

Business Formalization to Strengthen the Commercial Negotiation of Independent Waste Recyclers

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Abstract

In Latin America, cities are experiencing serious environmental problems due to rapid growth that exceeds their capacity for governance. At this juncture, the independent informal recycler is the workforce dedicated to the collection of recyclable inorganic solid waste that contributes to the effectiveness of municipal management. Thus, the objective was to determine the influence of business formalization and commercial negotiation from the perspective of these people. It was a basic, non-experimental, quantitative, causal correlational study. Three hundred waste pickers were surveyed using two validated and reliable questionnaires. The data was analyzed by ordinal logistic regression. It was determined that business formalization had a significant influence on commercial negotiation; however, there are aspects related to productivity and the application/compliance with legality that should be analyzed from a governmental management perspective, in order to provide better conditions to guarantee the sustainability of this activity within the communes. The role of municipal managers should be oriented on two main fronts: technical-legal and strategic management with a sustainable vision within the framework of the state modernization plan and the need to maintain the ecological balance that will sustain human survival in the future.

Keywords: *Environmental Management, Resource Management, Informal Sector, Waste Disposal, Environmental Economics.*

Introduction

The United Nations (UN) designed the goals for 2030 on the sustainable development of humanity, with 17 Sustainable Development Goals (SDGs), of which SDG 1, on the end of poverty (Khanal et al., 2021); SDG 8, on decent work and economic growth (Blair et al., 2021); SDG 10, on reducing inequalities (Fang et al., 2021); and SDG 17, on partnerships to achieve the goals (Lamichhane et al., 2021), have been taken as the basis for this research, considering that nearly 780 million people live on just US\$1.90 per day; to this end, the second target for 2030 is to reduce the number of citizens living in poverty to 50% (Rönkkö et al., 2022) and with their unprotected informal jobs (Liwiński, 2022; Yang, 2022). Likewise, by 2030, the aim is to include the most vulnerable socially, economically and politically, with equal opportunities (Souza-Silva & Mol, 2021). Therefore, it is important the implementation of inclusive partnerships with principles and values, with shared vision and objectives, prioritizing people and the planet (Sachs et al., 2019).

The World Bank reported on solid waste management 2.0 towards 2050 (Cao et al., 2020), due to the production of 2,010 million tons (mT) of municipal solid waste (Xu et al., 2022), with an alarming figure of 3,400 mT by 2050 (Maalouf & Mavropoulos, 2022), i.e., it would increase by 70%, classified as: metals (4%), glass (5%), plastics (12%), paper (17%) and food (44%) (Marseglia et al., 2022) in recycling; representing production in: Asia (802 mT), Europe (392 mT), North America (289 mT), Latin America (231 mT), South Africa (174 mT), Middle East and North Africa (129 mT); emphasizing that in low-income nations 90% of

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waste is inadequately managed, and contamination is extreme (Urban & Nakada, 2021) affecting the most vulnerable (Banco Mundial, 2018).

According to the World Economic Forum (WEF), Germany leads with 56,1% of Municipal Waste Recycling (MSW) (Stričík & Čonková, 2021), followed by Austria with 53,8%, South Korea with 53,7%, Wales with 52,2% and the other countries with less than 50%, Switzerland with 49,7%, Italy with 49,4%, the Netherlands with 46,3%, Slovenia with 45,8% and Singapore with 34,0% (Cajamarca et al., 2019); evidencing the inequality and lack of protection of almost 50% of the world's population in a situation of informal economic backwardness, such as Mexico, where 60% of its Economically Active Population (EAP) is not formal; the informal state being the result of low production, low development, high unemployment rates, ambulatory commerce and work, lack of technology, lack of social security and poor access to education (Robles & Martínez, 2018).

In Peru, informality reaches citizens who voluntarily, independently and with their own resources work in garbage collection, which they then trade and generate income, with which they can barely subsist; although this activity produces environmental risks affecting the soil, rivers, sea and air (Aparcana, 2022). As independent recyclers lack resources, they are dedicated to collecting and sorting unusable materials in the city and dunghills, as part of the waste production chain, which they then sell, and are mostly located in the lower socioeconomic levels and with social vulnerability (Singhal et al., 2021), and also lack the priority factors that help them to live in optimal conditions, because they do not obtain reasonable daily income to cover their minimum needs, such as water and sewage, health, education, energy, and social equity (Velenturf & Jopson, 2019).

Therefore, the government seeks to formalize the activity of independent recycling workers, based on the basic lines of public policies to formalize the activity of recycling and selective collection of solid waste and detailed in the law that regulates the work of recyclers (Law No. 29419), indicating that these workers must be part of a group or institution constituted in accordance with the law on the matter and also be registered in the appropriate records, then must submit the request to the relevant municipality, complying with: (i) having been trained; (ii) having received vaccinations against tetanus and hepatitis B; (iii) possessing the clothing for personal protection; (iv) possessing the appropriate collection vehicles; and, (v) being at least 18 years of age (MINAM, 2010).

In this regard, the National Movement of Peruvian Recyclers (NMPR) brings together 40 groups of recycling workers at the national level, each grouping 15, 20 and even 50 recyclers. That is, 200 thousand formal and informal recyclers, recycling scrap metal, cardboard, paper, plastic, wood, glass, tin, etc. For its part, the Defensoría del Pueblo (2020), prioritized the incorporation of recyclers into the formal sector and into small and micro-enterprises dedicated to these activities, with a minimum guarantee of sanitary and working conditions, preferably through the use of virtual platforms. It should be noted that in Peru, recycling inorganic solid waste barely reaches an average of 2% per year, although it manages to integrate 98% of recyclers who work informally (SIAR GORE Cajamarca, 2017).

In the north of Peru, as a result of the norms issued and commented above by the central government, since 2019 in the analyzed Provincial Municipality, the work of formalization of informal independent workers dedicated to solid waste recycling has begun, and with incipient achievements yet, reaching an association with 7 members and another in formation with 18 members, for the 30,000 families registered in the district. The causes identified for the limited progress are: (i) adaptability of the municipal management to national norms, (ii) the informal workers' rejection of formalization, (iii) the lack of credibility of the informal workers with the current municipal management and (iv) the urgency of the informal workers to collect and sell immediately in order to earn an urgent daily sustenance. These causalities open the need to design business formalization proposals that contribute to strengthening the commercial negotiation of independent recyclers. However, it is necessary to generate diagnostic information to support legislative initiatives, which is why this study aims to determine the influence of business formalization and commercial negotiation from the perspective of waste pickers in this part of the country, hoping to provide scientific evidence that will shed more light on municipal public managers.

This research is supported by important theories, by Business Formalization: (i) the Theory of Planned Behavior (TPB) by Icek Ajzen (1985), which associates the individual's habits and attitudes, establishing the performance under imposed rules, which in sum form the various behavioral expressions of an individual (Amésquita et al., 2018; Straub et al., 2023); (ii) Schultz's Human Capital Theory (1960), which states that knowledge and health favor the increase of individual and group performance, contributing to the improvement of the economy (Kosklin et al., 2023); and, (iii) Robert Putnam's social capital theory (1990), which empirically links firms and rules, with the impact of associativity on the growth of the economy and the social integration of a given group of people (Luoma-aho, 2018).

While for Commercial Negotiation, we have that (i) John von Neumann's Game Theory (1947) indicates that it is necessary in a distributive approach to profit in an equitable manner, with the risk associated with the commercial negotiation of prices in accordance with the agency theory; (ii) Walton and McKersie's Theory of Labor Negotiations, based on four processes: (i) the ability to negotiate distributively; (ii) the process of negotiating integratively; (iii) the definition of behavior; and, (iv) the ability to negotiate within the corporation (Kong et al., 2014); and (iv) Michael Porter's theories of strategic focus and competitive advantage (1985), which consider adding value for customers and winning over competitors (Bel, 2018). Finally, for both variables of Business Formalization and Commercial Negotiation, we have the three main theories that explain the existence of business informality - the exclusion, rational exit and dual economy models - the study offers an alternative path to business formalization (Olomi et al., 2018).

Metodología

Type and Approach

It was a basic research oriented to build knowledge of the fundamental elements of the real phenomenon (Aceituno et al., 2020). Non-experimental (Hernández-Sampieri & Mendoza, 2018). The approach was quantitative, due to the use of the causal analysis method, correlational, emphasizing the response to the objectives with the measurement of the variables and the corresponding dimensions (Mohajan, 2020).

Population, Sample and Sampling

The population in this study consisted of all independent recyclers who were collecting in the northern province of Peru, totaling 1,370 (Arias, 2020), which have the same demographic, social and geographic characteristics, given that they belong to the same age ranges, social strata and proximity in the jurisdictions. The sample consisted of 300 self-employed workers engaged in informal recycling, selected according to the application of the sampling formula for a finite population (Fuentes-Doria et al., 2020). A non-probabilistic sampling was performed, appealing to the willingness to participate until the sample was completed (Feria et al., 2019).

Techniques and Instruments

The survey was used to collect data. The instruments were two questionnaires created for this study, with options valued with the ordinal Likert scale. For the questionnaire on business formalization, there were: 25 items, divided into five dimensions: (i) reducing obstacles, with five items; (ii) encouraging formalization, with five items; (iii) increasing productivity, with five items; (iv) facilitating dialogue, with five items; and (v) application and compliance with legality, with five items. Likewise, the instrument called Questionnaire on Business Negotiation was composed of 20 items, divided into four dimensions: (i) preparation for negotiation, with five items; (ii) development or interaction between the parties, with five items; (iii) agreements and conclusions, with five items; and (iv) evaluation, with five items.

Validity and Reliability

Validity was done using the expert judgment technique and construct validity for each of the items for each instrument. The reliability was determined through the Cronbach's Alpha coefficient. For business formalization 0.768 was obtained and for commercial negotiation, 0.721 (De Barros et al., 2020).

Resultados

First, the levels of the responses of the waste pickers surveyed were analyzed. Thus, it was evident that for the variable Business formalization there was a predominance of the 'regular' level in contrast to the other two levels considered, and that for the 'bad' level the proportion was very small. In comparison, for the variable Commercial negotiation, the highest level was 'High', although it was not far from the medium level. For the lower level there was no reported frequency (See Table 1).

Table 1. Levels of Business Formalization and Commercial Negotiation of Independent Recyclers

Variables	Business formalization			Commercial negotiation		
	Bad	Regular	Level	Bad	Regular	Level
n	2	216	82	0	141	159
%	0.7	72.0	27.3	0.0	47.0	53.0

On the other hand, with respect to the testing of the general hypothesis, it has been determined that the approach of a theoretical functional predictive model includes those characteristics of business formalization that would allow configuring a proposal to contribute to the commercial negotiation of independent recyclers in the Lambayeque region, as detailed in Table 2.

Table 2. Hypothesis Test of Global Model Fit

Model Fitting Information				
Model	-2 Log Likelihood	Chi-Square	df	Sig.
a) Intercept Only	406.254			
b) Final	227.570	178.685	84	0.000

Note. Link function: Logit.

Therefore, it is possible to demonstrate statistically that the value $P=0.000 < 0.05$, allows rejecting the null hypothesis, so that the model is not relevant with only the constant. This would indicate that the characteristics of business formalization contribute to the adjustment in a very significant way, in relation to the model with only the constant ($X^2 = 178.685$); in the same way, it explains the dependence of Commercial negotiation on the characteristics of Business formalization manifested in this one.

Table 3. Goodness-of-Fit Hypothesis Test of Model Fit Adequately to Data

Goodness-of-Fit			
Items	Chi-Square	df	Sig.
c) Pearson	225.102	205	0.160
d) Deviance	220.167	205	0.222

Note. Link function: Logit.

Based on the information in Table 3 on the goodness of fit to the data, it can be shown that there is sufficient statistical argument with critical levels of $P=0.160 > 0.05$ and $P= 0.222 > 0.05$, to proceed to the acceptance of the null hypothesis and reject the research hypothesis, in the sense that the data related to

the characteristics of the Business formalization of independent recyclers adequately fit the model. Therefore, there would be an explanatory model of the contribution of Business formalization to Commercial negotiation. With this result, it was important to analyze the proportions of inference with which the results would be obtained, which are shown in Table 4 below.

Table 4. Pseudo R-Square

Coefficients	Values
Cox and Snell	0.449
Nagelkerke	0.599
McFadden	0.431

Note. Link function: Logit.

The value of the Nagelkerke coefficient presented in Table 4 confirms the predictive capacity of the characteristics related to Business Formalization with the index of 59.9% (0.599) of the variability of Commercial Negotiation by the regression model. This last indicator allowed the estimators of the ordinal logistic regression (OLR), shown in Table 5, to be obtained.

The result showed that only level 2 (Medium) of the dependent variable (Commercial negotiation) was significant, with an impact of 54.72% from two levels of the independent variable (Business formalization), although only the level 2 (Regular) of this variable was significant, with a level of influence of 51.76% (See Table 5). This reveals that there are already favorable signs of formalization of independent recyclers, which would be a good point to start strengthening processes.

Table 5. Estimators of the OLR of Business formalization on Commercial Negotiation

Variables	β	Dev. Error	Wald	gl	Sig.	95% confidence interval		Exp ^β (%)
						Lower limit	Upper limit	
e) Commercial negotiation = Medium [2]	-0.603	0.231	6.815	1	0.009	-1.056	-0.150	54.72
f) Business formalization = Bad [1].	-0.603	1.433	0.177	1	0.674	-3.412	2.206	---
g) Business formalization = Regular [2].	-0.659	0.268	6.033	1	0.014	-1.184	-0.133	51.76
h) Business formalization = Good [3].	0 ^a			0				----

Note 1. Link function: Logit.

Note 2. a. This parameter is set to zero because it is redundant.

As a complementary part of the analysis, OLRs were performed for each of the dimensions of the independent variable. However, neither D1 (Reduce obstacles), D2 (Encourage formalization) and D4 (Facilitate dialogue) showed statistical significance to determine the influence on the dependent variable (Commercial negotiation). Only level 2 (Regular) of D3 (Increase productivity) and level 1 (Bad) of D5

(Enforcement and compliance with legality) influenced the Commercial negotiation of independent recyclers, with differential contributions of 52.2% and 23.47% respectively (see Table 6).

Table 6. Estimators of the OLR of the Dimensions of Business Formalization on Commercial Negotiation

Parameters	Estimate	Dev. Error	Wald	df	Sig.	95% confidence interval		Expβ (%)
						Lower limit	Upper limit	
i) Commercial negotiation = Medium [2]	0.248	0.952	0.068	1	0.795	-1.617	2.113	----
j) Increase productivity = Bad [1].	-20.549	9938.226	0.000	1	0.998	-19499.113	19458.016	----
k) Increase productivity = Regular [2].	-0.650	0.276	5.562	1	0.018	-1.190	-0.110	52.20
l) Enforcement and compliance with legality=Bad [1].	-1.449	0.526	7.604	1	0.006	0.419	2.479	23.47
m) Enforcement and compliance with legality=Regular [2].	-0.062	0.312	0.039	1	0.844	-0.674	0.551	----
n) Enforcement and compliance with legality=Good [3].	0 ^a			0				----

Note 1. Link function: Logit.

Note 2. a. This parameter is set to zero because it is redundant.

In the further analysis of the dimensions, only two of the premises considered in dimension 5 (Enforcement and compliance with legality) resulted in that question 22 [You consider that social policies are a strategy that allows you to formalize your business] and question 24 [You consider that the information provided is sufficient for the creation of your business] were the ones that contributed the most to the significance of the dependent variable (Commercial negotiation) at level 2 (Medium), although the first one contributed 8.0% and the second 14.4%, which could indicate that this second question contributed more in a particular way (See Table 7).

Table 7. OLR Estimators For Questions 22 And 25 Of Dimension 5 (Enforcement And Compliance With Legality) Of The Business Formalization On Commercial Negotiation

Parameters	St	Dev. Error	Wald	1	Sig.	95% confidence interval		Exp * 100
						Lower limit	Upper limit	
o) Commercial negotiation = Medium [2]	-2.694	3.960	24.332	1	0.000	-224.456	-208.933	6.76
p) P22_D5_VI= Regular [2]	-2.526	2.062	25.657	1	0.017	0.445	4.608	8.00
q) P24_D5_VI= Regular [2]	-1.937	1.685	17.788	1	0.000	-223.239	-216.635	14.41

Note: Link function: Logit.

In general terms, the commercial negotiation of independent recyclers is influenced by business formalization, however, only the dimensions: Increasing productivity and, Enforcement and compliance with legality resulted significant to this same dependent variable. It is also relevant to point out that the most significant contribution came from dimension 5 (Enforcement and compliance with legality) of the independent variable, with questions 22 and 24 having the highest percentage of influence.

Discussion

The results showed differences in the distribution of the frequencies of the variables, highlighting that for business formalization the dominance was observed in the Regular level with a definite tendency towards Good, conditions that, although encouraging for the management processes that could be developed post study, it should be noted that the vast majority of respondents are similar and with a declared tendency towards formalization, although with hopes that are diluted with each change of local government. In this regard, many studies on this variable have been approached from the improvement of informal management practices, given that notable gaps were identified in literacy, training and orientation for the correct use of clothing for their protection, appropriate facilities, financial and technical government support; they have high exposure to environmental risks (Okwu et al., 2021), therefore, it is likely that these results are associated with the dissemination and strengthening programs of these urban recycling processes and, hence, it is important to deepen this research by choosing a larger sample including people who have not benefited from the aforementioned municipal programs, being able to take as selection criteria the determinants of informal business with the six econometric Probit models that influence on business formalization: gender, age and level of education, size and level of capital, infrastructure and administrative bureaucracy (Bakehe & Mbondo (2021) considered as sufficient reasons to encourage registration and business formalization of waste pickers. On the other hand, from the perspective of dual-channel reverse logistics - game theory approach - the informal recycler has two options, depending on his bargaining power, to allocate his production to formal or informal bulkers (Wang & Mishima, 2021) which could also be taken into account in the new proposals.

Another aspect that has been extensively studied is the inclusion of the informal recycling sector (IRS) through the formation of family productive units to adequately manage solid waste (Gutiérrez-Galicia et al., 2021). Therefore, considering that informality is present throughout the process of waste management for its business formalization, thus: i) grouping informal workers to associations or cooperatives; ii) grouping waste pickers in associations; or iii) hiring as waste picker workers. Situation that ends in the business formalization of recycling (Tovar, 2018) although the transition towards business formalization of the Mypes is not so simple, since the biggest problem is related to the excessive paperwork for business

formalization, which requires compliance with the laws enacted by the State (Silupu et al., 2022). In this sense, it is important to highlight the key aspects of success that every association of waste pickers should consider in their efforts towards formalization and business sustainability: associativity and collective work, leadership, alliances and agreements, key resources, environmental governance, citizen participation, etc. (Rateau & Tovar, 2019).

On the other hand, with respect to the variable of Commercial negotiation, the highest frequency was located at the High level, which was not so far from the Medium level, thus showing a simile with the previous variable and, although researchers have dealt with the subject very neatly from the direction towards productive goals and the negotiators' purposes that could affect their trade negotiation strategy to avoid the risk of losing and to come out of the negotiation successful, it is necessary to follow a conceptual model related to two negotiation strategies: win-win (integrative) and win-lose (distributive), respectively, to connect goal orientations with negotiation strategies (Asante-Asamani et al., 2021). In that vein, practical guidelines for designing collaborative and scalable recycling business models through the circular economy with commercial negotiation requires weighing that: (i) the market for recycled products is limited; (ii) lack of circular commercial negotiation models; (iii) partners must innovate; and (iv) quality is costly; are the strategies to recycle with commercial negotiation models, in recycling, partnership and scaling up (Damayanti et al., 2021), this once again pointing to the need to measure the variable in greater depth, which could be addressed through a mixed approach to compare the qualitative aspects with the quantitative aspects that would emerge in the measurement.

Another important aspect is the consideration of the fundamental elements that influence the behavior of waste electrical and electronic equipment (WEEE) recyclers, whose purpose is to reduce the waste of resources, pollution of the environment and threat to human integrity, with the intervention of the four key parties: manufacturers, consumers, recyclers and shredders, and the government (Liu et al., 2021). To the same end, it becomes imperative for worker cooperatives to be integrated to manage the formality of municipal recycling work. This would be a smart strategy in the circular economy, although it should also be considered that these groups report difficulties such as: (i) ergonomic problems related to body posture; (ii) complaints from buyers due to mixing of materials; (iii) resistance of tasters in the use of PPE (personal protection equipment); (iv) some collection centers have inadequate ventilation, lack of light and strong odor; and (v) lack of a commercial negotiation plan (Miranda et al., 2020). Therefore, a good management strategy that municipal authorities should do is to evaluate the performance of cooperatives in the recycling chain, proposing a method for the operational activities of commercial negotiation, based on: (i) waste in collection management, (ii) in production management, (iii) in waste in marketing management, and (iv) as an instrument of social inclusion (Fidelis & Colmenero, 2018). In this way, the different levels of managerial performance and administrative organization could be measured, analyzing the communication difficulties that make impossible the commercial negotiation of the production of the cooperatives created.

In the analysis of the general hypothesis, the influence of Business formalization on Commercial negotiation was determined, although it was only significant at the medium level. Most probably this was observed due to the tendency of the frequencies observed in the descriptive results; however, the interesting thing about the contrast was that two levels (Bad and Regular) of Business formalization were those that influenced the dependent variable. In this regard, it should be noted that in the evaluation of the variable Business formalization, the informal waste sector was analyzed, including individuals, groups and microenterprises that carry out this activity, following the guidelines of Aparcana (2022) finding in their responses that for their business formalization, they desire the reduction of registration and business development costs; therefore, the ILO (International Labour Organization) compares the costs with the benefits to manage a business, reducing the obstacles, which prevent them from entering the formal market, such as registration procedures that increase costs, fees and various taxes, the operating license and expenses for incorporation (OIT, 2017).

In the contrasts with the dimensions, it was observed that only the dimensions Increase productivity and Enforcement and compliance with legality were significant over the dependent variable, demonstrating with this that these dimensions were the most highlighted by the respondents, being coincident with what the literature reports, since to enter business formalization, informal microentrepreneurs identify motivations

for entrepreneurial opportunity, work experience and gender, despite the low level of education (Rahou & Taqi, 2021). In addition, the desire for formalization encounters various obstacles starting with the lack of availability of basic infrastructure (electricity, water, telephone, etc.), access to financing, premises, contracts, information, and administrative procedures (Rahou & Taqi, 2021). These conditions are aligned with respect to the dimension associated with compliance with legality, which was the most prominent, although this aspect alone has many aspects to analyze in the future, since it has to do not only with the regulations per se, but also with their implementation and execution within the municipal jurisdictions of the country's interior.

At the same time, market entry is facilitated by formalizing the business by complying with registration requirements (Public Registry, Single Tax Registry-STR) and providing access to legal records (Floridi et al., 2021). However, contact with new markets has a strong management component at the level of authorities, as the formation of recycling networks with other municipalities, communities, suppliers, buyers, NGOs, donors, social programs guarantee the sustainability of local recycling networks (Cohen et al., 2013). Therefore, it is imperative that, if the authorities have foreseen a formalization process, they also had to foresee a management strategy to guarantee the activities sustainably for the recyclers. In this sense, one of the immediate processes that should be analyzed at governance levels is the excess of requirements, identified as the major impediment that discourages the legal constitution, being able to follow existing models in other countries, such as Canada where there is only one (Deelen, 2015). The second aspect is that business formalization should be encouraged, promoting entrepreneurship as the gateway to new markets, with greater social security coverage, lower taxes and reduced administrative burden, for which, officials should facilitate access to specialized business advice in a strategic way (OIT, 2017).

Market access is produced by negotiation and renegotiation of prices, massive sales, and direct removal (Xia et al., 2022); considering social security coverage, which is inherent to the formalization of enterprises), which reduces the risk of recycling work and accident costs (Magoga-Sabatier & Dupont, 2021) and pension coverage for the worker's retirement. In addition, microenterprises would benefit from the reduction of burdens, due to the legal payment of taxes, lower in comparison to the informal situation, fines, penalties and private coverage (Lu et al., 2023). Thus, the reduction of unnecessary administrative burdens and costs that impede access to business formalization are urgently needed, and administrative simplification, which is still not sufficient for this sector, should be evaluated (Muñoz, 2011) which requires access to consultancy services to increase productivity through business modernization and the achievement of financing, business development and better market prices (OIT, 2017).

Within the framework of business modernization, innovative projects in the recycling industry are those that have the best economic and financial performance (Faria et al., 2022) although only those that are supported by functional and operational technical training (Montesinos et al., 2020) and access to financing, for higher production and profits (Fuentelsaz et al., 2019). Likewise, access to business development facilitates creativity and innovation, generating a better quality of life for all (Donovan et al., 2022); by obtaining better prices, which could not be obtained in the informal sector (da Silva et al., 2019). Thus, in the process, the facilitation of dialogue contributes to the approach to other companies with which the business would be consolidated. In this purpose, a good tool are the strategic business alliances with different private companies, public institutions, merchant associations, professional associations, and with the various merchant associations of the different commercial sectors, as well as the community's supply markets (Sun, 2022).

Finally, in order to consolidate the strengthening of enforcement and compliance with legality, a very broad approach should be given to business formalization, as a transit from informality to formality, with the reinforcement of economic, social and environmental policies fundamentally, based on the creation of solid and competitive private institutions in different markets (OIT, 2017). Thus, the preparation of the negotiation is prior and includes the goals, objectives, strategies and tactics, information, offers, arguments and agenda to achieve success (Siebert & Herbst, 2021) with the interactive participation of both parties to the negotiation, allowing them to develop the event with a true exchange of positions, which generates trust and adds value to the process, from the beginning to the end of the negotiations, with or without an agreement (Skandrani et al., 2021); to this end, game theory creates scenarios that maximize overall and

environmental sustainability (Collins & Kumral, 2020); and arrive at agreements and conclusions for the closure of the process (Skandrani et al., 2021). Finally, should not be forgotten that the evaluation occurs at the close of the negotiation, to assess the successes and failures (Roszkowska, 2022) and propose improvements (Azzini et al., 2021), since Recycling 4.0 aims at the digitization of the final process with the circular economy (Ragossnig & Schneider, 2019); being necessary separation and extraction methods, for the best control of time, labor, investment and costs, and environmental impact (Kaya, 2019).

By way of conclusions, it is indicated that the levels of business formalization of the evaluated waste pickers have a good tendency in the evaluated human group, although aspects of local government management should be worked on to strengthen the knowledge of the formalization processes and effective association. On the other hand, business formalization significantly influences the commercial negotiation of these same independent recyclers, however, there are aspects related to productivity and, the application/compliance with legality that should be analyzed from a governmental management perspective, so as to provide better conditions to guarantee the sustainability of this activity within the communes. Definitely, the role of municipal managers and officials is decisive for the strengthening of this activity in the jurisdictions of the municipality evaluated, orienting their work from two main fronts: technical-legal and strategic management with a sustainable vision within the framework of the state modernization plan and the need to maintain the ecological balance that will sustain human survival in these large Latin American cities.

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