Agricultura, Sociedad y Desarrollo

GENDER PERSPECTIVE IN THE USES AND VALUES REGARDING THE DIVERSITY OF RESOURCES ASSOCIATED WITH THE COFFEE AGROFORESTRY SYSTEM

Idalmis **Fonseca-Castillo**[1], Rady Alejandra **Campos-Saldaña**[1*], Luis Alfredo **Rodríguez-Larramendi**[1], Miguel **Prado-López**[1], Manuel Alejandro **La O-Arias**[2]

[1]Universidad de Ciencias y Artes de Chiapas (UNICACH). Facultad de Ingeniería. Sede Villa Corzo. Carretera Villa Corzo - Monterrey Km 3. 30520. Villa Corzo. Chiapas.
[2]Universidad Autónoma de Chiapas (UNACH). Facultad de Ciencias Agronómicas. Carretera Ocozocoautla. Villaflores Km. 84.5. 30470. Villaflores. Chiapas.
*Corresponding author: rady.campos@unicach.mx

Citation: Fonseca-Castillo I, Campos-Saldaña RA, Rodríguez-Larramendi LA, Prado-López M, La O-Arias MA. 2025. Gender perspective in the uses and values regarding the diversity of resources associated with the coffee agroforestry system. Agricultura, Sociedad y Desarrollo

ASyD(22): 74-92

https://doi.org/10.22231/asyd.v22i1.1672

Editor in Chief:
Dr. Benito Ramírez Valverde

Received: November 24, 2023.
Approved: March 7, 2024.

Estimated publication date:
January 8, 2025.

ABSTRACT

Coffee production in Mexico is managed by the family and peasant community. For this reason, the gender perspective may take better advantage of coffee agroforestry systems (CAFS). The objective of the study was to analyze the perception of the uses and values of the diversity of resources associated with CAFS in the Frailesca region, taking a gender perspective. A semi-structured interview questionnaire was applied, focusing on the following aspects: a) List of perceived diversity aspects in CAFS b) Perception of importance of the components of diversity, identified for marketing or family consumption and c) Analysis of governance considering a gender perspective for the categories: who works, who decides on production and income, who benefits from consumption and income. We carried out factorial analyses of simple and multiple correlations, Fisher's exact test, as well as the Chi square test. Results indicate that men are more conscious of resources destined to the market and for the generation of income, participate more in terms of labor and in making decisions concerning the destination of these products and any resulting income. Contrastingly, women have a more holistic view of the system and focus more on resources allocated to family consumption. The gender perspective is key to understanding the complexity of CAFSs and for the sustainable and equitable management of resources. Policies and strategies are required that promote the gender perspective for their management.

Keywords: gender perception, governance, management strategies, natural resource management, participation.

INTRODUCTION

The use and exploitation of agroforestry systems is an old but promising and sustainable practice for developing countries. It is considered a dynamic, ecologically-based natural resource management system that through the integration of different biological components, such as trees, shrubs and the agricultural landscape, diversifies and sustains production, resulting in increased economic, social and environmental benefits for rural areas (Debbarma *et al*., 2015; Abebe and Mulu, 2017). By definition, coffee cultivation

represents an agroforestry system, as it requires particular environmental conditions, achieved by the association of trees with shrubs. The products that can be obtained from CAFSs are diverse and can include agricultural crops and breeding of animals (Álvarez *et al*., 2020; Venegas *et al*., 2021). This fact renders a great diversity of uses and values to this agroecosystem and turns it into important natural capital that the coffee grower can take advantage to mitigate the detrimental factors that affect fundamental production (Venegas *et al*., 2021).

The coffee business has offered a way for peasant families to obtain income (Pérez and Villafuerte, 2018). However, the contribution of this crop to family income is unstable, due to fluctuations in coffee prices that are set by the international market (Sánchez, 2015). Given this reality, diversification is an important resilience factor for coffee growers. In the context of the State of Chiapas, coffee production is family and peasant oriented (Sánchez, 2015). In this sense, it is important to understand that diversity in the agroecosystem is biocultural (Montoya and Toledo, 2020). Therefore, the uses and values of biological resources are mediated by the family's perception of them. Several studies have highlighted diversification as a strategy to promote the sustainability and resilience of rural families, by reducing the vulnerability and risk caused by dependence on a single resource (Jezeer and Verweij, 2015; Venegas *et al*., 2021). Also, through this diversity, access to food and the quality of the family diet are improved (Colmenares, 2017; Soto *et al*., 2022). However, these studies have not taken into account how gender affects the perception of diversity.

According to gender theory, the differences between men and women are not only biological, nor are they absolutely preconditioned by biology. There is a process of social construction of gender identity, linked to reproductive and productive roles, as well as to habits and customs pertaining to each cultural context (Estrada *et al*., 2016). On this basis, men and women have different experiences in terms of their relationship with the environment and biodiversity. For this reason, the gender perspective could configure a more complete outlook for taking advantage of the system's diversity.

A development strategy to address the issue of resilience and sustainability in the coffee agroecosystem would be useless, if these gender-related processes that define the perception of biodiversity and its use are not understood. The gender perspective comprehends the way in which people benefit from, use and make decisions about the ecosystem (Cifuentes *et al*., 2021; Brown and Fortnam, 2018), reflecting cultural aspects, education, socioeconomic level, age, religious beliefs, access to information and governance (Allendorf and Allendorf, 2013; Calvet *et al*., 2016; Fortnam *et al*., 2019 and Yang *et al*., 2018).

Given that there are few studies that take a gender perspective in relation to the use of diversity in CAFS in Chiapas, this research aims to take a gender perspective to analyze the uses and values of the diversity of resources associated with these systems, in order to identify key elements in the design of development strategies for this crop, in the Frailesca region of Chiapas.

THEORETICAL FRAMEWORK

In 1955, John Money, a psychologist from New Zealand, used the concept of gender for the first time to refer to a cultural component in the formation of sexual identity (Flores, 2021). Sex is a biological component that determines the physical appearance of individuals but also represents a cultural component that structures the experiences of individuals. Based on this, biological sex is assigned, so that women and men are attributed different characteristics (Mejía, 2015). There are multiple definitions that have emerged around this category. Thus, for example, Lamas (1996) interprets this as "a symbolic construct that regulates and conditions the objective and subjective behavior of people, that is, through the process of gender constitution, society creates ideas concerning what men and women should be" of what is supposed to be proper to each sex. Similarly, Lagarde (1996) defines gender as "a category that encompasses the biological, but also has bio-socio-psycho-econo-political-cultural aspects." Mejía (2015) conceptualizes gender as the symbolic and imaginary framework, constructed collectively, that attributes to sexual difference (male, female, and others), a series of normative roles and values, as well as the social activities and expectations associated with these sexual members. Thus, the adoption of the identity of boy, girl, woman, man, and others, is defined more by what society constructs than by what biological constitution determines.

Society, rather than biology, defines gender. Behavior, expectations, personality, and the social roles, and norms that are followed determine a person's gender identity, which reflects that gender is a social construct, not a natural given. Therefore, the concept of gender mainly implies that sexual difference is socially constructed, not innate (Montalvo, 2020).

By definition, gender equality implies that all people have the same rights, resources and opportunities, both in public and private contexts, which guarantee the possibility of living a full life, regardless of whether they be men or women (UN, 2015). This is recognized nationally and internationally, as an essential condition for achieving fair and equitable societies, and which is expressed in the highest normative documents to promote it (Machado López *et al*., 2018). The United Nations highlights the importance of incorporating a gender perspective in the 2030 Agenda for Sustainable Development, emphasizing that the full enjoyment of women's rights and opportunities is essential to achieve sustainable development (UN, 2019). Likewise, the

Economic Commission for Latin America and the Caribbean (ECLAC, 2004) highlights that gender equality is not only a fundamental human right, but also the necessary basis for building a peaceful, prosperous and sustainable world that benefits society as a whole.

There are multiple gender inequalities that persist and affect women in various societal contexts. From wage differences to limitations in educational and professional opportunities; these inequalities are manifested in that almost two-thirds of the world's illiterate population are women, most of the world's poor are women and have less access to basic services than men, besides this, they earn less money than men for the same work; there are also 39 nations in which only male children have the right to inheritance. Being a woman in the world generally carries a significant risk, due to gender violence (Alonso, 2019). Historically, rural women have played a significant role in agricultural activity, contributing on average 43% of the workforce in developing countries (Martínez and Baeza, 2017). In the countries of the region, women contribute to food production and the well-being of families, as well as to the conservation and protection of the environment; all thanks to their wealth of knowledge on the management of animal and plant diversity, agricultural practices, production systems and family survival strategies (Dorrego, 2015).

In CAFSs, men maintain the nurseries and carry out pruning, shade management, replanting, harvesting, pulping, washing and drying of beans. Women concentrate on harvesting, pulping, washing and drying the beans, in addition to carrying out other reproductive activities, such as food preparation, housework and family care (Venegas *et al*., 2021). Blare and Useche (2015) emphasize that men and women assume different roles in the exploitation of forests and agricultural lands and in the management of economic resources. In cocoa agroforestry systems, men prioritize profitable plantations, whereas women prefer multifunctional ones that support family subsistence. For their part, Oteros *et al*. (2014) found gender variations concerning how services are valued. Men place greater value on livestock breeding and seed dispersal, whereas women attribute greater importance to forest regeneration and the provision of food and water.

Although women play an essential role in both the productive and reproductive contexts and contribute to improving the quality of life of individuals and society as a whole (Mandar *et al*., 2014), paradoxically, they face great economic, political and social restrictions. In her 2008-2014 report, Schutter states that women face multiple exclusive challenges, such as lack of access to land and capital, double workload, little or no participation in decision-making, low wages, inequality and discrimination and limited access to government support (Guereña, 2017), as well as suffering from insufficient attention to gender issues in projects for sustainable agricultural development.

The above makes evident the need to pay greater attention to the different functions and knowledge systems differentiated by men and women, because most studies focus on the role of men and exclude women from decision-making regarding the environment and the management of natural resources; likewise their knowledge and needs are rarely considered by development policies and programs (Morales *et al*., 2016).

This gender differentiation is constructed from people's perceptions and is formed according to their interaction with the environment, the reception of stimuli and the interpretation of indicators, according to the sociocultural and ideological context in which they develop. These meanings influence individual judgments and behaviors (Ruiz, 2014) and variations between genders, generations, communities and social classes are to be expected. Therefore, perceptions differ depending on the value assigned to the contributions of nature according to gender, ranging from domestic, family and community well-being to individual benefits (Elmhirst and González, 2017). Evidently, gender-differentiated perceptions, based on cultural systems and beliefs about role assignments in society, make it possible to identify the factors that reproduce inequalities and affect the deterioration or conservation of ecosystems (Tuñón, 2003). There are relatively few works that seek to understand how differences in perceptions of men as opposed to women, regarding the use of resources available in CAFSs, can provide elements for policy makers seeking to improve equality, effectiveness and sustainability in the coffee agroecosystem in the specific context of the Frailesca region of Chiapas.

MATERIALS AND METHODS

Study area

The study was carried out in agroforestry systems in the Frailesca region, specifically in the municipalities of Villaflores, Villa Corzo and Ángel Albino Corzo in the State of Chiapas, from January to May 2023. These municipalities were selected for their importance in coffee cultivation (Figure 1). The Frailesca region is located between the Pacific Coastal Plain and the Central Depression of Chiapas, forming part of the physiographic regions of the Sierra Madre in Chiapas and the Central Depression. It is the second largest region in the State of Chiapas, with a population of 281,045 inhabitants, of which 137,178 are men (National Institute of Statistics and Geography-INEGI, 2020). It stands out for its agricultural and livestock activity and is recognized for its importance in the production of maize, beans, mangos and vegetables. It is also notable for its dual-purpose poultry and livestock farming activities (Cadena *et al*., 2013). Besides this, it has become a focal point for the implementation of fair trade and sustainability practices in coffee production, as it represents an important coffee hub in the State of Chiapas (Venegas *et al*., 2020).

Total production		**281,045**
Sex	Male	137,178
	Female	143,867
Location	Urban	137,712
	Rural	143,333
	Primary	20,516
	Secondary	58,738
	High school	201,790

Source: self-elaborated (data from INEGI 2020).
Figure 1. Location of the study area in the Frailesca region, Chiapas, Mexico.

Population and Sample

The process began by outlining the objectives of the research, the inherent implications for those participating and the confidentiality measures adopted. Definitive requirements were voluntary participation and having a direct relationship with coffee production. The study population included families associated with the company Exportadora de Café California S.A de C.V, comprising 3,200 associates, of which 2,331 were men. The sample was non-probabilistic, with 41 people (20 men and 21 women), who mentioned resources in the CAFS 570 times (293 by women and 277 by men). The sample consisted of voluntary participants, appropriate when dealing with sensitive issues, such as gender relations, where individuals may have reservations or fears about participation. The interviews and questionnaires were developed in community workshops, collection centers and during visits to producers' homes. This sample resided in 8 communities, pertaining to 3 municipalities in the Frailesca region.

Paradigm and type of investigation

The research was carried out using an interpretive paradigm, taking a mixed qualitative and quantitative approach (Hernández *et al*., 2010), of a non-experimental, exploratory, descriptive and relational type.

Research design

The study was conducted using a semi-structured interview questionnaire with a gender perspective (Swiss Agency for Development and Cooperation - SDC, 2010). The interview guide focused on the following aspects: a) List of components of perceived diversity in the CAFS, b) Perception concerning importance of the components of diversity, identified for marketing or family consumption, according to gender, and c) Analysis of governance with a gender perspective in CAFS. Likert scales (1932) were used to evaluate b) and c).

We analyzed the perception of importance of diversity components for different categories of use: human food, animal food, medicinal, artisanal - religious, firewood, wood, shade, ecological. The semantic differential ranged between 1 and 3, where the lowest score means "little importance" and the highest score, "very important."

Gender-sensitive governance in the CAFS was analyzed for the following categories: who works, who decides on production, who decides on income, who benefits from consumption and who benefits from income. In this case, semantic differentials ranging from 1 to 5 were used, with the following ordinal categorization: 1 (only the woman), 2 (mainly the woman), 3 (both), 4 (mainly the man) and 5 (only the man).

Statistical analysis

Fisher's exact test was used to analyze the relationship between comments about the CAFS resource made by men or women and the destination attributed to this resource, either consumption or market. Considering the association between comments made by men or women and resource uses, the Chi square test was used, after verifying that more than 20% of expected values exceeded 5. Simple and multiple correspondence factor analyses were performed to determine the associations between gender, uses and destinations of resources mentioned. The non-parametric Mann-Whitney test was used to analyze gender differences concerning the importance assigned to resources, considering: human food, animal food, medicinal, artisanal - religious, firewood, timber, shade and ecological uses, as well as in the governance categories, which include: participation in work, decisions concerning resources and income, benefits from resources and income. Analyses were undertaken using the STATISTICA 8.0 program (StatSoft, Inc. 2007).

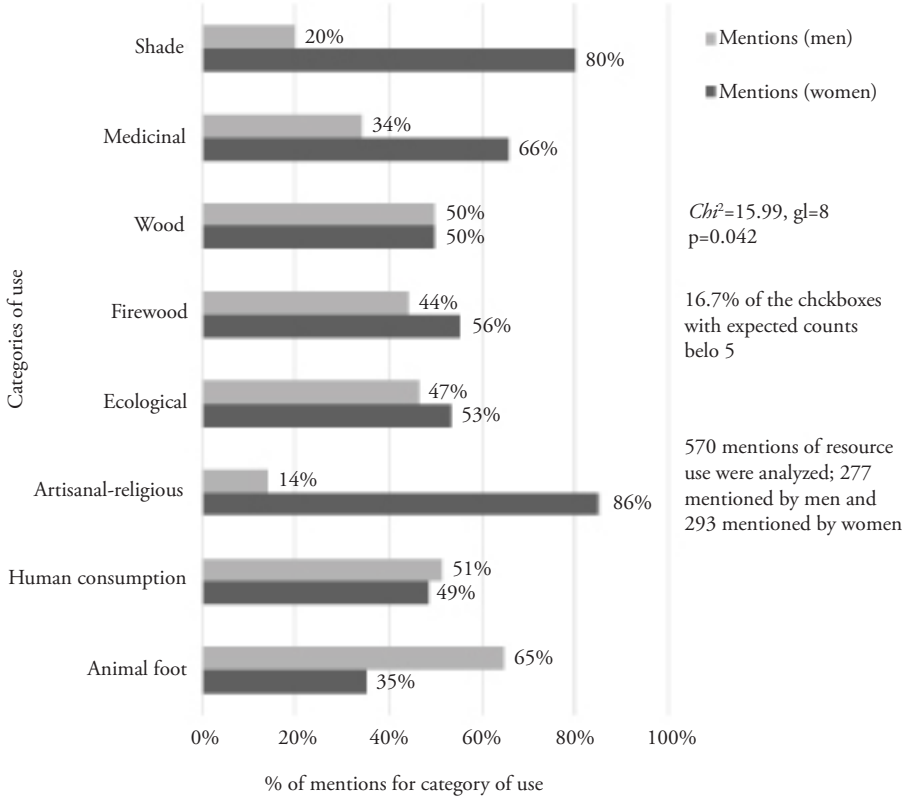
RESULTS

In the context of this study, men and women did not show significant statistical differences when applying Fisher's exact test ($p=0.07$), regarding

the destination of the resources they receive, "income" or "consumption". However, men tend to receive 12% more from resources that are marketed and generate income, whereas women tend to direct 7% more resources to family consumption.

In total, 89 resources of interest were identified, mentioned 570 times; these were grouped into 9 categories of use: animal food, human food, artisanal-religious, ecological, firewood, wood, medicinal and shade. Significant differences were observed between the comments made by men and women for each category, as indicated by the Chi square test (Chi^2=15.99, degree of freedom = 8, p=0.042; 16.7% of the checkboxes with expected counts below 5; Figure 2). Women more frequently perceive resources in the form of shade availability (60% more), medicinal (30% more) and artisanal-ceremonial (70% more) uses. Contrastingly, men more frequently mention animal food (30% more).

The multiple correspondence factor analysis showed significant associations between gender, uses and destination of the mentioned resources



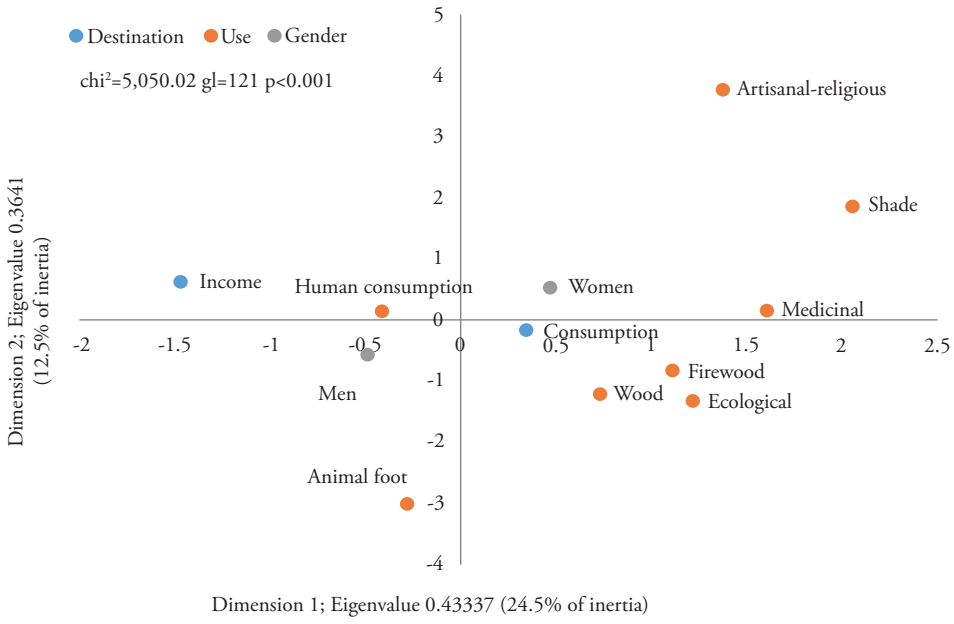
Source: self-elaborated using obtained data, 2023.
Figure 2. Gender perspective concerning use of perceived resources.

(Chi²=5050.02 gl=121 p=0.001). Women's perception of agroecosystem resources depending on their use is more comprehensive, so they are equidistant from all categories of use in the two-dimensional graph (Figure 3). The uses most perceived by men were human and animal food, which in turn were linked to income management through marketing. The rest of the multiple use categories, destined for family consumption, showed a tendency to be taken into account more by women than by men.

Perceptions on the part of men and women, regarding the resources available in the coffee agroecosystem, complement each other. Of all the resources mentioned, it was noted that 27% were apparent to both genders, 15% were taken into account mainly by men, and 58% by women (Figure 4).

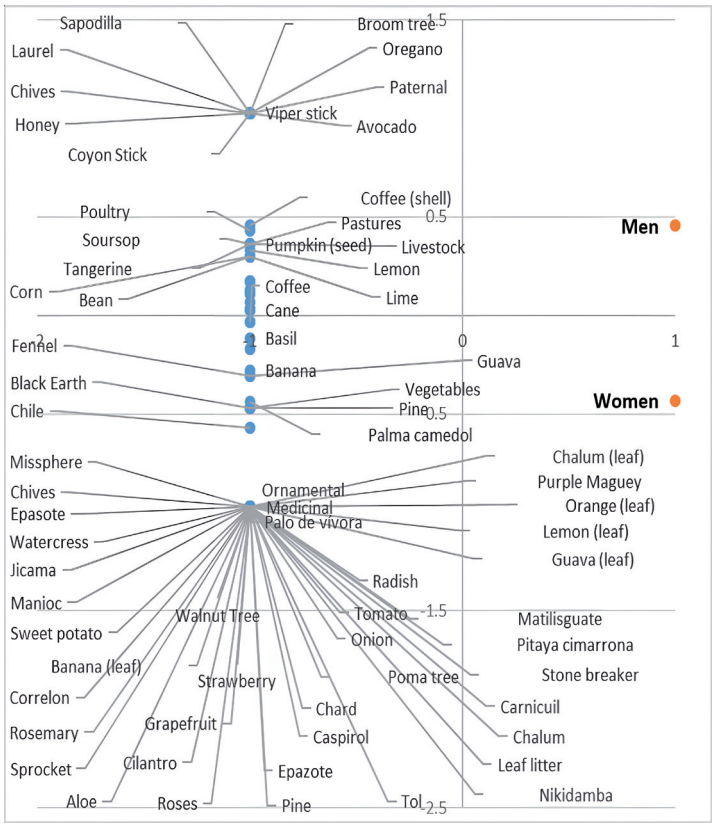
Besides assessing perception of resources, we analyzed the effect of gender on the importance attributed to them. In general terms, when applying the Mann-Whitney test, no significant differences were found concerning the level of importance assigned to resources according to gender, except in the case of ecological use (p=0.037), where men scored higher (Table 1).

In the analysis of governance with a gender perspective, a general tendency was identified for men to participate more in work, make decisions about production and control income when resources are destined to the market. This difference becomes statistically significant in decision-making about production, depending on the destination of the resources (p=0.014), as shown



Source: self-elaborated using obtained data, 2023.

Figure 3. Relationship between gender, uses and destination of resources.



Chi²=112.362 gl=88 p=.0413
Source: self-elaborated using obtained data, 2023.
Figure 4. Resources mentioned, depending on gender perspective.

by the Mann-Whitney test. Men make the decision of when resources should be destined to the market, whereas both genders share the decision when resources are destined for consumption (Figure 5). Importantly, the perception of access to benefits is similar among men and women, as both consider that they benefit equally, in terms of resource consumption and income generated.

DISCUSSION

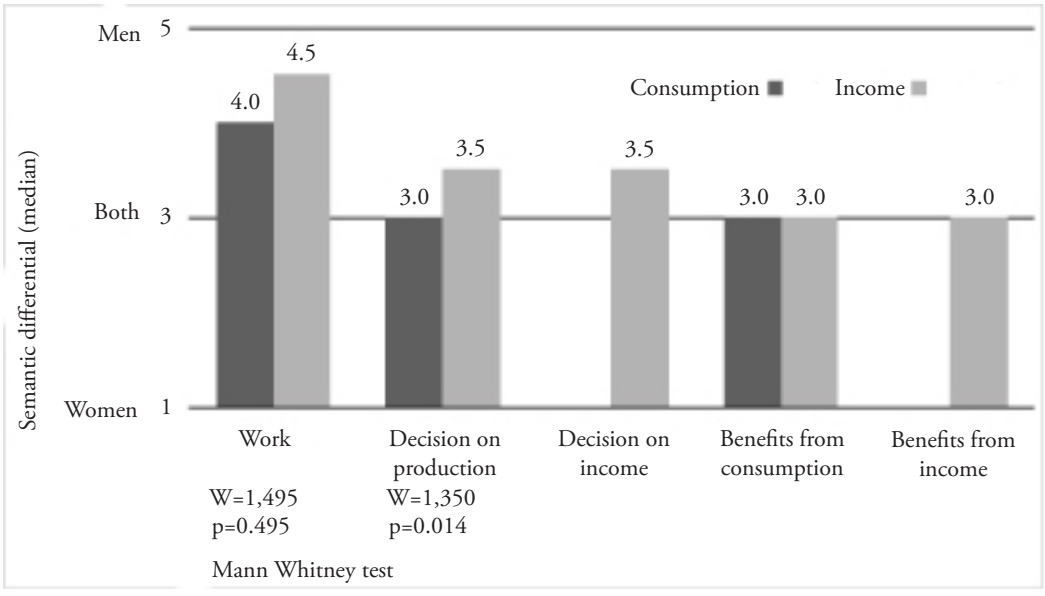
The final destination of resources, differentiated according to gender perspective, establishes the balance between commercialization and family consumption of available resources, by defining survival strategies, key to ensuring the ongoing renewal of the family group and its resilience, by guaranteeing its social reproduction (Juárez, 2015; Ávila and Ramírez, 2015). In this study, women were more associated with several multiple-use resources, appropriate for family consumption and survival; whereas men were more associated with resources destined for commercialization

Table 1. Degree of importance assigned to resources mentioned in terms of their use, according to gender.

Category of use	Perceived importance[a] Average		CI for the difference between medians 95%		Mann-Whitney test	
	Women	Men			Value W	p
Human food	3	3	0	0	16,763	0.16
Animal food	2.5	3	-1	0	45	0.39
Craft-religious	3	3				[b]
Medicinal	2	3	-1	0	503	0.081
Firewood	3	3	0	0	392	0.49
Wood	3	3	0	0	392	0.49
Shade	3	3				[b]
Ecological	2	3	-2	0	45.50	0.037

[a]Median in a semantic differential of 1 to 3, where the lowest score means "of little importance" and the highest score "of high importance"
[b]Test not performed due to identical observations in at least one category
Source: self-elaborated with obtained data, 2023.

and income generation. According to Hintze and Danani (2004), families manage resources in the form of a common good that is administered from two varying strategies; one is daily transformation for survival or domestic consumption and the second is economic, focused on practices to obtain income.



Source: self-elaborated using obtained data, 2023.
Figure 5. Gender perspective in terms of relations of governance and the use of resources depending on their destination.

Diversification is the main livelihood strategy for low-income households. And CAFSs are by nature widely diverse, which gives them different uses and values. In the context of the study, they were summarized in the following categories: animal and human food, medicinal and multiple utility (ecological, artisanal, timber, ceremonial, firewood, among others). Apparently, this diversity is taken advantage of according to perceptions, strongly defined by gender. This gender differentiation is based on the fact that this diversity comes from a natural environment that has been less modified than most agricultural agroecosystems (Castro and Estévez, 2021). Thus, it follows that a significant part of the diversity of secondary species is spontaneous, tolerated or introduced, without receiving specific cultural attention (Martín, 2015). For this reason, the experiential interaction is differentiated in terms of gender roles and progressively generates a process of construction of a biocultural memory (Baquero, 2021). This defines the correlation between identified resources, their uses and varied destinations.

Moreover, it is apparent that men and women have different perceptions about the diversity and use of resources in the CAFS. In this sense, Mirenda (2020) mentions that this establishes different forms of relationship with the agroecosystem and at the same time, different perspectives concerning the way available resources are perceived, which influences their preferences concerning land use and the implementation of certain agricultural practices (Blare and Useche, 2015).

A similar result, in terms of gender relations and perception of natural resources, was reported by Blare and Useche (2015), in cocoa agroforestry systems, who mention that men assign greater value to those plantations that generate profits, whereas women place more value on plantations of multiple uses associated with family subsistence. Similarly, Oteros *et al*. (2014) detected differences based on gender with respect to the valuation of the different services. Thus, men tended to consider livestock breeding (animal production, seed dispersal and bullfights) as more important, whereas women perceived the regulating services (forest regeneration, food, water and soil erosion control) as more important.

Because certain resources are perceived by men, whereas others are perceived only by women, the range of use of the resources available in the coffee agroecosystem is amplified, while providing different perspectives on the benefits of land use; these are complementary and improve the use of the wide range of resources associated with the CAFC. This outlook is related to the productive and reproductive roles that men and women develop in the CAFC. (Stoian *et al*., 2023). However, the fact that 58% of the resources are made visible essentially by women highlights the importance of recognizing and valuing their wealth of knowledge, in family survival strategies and natural resource

management, forcing decision-makers to generate policies and strategies that promote the participation of women in decision-making, related to resources in the coffee agroecosystem.

The gender differences in the perception and knowledge of resources, already mentioned, also have important implications for human development, conservation and germplasm management strategies. These differences are based on a more holistic approach on the part of women, which makes them "guardians" of biodiversity and precursors of greater use of diversity for family well-being (Solans, 2023). Likewise, the discrepancies concerning the amount of resources perceived by men and women indicate the need to share knowledge and experiences between them, in order to promote mutual understanding and the adoption of sustainable practices.

In the CAFC studied, gender roles are divided. Men are primarily responsible for the work of harvesting and processing coffee and other income-generating resources, such as maize, beans, and livestock. Women perform domestic work, participate in the harvest, pulping, washing, and drying of the beans, and seek to increase income through supplementary activities such as food processing and sales, small shops, sewing, weaving, and domestic work outside the home. This diversification can have positive effects by increasing income, giving greater empowerment, with less likelihood of food insecurity, as stated by Diallo *et al.* (2023). Likewise, Blare and Useche (2015) mention that women assume different roles to men in the exploitation of forests and agricultural land, as well as in the management of economic resources derived from these activities.

In reality, both genders complement each other to ensure food production and security. Women undertake dual roles as producers and caregivers in the home. While men own most of the agricultural assets and make decisions regarding food production, women are key to ensuring the availability of food and nutrition for the family (Doss *et al*., 2011). Recognizing these differences allows for the formulation of legitimate, relevant and effective strategies, institutional arrangements and development projects to mitigate poverty and manage resources (Machado *et al*., 2018). This is materialized by a family participation approach that promotes spaces for dialogue that facilitate social learning in this situation.

Although gender equality was not observed in terms of governance, considering the decision-making process of production and income from resources, there is equality in decisions related to consumption and benefits from income. This indicates that the assignment of family roles should not be analyzed arbitrarily, nor biased by egalitarian criteria, as the distribution of benefits is the ultimate goal of governance in family systems.

These results indicate that although women do not have equal control over productive-family income, despite their contribution to paid tasks in the agricultural, domestic, and informal trade spheres, they do have certain influence on the production decision, essentially when it is destined for family consumption. In this sense, recent literature has shown that rural women have more say in deciding how much to spend concerning certain household expenses (Puerta, 2015) and participate more with income (Rodríguez and Muñoz, 2015). Similar results were reported by Mwaseba and Kaarhus (2015) and Nsenga and Mwaseba (2021), in forestry practices in the highlands of southern Tanzania. For their part, Garay *et al*. (2022) emphasize that, although women's participation and bargaining power has increased in the home, there are still cultural patterns that limit achieving equality in productive and reproductive matters.

In the context of this study, the coffee marketing company implements programs for the benefit of women, as well as right to land ownership, in addition to facilitating agricultural and commercial training; it helps farmers to obtain certification for implementing sustainable practices. This could represent an opportunity for women to acquire their own benefits and income. Likewise, it is necessary to implement natural resource management policies and strategies, adapted to meet specific gender needs, ensuring that resources are used equitably and sustainably. As well as designing specific programs for women that offer them employment and income-generating opportunities for the development of their capacities and skills, taking into account their differences, needs and priorities, this also means equal rights, opportunities and responsibilities for men and women (Daza, 2022).

These results do not imply that gender perceptions about the use of resources associated with CAFSs is a general social phenomenon. Rather, they reveal the findings found in this study context. We recognize that gender perceptions vary according to culture, traditions and context, among others.

CONCLUSIONS

The gender perspective allowed us to understand the complexity of coffee agroforestry systems, which enables sustainable and equitable management of resources. It is apparent that gender-related differences exist concerning the perceptions and use of resources available in the coffee agroforestry system, where women have a more holistic view of the system and place more value on resources intended for family consumption; whereas men identify more with resources intended for income generation.

The diversity of resources identified in the coffee agroforestry system is key to the sustainability of this system, hence the need for policies and strategies that

promote the active participation of women and men in the management of coffee agroforestry systems and which recognize and value the complementary role that women play in production and adequate use of resources.

We suggest that more extensive and detailed studies be carried out to analyze the perceptions, roles and decisions of men and women in the management of coffee agroforestry systems, covering different geographical and cultural contexts. We also consider that participatory research be promoted to actively involve local communities, especially women and men farmers, as they identify challenges and solutions for the sustainable management of these agroecosystems, paying special attention to the division of roles associated with gender.

ACKNOWLEDGMENTS

The authors would like to thank the National Council of Humanities, Science and Technology (Conahcyt) for the scholarship granted to complete the Master's Degree in Agroforestry Sciences. We would also like to thank the company Exportadora de Café, California S.A de C.V and its associated producers, who collaborated in carrying out the work.

REFERENCIAS

Abebe T, Mulu D. 2017. The Role of Women in the Management and Utilization of Home Garden: The case of Dale District, in southern Ethiopia. Asian Journal of Plant Science and Research. 7(4). 41-54. https://www.researchgate.net/publication/321419132_The_Role_of_Women_in_the_Management_and_Utilization_of_Home_Garden_The_Case_of_Dale_District_in_Southern_Ethiopia

Allendorf TD, Allendorf K. 2013. Gender and Attitudes toward Protected Areas in Myanmar. Society y Natural Resources. 26(8). 962-976. https://doi.org/10.1080/08941920.2012.729295.

Alonso V. 2019. Desigualdades que persisten: Reflexiones en torno al trabajo y a la autonomía económica de las mujeres argentinas. BORDES Revista de Política, Derecho y Sociedad. (12). 67-74. https://publicaciones.unpaz.edu.ar/OJS/index.php/bordes/article/view/446.

Ávila LG, Ramírez CA. 2015. ¿Estrategias de vida o estrategias de reproducción social? Hacia la reconstrucción de una racionalidad reproductiva para el desarrollo rural. Revista Textual. (65). 55-80. https://biblat.unam.mx/es/revista/textual-chapingo/articulo/estrategias-de-vida-o-estrategias-de-reproduccion-social-hacia-la-reconstruccion-de-una-racionalidad-reproductiva-para-el-desarrollo-rural

Baquero JD. 2021. Memoria biocultural asociada a plantas de uso local en estudiantes de Puerto Nariño, Amazonas. Tecné, Episteme y Didaxis: TED, (Número Extraordinario): 972–978. https://revistas.upn.edu.co/index.php/TED/article/view/15222.

Blare T, Useche P. 2015. Is there a choice? Choice experiment to determine the value men and women place on cacao agroforests in coastal Ecuador. International Forestry Review. 17(4). 46-60. https://doi.org/10.1505/146554815816086390.

Brown K, Fortnam M. 2018. Gender and ecosystem services: a blind spot. *In*: Ecosystem Services and Poverty Alleviation (OPEN ACCESS). Schreckenberg K, Mace G, Poudyal M. (eds); Routledge: London; https://www.taylorfrancis.com/chapters/oa-edit/10.4324/9780429507090-20/gender-ecosystem-services-katrina-brown-matt-fortnam. pp: 257-272.

Cadena P, Camas R, López W, Navarro H. 2013. Implicaciones prácticas y teóricas de la nueva ruralidad en la Frailesca, Chiapas, México. Revista Mexicana de Ciencias Agrí-

colas. 4(7). 1013-1026. https://doi.org/10.29312/remexca.v4i7.1142.
Calvet L, March H, Corbacho D, Gómez E, Reyes V. 2016. Home garden Ecosystem Services Valuation through a Gender Lens: A Case Study in the Catalan Pyrenees. Sustentability. 8(8). 718. https://doi.org/10.3390/su8080718.
Castro JM, Estévez DS. 2021. Caracterización espacial de arreglos agroforestales en cuatro paisajes agrícolas del trópico alto, Cundinamarca–Colombia. Tesis en opción al título de Ingeniero Agrónomo. Universidad De Ciencias Aplicadas Y Ambientales U.D.C.A. Bogotá D.C. https://repository.udca.edu.co/handle/11158/4326.
CEPAL (Comisión Económica para América Latina). 2004. Entender la pobreza desde la perspectiva de género. Fondo de Desarrollo de las Naciones Unidas para la Mujer. http://hdl.handle.net/11362/5918.
Cifuentes JA, Feintrenie L, Gutiérrez I, Sibelet N. 2021. Servicios ecosistémicos y género en zonas rurales de Nicaragua: Diferentes percepciones sobre el paisaje. Servicios Ecosistémicos. 50. 101294. https://doi.org/10.1016/j.ecoser.2021.101294 https://repositorio.catie.ac.cr/handle/11554/8895https://repositorio.catie.ac.cr/handle/11554/8895.
COSUDE (Agencia Suiza para el Desarrollo y la Cooperación). 2010. Guía para la aplicación del enfoque de género dirigida a facilitadores(as) de procesos de formación técnica. La Paz, Bolivia; https://www.bivica.org/file/view/id/4874. 182 p.
Daza L, Křížková A, López P, Černohorská VM, Nyklová B, Partida R, Hermanová M. 2022. Mujeres y empleo: avances y desafíos en las políticas para la participación laboral de las mujeres en Europa, América Latina y Caribe en el contexto de la recuperación post-pandémica. EU-LAC Foundation: Hamburgo; https://eurosocial.eu/wp-content/uploads/2022/06/PS_EULAC_Policy-Brief-mujeres-empleo-ES.pdf. 27 p.
Debbarma J, Taran M, Deb S. 2015. Contribution of Women in Agroforestry Practices of West Tripura, North-East India. Octa Journal of Environmental Research. 3(4). 343-351. http://sciencebeingjournal.com/octa-journal-environmental-research/contribution-women-agroforestry-practices-west-tripura-north-eas.
Diallo TM, Mazu AA, Araar A, Dieye A. 2024. Women's employment in rural Senegal: what can we learn from non-farm diversification strategies? Journal of Agribusiness in Developing and Emerging Economies. 14(1). 102-127. https://doi.org/10.1108/jadee-01-2022-0019.
Dorrego A. 2015. Construcción de la sostenibilidad en Bolivia: Propuesta agroecológica de las mujeres. LEISA: Revista de Agroecología. 31(4). 13-15. https://leisa-al.org/web/wp-content/uploads/vol31n4_leisa.pdf.
Doss C, Raney T, Anriquez G, Croppenstedt A, Gerosa S, Lowder S, Skoet J. 2011. The role of women in agriculture. Special Issue on the State of Food and Agriculture (SOFA). Report for the Agricultural Development Economics Division. Report, (11-02). http://www.fao.org/3/a-am307e.pdf.
Elmhirst R, González M. 2018. Ecologías políticas feministas: perspectivas situadas y abordajes emergentes. Ecología Política. 54. 52-59. https://www.ecologiapolitica.info/wp-content/uploads/2018/01/054_Elmhirst_2017.pdf.
Escobar S. 2017. Las plantas comestibles en el agroecosistema de café: uso, conocimiento y diversidad en el Ejido La Rinconada Bella Vista, Chiapas. Tesis Maestría. El Colegio de la Frontera Sur. México. http://ecosur.repositorioinstitucional.mx/jspui/handle/1017/2071.
Estrada JL, Mendieta A, González B. 2016. Perspectiva de género en México: Análisis de los obstáculos y limitaciones. Opción. 32(13). 12-36. https://www.redalyc.org/pdf/310/31048483002.
Flores IC, Scotton D. 2021. El sistema internacional de protección de los derechos humanos una mirada de género en Nueva Zelanda y Ecuador en un periodo de análisis 2010 2020. Tesis Licenciatura. Universidad del Azuay. Ecuador. http://dspace.uazuay.edu.ec/handle/datos/11494.
Fortnam M, Brown K, Chaigneau T, Crona B, Daw TM, Gonçalves D, Hicks C, Revmatas M, Sandbrook, Schulte-Herbruggen B. 2019. The gendered nature of ecosystem services. Ecological Economics. 159. 312-325. https://doi.org/10.1016/j.ecolecon.2018.12.018.

Garay S, Torres JE, Murcia DL, Torres-Rodríguez GA. 2022. Caracterización y tipificación socioeconómica del trabajo de la mujer rural del municipio de Vistahermosa-Meta. Revista Aglala. 13(2). 84-99. https://revistas.curn.edu.co/index.php/aglala/article/view/2200.

Guereña A. 2017. Kuña ha yvy. Desigualdad de género en el acceso de a la tierra en Paraguay. Informe de investigación. OXFAM, ONU MUJERES: Asunción, Paraguay; https://lac.unwomen.org/es/digiteca/publicaciones/2017/08/desigualdad-de-genero-en-acceso-de-tierra-en-paraguay. 92 p.

Hernández R, Fernández C, Baptista P. 2010. Metodología de la investigación. México. (ed). 5ta. Ed. McGraw-Hill / Interamericana Editores, SA de CV: México; https://www.smujerescoahuila.gob.mx/wp-content/uploads/2020/05/Sampieri.Met.Inv.pdf. 656 p.

Hintze S, Danani C. 2004. Capital social y estrategias de supervivencia. *In*: Reflexiones sobre el capital social de los pobres. Danani C, Comp. Política social y economía social: debates fundamentales. UNGS-Fundación OSDE-Altamira: Buenos Aires, Argentina, https://www.flacsoandes.edu.ec/sites/default/files/agora/files/1252374169.hintzecapital_social_y_estrategias_de_supervivencia._reflexiones_sobre_el_capitall_0.pdf. pp: 87-116.

INEGI (Instituto Nacional de Estadística y Geografía). 2020. Principales resultados del Censo de Población y Vivienda 2020: Chiapas. México. https://www.inegi.org.mx/app/biblioteca/ficha.html?upc=702825197780.

Jezeer R, Verweij PA. 2015. Shade grown coffee - double dividend for biodiversity and small-scale coffee farmers in Peru. Hivos and Ultrech University: The Hague, the Netherlands. https://doi.org/10.13140/RG.2.1.1393.2405.

Lagarde M. 1996. La multidimensionalidad de la categoría género y del feminismo. *In*: Metodología para los estudios de género. González ML, Coord. Instituto de Investigaciones Ecomómicas y Universidad Nacional Autónoma de México: Argentina; https://www.pj.gob.pe/wps/wcm/connect/26675c0043f7b1eeb6c5b7009dcdef12/5.+La+multidimensionalidad+de+la+categor%C3%ADa+g%C3%A9nero+y+del+feminismo+.pdf?MOD=AJPERES. pp: 48-71.

Lamas M. 1996. La perspectiva de género. La Tarea, Revista de Educación y Cultura de la sección 47(8). 216-229. https://www.ses.unam.mx/curso2007/pdf/genero_perspectiva.pdf

Likert R. 1932. A technique for the measurement of attitudes. Archives of Psychology, 22(140). 5-55. https://legacy.voteview.com/pdf/Likert_1932.pdf.

Machado L, Morales T, Chávez LS. 2018. La igualdad de género, paradigma del desarrollo sostenible en la Agenda 2030. Universidad y Sociedad. 10(2). 7-13. https://rus.ucf.edu.cu/index.php/rus/article/view/816/915.

Mandar M, Parada S, Rodríguez K. 2014. Las mujeres en la agricultura familiar. *In*: Agricultura familiar en América Latina y el Caribe: Recomendaciones de Política. Salcedo S y Guzmán L. FAO (Organización de las Naciones Unidas): Santiago, Chile; https://www.fao.org/4/i3788s/i3788s.pdf. pp: 101-122.

Martín RN. 2015. Estudio etnobotánico de plantas alimenticias, diagnóstico y servicios realizados en la aldea Salquil Grande, Santa María Nebaj, Quiché, Guatemala, CA. Tesis Doctoral, Universidad de San Carlos de Guatemala, Guatemala, https://api.core.ac.uk/oai/oai:www.repositorio.usac.edu.gt:2324. 100 p.

Martínez I, Baeza M. 2017. Enfoques de género en el papel de la mujer rural en la agricultura cubana. Revista Prolegómenos. 20(39). 29-38. http://dx.doi.org/10.18359/prole.2721.

Mejía C. 2015. Sexo y género. Diferencias e implicaciones para la conformación de los mandatos culturales de los sujetos sexuados. *In*: Cultura, política y sociedad. Una visión calidoscópica y multidisciplinar. Taguenca, JA, Coord.; Universidad Autónoma del Estado de Hidalgo: Pachuca de Soto, México; https://www.aacademica.org/carlos.mejia.reyes/12. pp: 235-263.

Mirenda C. 2020. Percepciones del cambio climático en perspectiva de género en Jalisco, México. Letras Verdes, Revista Latinoamericana de Estudios Socioambientales. (28).

31-48. DOI: https://doi.org/10.17141/letrasverdes.28.2020.4307.
Montalvo J. 2020. El trabajo desde la perspectiva de género. Revista de la Facultad de Derecho. (49): 1-19. https://doi.org/10.22187/rfd2020n49a6.
Montoya D, Toledo VM. 2020. Historia de la caficultura en Chiapas (1880- 2010). Apuntes de una evolución social y ambiental. Sociedad y Ambiente. (23). 1-25. ISSN: 2007-6576. https://doi.org/10.31840/sya.vi23.2187
Morales EI, Gutiérrez JG, Antonio X, Balderas MÁ. 2016. Educación ambiental popular para el manejo sustentable de recursos naturales en una localidad rural del subtrópico mexicano. Sociedad y Naturaleza, 28(1). 39-54. https://doi.org/10.1590/1982-451320160103.
Mwaseba DJB, Kaarhus R. 2015. How do Intra-household Gender Relations Affect Child Nutrition? Findings from Two Rural Districts in Tanzania. Forum for Development Studies. 42(2). 289-309. https://doi.org/10.1080/08039410.2015.1020337.
Nsenga JV, Mwaseba DL. 2021. Intra-household gender relations and women participation in non-industrial private forestry in the Southern Highlands of Tanzania. International Forestry Review. 23(1). 68-78. https://doi.org/10.1505/146554821832140349.
ONU (Organización de las Naciones Unidas). 2015. Lograr la igualdad entre los géneros y empoderar a todas las mujeres y las niñas. ONU para la Igualdad de Género y el Empoderamiento de las Mujeres. https://www.un.org/sustainabledevelopment/es/gender-equality/.
ONU (Organización de las Naciones Unidas). 2019. Página principal de la Naciones Unidas. https://www.un.org/sustainabledevelopment/es/.
Oteros E, Martín B, González JA, Plieninger T, López CA, Montes C. 2014. Socio-cultural valuation of ecosystem services in a transhumance social-ecological network. Regional Environmental Change. 14. 1269–1289. https://doi.org/10.1007/s10113-013-0571-y.
Pérez EF, Villafuerte D. 2018. Efectos del mercado desregulado sobre los campesinos productores de café de Los Altos de Chiapas: el caso de UCIPA. Revista LiminaR. Estudios Sociales y Humanísticos. 16(1): 134-149. https://doi.org/10.29043/liminar.v16i1.569.
Puerta N. 2015. Intrahousehold Resource Allocation and Women's Empowerment. The Effect of FAMILIAS EN ACCIÓN on Colombian Households. Coyuntura Económica. 45(2). 269- 295. http://hdl.handle.net/11445/3162.
Rodríguez CR, Muñoz JA. 2015. Participación laboral de las mujeres rurales chilenas: Tendencias, perfiles y factores predictores. Cuadernos de Desarrollo Rural. 12(75). 77-98. https://doi.org/10.11144/Javeriana.cdr12-75.plmc.
Ruiz LE. 2014. Género y percepciones sociales del riesgo y la variabilidad climática en la región del Soconusco, Chiapas. Alteridades. 24(47). 77-88. http://www.redalyc.org/articulo.oa?id=74732508008.
Sánchez GK. 2015. Participación campesina en el mercado global de café. Cafeticultores organizados en Chiapas. Nóesis, Revista de Ciencias Sociales. 24(47-2). 1-19. https://doi.org/10.20983/noesis.2015.13.1.
Solans ML. 2023. Cuestiones de derecho, cuestiones de derecho: la paradoja del rol de las mujeres y conservación de la biodiversidad en Argentina. Ciencia Política. 18(35). 235-258. https://doi.org/10.15446/cp.v18n35.103677.
Soto L, Escobar S, Benítez M, López A, Estrada E, Herrera B, Jiménez E. 2022. Contributions of agroforestry systems to food provisioning of peasant households: Conflicts and synergies in Chiapas, Mexico. Frontiers in Sustainable Food Systems. 5. 756611. https://doi.org/10.3389/fsufs.2021.756611.
StatSoft. Inc. 2007. STATISTICA (data analysis software system), version 8.0.
Stoian D, Donovan J, Elias M, Blare T. 2018. ¿Apto para el propósito? Una revisión de las guías para el desarrollo de cadenas de valor con equidad de género. Development in Practice. 28(4). 494–509. https://doi.org/10.1080/09614524.2018.1447550.
Tuñón E. 2003. Género y medio ambiente. ECOSUR/SEMARNAT/Plaza y Valdés: México; https://biblio.iberopuebla.mx/cgi-bin/koha/opac-detail.pl?biblionumber=161645. 393 p.
Venegas A, Soto L, Balente O, Álvarez G. 2020. Transformaciones de la caficultura en

Chiapas: un análisis de las crisis desde la perspectiva del ciclo de renovación adaptativa. Sociedad y Ambiente. (23). 1-31. https://doi.org/10.31840/sya.vi23.2188.

Venegas A, Soto L, Álvarez G, Alayón A, Díaz E. 2021. La diversificación de estrategias socioambientales en la familia campesina: mecanismo de resiliencia ante la crisis del café en Chiapas. Revista Pueblos y Fronteras Digital. 16. 1-31. https://doi.org/10.22201/cimsur.18704115e.2021.v16.510.

Yang YCE, Passarelli S, Lovell RJ, Ringler C. 2018. Gendered perspectives of ecosystem services: A systematic review. Ecosystem Services. 31. 58–67. https://doi.org/10.1016/j.ecoser.2018.03.015.