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Identifying the small rural family business based on the categorization of family farming

Identificación de la pequeña empresa familiar rural, a partir de la categorización de la agricultura familiar

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Abstract

Supporting the continuity of rural family businesses through entrepreneurial strategies requires understanding the characteristics of their agricultural context. Therefore, the aim of this work is to categorize family farming to profile it and assess its potential and limitations for development into small rural family businesses. The work methodology is the qualitative descriptive approach. Through fieldwork in the rural community of San Antonio Portezuelo, in the state of Puebla, Mexico; the analysis method is applied to the family farming categorization, which is defined by seven variables: production destination, formation of the family farming (family involvement), number of hectares, infrastructure, diversification in terms of activities, market coverage and productive cycle. The results provide information at the local level in a developing country such as Mexico. Furthermore, they provide the grounds for recognizing subsistence farming and farming in transition and lay the foundations for designing business intervention programs that help transform the potential of small family businesses into tangible results.

Keywords: Family farming; Small family business; Business management; Rural enterprise; Continuity.

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Resumen

Apoyar la continuidad de la empresa familiar rural, a través de estrategias empresariales, requiere entender las características de su contexto agrícola. Por lo que, el objetivo de este trabajo es proponer una categorización de la agricultura familiar para identificar su perfil y poder valorar su potencial y limitaciones de desarrollo en la pequeña empresa familiar. La metodología utilizada es del tipo descriptivo cualitativo, a través del trabajo de campo en la comunidad rural de San Antonio Portezuelo, en el estado de Puebla, México; se aplica el método de análisis para la categorización de la agricultura familiar, la cual es definida por siete variables: destino de la producción, conformación de la agricultura familiar (participación familiar), número de hectáreas, infraestructura, diversificación de actividades, cobertura de mercado y ciclo productivo. Los resultados proporcionan información a nivel local de un país en desarrollo, como México. Asimismo, permiten tener una plataforma para reconocer a la agricultura de subsistencia y en transición, y a partir de esto, plantear las bases para diseñar programas de intervención empresarial que ayuden a convertir el potencial de la pequeña empresa familiar en resultados reales.

Palabras Clave: Agricultura familiar; Pequeña empresa familiar; Gestión empresarial; Empresa rural; Continuidad.

1. Introduction

Every country's quest for economic growth is unwavering, while the world economy's slowdown has profoundly affected some productive sectors. The agricultural sector is the most affected by the population's neglect, vulnerability, and poor training (Siche, 2020). The effects of the global economy's financial crises manifest themselves in the behavior of the agricultural and agri-food trade balance, which increases the likelihood of food insecurity (Luque-Zúñiga *et al.*, 2021; Basurto and Escalante, 2012).

This situation has led to macroeconomic pressures to place family farming in the foreground and improve the conditions of families living in rural areas whose economy is agriculture-based. For this reason, the United Nations (UN) proclaimed 2014 the "International Year of Family Farming" for policies that restore the value of and pay attention to family farming worldwide or be designed. Likewise, the document "Transforming Our World: the 2030 Agenda

for Sustainable Development" seeks to end poverty, combat inequality and injustice, and confront climate change by 2030 while not leaving anyone behind (ONU, 2019). Based on the results from a year's devotion to studying family farming, and since it allows achieving the objectives of the 2030 agenda on sustainable development in an inclusive, collaborative, and coherent fashion, the "United Nations Decade of Family Farming" 2019-2028 project (UNDFP) was established in 2017 (FAO and IFAD, 2019).

Based on its 2019-2024 National Development Plan (NDP), Mexico seeks to break the vicious circle between countryside prostration and food dependence through different programs, among which the following stand out: Production for Wellbeing Program; Guaranteed Price Program for corn, bean, bread wheat, and rice crops, and milk; distribution of chemical and biological fertilizers, and the creation of the Mexican Food Security agency (SEGALMEX), all of which mainly target small- and medium-sized producers (PND, 2019).

Family farming in Mexico demands certain land and agro-ecological, demographic, economic, and socio-cultural conditions, as well as access to financing, technology, labor, and specialized education. These conditions, and requirements, are far from being met due to the high educational and technological backwardness, poorly paid jobs or jobs under unfavorable conditions, and the heterogeneity of the soil and climate that prevail across the country. Such heterogeneity makes it unfeasible to consider developing a competitive advantage (Taboada *et al.*, 2020).

Academic studies on family farming reveal a series of business strategies in the quest to improve profitability, competitiveness, and productivity. A literature review on the subject will reveal later that only one of several characteristics that make it possible to profile agricultural producers has been considered. Therefore, in the researcher's opinion, those strategies may have failed in achieving their objective because they did not harmonize with producers' economic development potential.

Furthermore, although the United Nations' Decade of Family Farming (UNDFP) project advocates addressing family farming

from an integral perspective to eradicate countryside poverty (FAO and IFAD, 2019) and follows developing countries' interest in small farmers' current and future status, information is lacking, specifically on their production and technological capabilities. (FAO, 2021). Therefore, it is vital to conduct studies that afford a closer characterization of family farming, especially of smaller operations, to be able to assess their development potential and constraints.

2. Rural Family Business

Proposing a single definition of family farming has not yet been possible due to each country's particular characteristics. However, peasant economics scholars, such as Salas-Alfaro and Pérez-Morales (2007), define it as the peasant or family unit of production, characterized by self-consumption and which sells its surpluses for purchasing goods and services. Mora-Delgado (2008) characterizes it as a peasant production operation, where the family operates as an external exchange-oriented production, consumption, and reproduction unit. Moreno-Pérez *et al.* (2011), in turn, define it as legal ownership, where production is carried out through family labor.

The above definitions must be coupled with the robustness of the United Nations' Food and Agriculture Organization's (FAO) concept of family farming to recognize its importance in achieving the Millennium Development Goals, such as combating hunger and poverty, based on sustainable practices. Thus, up until 2013, this notion used to refer to a way of organizing agriculture, livestock farming, forestry, fishing, aquaculture, and pastoralism, as managed and run by a family (FAO, 2013). It subsequently sustains that family farming (which includes all family-based agricultural activities) is a means to organize agricultural, forestry, fisheries, pastoral, and aquaculture production as managed and run by a family, while strongly family labor-reliant. The family and the farm are tied together, evolve jointly, and conflates economic, environmental, social, and cultural functions" (FAO and IFAD, 2019).

Studying agricultural and non-agricultural businesses leads us to define what a small- and

micro-sized family business is. It is the result of diversifying activities, driven by external factors (like the supply and demand of agricultural products and production inputs and labor costs) and internal family-specific factors (such as the need to supplement the family income or there being sufficient family members to support the new activity).

A business is an entity of human, technical and economic resources that is profitmaking driven. In addition to being classified by the economic sector in which it operates (manufacturing, services, and commerce), since 2009, Mexican companies have also been classified by their number of employees and yearly reported sales (DOF, 2009). This sheds light on the capacity of companies to create jobs and serve or maintain their market share (DOF, 2009). Thus, we may distinguish three types of companies: micro, small and medium-sized.

Should FAO and IFAD (2019) offered family farming definitions incorporate the characteristics that tell family businesses from non-family businesses apart, family businesses being the economic unit where ownership (in money or kind) and management are mainly family-controlled (a group of people joined by a blood, marital or friendship bond), then family farming would be an agricultural production system where ownership, management, and labor are predominantly family-based if seen from a business perspective.

Family farming categorizations or typologies have not yet been officially established due to the different specific characteristics of the world's rural communities. Therefore, researchers have constructed their specific typology according to the conditions or characteristics of the communities under study. Mora-Delgado (2008) is an example as the author classifies them by the purpose of their produce, whereas Carmagnani (2008) does so based on the number of resources and production rate. FAO (2013) discerned several typologies based on the conditions of each country. For instance, in Latin America, these are Subsistence, in-Transition, and Consolidated Family Farming. Finally, the Center for Sustainable Rural Development and Food Sovereignty Studies (CEDRSSA)

considers specific categorization aspects, such as production process, type of activities, production purpose, crop area, family activities, type of tools, and environmental conditions of the land (CEDRSSA, 2014).

For this research and to profile those economic units that could be considered small rural family businesses, Family Subsistence Farming (Peasant Economy), Family Farming in Transition, and Entrepreneurial Family Farming will be understood as follows (Baldazo-Molotla *et al.*, 2020):

a. Subsistence Family Farming (Peasant Economy)

An agricultural production system in which ownership, management, and labor are entirely family-based, production is intended for self-consumption, and the production area is 9 hectares at most. It uses a rainfed production cycle, essential tools, and draft animals, and people need to diversify their activities to make ends meet.

b. Family Farming in Transition

An agricultural production system in which ownership, management, and labor are mainly family-based, production is meant for self-consumption and a small allotment for sale at the local market and the region. Its production area does not exceed 49 hectares, uses a rainfed and irrigated production cycle, and is supported by elementary tools, draft animals, and agricultural machinery. People occasionally engage in other activities to supplement the family income.

c. Entrepreneurial Family Farming

An agricultural production system in which ownership, management, and labor are family-based, but outside labor is also hired. Production exceeds 50 hectares and uses an irrigation cycle, supported by elementary tools, draft animals, agricultural machinery, and industrial processes; a small proportion is allocated for self-consumption and the majority for in-state, national and international sales.

3. State of the art

The earliest studies on family farming in Mexico were published in high-impact

journals in 1999 and analyzed its history and prospects under the country's economic development (Calva, 1999). Since 2000, the studies have focused on analyzing elements that review the forms of work in agricultural environments, such as the role of non-agricultural rural employment (Guzmán-González *et al.*, 2005), the labor market (Hernández and Barrón, 2013), and family labor (FAO, 2014). Research that accounts for economic diversification strategies (Tomé-Hernández *et al.*, 2014) and mechanisms to meet basic family needs (Magdaleno-Hernández *et al.*, 2014) has also been conducted as well as the use of natural resources and reproduction strategies within the communities (Parra-Sosa *et al.*, 2007). Others analyze the multifunctionality of peasant agriculture (Ayala-Ortiz and García-Barrios, 2009) and subsistence agriculture in rural development (Ramírez-Juárez, 2013).

In more recent years, the subsistence of specific production systems such as dairy farmers (Cortez-Arriola *et al.*, 2016; Cortez-Arriola *et al.*, 2015; Cortez-Arriola, *et al.*, 2014) has been analyzed. The profitability of goat production (Pinos-Rodríguez *et al.*, 2015) has also been addressed, and options to improve family income through alternative agricultural production systems such as a maize system (Flores-Sánchez *et al.*, 2015) have been considered.

The earliest studies on family farming in Mexico, specifically, entrepreneurship or business management studies on family farming propose strategies to improve profitability, competitiveness, and productivity, as Perea and Rivas (2008) did. They identified competitive strategies for coffee producers in the Córdoba, Veracruz. They selected their study subjects using farm size and crop type, meaning that only the land variable (number of hectares) was regarded. In this study, more than 80% of the interviewees display subsistence economy characteristics. Therefore, the proposed strategies will have to be revisited to align with the realities of the study subjects.

The work of Padilla-Bernal *et al.* (2012) seeks to provide information that will be an input to public policy proposals in support of production units' "upgrading," affording them competitiveness in the global market,

which will impact economic growth in the state. Their study considered the following study subjects' selection criteria: possessing an area greater than or equal to 2.500m², producing vegetables (seedling and flower production excluded), and availability to answer some questions. They also make a cluster classification using the technological advancement of the units of analysis, which can only lead us to think that their study considered the technology variable, in which case it possibly addressed consolidated agricultural businesses.

Authors from other disciplines have addressed the topic, such as Magaña and Leyva (2008). They sought to highlight the importance of assessing agricultural public policies, from detecting problems and needs to executing and concluding programs. The evaluation process of the Agricultural Development Program was at the core to diagnose the program's status and determine its impacts on the agricultural subsector in the state of Yucatan, as well as to account for effectiveness and efficiency. However, only the programs were analyzed, and support to producers was succinctly discussed. On the other hand, the characteristics of those producers are not specified, which leads to the assumption that agricultural subsector support should be sectorized according to the prevailing family farming characteristics and its impact measured from there.

Other studies on agricultural enterprises in Mexico include that of Sánchez-Sánchez, *et al.* (2020). They show that identifying the farmer's educational attainment, years of experience, and the number of family members involved in the agricultural enterprise can lead to higher innovation. Romero-Padilla *et al.*, (2020) believe it is essential to use variables such as the farmer's age, the production purpose, agricultural activity, and the value of family assets for succession. While not providing a categorization, identifying such variables leads to company continuity- and innovation-related issues.

The studies suggest that it is fitting to understand and explain how rural communities develop and their characteristics to better approach the reality these businesses face to generate business

strategies for smaller family businesses in rural areas. As such, we would not be setting off from generalizations that might diminish the efforts of the study and the tangible impact that may be perceived. Therefore, this paper proposes a categorization of family farming that profiles it and allows assessing its development potential and limitations, smaller businesses especially. Thus, based on being recognized as a small rural family business, the foundations will be laid for designing business intervention programs to help translate potential into tangible results.

4. Methodology

We based our work on a descriptive qualitative approach using a field study in the town of San Antonio Portezuelo, located in the municipality of General Felipe Ángeles, State of Puebla, Mexico. It is essential to mention that the fieldwork was conducted over several years within the community to get closer to its members and, later, the entrepreneurs, which allowed access to reliable data.

Puebla ranks fifth in agriculture and international migration. It has a 34,306 km² area, which represents 1.7% of the national territory; it is inhabited by 5,779,829 people that account for 5.1% of the country's population, 52% of whom are men and 58% women; 72% of the population inhabits urban areas while 28% live in the countryside. The state accounts for 3.2% of the country's Gross Domestic Product: 4.3% primary activities, 31.89% secondary activities, and 64.19% tertiary activities (INEGI, 2018).

General Felipe Ángeles is one of the 217 municipalities of the State of Puebla, Mexico, with 19,040 inhabitants. Agriculture occupies 63% of its area; forests occupy 18%, pasture 6%, scrubland 3%, and urban areas 10%. One of its five principal towns is San Antonio Portezuelo, populated by 3,515 people, representing 18.46% of the municipality's total. Seventy percent of its population is engaged in farming, and 76% are over 15 years old with incomplete primary education (INEGI, 2018); according to CONAPO (2018), it is regarded as a highly marginalized town.

The general method consisted of:

1. Outlining the study's object (general objective).
2. Defining the type of sampling (simple random sampling).
3. Establishing quantitative and qualitative variables (questionnaire).
4. Defining the measurement scale (nominal scale).
5. Carrying out the sampling:
 - 5.1. Sample size calculation.
 - 5.2. Numbering everyone.
 - 5.3. N uniform random numbers were selected {1, 2, ..., N}.
 - 5.4. The N individuals Q1, Q2, ..., Qn were selected from the population.

Of San Antonio Portezuelo's 3,515 inhabitants, 500 are *ejidatarios* (communal lands holders). We obtained a 117-people sample to conduct the surveys, the objective of which was to profile family farming in that municipality. It is worth mentioning that the sample size was statistically determined at 95% confidence and 5% error. The sample was obtained through the following equation to acknowledge the total number of units that make up the population.

$$n = \frac{NZ^2S^2}{d^2(N-1) + Z^2S^2} \quad (1)$$

Where:

n = sample size

N= total population

Z= assigned level of confidence.

S= variance of the population under study (square of the standard deviation)

d= absolute precision level

The specific method included:

Plotting the tabulated data in a two-dimensional matrix (survey number and response).

A specific number was assigned to each response alternative per question to prepare the matrix.

Once the matrix was ready, the data were plotted, and observations per question were obtained.

This research's family farming classifying parameters were Subsistence Family Farming (Peasant Economy), Family Farming in Transition, and Entrepreneurial Family Farming. The empirical data encompassed seven variables: production purpose, family participation, number of hectares (territory), infrastructure, diversification of activities, market coverage, and production cycle (Table 1).

5. Results

5.1. Demographic Data

Based on empirical data gathered during fieldwork, of the 117 communal land holders surveyed, 67% (78 people) were men, 30% (35 people) were women, and 3% (4 people) did not respond. Male communal land holders are a majority in this town.

As to age, 42.7% (53 people) were under 41 years old, 23% (27 people) were between 41 and 50 years old, 19.5% (23 people) were between 51 and 60 years old, 8.5% (10 people) fell between the ages of 61 and 70, 2.7% (3 people) were over 71 years old, and 0.9% (1 person) did not respond.

Concerning the communal land holders' educational attainment, 37% (43 people) had not completed elementary school, 33% (39 people) did complete elementary school, 9% (11 people) had not completed secondary school, 10% (12 people) did complete secondary school, 4% (5 people) held a high school diploma, and 6% (7 people) did not respond.

5.2. Classification of family farming


The results reported below are shown in Table 2.


Table 1. Categorization of Family Farming


Variable	Subsistence Family Farming (Peasant Economy)	Family Farming in Transition	Family Business Agriculture
Production destination	Self-consumption	Self-consumption: 80% Sale: 20%	Self-consumption: 20% Sale: 80%
Formation of Family Farming (Family involvement)	100% Family	80% Family 20% Employees	20% Family 80% Employees
Number of hectares	1-9	10-49	50 or more
Infrastructure	Basic tools Draft animals	Basic tools Draft animals Farm Equipment	Basic tools Draft animals Farm Equipment Industrial processes
Diversification of activities	Always	Usually Sometimes	Never
Market coverage	-	Local Regional	State National International
Productive cycle	Temporal	Water extraction pumps	Automatic irrigation system


Source: Authors' own elaboration.

Table 2. Classification variables of family farming

 Number of hectares (territory) and Productive Cycle							
# of hectares	% of ejidatarios	Use of the ground	Hectares	Harvest season	Hectares		
1 to 3	67,50	Own	275,8	Temporal	293,05		
4 to 7	23,10	Rented	40,8	Irrigation	108,5		
8 to 10	5,10	Half	83,5	Did not answer	5		
More than 10	4,30	Did not answer	6,5				

 Diversification of activities and Infrastructure							
Production	Ejidatarios	Sowing	Hectares	Sacks for hectares	Ejidatarios	Production capital	Ejidatarios
A seed	53	Corn	211,57	1 to 15	11	Basic tool	5
Two seeds	51	Thin bean	99,56	16 to 30	24	Draft animals	42
Three seeds	11	Coarse bean	22,82	31 to 45	46	Farm Equipment	18
Four seeds	2	Broccoli	16,59	45 to 60	12	Basic tool and draft animals	5
		Cabbage	22,82	More than 60	8	Basic tool and farm equipment	7
		Lettuce	26,97			All resources	20
		Others	6,22			Did not answer	1

 Destination of production and market coverage					
Annual sacks	Ejidatarios	Activity	Ejidatarios	Destination	Sacks
1 to 100	63	Sale	4	San Antonio Portezuelo	2889,7
101 to 200	14	Self-consumption	25	Customers	3562,2
201 to 300	2	Sale and self-consumption	86	Mediator	47,5
301 to 400	1	Did not answer	2	Not reported	815,1
More than 400	2				
They do not know	16				
Did not answer	19				

 Family Involvement					
Participation in the field		Earning income		Hiring	
% of the members	Families	Concept	% population	Families	External employees
0	11	Fixed salary	18	46	0
1 to 20	5	Harvest	51,1	46	1 to 3
21 to 40	15	Occasional financial support	9	18	4 to 6
41 to 60	25	Family	18	2	7 to 10
61 to 80	26	Others	0,8	2	More than 10
81 to 100	32	Did not answer	2,3	3	Did not answer
		Did not answer	3		

Source: Authors' own elaboration

Regarding the first variable, i.e., most communal land holders retain 1 to 3 hectares (ha) of land (67.5%), while 23.1% hold 4 to 7 ha, 5.1% control 8 to 10 ha, and only 4.3% hold more than 10 ha. Furthermore, it is worth mentioning that the overall number of hectares declared is 406.55; on average, the number of hectares per communal land holder is 3.5 ha.

Out of those 406.55 hectares distributed among the 117 communal land holders in the survey, 67.8% (275.8 ha) is the holder's, 10% (40.8 ha) is rented, and 20.5% (83.5 ha) partially owned. There was no response for 1.6% (6.5 ha).

Regarding the production cycle, 293.05 ha (72.1%) are rainfed, 108.5 ha (26.7%) irrigated, and 5 ha (1.2%) not identified as either because that survey question was left unanswered.

Concerning production and diversification, land allotment per crop type is 211.57 ha (52%) for corn, 99.56 ha (24.5%) for thin beans, 22.82 ha (5.6%) for thick beans, 16.59 ha (4.1%) for broccoli, 22.82 ha (5.6%) for cabbage, 26.97 ha (6.6%) for lettuce and 6.22 ha (1.5%) for other seeds, which some surveys listed as nopal. On the other hand, it is essential to stress the number of seeds that the communal land holders of San

Antonio Portezuelo sow on average: out of 117 communal lands holders surveyed, 45.3% (53 communal land holders) sow only one type of seed, 43.6% (51 communal land holders) sow two types of seeds, 9.4% (11 communal land holders) three types and 1.7% (2 communal land holders) do four types.

Concerning production, 9.4% (11 communal land holders) produce 1 to 15 sacks per ha, 20.5% (24 communal land holders) produce 16 to 30 sacks per ha, 39.3% (46 communal land holders) yield 31 to 45 sacks per ha, 10.3% (12 communal land holders) 45 to 60 sacks per ha, 6.8% (8 communal land holders) more than 60 sacks per ha. In comparison, 1.7% (2 communal land holders) do not know how many sacks they produce per ha, and 12% (14 communal land holders) did not respond. Also, the average sack production per hectare is 44.5 sacks per communal land holder.

In the same vein, 53.8% (63 communal land holders) produce between 1 and 100 yearly sacks, 12% (14 communal land holders) between 101 and 200 sacks, 1.7% (2 communal land holders) produce between 201 and 300 sacks, 0.9% (1 communal land holder) between 301 and 400 sacks, 1.7% (2 communal land holders) more than 400 sacks. In contrast, 13.7% (16 communal lands holders) did not know how many sacks they produce per year, and 16.2% (19 communal lands holders) did not respond. It should be noted that the average annual sack production is 89.2 sacks per communal land holder.

Fifty-nine percent of the town's communal land holders are engaged in other activities to earn an income: 16% (19 communal land holders) work as bricklayers, 2% (2 communal land holders) work as laborers, 6% (7 communal land holders) are merchants, 9% (11 communal land holders) are involved in livestock farming, 3% (3 communal land holders) rent out machinery they own (tractors, mowers, and the like), 14% (16 communal land holders) are employed in business establishments, 6% (7 communal land holders) are homemakers and make money out of this activity, 1% (1 communal land holder) makes money from a relative, 12% (2 communal lands holders) are engaged other activities, and 9% (11 communal land holders) did not answer the question.

The frequency with which the communal land holders engage in supplementary activities to earn some money is as follows: 41% (33 communal land holders) sometimes engage in a supplementary activity, 23% (19 communal land holders) are almost always otherwise employed, 20% (16 communal land holders) always perform a supplementary activity, and 16% (13 communal land holders) did not reveal how often they engage in supplementary activities.

Regarding infrastructure, 4.3%, that is five communal land holders, use only the strictly necessary tools, 36% (42 communal land holders) only use draft animals, 15% (18 communal land holders) only use agricultural machinery, 16% (19 communal land holders) work with essential tools and draft animals, 4.3% (5 communal land holders) use basic tools and agricultural machinery, 6% (7 communal land holders) work with draft animals and agricultural machinery, 17% (20 communal land holders) work with basic tools, draft animals and agricultural machinery. One communal land holder (0.9%) did not respond to the question. Industrial processes have not yet been accounted for in the municipality.

Concerning production purposes, 3% of the communal lands holders sell their produce, which is their primary business activity for earning income. On the other hand, 21% (25 communal lands holders) reserve their produce for self-consumption, wherefore they perform another activity to make an income. In addition, 74% (86 communal lands holders) allocate their production for sale and self-consumption at home. Finally, 2% (2 communal lands holders) did not answer the question.

The distribution of sack production in the municipality of San Antonio Portezuelo is as follows: 39.5% (2,889.7 sacks) is for home consumption, 48.7% (3,565.2 sacks) is for sale, 0.6% (47.5 sacks) is for an intermediary, and 11.1% (815.1 sacks) were not reported in the surveys.

Regarding market coverage of San Antonio Portezuelo yields, 38% is sold in the town, 43% is so to the municipalities of Quecholac, Acatzingo, San Juan Atenco, and El Seco, and 16% is sold to other municipalities in the

state of Puebla; no point of sale was reported for 3% of the produce. Finally, none of the produce is sold in other states of the Republic or abroad.

The families of San Antonio Portezuelo consist of 1 to 4 people at 41.9% (49 families), 5 to 8 people at 43.6% (51 families), 9 to 12 people at 6% (7 families), more than 12 people at 6.8% (8 families), and the survey reported no information in on 1.7% (2 families).

Concerning family member engagement in working in the fields is as follows: 9.4% (11 families) indicated that no member works in the fields, 4.3% (5 families) said that 1% to 20% work in the fields, 12.8% (15 families) pointed out that 21% to 40% work in the fields, 21.4% (25 families) stated that 41% to 60% work in the fields, 22.2% (26 families) claimed that 61% to 80% work in the fields, 27.4% (32 families) pointed out that 81% to 100% work in the fields, and 2.6% (3 families) did not answer the question.

On the other hand, the population of San Antonio Portezuelo working in the fields is entitled to some benefit: 18.8% receive a fixed salary, 51.1% receive a share of the harvest, 9% obtain occasional economic support, 18% have their expenses covered, and 0.8% receive another type of benefit for working in the fields. No information was recorded in the surveys on 2.3%.

The communal lands holders in the survey reported that, apart from their family, there are some outside workers in the fields, as follows: 39.3% (46 people) said that they do not hire outsiders, 39.3% (46 people) claimed to hire 1 to 3 outsiders, 15.4% (46 people) mentioned that they hire 4 to 6 outsiders, 1.7% (2 people) reported hiring 7 to 10 outsiders, 1.7% (2 people) indicated that they hire more than ten outsiders, and 2.6% (3 people) did not answer the question.

6. Discussion

The results of this study are sufficiently robust to characterize family farming since they meet most of the FAO-suggested criteria (except for the innovation criterion as to the use of improved seeds) (FAO, 2021) and CEDRSSA's (except for environmental

conditions of the land) (CEDRSSA, 2014). Moreover, this research also provides evidence on other variables such as identifying the participation of non-family personnel, market coverage (local, regional, state, national and international), and the production cycle (rainfed and/or irrigated). Due to the above, the following findings are worth highlighting:

- Production purpose: The foregoing type of agriculture is entrepreneurial family farming because 48.7% of production is intended for sale and 39.5% for self-consumption.
- Family engagement: 88% of the people working in the fields are relatives of the communal lands holders, whereas 9.4% are outsiders. Therefore, it is determined that this is in-transition family farming.
- The number of hectares: 93% of communal lands holders surveyed own 1 to 9 ha, 7% possess over 10 ha, and the average is 3.5 ha per communal lands holder. Thus, we may conclude that this is subsistence family farming.
- Infrastructure: The equipment that communal lands holders often use to work in the fields are draft animals (mules, oxen, horses, etc.) with 36%, 15% use some machinery (harvester, cutter, mower, etc.), 4.3% use basic tools (shovel, pickaxe, machete, etc.) and 17% use basic tools, draft animals and agricultural machinery. This information suggests that this is in-transition family farming.
- Diversification of activities: The communal lands holders also perform other activities to procure additional income, with "sometimes" and "almost always" at a 64% frequency. This tells us that this type of agriculture is in-transition family farming.
- Market coverage: 97% of the points of sale are in San Antonio Portezuelo and nearby towns, which establishes this as family farming in transition.
- Production cycle: 72.1% of the hectares of land that the communal lands

holders use are rainfed, whereas 26.7% are irrigated, making this subsistence family farming.

FAO recognizes the importance of family farming for eradicating poverty and hunger, thereby achieving the Sustainable Development Goals by 2030. However, despite there being a list of variables that could be used to understand how farming families operate, reliable information is lacking on the profile of these units, especially the smaller ones (FAO, 2021). The results of this study provide such information on a local level of a developing country such as Mexico. It is also an early attempt to have a stratification of family farming that allows public policies to identify the most vulnerable farmers and design policies that align with each community. In this regard, Aguilar-Jiménez *et al.* (2019) point out that it is necessary to modify public policies to increase the adaptability of farms and reduce the vulnerability of livestock farming families. Concerning reliable information, gathering it is only possible through having the research teamwork and interact with the community for several years.

In the opinion of the researchers, there are few studies in the high-impact literature on the characterization of family farming in Mexico. In the case of Chile, Avilez *et al.* (2018) conducted a cluster characterization which, unlike our research, only considers farm size, management, and profitability, as well as the farmers' age and personal situation. These authors recognize the need to diversify family income sources through handicrafts and tourism activities. In this regard, our study considers diversification as something present in subsistence and transitional farmer families, which leads us to propose their being recognized as small businesses operating under a family structure. This recognition as small rural family businesses affords the essential elements to plan business intervention programs that help turn their potential into actual results.

Even though family farming is one of the main areas targeted by the 2030 development goals, the United Nations (UN) proposes that Mexico's priorities of the 2030 Agenda be framed in four main areas: People, Prosperity, Planet, and Peace, because the country's

economy has been contracting since 2019 and recorded a Gross Domestic Product that shrank by 8.5 in 2020, with secondary and tertiary activities being the most affected (NUM, 2021). Therefore, government efforts are expected to try and strengthen the most affected sectors, leaving the primary sector on the waiting list for prioritization as a poverty and inequality reducer in the country. Nevertheless, it should not be forgotten that Mexican family farming promotes self-employment and preserves family traditions in rural communities (González-Félix *et al.*, 2021).

Some limitations of this work are that research in thesis, reports, or disclosed and disseminated in journals not considered high impacting could have been left out. Moreover, we will need to continue to validate the characterization instrument in different communities.

7. Conclusions

This research is the earliest effort to recognize and characterize family farming, small family farming especially, to be able to assess its potential and limitations for development as a small rural family business. The study carried out in San Antonio Portezuelo shows that, out of seven variables, two tend to be subsistence family farming, four behave as family farming in transition, and one has entrepreneurial family farming characteristics. Hence, the evidence suggests that there is a type of family farming in transition, characterized as follows: rainfed and irrigated production, intended for sale in the town and surrounding areas; its technology consists of basic agricultural tools and machinery and draft animals; its members occasionally engage in other activities to supplement the family income.

Categorizing family farming help discern its strengths and weaknesses as a family business for planning targeted business intervention programs on all levels of government. For instance, the market requires that entrepreneurial family farming be incorporated into modern supply chains and compete in quality and volume. Family farming in transition requires access to different sources of financing to invest in

technology and improvements in cropping techniques, as well as training to manage a strategy for diversifying its economic activities. In the case of subsistence family farming, if feasible, low economic impact ventures are undertaken.

Should these last two cases (transition and subsistence) be recognized as rural family businesses and empowered by having their potential recognized, continued training and business interventions based on the professionalization of the father of the family and future successors, the foundations could be laid for them to generate their own opportunities for economic growth and to improve their family's quality of life, as well as inclusive financial and sustainable development for the community. Per the above, they might create income and paid jobs for their family and the community, facilitate bartering among town inhabitants with less financial resources and implement actions that mitigate their environmental impact, such as recycling packaging, composting food waste, and refraining from burning garbage.

Finally, interdisciplinary links and work are necessary to conduct more robust studies that provide more accurate answers to the needs and problems faced by this economic entity.

8. Conflict of interest

The authors declare no conflict of interest.

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