian access to means of production and social capital. The gender view has managed to highlight that in matters of sustainable development and in relation to agricultural and forestry systems, the participation of women is present. For example, FAO (2018) highlights that women are notable stakeholders and agents of change, since they recognize that they have knowledge and competencies that can be useful in different scenarios, such as in the reduction of disasters, mitigation, and by generating strategies to adapt to climate change. Likewise, the central participation of women has been documented in the gathering, sowing, care and harvest of crops (Krapovickas, 2010) and even in the transformation of natural resources towards products of consumption. Under these contexts, and according to the premises of the modernizing development model (Guzmán, 2016), women many times direct initiatives for local and regional growth, although their participation tends to be inserted in structural conditions of marginalization, in social frameworks of inequality that are generally found within the axes of hegemonic development models that seek to standardize the population and to qualify social groups based on guidelines that cannot always be applied to the different realities in the territories. Following these ideas: "this inequality is experienced intensely in the rural sphere, where women, most of the times do not have the ownership of their lands, due to cultural or political patterns. They also have difficulties in opting for credits that would allow them to incorporate new technologies to their plots or projects" (Guzmán, 2016:36). Despite the importance of the forestry sector for the development of rural communities, forest use still continues to be a mainly masculine activity, while feminine participation has been limited and has fallen behind, particularly in decision making for the management of forest resources (Almeida, 2012).

Diagnoses about the participation of women in the forestry sector globally point to them being at a disadvantage in face of men when it comes to access to land, production means, and economic opportunities. The following have been argued: differences in physical capacities, discrimination in land ownership and regimes, and the load of domestic tasks, among others (Stloukal *et al.*, 2013; Sunderland *et al.*, 2014).

In Mexico, forestry activities represent a significant potential because of the extension of the surface occupied by forests and tropical forests and due to their importance for the social and economic development of rural communities. Of all of the national territory (196,437,500 ha), 553 thousand hectares (28%) have timber-yielding forest exploitation (CONAFOR, 2018) and have resources that are an important source of economic income for the families in the *ejidos* and communities; in addition, they provide food, medicinal plants, construction materials and fuels. In these territories, there are 2,311 plots with *ejido* and communal property where approximately 427,373 speakers of indigenous languages reside. These groups own collectively 55% of the forest surface under a scheme of social property, primarily in the states of Durango, Chihuahua, Oaxaca, Guerrero, Jalisco, Chiapas, Quintana Roo and Campeche, while the remaining percentage belongs to private and national property (Madrid *et al.*, 2009; CONAFOR, 2019a).

At the national level, women represent 25% of *ejido* rights ownership, as well as 22% of the agencies of representation and only 8% of the presidencies of the *ejido* commissary or vigilance councils. This is verified through statistics such as those concerning land property and ownership rights in Mexico. As stated in the National Agrarian Registry (*Registro Agrario Nacional*, RAN, 2022b), which has incorporated the gender perspective in its databases, making evident the divergences in access and participation of women in representation and decision agencies in the agrarian nuclei. The RAN makes it obvious that regarding land ownership, there is still a notorious difference in gender within the *ejido* nuclei, both in rights ownership and in the integration and participation in representation agencies.

For Quintana Roo, only 21% of the rural population is recognized as women *ejidatarias* against the 73% that correspond to men. From the 1,467 people who make up the representative organs or directive boards, only 14% (209) are women, while 86% (1,258) are men. Only 7% of them have reached the position of president of the *ejido* committees and 3% are presidents of the vigilance councils, while 93% and 97% of these positions, respectively, are occupied by men.

These committees represent 258 certified agrarian nuclei (RAN, 2022). Based on these figures, it is possible to note that even when there is work being done to attain gender equity in government programs and agendas, there is still a long path to travel to shorten the gap that women face in relation to men, and which ranges from differences in the levels of participation, design and implementation of projects, access to the benefits of forestry activities, to strategies to achieve greater equity (Zamora, 2014).

This evidences the need to incorporate the gender approach in the management of forest resources, mainly to strengthen the participation of women in productive activities,

given their relevance. In Mexico, the contribution of women in the productive sector has been focused basically on food gathering, cultivation and harvest of medicinal plants, and firewood extraction; that is, primarily non-timber forest products (Román-Suárez *et al.*, 2021; Zamora-Martínez, 2014). These productive practices in charge of women are found in low-impact exploitation (Navarro-Martínez *et al.*, 2000), as will be explained further through the case of Maya women in Quintana Roo. Thus, focusing on them as development agents within a framework of sustainability based on cultural identity could generate positive changes to successfully implement conservation initiatives integrated with community and territorial environments (Guzmán, 2016).

### THEORETICAL CONTEXT

Within the currents that analyze the gender-environment relationship there have been various conceptual proposals to understand interactions between the social and the environmental spheres; some of these postures are ecological feminism, ecofeminism and feminine political ecology, whose aim is to understand the challenges between women and the care for the environment and the suggestion of actions needed to attain sustainability from a cultural perspective (Carcaño, 2008). Ecofeminism conceptualizes the relationship of women with nature, exposing the existence of a strong link between both, defending the recovery of a feminine principle that implies harmony, sustainability and diversity. This relationship gives women special knowledge that allows them to have a management of natural resources that is less invasive and for conservation; that is, using exploitation practices of low impact (Shiva, 2004).

Vandana Shiva, one of the main exponents of ecofeminism, suggests “the feminine principle as the source of life and the basis of sustainable development” (Carcaño, 2008:183). This principle is characterized by valuing the activities for the care of nature linked to women, which denotes harmony between them and the environment, giving it a cultural and spiritual meaning (Tardón, 2011). Therefore, the author suggests that the relationship between women and nature is sustained by cooperation, mutual care and love, and this in turn allows respecting and conserving biological diversity, including cultural manifestations (Mies and Shiva, 2004).

In this sense, it goes against the current capitalist economic model promoted by dominating groups that control the distribution of resources and which have a different view of the environment by conceiving it solely as a resource (Carcaño, 2008). In this same line of ideas, ecofeminism points to the importance of analyzing the institutions of gender and the social norms that perpetuate and reinforce a division of labor based on the subordination of women.

This also agrees with the approach of biocultural heritage, which posits that the knowledge of men and women are complementary and refers that “the ways of structuring knowledge and its transmission are distinctly indigenous and peasant, involving women and men from different age groups” (Boege, 2008:170), where native languages are the transmission platforms for these understandings and practices. In literature, it has been documented

that women who have led the conservation of biocultural heritage of their territories concretely recognize this role, among other ecosystems in those related to forests where women have proven to be important users of forest resources, promoting initiatives both in their households and at the community and territory level (Shiva, 2004; Carcaño, 2008; Tardón, 2011; Stloukal *et al.*, 2013; Guzmán, 2016; Coleman and Mwangi, 2013). Under the premise that understandings about the environment obtained by men and women are different, the gender perspective in the study of environmental management considers such differences in the perception and use of the environment. Taking into account that the understanding of the environmental sphere at the local level influences how natural resources are used and managed, political ecology analyzes the gender view and the application of information (Chávez, *et al.*, 2018; Coleman and Mwangi, 2013), and the importance of distributive environmental justice stands out here; that is, the equitable access to resources independently of the condition of gender or age.

Ignoring the relevance of the gender perspective and, therefore, the conditions of feminine participation in the use and management of forests, can lead to less efficient policies that result in an incorrect assessment of the costs and benefits in economic and environmental matters, as well having a biased impact of the policies in forest communities (Manfre and Rubin, 2013). Vázquez-García (2015) and Guzmán (2016) maintain that the absence of women in community forest management is the result of not taking into account their interests and needs, in addition to differences in land ownership, gender division of labor, lack of equity in the distribution of benefits, and the strictly commercial view of management plans.

This review makes clear the need to continue rethinking the role and importance of women's participation in productive forestry activities, where their contribution is hardly seen, which is equally necessary in light of the new contributions and the course imposed by international agendas in the matter. However, when the contributions by women are recognized, two great challenges can be seen: proposing mechanisms for their effective participation in decision making about the contribution of natural resources and having access to land ownership rights (Boege, 2008).

As a result, the objective of this study is to delve into how opportunities are created for the access and participation of women in the diversification of productive forestry activities, as well as in the use of forest resources to strengthen the management of biocultural heritage based on the knowledge and needs of women from the community of Kancabchen, Quintana Roo, Mexico.

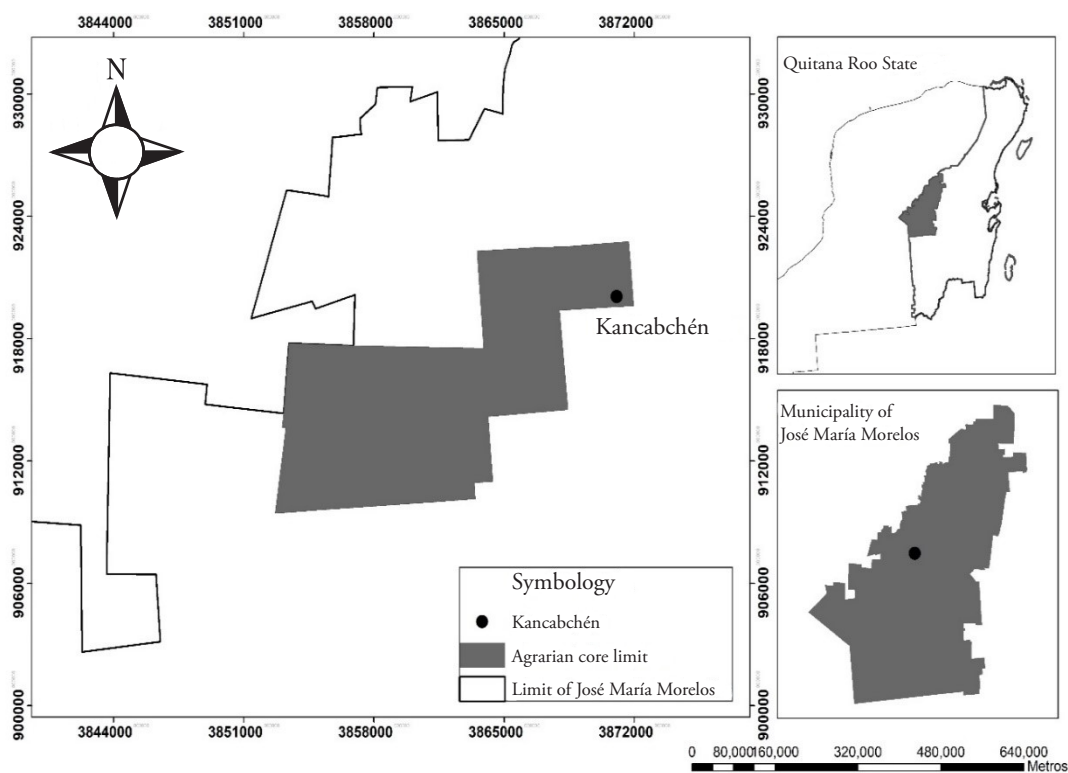
## METHODOLOGY

The study area is located in the center of the state of Quintana Roo, in the municipality of José María Morelos, jurisdiction with 64 communities in the Maya territory of Quintana Roo. In this zone, the main economic activities are slash-and-burn farming, apiculture, forestry, and livestock production (INEGI, 2010). The research was done in Kancabchen (Figure 1) because it is an *ejido* with historical tradition in the use of timber

and non-timber resources and because in 2019 the Forest Management Plan for timber production (*Programa de Manejo Forestal Maderable*, PMFM) was implemented, with a patrimonial approach, a new way of managing the Mexican timber-yielding productive tropical forests (Navarro *et al.*, 2021).

The name of the locality comes from the Mayan word “Kancabchen” and it means “well of red soil”. Since the conformation of the *ejido*, the use of tropical forest resources has happened in two ways: the first, for commercial activities where the extraction of chicle gum (resin obtained from the chicozapote tree, *Manilkara zapota* (L.) P. Royen) and timber extraction of different species for sale as roundwood stand out; and the second linked to immediate family needs of timber resources of different species for construction of the Maya house, and cutting huano leaves, a palm species abundant in the region (*Sabal japa* C. Wright ex Becc). Other products obtained from the tropical forest are firewood, fruits and wild plants for home remedies, according to their traditional medicine practices.

Kancabchen was founded approximately 75 years ago, as a result of agrarian distribution, but it was not until January 24, 1994, when it obtained its certification as *ejido* nucleus with a registry of 195 *ejidatarios*, although the *ejido* commissary informed about the recognition of 203 *ejidatarios* and 58 *avecindados* (RAN, 2022a); only four are women



Source: prepared by the authors with data from INEGI Geoestadístico, 2020.  
**Figure 1.** Location of the study area.

*ejidatarias*. The total surface of the *ejido* is slightly larger than 13,221 ha, of which 12 159 ha correspond to lands of common use, while 87,816 ha are destined to the urban zone and 1,062,372 ha are considered for the growth of the latter (RAN, 2022a). Public transport is scarce, there is public or collective transport that leaves from the locality at 7:00 or 8:00 in the morning and returns at noon, so if there is the need to leave the town they must pay for transport or ask for a free ride in a private car. The road to reach the town is paved and from the municipal township it is a 20 minute ride by car.

Kancabchen has a population of 1,058 inhabitants primarily in the age group of 25 to 59 years (INEGI, 2020), while adults 60 and over barely reach 10% of the inhabitants. Most people in this *ejido* speak the Mayan language (Table 1), and more than 93.5% of the families conserve that language. Monolingualism is minimal, and only 16 people show it; that is, 1.29% of the total population speaks only Mayan. The rest of the population is bilingual and more than 93.44% of the inhabitants recognize themselves as Maya by attribution (INEGI, 2020).

As in other Maya communities, in Kancabchen the primary activities are related to the exploitation of natural resources and the pluriactivity in their territories. These include the historical tradition of rainfed and irrigation agriculture, honey production, livestock production, and forest use, and the new economic activities that are incorporated according to the demands from different sectors, such as ecotourism and preparation of beauty products and preserves.

The economy and diet in Kancabchen are based on primary activities, and small-scale agriculture and livestock production prevail. Most of the population is devoted to activities related to the countryside, such as sowing corn in two modalities: traditional by *espeque* (rainfed) and modernized, and they use two varieties of corn seeds that are identified as “white” and “yellow”. The *ejidatarios* that have modernized agricultural lands combine corn growing with the production and commercialization of lime, citrus that is kept throughout the year. According to the *ejido* registries, 360 ha were distributed among 120 *ejidatarios*, of which only 6 are women, with two to three hectares corresponding to each. In rainfed lands, one to two hectares of corn are generally sown, although the farmers mention that the harvests do not yield as before due to the lack of rains. According to their testimonies, in the past one hectare of corn yielded 30 to 60 sacks, each of 10 kilograms, while today only 2 to 3 sacks are harvested, which is why it is mostly for subsistence

**Table 1.** Demographic characteristics of the population from Kancabchen.

Locality	Population			Mayan speakers			Occupied population		
	Total	M %	W%	Total	M%	W%	Total	M%	W%
Kancabchen	1,058	49.7	50.3	518	51.5	48.5	673	52	48

Sex: M: Men; W: Wome.

Source: prepared by the authors with data from INEGI's population and housing census, 2020.

or for sale in the same town. Apiculture is practiced marginally, and there are only 30 beekeepers. Livestock production happens at a small scale, fundamentally for subsistence; only 8 *ejidatarios* have 8 or 10 heads of livestock.

On the other hand, even though women *ejidatarias* have agrarian rights, only two are recipients of the earnings from timber obtained with Forest Management Plan (*Programa de Manejo Forestal Maderable*, PMFM), because most of them recognize that their main activity is domestic work, although they participate in other activities that contribute to the family economy. In family practices such as rainfed agriculture with corn sowing, women participate in seed selection, dekerneling, and the harvest sale.

### **Field work**

For data collection, two methodological approaches were used, one qualitative and another quantitative. The first consisted in field work, primarily with anthropological techniques, where the rapid ethnography assessment producer method was used, which consists in performing ethnography based on observation. In addition, 30 in-depth interviews were applied and the focal groups technique was implemented through a Strengths, Weaknesses, Opportunities and Threats (SWOT) workshop that had the participation of 5 men *ejidatarios* and 3 women *ejidatarias* recipients of a program for forest use. Three visits were made to the community, each in four-month periods as follows: 1) April 15 to May 30, 2019; 2) January 23 to February 27, 2020; and 3) February 15 to 18, 2021. Likewise, 30 in-depth interviews were conducted with key informants such as local authorities, men *ejidatarios*, women *ejidatarias*, and other women from the locality with the aim of having a diagnosis about the timber and non-timber forest use, as well as the requirements to participate in this activity, and to understand their opinions regarding the way in which timber harvest is carried out and feminine participation. Complementarily, 30 surveys were applied with people related to the forestry activity to complement the information. A non-probabilistic intentional sampling was used for the surveys and interviews, the sample size was decided by the saturation method, that is, when responses were repetitive.

The samples allowed obtaining information about the economic profile of families and the way in which they are organized for forestry activities in the *ejido*, as well as which are the products obtained and used from the tropical forest, which is the activity that they mostly identify with inside the community, what is the conformation of the households, the head of households, and land ownership. A SWOT workshop was also carried out that allowed identifying the strengths, weaknesses, opportunities and threats about timber-yielding exploitation, as well as the participation and agency of women in the forestry sector. Finally, an ethnography was prepared whose purpose was to understand the environment, the community organization for the use of forest resources, and the feminine participation in these activities, emphasizing the biocultural component of the society-nature relationship, where traditional knowledge of women in forestry activities and uses and customs (agrarian rights and succession or patrimonial inheritance) around the tropical forest are relevant.

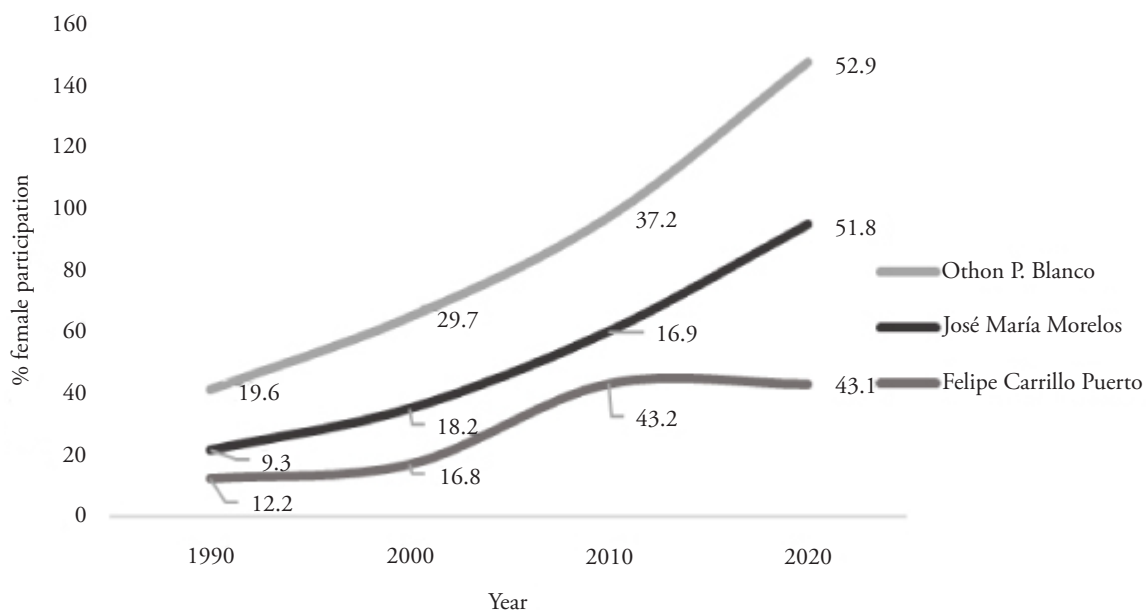
In addition, during the field visits, a photographic record was made to complement the information and to obtain it first-hand, taking into account the cultural practices with regards to the forestry activity, as well as the economic and political situations that favor or hinder this activity in Kancabchen. The systematization of the information and the data gathered were analyzed through the triangulation of results through interviews and descriptive statistics of the surveys.

Finally, the information gathered during the field visits allowed the characterization of the community context and made it possible to understand the environment and the community organization for the use of forest resources, as well as the identification of biocultural components, focusing on two of them for the analysis of the society-nature relationship: 1. The traditional knowledge in forestry practices and uses; and 2. The customs that influence the participation in forestry extraction from the gender perspective.

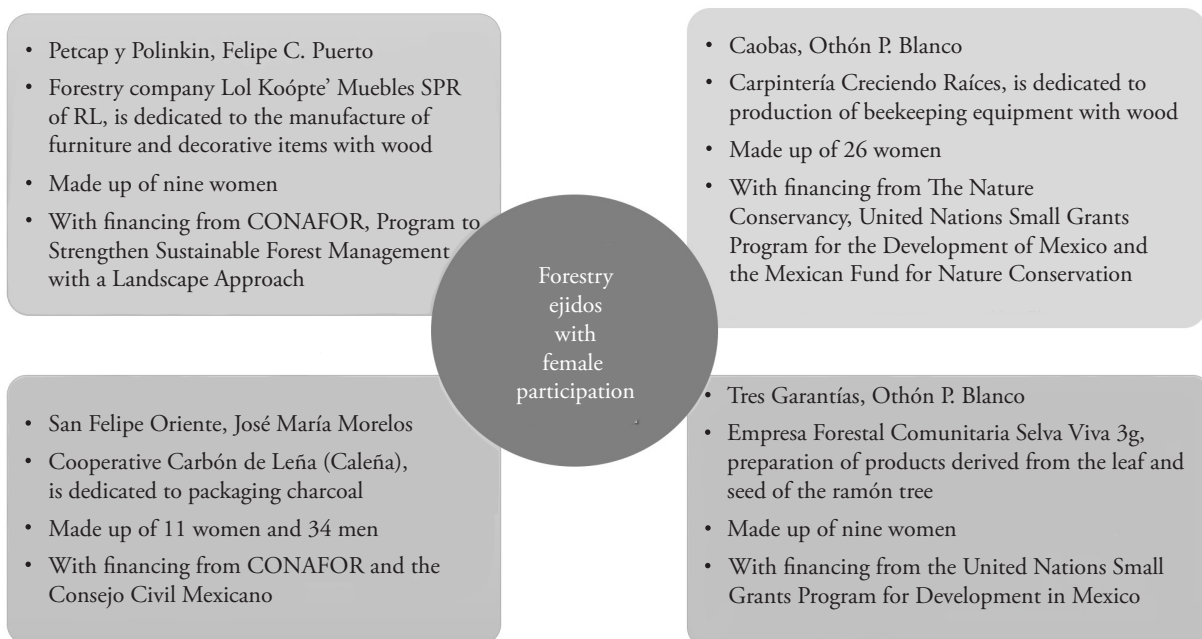
## RESULTS AND DISCUSSION

In Kancabchen the main productive activities identified are non-timber forest use and agriculture, with sowing and commercialization of lime being the most important in the latter. In this activity, the masculine participation stands out, and there is women's contribution only in a complementary and indirect way; they are in charge of food preparation or function as a companion when the task is to irrigate or monitor the plot. Therefore, the participation of women in the agricultural sector is focused on the activities related to unpaid family care. This contrasts with the participation of women in other communities of the region. For example, in Petcacab, an *ejido* with timber production importance, a society has been created called Lol Koópte' constituted by nine women devoted to the elaboration of wood furniture and handcrafts. Another successful example is the group of women who produce foods derived from breadnut leaves and fruits (*Brosimum alicastrum*), one of the most abundant multipurpose trees in the tropical forests of the Yucatan Peninsula (Figure 2). The reasons probably point to the long history of commercial timber exploitation, of more than 30 years, in these *ejidos* compared to Kancabchen, where this activity is relatively recent (2019 to date) (Navarro-Martínez, 2011, 2015). In this regard, CONAFOR in collaboration with the United Nations Development Program (UNDP) and with support from the World Bank, have managed to highlight four enterprises –one mixed– at the state level that involve five to 108 forest *ejidos* (CONAFOR, 2019b) (Figure 3).

The contribution of women is increasingly visible in rural communities with Mayan speakers. As presented in Figure 2, the figures of feminine insertion into economic activities are higher in recent years, with high values for Othón P. Blanco, followed by José María Morelos and Felipe Carrillo Puerto. Likewise, women's participation in the forestry activity in Quintana Roo, particularly in the *ejidos* mentioned (Figure 3), is focused on the timber-yielding and non-timber exploitation, through the constitution of producers' organizations.



Source: prepared by the authors with data from INEGI's population and housing census, 1990, 2000, 2010 and 2020.  
**Figure 2.** Evolution of the rate of women's participation in productive activities in three municipalities of Quintana Roo, Mexico.

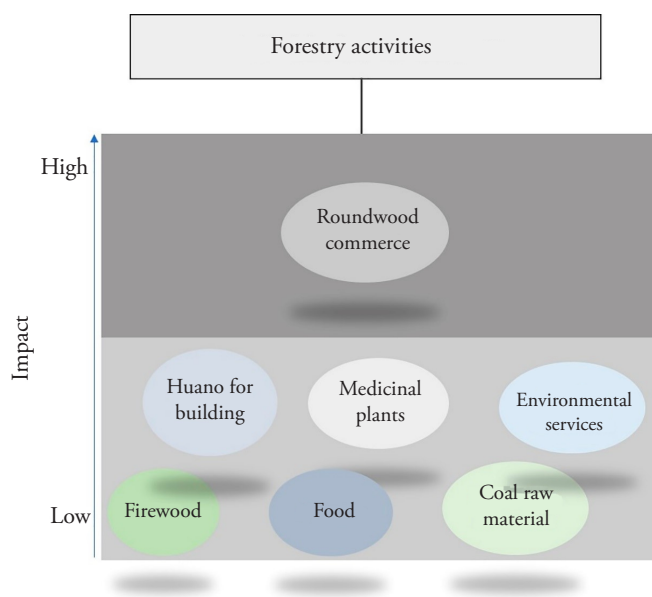


Source: prepared by the authors with data from CONAFOR, 2019b.  
**Figure 3.** Participation of women in forestry productive enterprises in Quintana Roo.

In Kancabchen women are active both in the exploitation of the tropical forest with low impact, and in commercial forestry, with the first being more important (Figure 4). This is possibly due to the uses and customs determined culturally that restrict their intervention in commercial timber extraction. Concerning non-timber forest resources, in this Maya community, women have participated traditionally in the extraction of huano leaves for rural construction, seeds and firewood. This agrees with the findings by Roman-Suárez *et al* (2021) on the participation of women in the exploitation of tropical forest resources in three Maya *ejidos* in Quintana Roo, where their work in the elaboration of handicrafts and other timber and non-timber products is recognized.

Although timber has been produced commercially in the *ejido* since 2001, it was not until 2019 with the Forest Management Plan (*Programa de Manejo Forestal Maderable*, PMFM) with patrimonial aims, when women were integrated as forestry producers, although their participation is nominative not active, since they must have the support of a male family member to fulfill their obligations towards the *ejido* and to manage the projects. This agrees with what was found by Vázquez (2015) in the state of Hidalgo (Mexico) about women maintaining the same conditions of participation in productive projects, “since they depend on having the land tenure, in addition to the State placing them in a vulnerable situation when it forces them to resort to male relatives for any procedure. Men can deny the support or their signature, or simply are not present to find out what is happening” (Vázquez, 2015:618).

The women in Kancabchen with or without *ejido* rights can participate in the community projects promoted by the government, although sometimes some of them must have



Source: prepared by the authors with field data, 2021.

**Figure 4.** Forestry activities carried out in Kancabchen considered as having high and low impact.

agrarian rights, by regulations. Some examples are the following programs: Payment of environmental services, productive forests for or *Sembrando Vida*, among others that require land tenure or *ejido* rights.

Of the total of *ejidatarios* who are legally recognized, 38 men and two women participate in the current PMFM. As has been mentioned, of all the *ejido* rights, only six are in possession of women, which were obtained in the following way: four obtained the right by inheritance from their parents and two from the death of their husbands; of the latter, it is the adult sons who are in charge of complying with the agrarian obligations due to lack of education and because culturally men are the ones in charge of making decisions. Another reason for the scarce participation of women in *ejido* forestry is the lack of agency in face of the masculine majority, in addition to scarce training and information. Globally, this situation is present in several countries. For example, in a study carried out in the archipelago of Chiloé it was found that the inequalities in the access to resources are more notorious in rural environments, with women being the ones who are at a disadvantage because they do not own the lands, due to political or cultural patterns, or because of the difficult access to economic credits to improve their productive projects incorporating new technologies (Guzmán, 2016). According to diagnoses by the UN for Mexico, although in the rural sector there is an increase of women in farming activities, there are still obstacles for the egalitarian access to resources, in addition to the intervention of other factors such as the little time they have available to participate in the care and work of households (ONU, 2019), which could be identified as cultural.

In this same sense, the women of Kancabchen are considered to be at a disadvantage because they lack school education (one of them indicated she was illiterate). Finally, domestic work was an outstanding indicator within their daily activities. In presence of the assembly, the two forestry women *ejidatarias* delegate to men their responsibility and participation in the productive activities: one who is 40 years old delegates to her husband, and another, a widow who is 42 years old, to her son. That is, their participation in forestry activities consists only in attending assemblies and signing the documents required.

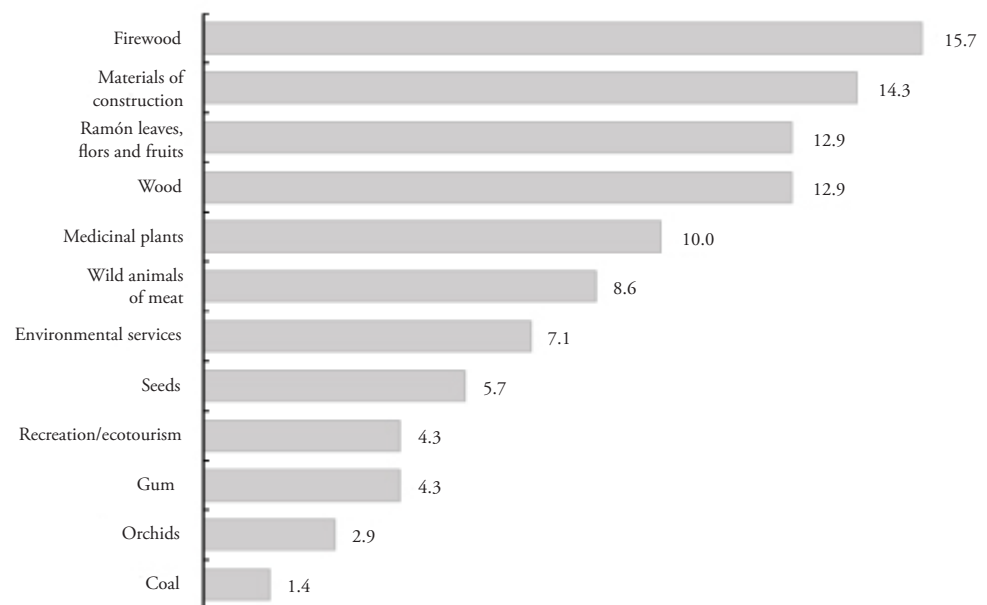
According to data from INEGI (2020) in relation to the population and housing census, of the total households registered in Kancabchen, 206 have a male head of household and 68 feminine (33%). This difference was corroborated when analyzing the interviews carried out in the locality, according to which in the *ejido* men being in charge as the family head of household still prevails, since men self-determine as heads of households in 67% of all the households surveyed, which recognize the masculine leadership, 25% declared having as head of household a woman, and 8% considered they make decisions together. It should be highlighted that although some women have *ejido* rights or contribute economically to the household, the feminine head of household is only found in families where women are widows or separated.

Concerning non-timber forestry activities, the participation and agency of women in the *ejido* are focused on gathering firewood for auto-consumption or for sale when it is necessary to obtain an income. At the same time, they are devoted to herbal medicine and

sowing in family gardens of healing plants that they use as home remedies through the preparation of teas or infusions. Women from Kancabchen have also suggested projects for the elaboration of cosmetic products for hair and body care, such as soaps or creams. This situation still persists in the world where various studies about the participation of women in productive activities describe that the women are devoted only to gathering, tending to the family gardens, caring for backyard animals and, above all, domestic labor (FAO,2013; Vázquez 2015; Guzmán, 2016; Román-Suárez, 2021). Because of this, it could be said that forest use in Kanchabchen is predominantly of low impact, based primarily in non-timber activities and to a lower extent in the commercial timber-yielding activities (Figure 5).

Regarding the products that are most extracted from the tropical forest, both men and women agree that one of the main products obtained from the forest is firewood for consumption in the households and for local sale. In gathering it, there is broad participation of women and youth who, from an early age, learn to distinguish which wood is good for firewood and how to transport it to the households. Thus, traditional uses coexist with the models of commercial exploitation, but greater organization is required to incorporate activities such as ecotourism, environmental services, and the commercial exploitation of wood.

Although the participation of women in Kancabchen in the agricultural and forestry sector does not stand out as one of the economic activities, it does represent a fundamental part of the household economy, in addition to hand embroidery of various products such



Source: prepared by the authors with data from field work, 2021.

**Figure 5.** Percentage of use of timber and non-timber forest products in *ejido* Kancabchen, Quintana Roo.

as blouses, hipiles (traditional Maya dress of daily use), napkins, tablecloths, and *ternos* (traditional gala clothing for women). This activity is quite attractive for them, because they carry it out in their houses during free times, which allows them to spend time with the family and transmit knowledge to the new generations, particularly daughters who obtain their own income and continue with their traditions referring to traditional clothing that predominates in the Yucatan Peninsula.

In Kancabchen embroidery is done independently, although a family was also found that organizes the production collectively and has contacts or “brokers” that provide thread, fabric and the necessary materials to embroider. The payment for finished piece or embroidery is between 200 and 300 pesos and they are taken to the touristic zone for their sale. In addition to what has been mentioned about the participation of women in garment embroidery, their intervention in agroecology could be identified through the backyard gardens where they obtain a substantive part of foods for daily family consumption, through their work, effort and creativity in food preparation, where the tasks of grinding corn, making the dough and the tortillas are included.

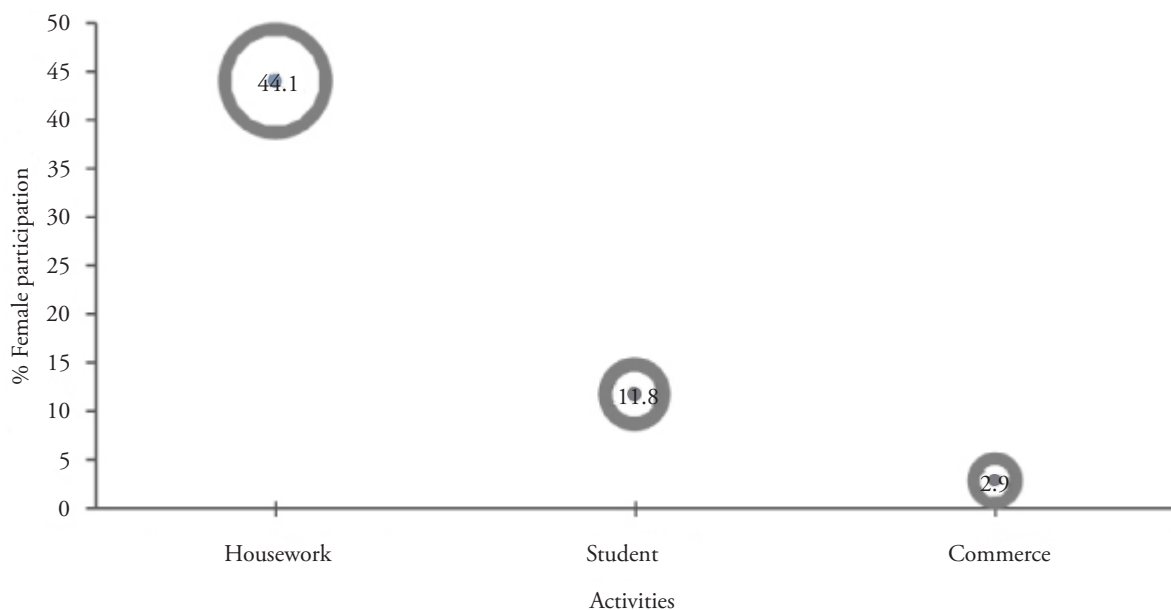
In sum, the traditional knowledge ranges from the practice of herbal medicine, gathering and identification of inputs for firewood, fruits or herbs for the preparation of foods and for backyard animals’ feed that they tend to have. These activities constitute complementary family income, although the women put their responsibility in the tasks directed to reproduction first, and the main ones are by far domestic activities (Figure 6).

Likewise, it was possible to see that women prioritize their role as suppliers and caretakers of the household, that is, unpaid work; they leave in second plane the activities that contribute to the family and local economy such as the exploitation of timber-yielding forest resources. Thus, it can be said that the distribution of work is determined by the traditional organization based on gender roles as can be seen in the responses from women with secondary family income.

Therefore, women’s participation stands out in low-impact productive activities (Table 2). The commercial timber production activities are limited to making charcoal or daily wage for felling trees, tasks carried out by men. In the *ejido*, there is the proposal to diversify the activities in the forest areas with the reproduction of orchids, activity that offers a greater space for women’s participation.

In addition, among the activities of women in the locality, there is the organization of committees for the town’s traditional festivities, the elaboration of food and the execution of traditional dances (*jarana*).

According to the needs recorded by women in the SWOT analysis about the PMFM, there are courses and workshops to understand how to use the forest resources efficiently or to elaborate handicrafts, create carpentry shops, and produce edible byproducts from the tropical forest trees. For the case of the courses, there was the suggestion of taking into account that the population lacks background and tradition in commercial forest management. The women also see an opportunity in the diversification of activities within forest use and they also consider it a disadvantage



Source: prepared by the authors with data from field work, 2021.

**Figure 6.** Main productive activities of women interviewed in Kancabchen, Quintana Roo.

that they do not have the necessary equipment for the development of the activity, such as helmets, gloves, chainsaws, etc.

They mentioned that the “Sembrando Vida Program” ought to allow reforestation of the logged areas with high value timber trees such as Spanish cedar (*Cedrela odorata* L.), mahogany (*Swietenia macrophylla* King) and ciricote (*Cordia dodecandra* A.D.C), since they are the most demanded species by the industry. Although women have the knowledge to contribute to the forest management plan mentioned before, their participation is hindered because they are not *ejidatarias*, which limits them in having access to forest

**Table 2.** Use of forest resources by gender in Kancabchen, Quintana Roo, Mexico.

Resource	Men	Women
Medicinal plants	●	●
Huano	●	
Firewood	●	●
Corn cob for firewood		●
Roundwood	●	
Fruits	●	●
Seeds	●	
Orchids		●
Breadnut leaves	●	

Source: prepared by the authors with field data, February 2021.

resources and their benefits. It is another forestry program that exposes the lack of equity in the access to resources and the gender perspective (García, 2019).

Identifying the participation of women from Kancabchen in forestry activities has made it possible to visualize how their intervention in this community is suppressed in decision making of productive activities that involve mixed organization. In the contexts where men's participation is greater, the figure of women is more nominative than active. However, in the life dimensions of family and community, it can be seen that it is women who are in charge of the strategies to provide the means of subsistence within agroecological systems.

The issue of land ownership and the tasks for the exploitation of natural resources by women has been broadly discussed and, although there is recognition that there have been advances, according to statistics from RAN, UN and FAO, the percentage of women who participate in decision making about resources in Kancabchen is still minimal because they lack *ejido* rights, which implies a lack of recognition of their capacities and their contribution (Román-Suárez, *et al.*, 2021; Vázquez, 2017; Summerland *et al.*, 2014; Coleman and Mwangi, 2013). These practices, in the local universe, are displayed daily having traditional knowledge as a basis, which, together with the new information, is inherited to the next generations recreating the biocultural heritage by diversifying the strategies of family reproduction in peasant economy. Thus, the coexistence between the models of commercial and traditional forest use that prevails in Kancabchen places women in the use of low-impact forest resources, based primarily in the practices of non-timber exploitation. Therefore, in order to foster their participation in the commercial timber-yielding activity, in addition to addressing the theme of land ownership, it is fundamental to make visible and ask how and where women can contribute according to their experiences.

Because of this, the activities for forest use can be fundamental to focus the proposals that include the environmental and cultural identity spheres with the aim of strengthening the productive experiences that are carried out around their territories, where there is potential exploitation with a biocultural approach.

The relevance of addressing the gender gaps in specific contexts such as forest management allows understanding the role of women in the conservation and the recreation of the biocultural heritage, as well as the challenges to strengthen their participation in the use of resources in their territories. Diverse experiences refer to lessons learned as promoters of productive projects such as the cases cited in Quintana Roo, where women forest producers achieved processes of certification and exports with timber-yielding activity through cooperatives (Programa de las Naciones Unidas Para el Desarrollo, 2022).

## CONCLUSIONS

Based on this study, it is clear that there still persists a notorious inequality in the participation of rural women in productive activities and in the access to natural resources, which could be determined by the uses and customs that are reflected in the family practices of distribution and control of the participation of men and women in different productive activities. To offset these differences, mechanisms of public policy

have been generated that allow managing spaces where women can participate in rural areas, constituting cooperatives such as the Industrial Agricultural Women's Unit (*Unidad Agrícola Industrial de la Mujer*, UAIM).

Despite the efforts made to incorporate women into productive commercial activities, their full interest has not been awakened, due to different factors such as guaranteeing domestic reproduction and their complementary economic contributions based on their extra-domestic economic participation, space where they still find many challenges: lacking time and organization, training in the transformation of fruits from forest and agroecological species, as well as designing commercialization strategies.

In the case exposed and according to the premises of the biocultural approach, Maya women from Kancabchen are bearers of knowledge and traditional productive practices, locating the contribution of the resources in a scale of low impact and balancing the commercial use of the forests. This condition establishes the basis of a coexistence of models of timber-yielding and non-timber forest product exploitation in the *ejido*; although women who participate in both spaces are better positioned in activities of gathering and transformation of these goods.

These cases have set the standard to visualize the active participation, from the gender approach, in government programs within the development of projects focused on this sector. However, within the standards of the PMFM it can be seen that the transversality to include women is absent. In addition, the schemes that assign women the role of helpers in agricultural tasks are still in force. Furthermore, their recognition as heads of households is still difficult, particularly in rural communities. However, the new generations of women are changing these dynamics of labor division and access to property in rural areas because of the need to contribute economically. Nevertheless, there is still stigmatization of women regarding not having anything to contribute to the forestry activities because these are tasks only for men and therefore they allow the husband or the eldest son to decide what to do with the lands, even when the woman is owner of the *ejido* rights.

The merit of women lies in the cultural and social position that they have taken in face of development proposals, as a result of their fundamental contributions in the construction of sustainability and their input to strengthen the identity in their territories.

In Kancabchen there is still much to do to position and recognize the potential of women as leaders in the conservation of biocultural heritage, theme that is in the government agendas which have a territorial view and are founded on international agreements such as the most recent from Escazú, regional agreement about the public participation and access to information and justice in environmental issues in Latin America and the Caribbean. However, in rural communities, the mechanisms and spaces to encourage the participation of women have still not been generated, or to promote their capacity of agency as leaders in the community and to potentiate their participation in the exploitation of forest resources. Gender inequality is definitely a problem because the exclusion or omission of women in productive processes and decision making has had grave consequences, both social and environmental.

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