

Rural poverty, network ties and institutional forces: an analysis of empirical evidence in Aguascalientes, Mexico

Pobreza rural, laços de rede e forças institucionais: uma análise de evidências empíricas em Aguascalientes, México

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Abstract: The research objectives are: 1) to determine the effects that knowledge, educational and socio-cultural capabilities have on poverty reduction; 2) to determine the effects that collaborative networks have on knowledge, educational and socio-cultural capacities; and 3) to determine the effects of legal protection and government support on collaborative networks. The capability approach was taken as a theoretical basis to develop the study variables. We conducted an empirical study, using a sample of 95 farmers located in the state of Aguascalientes, Mexico. Important implications were obtained on the necessity to have network ties to impact capabilities that reduce rural poverty. One of the most important findings was not finding empirical evidence on the relationship between educational capabilities and the reduction of rural poverty. For this reason, this situation must be reviewed in-depth by the educational policy of the region. Farmers who reported having better socio-cultural capacities had the greatest effects in reducing poverty within their rural communities. Similarly, collaborative networks favor knowledge capacities because important information is shared through social and economic actors.

Keywords: institutional forces, networks ties, rural poverty, structural equation modelling.

Resumo: Os objetivos da pesquisa são: 1) determinar os efeitos que o conhecimento, as capacidades educacionais e socioculturais têm na redução da pobreza; 2) determinar os efeitos que as redes colaborativas têm no conhecimento, nas capacidades educacionais e socioculturais; e 3) determinar os efeitos da proteção legal e do apoio governamental nas redes colaborativas. A abordagem de capacidade foi tomada como base teórica para desenvolver as variáveis do estudo. Conduzimos um estudo empírico, usando uma amostra de 95 agricultores localizados no estado de Aguascalientes, México. Implicações importantes foram obtidas sobre a necessidade de ter laços de rede para impactar capacidades que reduzam a pobreza rural. Uma das descobertas mais importantes foi não encontrar evidências empíricas sobre a relação entre capacidades educacionais e a redução da pobreza rural. Por esse motivo, essa situação deve ser revisada em profundidade pela política educacional da região. Os agricultores que relataram ter melhores capacidades socioculturais tiveram os maiores efeitos na redução da pobreza em suas comunidades rurais. Da mesma forma, as redes colaborativas favorecem as capacidades de conhecimento porque informações importantes são compartilhadas por meio de atores sociais e econômicos.

Palavras-chave: forças institucionais, laços de redes, pobreza rural, modelagem de equações estruturais.

Introduction

Poverty is considered a multidimensional concept that refers to the absence or deprivation of human dignity, lack of opportunities in terms of food, education, health and income (Alkire, 2003; Alkire & Foster, 2011). According to Tackie et al. (2020), the population living in poverty tends to have limited access to better living conditions due to the lack of meeting basic and



aspirational needs. The term of poverty originates in the interpretation of the current condition that a person lives with other members of society (Osei & Zhuang, 2020). In empirical terms, the analysis carried out by the World Bank to measure world poverty classifies poor people as those individuals who live on less than USD \$ 5.50 a day and USD \$ 1.90 for the population living in extreme poverty (Ferreira & Sánchez-Páramo, 2017). It is evident that studies on poverty have increased in recent years (Rodríguez-Pose & Hardy, 2015). However, there are few studies that assess the capacities of individuals in vulnerable conditions to reduce their poverty. One first aspect to consider for this study is the fundamental role that knowledge capacities have on poverty reduction. Knowledge is reflected in better jobs, education, and health opportunities (Gale & Molla, 2015). Knowledge capacities are a capital that reduces the possibilities of discrimination and political or civil repression in vulnerable individuals (Molla & Gale, 2015). Although there are studies on how knowledge serves to promote greater opportunities for people living in poverty, there has been little discussion regarding this topic. As well, there is no clear position on the effects of knowledge capacities on poverty reduction.

Education is also a fundamental component to achieve social well-being (Banerjee & Duflo, 2011; Banerjee et al., 2007). Educational capacities in turn trigger other capacities associated (e.g., capacities to make personal or work decisions) with human development that guarantee individuals access to better living conditions (Cin et al., 2020). When you have the appropriate educational mechanisms, the empowerment of individuals from an aspirational and vocational nature is favored (Trani et al., 2016). The purpose of this article to include educational capacity is to contribute to the discussion on the contribution of the classical literature regarding how education serves to promote human well-being (Peppin Vaughan, 2016).

Another important element to reduce vulnerable conditions of poverty is socio-cultural capacity. For Robeyns (2005), socio-cultural capacities are the reflection of the beliefs, values, attitudes, and notions that an individual has to make decisions which are of concern. Human interactions provide tangible and intangible resources essential to carry out an economic activity that favors the living conditions (Naminse & Zhuang, 2018). When ideas, resources, and knowledge are shared, the democratic environment is favored and community processes become transparent (Naminse et al., 2019). In this sense, this article contributes to the theoretical and empirical discussion of how socio-cultural capacities have effects on poverty reduction.

The article incorporates an essential element which the literature has discussed as a precursor of capabilities. We include the collaborative networks that individuals have as fundamental to benefit from knowledge, educational, and socio-cultural capacities. We believe that collaborative networks are essential for farmers to exchange knowledge (Pratiwi & Suzuki, 2017), as well as to generate new cognitive learning processes for their adaptation to new scenarios (Saint Ville et al., 2016). Furthermore collaborative networks provide social cooperation which support inclusion and empowerment (Méndez-Lemus & Vieyra, 2017).

We integrate institutional forces as essential components to generate more collaboration among farmers. Institutional forces are social pressures that an individual faces to make important decisions in their personal, social, and economic life (Besharov & Brickson, 2016). They also provide legitimacy and certainty to the social environment and, mainly, the way in which the actors of a society relate with each other (Davidsson et al., 2006). On the one hand, legal protection is an institutional force that favors the protection of common interests and generates trust in the interrelationships that exist with others. Legal protection reduces the risk of establishing social and economic relationships by the principle of sovereignty (Banerjee & Duflo, 2011). Similarly, government support, as an institutional force, promotes successful collaboration so that vulnerable groups are included in public support and financing programs

(Alatas et al., 2010). Government support is a way to diversify the management of public resources so that they are implemented in capacity development (Zhang & Venkatesh, 2017). Both legal protection and government support are prevailing forces to build better collaborative networks, and for that reason, they were considered in the theoretical model.

As mentioned above, the complex proposed model is to answer the questions present in the scientific literature of rural poverty in developing countries. The first question we ask ourselves is: Can knowledge, educational, and socio-cultural capacities have positive and significant effects on rural poverty reduction? In this sense, the second question we asked ourselves was: Can the collaborative networks that Mexican farmers have favor the development of better knowledge, educational, and socio-cultural capacities? Given this, the third question to answer would be: Can institutional forces positively and significantly influence the collaborative networks established by Mexican farmers? Following this order of questions, the research objectives are: 1) to determine the effects that knowledge, educational, and socio-cultural capacities have on poverty reduction; 2) to determine the effects that collaborative networks have on knowledge, educational, and socio-cultural capacities; and 3) to determine the effects of legal protection and government support on collaborative networks.

To achieve these objectives, we conducted an empirical study, using a sample of 95 farmers located in the state of Aguascalientes, Mexico. Important implications were obtained regarding the capabilities that reduce rural poverty. One of the most vital findings was not finding empirical evidence on the relationship between educational capabilities and the reduction of rural poverty due to the result of the migration present in the context. Farmers who reported having better socio-cultural capacities had the greatest effects on reducing poverty within their rural communities. Similarly, the collaborative networks established encourage knowledge capacities because important information is shared through social and economic actors. The contribution to the literature is consistent with several authors (Gale & Molla, 2015; Naminse & Zhuang, 2018), however, the results obtained offer empirical evidence which can be discussed more in-depth in subsequent analysis.

The structure of the article is as follows: first, the literature review of the variables considered in the study and the hypotheses of the proposed model are presented. Second, the research methodology is explained. The sample and the statistical tools used are presented. Third, the results obtained are stated and the differences with the theoretical evidence consulted are discussed. Finally, the conclusions are given along with the limitations and possible future research.

Theoretical Foundation

The capability approach (CA) has a multidimensional character that defines poverty as a lack of resources necessary to allow individuals in a community to participate in activities that contribute to the formation of their capacities (Robeyns, 2017; Sen, 2008). The contributions of Nussbaum (2013) to the theoretical perspective reflect the complexity of the conditions of the ways of living of each individual. The notion of CA is to promote functions that have value for society (well fed, moving freely, sheltered, etc.). The essential characteristic of CA is the role of agency, what people are empowered to do and to be (Robeyns, 2005) in a state of self-determination for political, economic, and social transformation (Sanz et al., 2017).

The deprivation of functions represents the poverty to which an individual may be subjected due to the lack of capacities that lead them to have more freedom (Alkire, 2008). The CA offers the possibility of analyzing multiple scopes of poverty with valuable freedoms that are determined

from conflicting value statements (Alkire & Foster, 2011). The literature has considered the measurement of rural poverty from the CA by adjusting to the skills necessary to increase the quality of life of individuals who carry out their economic activity in rural areas (Ataguba et al., 2013; Naminse & Zhuang, 2018). In the case of this research, three capabilities of farmers are evaluated from the CA approach to reduce poverty presented by farmers: knowledge, socio-cultural, and educational.

Capabilities

Knowledge capabilities

Knowledge capacities contribute to improving development opportunities based on access to information through the media (Trani et al., 2016). In the same way, they contribute to the educational formation of individuals to have intervention within a society (Molla & Gale, 2015). This is reflected in a larger civic participation that increases their levels of health, recognition, and rewards (Gale & Molla, 2015). Knowledge has intrinsic value to expand one's life options towards aspirational levels (Hannon et al., 2017). Knowledge is a cultural capital of social groups, which generates superior inclusion since different points of view are shared, and it also reduces discrimination or repression, based on gender, ethnicity, religion, or political perspective (Gale & Molla, 2015).

In the case of Urquhart et al. (2008), knowledge and social capital facilitate the intervention of information technologies to reduce poverty. According to Zhizhang & Zili (2014), the infrastructure and adequate distribution of knowledge in society helps reduce poverty from the dissemination of relevant information from society. In this vein, the acquisition of knowledge is built through the appropriate actors in a society that serve as channels to transfer information (Tackie et al., 2020). The main contribution of the work of Godinot & Walker (2020) shows that people who acquire skills related to knowledge tend to share what they learn with others. In this order of ideas, the following hypothesis is proposed:

H_{1a} : The knowledge capabilities have a significant influence on rural poverty of the producers of Aguascalientes.

Educational capabilities

Education constitutes a component of development that favors the freedom of individuals (Gale & Molla, 2015) and is crucial to achieve social well-being (Molla & Gale, 2015). Education is a transformative process that helps the individual to make better individual and social decisions (Partir & Escuela, 2018). The freedom to be educated represents a condition that triggers other capacities, causing an individual to prosper in their own understanding and protection of their rights (Cin et al., 2020). Trani et al. (2016) show the importance of education as a significant factor to lower poverty and inequality by creating greater employment opportunities.

For Cin et al. (2020), education promotes democratization and plurality in society by enabling individuals to make better vocational decisions. As well, it, encourages creativity and solidarity (Fombad, 2018). A system composed of effective education mechanisms reverses poverty from the empowerment of ideas with a social objective (Zhizhang & Zili, 2014). Rural areas in the world often have the same problems, such as little infrastructure, and absenteeism and underdeveloped policies to advance education (Dotter & Klasen, 2020). Education in rural Mexico has deficiencies in basic services, for example difficult access roads or little teaching capacity

(Partir & Escuela, 2018). Leading efforts to improve rural education in Mexico would help reduce rural poverty conditions for farmers. Based on the above, the following hypothesis is proposed:

H_{1b}: The educational capabilities have a significant influence on rural poverty perception of the producers of Aguascalientes.

Socio-cultural capabilities

This component represents the beliefs, values, attitudes, and notions that a society configures over time (Robeyns, 2005). Socio-cultural capacities give certainty to human interactions, since they are expressed between the different actors providing resources, information, and support to equalize their living conditions (e.g., families, communities, governments, etc.) (Naminse & Zhuang, 2018). They are embedded in individuals in different areas, defining the decision-making process to achieve economic and civil objectives (Sen, 2008). In the rural context, professional choice is largely driven by the different values and cultures of rural activities (Sargani et al., 2018).

The literature has considered that the democratic environment, management transparency, and openness to share ideas are aspects that improve well-being, freedom, and decision-making processes within a rural community (Naminse et al., 2019). Naminse & Zhuang (2018) found that socio-emotional competencies contribute to the formation of growth and entrepreneurial attitudes to reduce rural poverty. Likewise, for Heckman & Corbin (2016), socio-cultural skills serve as a pivot to understand the scope of well-being present in the community, since individuals manifest shared experiences. For this reason, the following hypothesis is proposed:

H_{1c}: The socio-cultural capabilities have a significant influence on rural poverty perception of the producers in Aguascalientes.

Network ties

In terms of the theory of social capital (Nahapiet & Ghoshal, 2009), networks are useful for providing information and resources. Collaborative networks are valuable, although their value lies in the set of actors that are established in a context (Luu & Ngo, 2019). In the case of rural areas, commercial networks generate important information and resources (Shane & Cable, 2002). Above all, for those farmers who seek to develop their commercial skills, contact with commercial actors offers them openness and understanding of the market, as well as new supplies and input (Jiang et al., 2018). In the same manner, institutional networks help individuals to overcome contextual barriers, by helping them to distinguish new ways of interacting, either in economic or social growth opportunities (Henke & Vanni, 2017).

In the study of Pratiwi & Suzuki (2017), significant effects of the networks of coffee farmers were found in the acquisition of knowledge. Similarly, for Saint Ville et al. (2016) relationships are crucial to build the capacity for adaptation of farmers because the relationships facilitate the exchange of knowledge beyond the available legal information. Networks are instruments that represent bridges towards learning new cognitive processes. Therefore, we consider that collaborative networks are triggers for knowledge capacities. Also, the literature has indicated that the role of the farmers' social capital helps to build tools that facilitate community resilience for education (Sadri et al., 2018). For authors such as Ganguly et al. (2019), the relationship of social capital is significantly supported by social interactions and the values and ideas that are shared among rural actors with education.

The relationship between network ties and socio-cultural capabilities has been studied ambivalently in the literature. Theoretical evidence has been found regarding how socio-cultural

determinants affect collaborative networks. For example, Li et al. (2005) show that when an individual is in a disadvantaged position, the individual is more likely to build weak links with others. Other studies have begun to measure the influence of collaborative networks on socio-cultural capacities with both positive and negative effects. Fonte & Cucco (2017) point out that the presence of social cooperation is reflected in the provision of greater social experimentation to solve paradigms of agriculture and offer alternative solutions. Méndez-Lemus & Vieyra (2017) conclude that collaborative networks favor inclusion, empowerment, and greater social recognition towards individuals. For Zhang & Venkatesh (2017), collaborative networks are a contingent factor for political and economic inclusion of agents of change. However, in a negative way, in the work of Claridge (2018), the distrust that exists in relationships negatively affects the socio-cultural context, creating nepotism, corruption, or invisibility of certain social groups. Since the literature on the relationship between network ties and socio-cultural capabilities has not been conclusive, we propose the following hypotheses:

H_{2a}: The network ties have a significant influence on the knowledge capabilities of the producers of Aguascalientes.

H_{2b}: The network ties have a significant influence on the educational capabilities of the producers of Aguascalientes.

H_{2c}: The network ties have a significant influence on the socio-cultural capabilities of the producers of Aguascalientes.

Institutional forces

The study of institutions begins as a sociological treatise on the social constructions that shape the behavior of individuals in a society (Tang, 2010). Institutions are the representation of the social pressures that an individual faces as a reflection of the cultural value system that establishes the rules of the social game (Besharov & Brickson, 2016). A key point in the literature on entrepreneurship and the creation of opportunities for individuals is based on the concept of institutional forces (Hansen et al., 2015). These are forces that directly impact the decisions of individuals, and thus generate legitimacy, certainty, and formal structure of behavior before society as normalized (Davidsson et al., 2006). According to Cai et al. (2010), legal protection functions as an institutional force which reduces uncertainty, and builds legal reputation and trust in the market. Similarly, government support represents a force that contributes to the guidance and motivation of individuals to develop their social and economic activities.

On the one hand, the protection offered by law is relevant for building successful collaborative networks between individuals (Slade Shantz et al., 2018). Banerjee & Duflo (2011) conclude that the best ways to promote collaboration are through the generation of institutions that protect individuals living in poverty from risk, such as coverage programs and diversified portfolios. Rosenman (2019) suggests that the legal framework focused on reducing poverty can be supported through the financial networks that individuals use. On the other hand, the social, economic, and physical infrastructure provided by the government from its role as manager helps the implementation of programs which improves collaboration between social actors. Alatas et al. (2010) analyzed how the association with the government in Indonesian communities allows a greater well-being for the members. Goodhand (2003) discusses the role of legal protection as a monitor and evaluator of agents to reduce vulnerability and prevent the lack of coverage in people with limited resources. Zhang & Venkatesh (2017) contribute to this discussion because they provide an explanation of the effects that government mechanisms

have for the development of collaborative networks for vulnerable groups such as women from rural communities. Taking the above as valid arguments, the following hypotheses are raised:

H_{3a} : The legal protection has a significant influence on network ties of the producers of Aguascalientes.

H_{3b} : The governmental support has a significant influence on network ties of the producers of Aguascalientes.

Methodology

The quantitative methodology was based on an empirical investigation of an explanatory type with a causal, non-experimental, and cross-sectional design through the statistical technique of modeling structural equations by partial least squares (PLS-SEM). The statistical software Smart PLS 3.2.7 (Ringle et al., 2015) was used, first considering the estimation of the measurement model and then evaluating the structural model as a hierarchical component model (Lohmöller, 1989). The model was measured using the indicator repetition approach (Ketchen Junior, 2013; Wetzels et al., 2009) which represented an action necessary to be able to execute higher-order measurement models with PLS-SEM, through the Smart PLS statistical software (Cuevas-Vargas et al., 2019; Ketchen Junior, 2013). The conceptual theoretical model is shown in Figure 1. This model establishes the relationships between the study variables, and these relationships were conceptually explained in the previous section.

The technique of structural equations through partial least squares was implemented because it provides a different vision of measuring rural poverty than what conventionally exists to measure poverty. This technique is characterized by evaluating perceptions of a study subject. The perception is tested to see if it is statistically coincident with all the cases surveyed, taking into consideration the main value to know the reliability and validity of the variables analyzed. Likewise, the groups of indicators are evaluated to evaluate a perception. If there is a group of indicators that measure legal protection, there will be no statistical problems with considering that they also measure government support. In this way, the perceptions are validated statistically, to evaluate the relationship between the study variables. Figure 1 represents the theoretical conceptual model with the hypotheses.

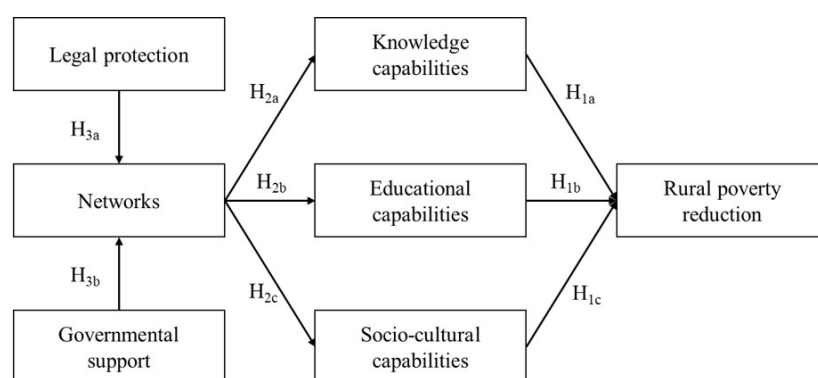


Figure 1. Theoretical conceptual model.

Sample design and data collection

The vine producers of the State of Aguascalientes were analyzed. The State Committee for the Vine Product of Aguascalientes was contacted to request support in locating the farmers

who produced different types of grapes in the region during the year 2020. The information collection period was from January to December 2021. The municipalities with the largest cultivated area are Aguascalientes and Cosío with crops of table grapes (67.8%), grapes for wine (26.1%) and grapes to transform into other derivatives (6.1%).

Variables

The present study used reflective type variables. The main characteristic of this type of model is that direction and influence flow from the construct to the indicator. Manifest indicators or variables are a reflection or expression of the construct, which is not observed except in a relationship (Bollen & Lennox, 1991; Jarvis et al., 2003). Reflective type variables are characterized by high correlations between all indicators (co-variation), which are interchangeable. For this reason, adding a new indicator does not alter the content of the construct (Jarvis et al., 2003; Wetzels et al., 2009).

For the measurement of rural poverty (RP), socio-cultural capabilities (SCC), educational capabilities (EC) and knowledge capabilities (KC), the scale developed by Naminse & Zhuang (2018) was used, which is an adaptation of scales from Aryee et al. (2002), Diener et al. (1985), Granovetter (2002), Nussbaum (2013) and Sen (1979). For the RP variable, four indicators were considered that assess medical facilities, higher incomes, and recreational activities in their communities. The SCC variable measured the openness and transparency of public affairs, more democratic processes, and willingness to collaborate in the community. For the EC variable, children's attendance at school, better conditions and quality of education were evaluated. We consider, due to the nature of the EC construct, the assessment of the quality of children's education was included in EC. When creating the measurement model for this construct, the factor loading of the indicator was satisfactory (Table 1). Regarding the variable KC, the information available on agrifood markets, access to technology, management knowledge, and available training were measured. In the case of KC, we considered that knowledge sharing skills needed to be assessed separately from EC to explore farmers' KC and the link with rural poverty. Therefore, the measurement model was carried out without discriminant validity problems between the KC and EC constructs (see Table 1). The constructs are reflective with the indicators on a 5-point Likert scale.

The scales used to measure legal protection and governmental support have a five-point Likert scale based on the Cai et al. (2010) instrument to measure institutional forces. In the case of legal protection, the indicators evaluate the existing perception in the environment of legal protection, prevention of being scammed, assurance of payments by third parties, and protection of investments. Governmental support values the support offered by the government through policies or special projects to benefit the economic activity with financing or resources, as well as the role of the government in providing valuable information to carry out the activity.

Networks are measured by the Yiu et al. (2007) scale which was adapted in nine items separated in two dimensions as a higher order component: firm networks and institutional networks. Firm networks assess how close the farmer is to other growers, customers, and suppliers. Institutional networks assess how close the farmer is to government institutions, researchers, financial institutions, business associations, business owners from other industries, and legislative commissions.

Reliability and validity

The results showed high internal consistency in the measurement model (see Table 1). Convergent and discriminant validity were approved. Composite reliability was above of the

value of 0.708 (Hair et al., 2017), Cronbach's Alpha exceeds 0.7 (Cronbach, 1951), and average variance extracted upper to 0.5 (Fornell & Larcker, 1981; Hair et al., 2012). Each factor loading was higher than 0.708 and statistically significant ($p < 0.001$) (Hair et al., 2017).

Table 1. Reflective Measurement Model Assessment

Lower Order Construct	Indicator	Descriptive Statistics		Convergent Validity			Internal Consistency Reliability	
		Mean	SD	Loadings	t-value	AVE	Composite Reliability	Cronbach's Alpha
				>.708	>2.57	>.5		
Rural poverty	RP1	2.96	1.00	.799	10.696	.659	.885	.828
	RP2	2.76	1.02	.860	17.594			
	RP3	2.71	0.92	.830	13.075			
	RP4	2.72	0.85	.755	11.280			
Socio-cultural capabilities	SCC1	2.83	0.85	.879	22.383	.727	.888	.812
	SCC2	2.90	0.84	.881	29.448			
	SCC3	3.01	0.85	.795	16.720			
Educational capabilities	EC1	3.87	0.98	.787	8.084	.653	.849	.747
	EC2	3.95	0.89	.794	5.328			
	EC3	3.65	0.93	.843	6.773			
Knowledge capabilities	KC1	3.56	0.97	.769	13.376	.646	.879	.819
	KC2	3.77	0.89	.805	14.080			
	KC3	3.38	0.91	.772	9.587			
	KC4	3.68	0.90	.866	26.974			
Governmental support	GS1	3.47	1.02	.875	7.060	.705	.905	.865
	GS2	3.36	1.08	.778	5.105			
	GS3	2.96	1.14	.844	5.384			
	GS4	3.12	1.18	.859	5.457			
¹ Legal protection	LP1	2.65	0.96	.761	4.237	.767	.907	.857
	LP2	2.52	1.01	.968	6.120			
	LP3	2.58	1.02	.886	5.692			
Firm networks	FN1	2.87	1.23	.885	30.691	.779	.913	.856
	FN2	2.97	1.21	.943	68.045			
	FN3	2.74	1.24	.814	16.875			
Institutional networks	IN1	2.75	1.20	.855	25.887	.761	.950	.937
	IN2	2.45	1.21	.912	33.783			
	IN3	2.48	1.26	.782	12.859			
	IN4	2.42	1.22	.888	27.490			
	IN5	2.42	1.21	.887	31.178			
	IN6	2.13	1.15	.905	33.147			
Higher Order Construct	Construct		Path Coefficient	t-value	AVE	Composite Reliability	Cronbach's Alpha	
Networks	Firm networks		.875	27.696	.679	.950	.940	
	Institutional networks		.974	187.279				

¹ LP4 was not considered in the measurement model for adjustment issues. Source: Own contribution from results obtained with Smart PLS 3 (Ringle et al., 2015).

The discriminant validity of the constructs was evaluated through two tests (see Table 2). On the one hand, the heterotrait-monotrait ratio tested the variability of the estimated parameters with the bootstrapping procedure. Values were lower than 0.85 as recommended by Clark & Watson (1995), Kline (2011), and Henseler et al. (2014). On the other hand, the Fornell-Larcker criterion test was determined by the square root of the AVE of each construct (values represent the diagonal), and these results are greater than their corresponding correlation with any lower order construct, as suggested by (Fornell & Larcker, 1981).

Table 2. Discriminant Validity for the Lower Order Constructs

Lower Order Constructs	LOC1	LOC2	LOC3	LOC4	LOC5	LOC6	LOC7	LOC8
Rural poverty (LOC1)	.812	.813	.470	.686	.275	.470	.571	.598
Socio-cultural capabilities (LOC2)	.692	.853	.367	.613	.204	.427	.454	.493
Educational capabilities (LOC3)	.390	.302	.808	.574	.343	.210	.248	.351
Knowledge capabilities (LOC4)	.584	.501	.490	.804	.174	.425	.480	.603
Governmental support (LOC5)	.254	.187	.276	.146	.840	.052	.111	.290
Legal protection (LOC6)	.295	.362	.147	.368	-.015	.876	.152	.251
Firm networks (LOC7)	.489	.379	.224	.413	.085	.133	.883	.828
Institutional networks (LOC8)	.536	.436	.311	.535	.275	.248	.742	.872

NOTE: The diagonal numbers (in bold) represent the square root of the AVE values. Above the diagonal the HTMT_{.85} correlations ratio Test is presented; below the diagonal, the Fornell-Larcker criterion test is presented. Source: Own contribution from results obtained with Smart PLS 3 (Ringle et al., 2015).

Therefore, based on these previously evaluated criteria, it can be concluded that the different measurements performed in this study demonstrate enough evidence of reliability and convergent and discriminant validity of the measurement model.

Results and Discussion

First, the descriptive statistics of the manifest variables of the theoretical model were estimated, which are shown in Table 1, with the purpose of identifying the variables that had the greatest and least relevance for the grapevine producers of the state of Aguascalientes. In this sense, it has been found that the producers perceive that the reduction of rural poverty has been low. The arithmetic mean of the four manifest variables with which it was measured is between 2.71 and 2.96. This means that, in the first instance, farmers' perceptions of medical conditions and income were negative, as well as business opportunities that they believe have not increased. There are also no activities to distract oneself that help the integral development of the individual.

With reference to socio-cultural capacities, the average scores obtained by these variables are between 2.83 and 3.01. This means that producers perceive that issues of interest to the community cannot be discussed without some retaliation. Likewise, producers consider that the members of their communities do not collaborate to improve the conditions in which they live.

Regarding the educational capacities, it can be observed that it was the best evaluated variable, which indicates that the educational conditions of the children are better than before (3.95). There are more children who attend school (3.87), and for longer time (3.65). Broadly speaking, this suggests that educational conditions in rural communities have improved in recent years.

Regarding knowledge capacities, it was found that the farmers currently have greater access to technology (3.77). They also have more opportunities to receive training (3.68), they have more information about agri-food markets (3.56), and they have more knowledge of administration (3.38). It was observed that farmers consider that the information is more accessible, which is necessary for the development of their agricultural activity. The perception of access to technology was considered low (barely three Likert points), which can be considered that the farmers surveyed are limited in the use of ICTs.

Concerning legal protection, the average ratings of the variables are between 2.52 and 2.58, which indicates that it is necessary for the legal system to ensure the protection of the farmers' interests, prevent them in the event of being scammed and have the security of that customers pay. The results provide evidence of the lack of laws that predominate the rural region. These conditions restrict the scope of collaborative networks.

In relation to government support, the government has implemented policies and special projects that benefit their activity (3.47) in the last three years. The farmers have been provided with the necessary information for their activity (3.36), and to a lesser extent the government support has helped them obtain resources (3.12), and no financial support has been provided for their activity (2.96). It is important to highlight from these results that producers consider that government activity is close at hand to the agricultural sector, contrary to the lack of application of the law that seems to only favor a group of interested parties.

In the case of business networks, these have not been consolidated with the ratings from 2.74 to 2.97. The results of the institutional work networks have a range between 2.13 and 2.75. This indicates that the relationship of the producers with government offices or institutions, universities, banks or financial institutions, associations or guilds, and legislative commissions is very distant. The link with universities and producers is the most distant of the relationships evaluated, which suggests that research provides little support for the agricultural sector.

When evaluating the structural model, through bootstrapping with 10,000 subsamples, as suggested by Streukens & Leroi-Werelds (2016), the results showed that the structural model has predictive and explanatory relevance. Therefore, there is sufficient evidence to obtain confidence intervals that allow evaluating the accuracy of the parameters (see Table 3) and testing the hypotheses. In the case of the rural poverty variable, 56.1% is explained by the variables socio-cultural capabilities, educational capabilities, and knowledge capabilities. Likewise, knowledge capabilities are justified with 27.8% for networks. The endogenous socio-cultural capabilities variable is explained with 19.8% for networks. Educational capabilities obtained the lowest level of explanation for networks (9.1%). Therefore, the model has explanatory capacity as it has been shown to have R² values greater than 0.20 (Chin, 1998; Hair et al., 2017). In the case of educational capabilities, a value close to 0.10 (Falk & Miller, 1992) was found.

Table 3. PLS-SEM Results of the Structural Model

Hypotheses	Path	Standardized Coefficient β	t-value	p-value	Decision
H1a	Knowledge capabilities → Rural poverty	.272***	3.306	0.001	Supported
H1b	Educational capabilities → Rural poverty	.098 NS	1.208	0.227	Not Supported
H1c	Socio-cultural capabilities → Rural poverty	.526***	6.308	0.000	Supported
H2a	Networks → Knowledge capabilities	.528***	7.311	0.000	Supported
H2b	Networks → Educational capabilities	.302***	2.867	0.004	Supported
H2c	Networks → Socio-cultural capabilities	.445***	5.458	0.000	Supported
H3a	Legal protection → Networks	.228*	1.899	0.058	Supported
H3b	Governmental support → Networks	.231**	2.221	0.026	Supported

Significance: *** = $p < 0.01$; ** = $p < 0.05$; * = $p < 0.1$; NS = Non-significant. Rural poverty $R^2 = .561$; Knowledge capabilities $R^2 = .278$; Socio-cultural capabilities $R^2 = .198$; Educational capabilities $R^2 = .091$; Networks $R^2 = .104$. R^2 values: >0.20 = Weak; >0.33 Moderate; >0.67 = Substantial (Chin, 1998). Source: Own contribution from results obtained with Smart PLS 3 (Ringle et al., 2015).

Regarding the verification of the research hypotheses. First, in relation to H1a, the results indicate that knowledge capabilities have positive and significant effects on rural poverty, with an impact of 27.2% ($\beta = 0.272$, $p < 0.01$). Therefore, the hypothesis of existing influence was not rejected. Considering H1b, it was found that educational capabilities have a small positive effect on

rural poverty. However, this effect is not statistically significant, with an impact of 9.8% ($\beta = 0.098$, NS). Hence, H1b was rejected. Regarding H1c, the empirical evidence indicates that socio-cultural capabilities have positive and highly significant effects on rural poverty, with an impact of 52.6% ($\beta = 0.526$, $p < 0.01$); therefore, H1c was not rejected.

Concerning the causal relationships that networks have with capabilities, the results indicate that the influence of networks on knowledge capabilities was positive and highly significant with an impact of 52.8% ($\beta = 0.528$, $p < 0.001$); therefore, H2a was not rejected. In the same way, the results indicate that networks positively and significantly affect educational capabilities with an impact of 30.2% ($\beta = 0.302$, $p < 0.01$); thus, H2b was not rejected. Regarding H2c, the empirical evidence shows that networks have positive and highly significant effects on socio-cultural capabilities in 44.5% ($\beta = 0.445$, $p < 0.001$); therefore, H2c was not rejected.

Finally, the verification of H3a indicates that there are positive and significant effects of legal protection of networks, with an impact of 22.8% ($\beta = 0.228$, $p < 0.1$); therefore, H3a was not rejected. In the case of H3b, positive and significant effects of governmental support on networks were obtained, with an impact of 23.1% ($\beta = 0.231$, $p < 0.05$); therefore, H3b was not rejected.

The results showed that knowledge and socio-cultural capacities directly affect measures of rural poverty reduction. The CA literature agrees that attention should be paid to the functions that increase human well-being and the quality of life of individuals. The results obtained gave empirical evidence on the causal relationship between knowledge and poverty reduction. Knowledge capabilities improve recognition, health, and reward opportunities, thanks to access to information as a cultural capital of the social group (Gale & Molla, 2015). There was no influence of the education component and the reduction of rural poverty in the community. This allows us to make a relevant contribution on how to develop education policies and their real impact on rural communities. It was found that the most educated individuals in rural communities migrate to locations that offer greater job opportunities. The efforts made in rural education are not reflected in the communities, as had been pointed out by Sobrino (2014) in his study on the possibilities that rural migration brings. It was also observed that socio-cultural capacities have effects on the reduction of rural poverty. The component reveals the beliefs, values, attitudes, and notions that communities have to inform and support each other to make better group decisions (Naminse & Zhuang, 2018). One of the most important findings is that of the three capacities evaluated, socio-cultural capacities have the greatest influence on poverty reduction. This is an important aspect to consider when generating rural development policies, as has been pointed out by Banerjee & Duflo (2011).

Another of the results obtained is the effects that collaborative networks have on knowledge, educational and socio-cultural capacities. There were positive effects of commercial and institutional networks on the capacity of knowledge and education. The literature indicates that when farmers associate with others commercially or institutionally, they share ideas and information that is valuable to the communities (Pratiwi & Suzuki, 2017). Similarly, individuals use collaborative networks as social capital to generate new cognitive learning processes (Saint Ville et al., 2016). A relevant contribution of this study was to provide more information to the theoretical discussion of the socio-cultural component and its ambivalent relationship with collaborative networks. The results showed the positive and significant effect that collaborative networks have on the increase of better socio-cultural practices. As several authors had mentioned (Krom, 2017; Fonte & Cucco, 2017; Méndez-Lemus & Vieyra, 2017). Therefore, the effects imply the relevance of collaborative networks to favor the inclusion, empowerment, and social recognition of the individuals of a community.

Institutional forces such as legal protection and governmental support had positive and significant effects on collaborative networks. On the one hand, it was found that the law helps the problem of assuming the risk when establishing commercial or institutional relationships with other actors in the value chain. Rosenman (2019) suggested that when the legal framework protects financial relationships, it will help reduce poverty in a rural community. Therefore, formal institutions such as laws and regulations are relevant to building successful collaboration networks (Slade Shantz et al., 2018). On the other hand, governmental support had a positive influence on collaborative networks. The adequate infrastructure and implementation of government programs that help agricultural activity have repercussions in strengthening collaborative networks of vulnerable groups such as farmers (Alatas et al., 2010), or even women in the rural sector (Zhang & Venkatesh, 2017).

Conclusions

The study is based on CA due to the multidimensional nature of defining poverty. The proposed model proved the possibility of retaking the capabilities approach towards a theoretical direction that generates operations from the social and institutional understanding of the communities. The lack of literature in CA concerning legal protection, governmental support, and network ties is one of the aspects that was intended to be covered with the study proposal. The causal relationships of the study variables were significant at 1% in most cases. The role played by the legal framework and government support are institutional incentives for the construction of better collaborative networks. Therefore, the work concludes that, in general, the capacities that reduce rural poverty increase when the commercial and institutional networks are closer. In turn, collaborative networks are closer when the institutional context creates adequate conditions of protection and support for the generation of the political and economic agent of the rural area.

Two main contributions are provided with this work. First, the main contribution is aimed at the development of public policies that encourage collaboration between farmers from an institutional perspective so that, in this way, a successive effect is generated in the capacities of the communities. For example, studies that offer a response to improve human well-being in conditions of poverty contribute to the formation of human capacities that help increase equal opportunities (Ataguba et al., 2013). The approach that is taken with this work is to benefit from the theory of social capital (Nahapiet & Ghoshal, 2009), to generate value in the economic interrelationships established in the farmers' agricultural activity, whether with suppliers, customers, or competitors. The networks are a source of resilience for the community where rural actors acquire knowledge, generate learning, and strengthen their links to promote inclusion, visibility, and trust in the group. Strategic actors can benefit from the association with governmental, educational, financial, and business institutions as well as legislative commissions, all of which generate scenarios for the best economic and social performance.

Second, the theoretical contribution regarding the approach of the institutional perspective aims to build the best environment to equalize the living conditions of vulnerable groups such as farmers in emerging countries. It was shown that the role of institutional forces, both legal protection and the support given by the government to economic activities, support the interrelationships carried out by farmers. Therefore, this implies that when the law prevails, the interests of farmers are protected by well-defined regulations. Scams, or corruption in the sector are avoided, and the invested money is protected by a legal framework. In the case of the farmers surveyed, a malicious legal framework is the one that predominates, since the

descriptive results give evidence of a lack of laws which do not protect the productive activity. Also, governmental policies and programs help the agricultural activity, the benefits of providing valuable information or supporting farmers financially are not reflected in better results because a failure on state of law. Therefore, there may be corruption or nepotism in the legal system, as previously mentioned in the results of Banson et al. (2015).

The practical implications of the study are mainly focused on pointing out that the measures carried out to address the problems of rural poverty in Mexico have not been satisfactory. Similarly, socio-cultural capacities have not been exploited enough by the social and political infrastructure. The networks that would favor the construction of better knowledge and learning capacities are not present, even though the results of the influence are significant. There is institutional environment conducive to developing relationships with institutions due to the lack of legal protection. One of the largest problems in the agricultural sector in Mexico is the lack of joint collaboration (Boza et al., 2019). The role of policy makers is essential to transform the institutional framework that corresponds to farmers, especially in those institutional forces that would create well-being of individuals through close collaboration or partnership.

The limitations in methodological terms were, first, the sample size of local producers. Although the objectives of this study were achieved, the number of the participants could be increased to achieve greater statistical inference. Second, the conclusions are directed mainly at the legal framework of farmers and do not include vulnerable groups that do not have this productive activity. Therefore, for further research, it would be viable to analyze heterogeneous samples which consider other important actors in the rural environment to contribute to the multidimensional definition of rural poverty analyzed. Third, since Mexico is a country with diverse contexts, especially in rural areas, the evaluation of the factors that affect poverty may involve political, cultural, and economic variables of regions. Lastly, we recommend to leave open the door that this research may be of help to other countries.

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