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Renewable energies and local economic development in Nayarit

Energías renovables y el desarrollo económico local en Nayarit

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Abstract

Resumen

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Introduction

Renewable energies have been experiencing an unprecedented global boom over the last thirty years. Political, social, economic and environmental aspects are included in this maelstrom of transformation, which is clearly illustrated in international and national agendas. The use of renewable energies as a focus of action within national policies and programmes is evident in most of the country's living spaces. In addition, the country's regulatory framework has also been modified, as laws and regulations have been created which, at least in the case of Mexico, regulate the use and exploitation of this type of energy. However, at the local level, there are still many challenges regarding the state of knowledge of renewable energies for their use. There is no doubt that this new way of harnessing solar energy in Mexican households has a long way to go before it can be harnessed more extensively and intensively.

In this sense, the objective of this research is to present an approach to the state of knowledge of renewable energies in the local context, highlighting the importance of territories as dynamic spaces where diverse local actors converge and how, through the social processes that are generated in these spaces, the energy transition towards renewable energies is experienced. In this way, some households in the municipalities of Tepic and Compostela in the State of Nayarit that have solar panels are analysed, and in which it is important to know whether these panels represent an ecological or savings awareness, so it is important to identify the economic and social variables that make up the analysis of renewable energies in the territory.

The methodological approach is of a mixed nature: qualitative-quantitative, in terms of methodological scope, by analysing two municipalities in the state of Nayarit, the research has the characteristics of a comparative and descriptive study. Likewise, as no previous studies similar to this field of research were found, it is also considered to have an exploratory scope.

The expected results cover even theoretical evidence, which consists of linking the paradigms or aspects that are related to the object of study of this research, that is, to the homes and businesses in Nayarit that experience the energy transition towards renewable energies by means of solar energy, through solar panels, and their repercussion on the social processes that take place in the territories.

Background and research problem

The construction of the present background is linked to two fields of research: renewable energies and Local Economic Development (LED). Based on this delimitation, an exhaustive search of studies was carried out in databases and websites such as Dialnet, Redalyc, Scielo, among others, and the Institutional Repository Aramara of the Autonomous University of Nayarit (UAN) and the Theses website of the UNAM Library System were also consulted in order to find out which studies have been carried out in this field of research.

In this sense, it was concluded that there is a predominance of European studies that analyse renewable energies from the context of the social and economic sciences, with an emphasis on economic development. With regard to the studies identified in the Latin American region, a scarce link was found between these two topics, and where the majority of these studies have engineering and economic tendencies, where factors such as economic growth, economic performance, GDP, etc. are highlighted in the latter field. However, in Chile, the analysis of renewable energies has recently been undertaken with a sociological approach, as expressed by Blanco-Wells:

It is only since the 2010s that the social sciences in Chile have begun to approach energy research from perspectives centred on actors and their practices, territorial experiences and considering the set of technologies and materialities inherent to the various forms of energy, epistemologies and ontologies. The call for Ibero-American sociologists to develop a sociology of energy is quite recent (Pardo, 2006; Ariztía et al., 2017, cited in Blanco-Wells, 2019, p. 163).

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In the case of Mexico, it is very difficult to find information that encompasses these topics, and the specific case of the state of Nayarit was no exception, not finding a link in this field of research. Nevertheless, there are many studies that recognise Mexico's potential for the use of renewable energies, such as solar energy, given the favourable climatic conditions for its use, as well as the existence of a legal regulatory framework that identifies and recognises the importance of using renewable energies in our country.

Hence, and according to the German Society for International Cooperation (in German GIZ), it is determined that in the case of solar potential: "95% of the Mexican territory has an annual average of IGH greater than 5 kWh/m2 per day... The areas with the greatest use of the resource are located in the northwest of the country..." (2018, p.16).

Once the solar potential of Mexico is recognised, it is worth highlighting what this potential is like in the state of Nayarit. Hence, the author Messina Fernández presents an overview of solar radiation and its link to solar panels, who points out the following:

> 'Since 2010, solar radiation parameters have been measured in the entity, and it is estimated that the daily insolation of energy is 5.5 kilowatt-hours per square metre (kWh/m2) with maximums of up to seven kWh/m2 on the sunniest days, an amount similar to that of cities in the north of the country' where...it is successful in harnessing the resource...'. (Messina Fernández, 2016).

Thus, the municipalities analysed in this research present key geographical locations for the use of solar panels. In the case of Tepic, this is the largest and most populated city in the state, with a very low degree of marginalisation. In the case of Compostela, it has a medium degree of marginalisation; however, the Municipal Development Plan (PMD) of the latter municipality does include the use and exploitation of renewable energies among its main lines of action, according to the PMD Compostela 2017-2021.

Objectives

General

- To identify the links of solar panels as a field of study in Local Economic Development in the State of Nayarit from a context of savings and environmental sustainability.

Specific

- To analyse and explain the state of knowledge of Renewable Energies in the State of Nayarit.
- Determine the linkages and/or savings levels of households and businesses in the municipalities of Tepic and Compostela, through the use of solar panels.
- Contrast the economic development in the diagnosis of the use of solar panels in the municipalities of Tepic and Compostela.

Research questions

- Does the use of renewable energies through solar panels represent for the population of Nayarit an ecological awareness or savings?
- How can we determine the level of significance of the savings that the use of Solar Panels represents in the homes and businesses of Tepic and Compostela?
- What are the economic and social variables that influence the economic development of Tepic and Compostela for the use of Solar Panels?

Theoretical framework

The proposed theory or approach to Local Economic Development is the theory of Sustainable Development, proposed by Carvajal (2011), who seeks to vindicate the human, cultural and environmental aspects through the relationship between Local Economic Development and the environment.

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Therefore, it is taken as a reference to explain how the energy transition towards renewable energies is inserted in the territory, which are contextualised as the drivers of economic development at the local level, that is, the use of renewable energies in the territory is recognised, highlighting the importance of the social processes and their local actors that converge in these processes. In this sense, and given the importance of the mechanisms for the use of renewable energies, the importance of technological advances as a function of development is also highlighted, which is why the theories or approaches that propose the use of technological innovations as a way to generate development are incorporated, which is why Schumpeter's approach is highlighted (in Olaya, 2008). Likewise, the approaches of Alburquerque (2007) are incorporated, which offer us approaches linked to the incorporation of innovations in the productive fabric, also highlighting human resources according to existing local needs. In this same line of research, we finally take up the contemporary and novel approach known as the socio-technical system, which seeks to incorporate social processes and local actors in decision-making on the adoption and adaptation of new technological innovations.

Based on the above, it is consequently important to point out the importance of solar panels in the domestic and work space, so it is worth referring to the theoretical-methodological proposal of Blanco Wells (2019), called "the social life of energy", in which one of its three fields of study is to explain the phenomenological experience of its inhabitants in the domestic and work space around energy. This proposal allows us to approach the case study of this research, allowing us to know the possible results or phenomenological experiences in similarity.

Finally, the legal regulatory framework for renewable energies in Mexico should not be overlooked, especially the Electricity Industry Law and the Energy Transition Law, both of which involve the promotion of the use and exploitation of renewable energies.

Methodological approach

In congruence with the objectives of this research, it is considered that the most suitable methodology to achieve them is of a mixed type, that is, qualitative-quantitative in nature. The mixed use of this methodology will allow us to identify in a more detailed way the thematic of the energy transition towards renewable energies, specifically solar energy through solar panels, with an approach to the territory, where it is contextualised as a dynamic space where different local actors converge, and which in the case of this research are analysed from three dimensions: environmental, economic and political, which go hand in hand to understand the processes conceived from the territory at the local level.

By analysing two municipalities in the state of Nayarit, the research has the characteristics of a comparative study, however, given the nature of the objectives set out, and in which it seeks to contemplate the dimensions of the territory, it also has a descriptive scope. Likewise, in accordance with the results obtained from previous studies similar to this research, and in which similar information was not found, the research has an exploratory scope. In terms of design, this research is methodologically based on case studies.

With regard to the categorisation of the elements of analysis for the territorial delimitation of the localities in the municipalities of Tepic and Compostela, the following elements were considered:

Element	Optimum category
Degree of marginalisation by Locality.	Very Low-Medium
Strategic geographic location by Locality.	Near Tepic
Economic units with the line of business of "Electricity generation from solar energy".	Largest number
Trade as a predominant activity in localities.	Tertiary sector

Table 1 Categorisation of the elements for the territorial delimitation of localities
Source: Own elaboration

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According to the table above, it is important to note that each of the elements considered to determine the delimitation of the localities, considers households with electricity, which are included in the category of degree of marginalisation per locality, considering a range of very low to medium. On the other hand, one of the important factors is the geographical location of the localities, which is why those that are close to the municipality of Tepic are taken into account, thus allowing the development of case studies that do not involve long distances or high costs that can be incurred in transfers. In this sense, it was sought that the localities had the tertiary sector as their main sector of economic activity, in order to delimit the business sector, which represents one of the objects of study of this research. Finally, those localities where there are economic units that provide the service of supplying solar energy equipment are also considered.

Preliminary results

Given that the research is derived from the thesis research, which is 50% advanced, the preliminary results cover up to the bibliographical review or, in other words, the theoretical framework. In this sense, it was determined that the paradigms around renewable energies and their link with Local Economic Development had as a starting point the study of the environment and its importance for economic growth and development, considering as decreasing factors the irrational use of natural resources. On the other hand, it was analysed through different aspects and paradigms how technological advances have an impact on economic development in favour of social welfare, which is linked to the social processes that take place in the territories through local actors, in this way, we speak of socio-technical systems, which are characterised by generating an interaction between technological systems and social systems.

In this sense, it is concluded that the study of the environment and technological advances from the approach of economic development represents a challenge, since it is necessary to explain the worldview of the territories in the process of energy transition towards renewable energies, in a given time and space.

Discussion and conclusions

It is evident that there is a gap between the study of renewable energies and the social sciences, i.e. studied from a non-engineering and strictly economistic approach, where the importance of the territory is highlighted in which the different local actors converge in the different dimensions, i.e. socio-economic, environmental and political, among others, and which are important in the process of transition towards the use of renewable energies. In this sense, what stands out in this research is the recognition of the scopes and limitations that are experienced in the territories towards the energy transition and how the study and analysis of renewable energy can shape or not their social processes. By analysing these dimensions, we seek to link each of them in order to determine the challenges presented by the key local actors in Nayarit for this research, as well as the challenges that the research itself characterises, as this is an exploratory investigation.

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