

Who is in charge? Achieving Sustainable development goals in rural communities: case study Santa Engracia México.

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Abstract

The 2030 Agenda and the Sustainable Development Goals (SDGs) have gone through different challenges since 2015 when the United Nations (UN) pronounce them in response of 17 problematics that was focus on different topics like poverty, health, education, equality, environment, among other more. Until now, we have seen slow progress in achieving the goals, and the core assignment is the unawareness by members of the society. Therefore, many institutions have been looking for an alternative to develop programs to achieve the SDGs. For academic institutions is important to provide tools not just to the students but also to the community and the society around them. With the intent to impulse the growth of the communities and the local development, the universities improve investigation areas in the structure of postgraduate studies. With the purpose of giving a contribution to society, boosting economic growth, and attending to the necessities of the rural location, in this case, the Santa Engracia region in Tamaulipas México, the Autonomous University of Tamaulipas developed an integral project to encourage local entrepreneurship pursuing sustainable development at the same time. The aim of this research project and as part of the first stage, was to understand the awareness that the population of the community of Santa Engracia has about the SDGs. Therefore, an instrument to study the liability between government, private sector and society, and the perception of Agenda 2030 based on a five points scale, was developed. For this, 50 residents of different localities of the region were questioned, showing a significant interest in all the SDGs. However, most of the population agrees that the liability to achieve the goals is the government's responsibility, continued by the private sector and in the end the society. This result expresses the preoccupation of the population about 2030 Agenda, but also the slighter commitment to work and take responsible actions to find solutions to global problems.

Introduction

Every 15 years, within the UN General Assembly, an agenda of global commitments to improve the quality of life of humanity and the protection of the world's resources is manifested (Dawes, 2018) where the 2030 Agenda and the Sustainable Development Goals (SDGs) were born in the 2015, responding to environmental, social and economic issues, which, working together, lead to the desired development (Fröberg and Lundvall, 2022). Since then, efforts have been made to report yearly to achieving the SDGs; however, insufficient progress has been reported in Latin American countries, showing the need for strategic planning for implementation and response at the local level (Garay, 2020).

To identify the factors that are holding back progress, international (Smaniotto, 2022), continental (Acuña et al., 2022) and regional government institutions have been working to understand people's perspectives and knowledge of the 2030 Agenda. In addition, academic institutions at different levels of education have analyzed their students' awareness of the SDGs and sustainability issues. As in the case of China, where high school students were assessed on their SDGs knowledge, their interest in sustainable practices, and ultimately the possibility of continuing their studies in university careers related to sustainable development, to understand the awareness and initiative to work in line with the goals of the Agenda (Yuan, Yu, and Wu, 2021).

Another example is the case in Italy, where a tool to evaluate sustainable knowledge from environmental, economic, and social perspectives were applied to measure teachers, staff, and students of the institution level of literacy (Zwickle et al., 2014). Similarly, identifying students' knowledge about the proposed objectives and their understanding as a requirement for future professionals who will have to address the corresponding topics, as in the case of Chile (Villarreal and Bastías, 2021).

As mentioned in the previous cases, the analysis of knowledge and perceptions of the SDGs performed by educational institutions has focused on students and professionals. However, universities have a more important role in society. Rural communities play a crucial role in enriching cultures and traditions, which leads creation of comprehensive strategies that include community activities and the collaboration of diverse organizations in SDGs achievement (Ohta, Yata, and Sano, 2022). For this reason, this research was carried out as part of a social project in a rural community under development by the Autonomous University of Tamaulipas.

To determine the knowledge of the SDGs and civil society's perception of its role in sustainable development, as mentioned by Sousa and Uceda (2017), maintaining attention to the public, which allows us to promote active awareness of sustainability, allows us to increase the capacity to have skills and knowledge of the subject for their contribution, through communication channels as a determining element.

Literature Review

2030 Agenda and México

The 2030 Agenda, known as such for its period of application 2015-2030, is made up of 17 goals manifested in 168 targets, which in turn are developed by 230 indicators with which compliance is measured for taking actions towards improving the quality of life for all humanity, global economic growth and the protection of natural resources, three dimensions of sustainable development, giving the necessary importance to issues such as poverty and hunger, the defense of human rights, gender equity, re-evaluating unsustainable consumerist behaviors, among other (Boeren, 2019).

This agenda poses various challenges in its implementation, the first of which is the importance of considering the territory to be intervened to generate development: the location, its specific needs, government policies, among others, bearing in mind that working for development generates both economic compensation and social recognition. Consequently, it speaks of a responsibility of accountability acquired at the time of action; at the same time, it identifies it as a transformative potential, recognizing all institutions aspiring to development based on their potential. At the same time, the SDGs represent

a challenge for the scientific field, as they promote the strategic identification of indicators to recognize progress precisely. (Gehre and Zeferino, 2020).

Some researchers have analyzed Mexico's progress. For example, research on water accessibility in rural communities in Puebla discovered a lack of water resources, which becomes a risk to achieving the SDGs (Moraes, 2021). On the other hand, the objective of quality education poses several challenges from which other objectives are derived, such as economic barriers, infrastructure, and poverty, social factors which, in the Mexican context, are indirectly related to the objective and are decisive for its effective implementation (Huerta, Severino, and León, 2023).

The Role of Government, The Private Sector, Society and Universities in Sustainable Development

When talking about compliance with the SDGs, it is important to consider all stakeholders and the role each plays. To begin with, the success of the 2030 Agenda depends on the sustainable development policies, plans, and programs that countries adopt and implement within their governments, this will help to ensure that they are effectively monitored and include targets subject to continuous evaluation (Gómez, 2021).

For the private sector, the role it plays has certain aspects that must be considered, such as corporate social responsibility, which sets sustainability, social and environmental standards; it must also consider the circular economy so as not to harm society and the environment, and it is crucial to consider social return with education and health services and the creation of new jobs. However, even if companies take these aspects into account, there are problems such as lack of leadership, harmonious alliances, lack of investment and complex interactions between some objectives and others (Rashed, 2021).

Authors such as Marx (2019) emphasize the importance of collaboration between the public and private sectors in SDGs achievement; the private sector has the tools to provide an enabling environment for private sector participation, leveraging the strengths of each. This requires careful planning, negotiation and monitoring to ensure that needs are met and that risks, responsibilities and rewards for work performed are shared.

For universities, it has been an arduous task, as they have had to implement different changes in each of their areas and adapt to sustainable practices, both as an institution and in their work of training professionals, while also being evaluated for their growth and significant impact on the SDGs (De la Poza, 2021). Educational institutions are essential in disseminating and promoting the 2030 Agenda through education, research, and innovation. Moreover, they can do this by implementing the SDGs in their policies, strategies, and operations and their students' professional training, involving stakeholders such as local communities, businesses, and governments, leading in the implementation task (Caballero, 2021).

Authors such as Reverte (2022) propose a model of the interrelationship between governments, universities, and the private sector to face the SDGs' social, economic, and environmental challenges. Universities contribute to research and innovation, while the private sector provides the resources and expertise to implement initiatives. The creation of these ecosystems can lead to innovation and facilitate the achievement of sustainable development.

Rural Development and the contribution of Mexican communities to the SDGs

Within a complex analysis, various demographic, economic, social, environmental, and institutional indicators influence the relationship between population and sustainable development. It is crucial to consider the needs of the population together with those of the dimensions in order to create a growth plan (González and Holguín, 2021) that is more than adequate and efficient, but also makes use of natural resources, thus providing a better quality of life for society in the context of economic growth (Herrera, Treviño, and Cerecedo, 2022).

Rural development refers to improving the inhabitants' standard living, fostering local participation, and enhancing the locality's own resources; always aimed at generating growth closer to what could be called modernization (Tapia, 2013). In this context, there are two important laws in Mexico; the Agrarian Law, which gives the State and tenants the right to own land for agricultural exploitation. On the other hand, the Sustainable Rural Development Law (SRD) states that "the State will promote the conditions for integral rural development, to generate employment and guarantee the wellbeing, participation, and incorporation of the peasant population in national development and will promote agricultural and forestry activities for the optimal use of the land, with infrastructure works, inputs, credits, training services and technical assistance" (Tapia and Demetrio, 2018).

SRD play an important role in achieving the 2030 Agenda, as they contribute significantly to producing resources and raw materials that feed the rest of the population; this means taking action to improve people's quality of life, thinking about sustainable agriculture, overcoming rural adversity, creating an economy in constant motion, and increasing opportunities for economic, social, and educational development, among other things (Bastante et al., 2020).

As of 2020, the percentage of rural population in Mexico was 21%, which has been decreasing year after year. However, agriculture accounts for 14 percent of the working population, contributing 3.89 percent to the national GDP (Martínez and Salazar, 2022). Considering that for rural communities the main economic activity through which they develop is agriculture, based on traditions that have been practiced from generation to generation (Ramos, Cruz, and Hernández, 2022).

Research Design

This project aims to identify the knowledge of the SDGs and the perception of society, government, and the private sector's responsibility, in the fulfilment of the 2030 Agenda, to achieve this, a descriptive non-experimental cross-sectional study has been designed to analyze the population's perception and knowledge of sustainable development, its main pillars and the problems identified by residents.

For the development of the instrument, a literature review was conducted on similar studies developed on the knowledge of a specific group about the 2030 Agenda and its SDGs, which identified several variables such as perception, knowledge, importance, and commitment (Chart 01).

Chart 01. Similar Studies

Article	Author(s)	Variables of study	Instrument
Assessing sustainability knowledge of a student population: Developing a tool to measure knowledge in the environmental, economic, and social domains	Zwickle, Koontz, Slagle, and Bruskotter, 2014	Knowledge	Multiple choice
Questionnaire survey on consciousness and behavior of students to achieve SDGs in Kyoto University	Ando, Baars, and Asari, 2019	Knowledge Information source Importance Perception	Likert scale Multiple choice
Sustainable Development Goals and 2030 Agenda: Awareness, Knowledge, and Attitudes in Nine Italian Universities, 2019	Smaniotto et al, 2020	Knowledge Information source Expectations about future actions	Likert scale Multiple choice
Sustainable Development Goals and 2030 Agenda—Survey on Awareness, Knowledge, and Attitudes of Italian Teachers of Public Mandatory Schools, 2021	Smaniotto et al, 2022	Awareness and knowledge Information source Attitude and commitment	Open questions Multiple choice
Awareness of Sustainable Development Goals among Students from a Chinese Senior High School	Yuan, Yu, y Wu, 2021	Knowledge Learning Information source Personal impact Planning	Multiple choice

Instrument

Through the descriptive experimental model and using the survey technique with the references, a questionnaire structured in four parts was generated (Chart 2).

Chart 2. Instrument Construction

Elements	Number of items	Type of response	Objective
Section 1. General data	4	Multiple choice	Descriptive elements of the study population.
Section 2. SDGs Perception	17	Likert Scale	Identify the population's perception of different social, economic and environmental problems.
Section 3. SDGs knowledge	18	Likert Scale	Know the degree of knowledge of the population about the 2030 Agenda and the SDGs.
Section 4. Liability	17	Multiple choice	Identify, according to the population's perception, who is responsible for the fulfillment of the SDGs.

Data collection

Using the instrument developed, residents were randomly approached directly in their homes. With the support of a working team, the data collection was carried out over a period of two days, during which 50 questionnaires were completed, making it possible to carry out a pilot study of the study area by means of personal interviews.

To carry out this exercise, a brief introduction of the research objective was developed and then the remaining elements of the questionnaire were completed. At the end of the data collection, an analysis of the data was carried out to determine the trend of the results, thus describing the perception and knowledge of the SDGs and the 2030 Agenda among the population of the region.

Analysis unit and location

Santa Engracia is identified as town, according to INEGI (2020), with the largest extension and population in the municipality of Hidalgo, Tamaulipas, with 6121 inhabitants of which 3035 are women and 3086 are men. For this study we had the participation of 50 randomly selected individuals who answered a digital form during the month of February of this year.

Results and Analysis

From the application of the instrument during this exercise, a descriptive analysis was performed, resulting in 74% of the participants were women and 26% were men, mostly between 30 and 41 years old (37%). In terms of the education of the group studied, 33% had secondary education, 31% had high school, 22% had a bachelor's degree, 11% had primary education and 3% had not studied, with 60% of the participants coming from Guillermo Zúñiga Town.

For the analysis of the variables, the data collection and processing were carried out in the SPSS program, where a total of 53 surveys were recorded, which were then searched for outliers, finding 3 missing cases, leaving a total of 50 validated cases. To verify the reliability of the measurement scale for each item to be scored, a factor analysis was performed to eliminate the items with factor loadings below .500 (Hair et al., 2014), this leaves a total of 8 items for the perception variable and 15 for the knowledge variable.

Once each the constructs were delimited, the value of its reliability was calculated using the Cronbach's Alpha test, which must exceed the optimum value of 0.7 to be accepted, it should be noted that if the values exceed 0.95, the wording of the corresponding questions and the number of using items need to be revised. Finally, the sample adequacy ratios (KMO) were evaluated, considering valid those that exceeded the .7 indicated as mean values (Hair et al., 2014). The results are presented in Chart 3 below.

Finally, a descriptive analysis was carried out to liability evaluation, with 7 possible answers; society (choice 1), government (choice 2), private sector (choice 3), society, government and private sector (choice 4); society and government (choice 5); society and private sector (choice 6); and government and private sector (choice 7); which results are presented in Chart 4.

Chart 3. Values of the analysis performed. Perception and Knowledge

Item	Variable	Factorial loading	Cronbach's Alpha	KMO
SDGs Perception				
P4	It is important to be prepared for climate changes such as drought and frost.	.656		
P5	Maintaining rivers and streams helps protect endemic fish species	.722		
P7	It is important to have access to healthy, nutritious and good quality food.	.676		
P8	It is important to have easy access to medical and health services (doctors, medicines, clinics).	.787	.775	.763
P9	It is important to have easy access to education.	.898		
P10	The opinions of both women and men should be taken into account in decision-making.	.598		
P16	Roads and highways in good condition facilitate communication between localities and easy access to other basic resources.	.640		
P17	For the development of the region it is necessary for the inhabitants of the different communities to work together.	.575		
SDGs Knowledge				
K4	Good health and well-being	.803		
K5	Quality education	.837		
K6	Gender equality	.771		
K7	Clien water and sanitation	.818		
K8	Affordable and clean energy	.803		
K9	Decent work and economic growth	.927		
K10	Industry, innovation and infrastructure	.769		
K11	Reduced enequalities	.749	.968	
K12	Sustainable cities and communities	.789		
K13	Responsible consuption and production	.845		
K14	Climate action	.894		
K15	Life below water	.845		
K16	Life on land	.909		
K17	Peace, justice and strong institutions	.938		
K18	Partnerships for the goals	.909		

Chart 4. Values of the analysis performed. Liability

Liability to the SDGs								
Item	Who is in charge to...	C1 (%)	C2 (%)	C3 (%)	C4 (%)	C5 (%)	C6 (%)	C7 (%)
L1	no poverty?	14	32	2	36	12	2	2
L2	zero hunger?	12	28	-	36	20	-	4
L3	good health and well-being?	12	46	-	34	4	-	4
L4	quality education?	6	46	-	36	12	-	-
L5	gender equality?	38	12	-	38	12	-	-
L6	clean water and sanitation?	26	26	2	42	2	2	-
L7	affordable and clean energy?	22	26	12	40	-	-	-
L8	decent work and economic growth?	12	22	6	40	8	2	10
L9	Industry, innovation and infrastructure?	2	42	6	32	6	-	12
L10	educed enequalities?	28	20	-	38	12	2	-
L11	sustainable cities and communities?	10	36	-	40	14	-	-
L12	responsible consuption and production?	30	8	2	40	12	6	2
L13	climate action?	28	10	4	46	6	4	2
L14	life below water?	34	16	4	40	4	-	2
L15	life on land?	38	10	2	40	8	-	-
L16	peace, justice and strong institutions?	20	16	-	42	22	-	-
L17	partnerships for the goals?	10	24	-	50	14	-	2

Discussion

With the objective of validating the questionnaire presented to assess the perception of the SDGs by the population of the region of Santa Engracia, Tamaulipas. Through a pilot test, this study was able to identify the interaction of the different dimensions, in addition to the question understanding by the respondents and based on the above idea, the following conclusions can be drawn.

The knowledge variable shows a higher score than the others, despite this, as mentioned by Hair (2014), it has a value above 0.95. Therefore, it is necessary to rephrase the questions about knowledge of the SDGs in a way that respondents can understand and answer effectively. On the other hand, the perception variable indicates a score of .775, so it can be determined that with the questionnaire presented it is possible to evaluate the population's perception of sustainable issues and the SDGs.

And to end the evaluation, within the responsibility variable, there is a higher response to the option that groups the government, the private sector and society, with an average response rate of 40% in all the questions. Therefore, it can be determined that for the population in the Santa Engracia region, compliance with the SDGs is a joint responsibility for all parties involved.

Conclusion

After analyzing the results and validating the instrument, we can conclude that within the population of Santa Engracia there is a clear perception of the sustainability issues addressed by the 2030 Agenda since they recognize that they are present in their environment and admit that they need to work on sustainable solutions. However, there need to be more knowledge of what the 2030 Agenda is institutionally, that there are 17 goals that show a line of action that can be carried out through the work of its goals.

In addition, they admit that, in order to achieve sustainable development, it is necessary for the government, the private sector and society in general to work together. Therefore, we can conclude that there is a clear awareness that they are an essential part of the solution to the problems. However, there is no apparent action on the part of the citizens of the intervened localities.

Returning to what Marx (2019) says, in order to have a solid management base for the implementation of the 2030 Agenda, it is crucial that the public sector, in this case the government and institutions, and the private sector, which are the companies that contribute to the localities, work together with their respective roles. In this way, society has a starting point to identify the opportunities and existing initiatives in which it can feel sheltered and supported to work.

Therefore, creating a shared collaborative ecosystem would facilitate communication channels between stakeholders. As Reverte (2022) mentioned, integrating universities into these collaborations could bridge of trust between society, business and government. This way, active citizen participation in implementing the SDGs and the 2030 Agenda could be achieved.

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