









## Impact on education, health, and culture during the construction of the Maya Train

### Impacto en la educación, la salud y la cultura durante la construcción del Tren Maya

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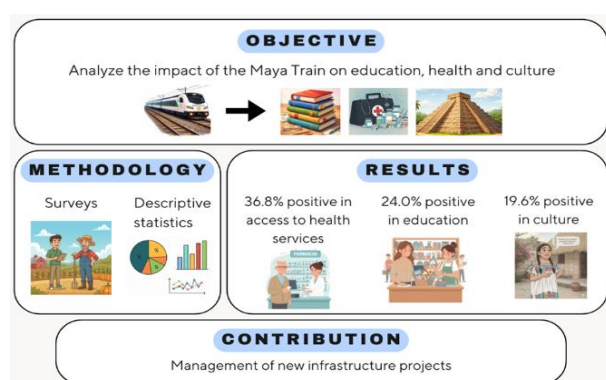


#### Abstract

This study analyzes the perceived impact of the Maya Train project on education, health, and culture in the communities along the Camino Real Campeche. A cross-sectional, multidimensional analysis of perceived social impact was conducted using a non-experimental, mixed-methods design. Two hundred and four residents were surveyed, including ejido members, project workers, and merchants. The results show that health experienced the greatest positive impact [36.8%], due to improvements in access to medicine, medical consultations, and other resources. Education registered 24.0%, related to the purchase of school supplies, uniforms, breakfasts, and other items. Culture accounted for 19.6%, attributed to the dissemination of information and campaigns related to the train. The study concludes that the construction of the Maya Train in the communities along the Camino Real Campeche had a positive social impact during the analyzed period, with effects varying across different dimensions. Longitudinal and comparative studies between communities are recommended.

#### Resumen

Este estudio analiza el impacto percibido del proyecto Tren Maya en las dimensiones de educación, salud y cultura de las comunidades del Camino Real Campeche. Se realizó un estudio de análisis multidimensional del impacto social percibido de corte transversal, con diseño no experimental y enfoque mixto. Se encuestaron a 204 habitantes: a ejidatarios, trabajadores del proyecto, comerciantes, etc. Los resultados muestran que la salud concentró el mayor impacto positivo [36.8%], debido a mejoras en la adquisición de medicinas, consultas, entre otros. La educación registró 24.0% relacionada con la compra de útiles escolares, uniformes, desayunos, etc. La cultura con 19.6% atribuidas a la difusión y campañas relacionadas con el tren. Se concluye que la construcción del Tren Maya en las comunidades del Camino Real Campeche tuvo un impacto social positivo en el periodo analizado, con efectos diferenciados por dimensión. Se recomiendan estudios longitudinales y comparativos entre localidades.



Schools, Hospitals, Income

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## Introduction

The Maya Train is a passenger and freight transportation project [Rocha & Jimenez, 2021], which is the largest infrastructure, socio-economic development and tourism initiative of Mexico's 2018-2024 administration [Diario Oficial de la Federación [DOF], 2019]; Andrés Manuel López Obrador's administration [Salgado, 2026]. The train will have a route of 1,525 kilometers, crossing the states of Chiapas, Tabasco, Campeche, Yucatan and Quintana Roo and will connect the most important cities and tourist destinations of the Yucatan Peninsula. A significant portion of its route will follow pre-existing rights-of-way, such as railways, roads and power lines [DOF, 2019].

Since 1950, tourism has been a rapidly growing economic sector worldwide [Medina & Hernández, 2026], despite the various problems it can cause [Pérez, 2021, cited in Camacho et al., 2026]. The project is focused on increasing the economic impact of tourism in the Yucatán Peninsula by generating employment, promoting sustainable development, protecting the environment through the reduction of illegal activities such as logging and wildlife trafficking. It also seeks to strengthen land-use planning and ensure that residents benefit from the project. Rights-of-way not yet owned will be managed through agreements with the landowners, while beneficial arrangements will be pursued in areas where federally owned roads are occupied. In addition, the acceptance of local communities and Indigenous peoples will be sought through consultation processes [DOF, 2019]. Overall, the Maya Train seeks to generate significant economic, social, environmental, and cultural benefits for the communities located along its route.

The Maya Train route is divided into seven sections. Section 2 extends from the municipality of Escárcega to Calkiní, covering a distance of approximately 235 kilometers [Fondo Nacional de Fomento al Turismo [FONATUR], 2022] in the state of Campeche. Part of this section runs along the Camino Real Campeche, passing through the municipalities of Calkiní, Dzitbalché, Hecelchakán, and Tenabo. These municipalities include communities such as Nunkiní, Bécal, and Pomuch, among others [Chi et al., 2022]. Consequently, the projected benefits of the Maya Train are expected to reach these communities.

## Education

Education is defined as a social process aimed at the holistic development of individuals, encompassing the acquisition and construction of knowledge, the development of skills, strategies, and attitudes, as well as ethical and value-based dimensions [De Vincezi & Tedesco, 2009]. Through education, individuals gain and understanding of their rights and responsibilities toward their family, society, and nation [Sokolova & Sorokina, 2022]. Education is a fundamental right, and therefore, should be provided as a public service accessible to all [Restrepo-Tamayo, 2020, cited in Cardozo & Henao, 2022], as access to quality education enables individuals to break cycles of poverty [Naciones Unidas, 2022].

Education directly promotes economic growth by improving workforce skills and productivity. [Ali, 2024]. This process strengthens human capital and enhances its productive and income-generating capacity.

Higher levels of education lead to greater efficiency in the production of goods, representing the development of human capital. In turn, this development increases both productive value of human capital, as well as its income value, fostering economic growth and improving individuals' purchasing power. Additionally, the reading and interpretive skills of individuals with higher incomes contribute to greater social recognition, increased freedom, and overall well-being [Delgado & Cisneros-Cohernour, 2017].

According to Ali [2024], countries with higher income or greater per capita income tend to experience faster economic development and better living standards when education levels are higher. However, data from the 2020 Population and Housing Census [extended questionnaire] conducted by the Instituto Nacional de Estadística y Geografía [INEGI] [2021, cited in the Secretaría de Economía, 2021] reveal that in the municipality of Calkiní, the highest level of education completed by individuals aged 15 and over is secondary school [27.1%], followed by primary school [24.0%] and high school or general baccalaureate education [17.2%]. In Hecelchakán, secondary education also predominates [31.2%], followed by primary education [20.9%] and bachelor's degrees [17.1%].

Similarly, in Tenabo, the highest level of education attained is secondary school [31.7%], followed by high school [26.6%] and primary school [23.9%]. These data indicate that basic education levels predominate in the municipalities along the Camino Real Campeche, which may be interpreted as a lack of preparation to meet current labor market demands.

In this context, FONATUR [2019, cited in Pérez, 2022] notes that the Maya Train will improve access to educational institutions by enhancing connectivity between cities. Furthermore, Vásquez [2021, cited in Espinosa et al., 2023] reports that the project has provided schools with internet access, sanitary facilities, and other amenities. According to ONU-Habitat [2020] by 2030, the Maya Train is expected to increase the average years of schooling by two years in municipalities with stations along its route. This increase in educational attainment among individuals aged 15 and over in the communities to enhance training opportunities, expand access to the labor market, and stimulate economic, tourism, and productive activities by two year. Therefore, the Maya Train is expected to generate positive educational impact for the local population.

## Health

Health refers to a state of complete physical, mental, and social well-being, rather than merely the absence of disease or infirmity [World Health Organization [WHO], n.d., cited in Canova et al., 2023]. It is an essential component of individuals' lives, enabling them to perform and sustain daily activities [Sepúlveda et al., 2020]. Health contributes to improve worker productivity, increasing market value and income [Jiang, 2021] as healthy individuals are able to participate more efficiently in economic activities [Riaz et al., 2024]. Consequently, health plays a crucial role in individual and collective well-being, as well as in economic and social development [Castro, 2018].

Thus, as Reshi & Sudha [2022, cited in Shobichah & Widya, 2023] state, healthcare is an important aspect of social well-being, and ensuring equitable access to health services is fundamental to achieving better health outcomes and improving the quality of life in communities.

However, data from the Consejo Nacional de Evaluación de la Política de Desarrollo Social [CONEVAL] [n.d.] indicate that in 2020, 19.5% [12,855] of the population in Calkiní lacked access to health services, compared to 15.2% [5,708] in Hecelchakán and 21.5% [2,602] in Tenabo. These figures suggest that a significant portion of the population remains vulnerable to illness, accidents, and other health-related risks.

In response to this situation, the Maya Train aims to improve access to specialized hospitals by strengthening connectivity between cities [FONATUR, 2019, cited in Pérez, 2022]. Furthermore, the project's Comprehensive Development Plan includes 13 health infrastructure initiatives, such as the construction, remodeling and equipping of clinics and medical facilities [FONATUR, 2023]. As a result, the project is expected to have a positive impact on health conditions in the communities of Camino Real Campeche.

## Culture

Culture encompasses the intellectual, religious, and emotional traits that shape ways of life, life, values, traditions, and rights [Tayo et al., 2025], identifying specific social groups [UNESCO, 1982, cited in Suárez et al., 2021] and territories [Boal, 2021]. These elements constitute sociocultural heritage and influence ways of thinking and acting [El Amri & Kobiyh, 2022] serving - together with education - as a tool for growth and development [Bassante et al., 2022].

Cultural aspects play a key role in development by generation resources capable of meeting diverse social needs [El Amri & Kobiyh, 2022]. According to Bassante et al. [2022], culture provides meaning to human life and encompasses multiple dimensions, including ethnicity, social class, customs, traditions, behavioral norms, worldviews, and language. According to the 2020 Population and Housing Census conducted by INEGI [2021, cited in the Secretaría de Economía, 2021] 36,373 individuals aged three and older in Camino Real Campeche speak an indigenous language, representing 35.5% of the total population. Of these, 99.6% speak Maya, while the remaining percentage corresponds to languages such as Zapotec, Tzeltal, Ch'ol, Nahuatl, Chontal, Tlapanec, Mixtec, and others unspecified language.

The significant gap between Indigenous language speakers and non-speakers may be interpreted as a risk of cultural loss, particularly with respect to language preservation.

In this regard, Almeyda et al. [2023] note that three objectives of the Maya Train project are directly related to cultural heritage: 1] protecting and restoring natural protected areas, 2] promoting and preserving Indigenous cultures, and 3] strengthening territorial planning across the peninsula. Although Mexico ranks sixth among countries with the most awards in this category, boasting 33 sites recognized as World Heritage Sites, six of which are in the south-southeast. On the other hand, according to Morales et al. [2020], in the state of Campeche, the Maya Train is projected to increase the number of indigenous language speakers by 43,900 people in absolute numbers, but in relative terms, it will decrease by 0.9 percentage points, placing it at 9.2% by 2030.

### Problem

The social conditions described above reveal significant challenges in education, health, and culture among the inhabitants of Camino Real Campeche. In terms of education, insufficient preparation limits the population's ability to meet current labor market demands, which increasingly require secondary education, digital skills, higher education or postgraduate qualifications. This situation restricts access to formal and well-paid employment opportunities. In the health sector, limited access to healthcare services increases vulnerability to diseases and emergencies, as evidenced during crises such as the COVID-19 pandemic. With respect to culture, the declining proportion of Indigenous language speakers suggests a potential risk of cultural erosion, particularly in linguistic heritage.

Although, the Maya Train aims to improve living conditions and generate multiple benefits, its specific impacts on the communities of Camino Real Campeche remain unclear. Therefore, this study is essential, as it examines the effects of the project on education, health, and culture in the region. The findings may also serve as a reference for the planning and implementation of similar development projects in the future which will benefit people in these and other areas.

Accordingly, this research aims to analyze the impact of the construction of the Maya Train education, health, and culture in the communities of Camino Real Campeche.

### Methodology

This research followed a descriptive and field-based research design, as it sought to document all the information obtained, as well as additional insights and contextual details provided by the respondents in their own environments. A non-experimental design was employed, as no variables were manipulated during the research process. The study was also cross-sectional, since data were collected only once in 2024, with no intention of repeating the measurement using the same sample. A mixed-methods approach was adopted due to its advantages in integrating data collection, analysis, and interpretation of the statistically processed results.

For sample selection, a non-probability convenience sampling method was used, owing to time and resource constraints.

The population under study consisted of 115,019 inhabitants of Camino Real Campeche, according to 2023 population projections from the Consejo Nacional de Población [CONAPO] [n.d., cited in the [Secretaría de Bienestar, 2024](#)].

This population is distributed across communities such as Nunkiní, Calkiní, Bécál and Tepakán in the municipality of Calkiní; Dzitbalché and Bacabchén belonging to the municipality of Dzitbalché; Pocboc, Santa Cruz Hecelchakán, Hecelchakán and Pomuch belonging to the municipality of Hecelchakán; and Tenabo in the municipality of the same name.

The sample size was calculated using the formula proposed by Murray & Larry [2005] [1]:

$$n = \frac{Z_a^2 * N * p * q}{i^2 * (N - 1) + Z_a^2 * p * q} \quad [1]$$

Where:

n = sample size

N = population size = 115,019

Z = value corresponding to the Gaussian distribution  $Z_{\alpha=0.05} = 1.96$  and  $Z_{\alpha=0.01} = 2.58$

p = expected prevalence of the parameter to be evaluated = 0.05

$$q = 1 - p = 1 - 0.05 = 0.95$$

$$i = \text{expected error} = 0.03$$

Replacing the values in the previous formula [1], we obtain [2]:

$$n = \frac{1.96^2 * 115019 * 0.05 * 0.95}{0.03^2 * (115019 - 1) + 1.96^2 * 0.05 * 0.95} \quad [2]$$

$$= 202.3960947$$

$$= 203$$

A combined methodological approach was applied, drawing on previous studies such as those by Tapia [2017] and Toctaguano [2019], which analyze the socioeconomic impacts of trains and railway projects. The variables considered were education, health, and culture. The survey technique was used, employing a structured questionnaire as the data collection instrument. The questionnaire consisted of 22 items divided into two sections: the first section collected general demographic information [e.g., age, municipality, community, occupation], while the second section focused on education, health, and culture aspects.

The questionnaire was administered using Microsoft Forms and was completed by 204 residents from communities located in the municipalities of Calkiní [38.2%], Dzitbalché [19.6%], Hecelchakán [31.4%], and Tenabo [10.8%], located along the Camino Real Campeche. Respondents primarily included ejido members, Maya Train workers, merchants, and other community members.

For data analysis, the Excel spreadsheet, generated directly from Microsoft Forms was initially used as the database. Subsequently, the data was processed using the SPSS statistical program.

## Results

**Demographics.** The demographic distribution of participants reflects a diverse representation of the local population. Among respondents, 31.4% belonged to the 61-70 age group, followed by 17.6% aged 51-60 and 15.7% aged 41-50. The remaining percentage comprised individuals aged 18-30, 31-40, 71-80 and over 80 years.

**Education.** With respect to educational attainment, basic education levels predominated. Approximately 20.1% of respondents reported incomplete primary education, while 17.2% had completed secondary education. Additionally, 16.2% had completed primary education, and an equal proportion [16.2%] reported holding a bachelor's degree or higher, making these the most prevalent educational levels. The remaining respondents reported completed high school or preparatory education, incomplete secondary education, incomplete high school or preparatory education, incomplete higher education, or no formal education.

**Occupation.** Regarding occupational activities, 51.0% of participants were engaged in agriculture, highlighting the central role of farming in the regional economy. Homemakers accounted for 9.8% of respondents; this proportion reflects the inclusion of partners of Maya Train project workers who experience the project's indirect social impacts. Additionally, 9.3% worked as construction workers or laborers, followed by 4.4% who were merchants. The remaining respondents were employed in diverse occupations, including professionals, teachers, employees, assistants, mechanics, motorcycle taxi drivers, taxi drivers, tailors, retirees, and others.

## Education

In the education dimension, 24.0% of respondents in Camino Real Campeche report experiencing improvements. These improvements were attributed to benefits such as compensation received by ejido members affected by land use for project construction, increased income from employment and commercial activities, and job creation directly associated with the Maya Train project. These benefits enabled families to enroll in or continue educational activities, improving access to school supplies, uniforms, and daily expenses such as food. Among respondents who reported educational benefits [24.0%], 32.7% resided in Calkiní, 30.6% in Dzitbalché, 24.5% in Hecelchakán, and 12.2% in Tenabo.

The finding that 24.0% of participants experienced income-related or educational improvements suggests a link between the Maya Train project and educational support.

This result is significant as it highlights the project's role in enhancing educational and social conditions within these communities. Conversely, analysis of 76.0% who reported no educational improvements provides important context. Some respondents indicated that they already possessed a certain level of education or that their children and relatives were already employed, suggesting that the project's educational impact may vary according to individual and household circumstances.

Another aspect examined within the educational domain was the creation of new educational institutions associated with the Maya Train project.

The finding that 94.1% of communities did not report the establishment of new educational institutions underscores a notable gap in institutional development. However, the 5.9% who reported institutional expansion, particularly the construction of a university in the municipal seat of Dzitbalché, highlights localized variations in project impact.

Overall, the analysis reveals the complexity of the Maya Train's effects on education and institutional development. While improvements in education conditions suggest a positive contribution to social development, the limited expansion of educational infrastructure indicates opportunities for further institutional strengthening.

Recognizing individual social factors - such as prior educational attainment and employment status - adds depth to the interpretation of these findings.

Regarding the overall social impact of the Maya Train's construction in Camino Real Campeche, 76.0% of respondents perceived it as positive, indicating that even when educational benefits were not directly observed, improvements in other social dimensions influenced this assessment.

Conversely, 1.5% of respondents reported no perceived social impact, despite having experienced educational benefits [see table 1].

## Box 1

**Table 1**

Social impact on education

		Social impact			Total
		Positive	Neutral	Negative	
*	Yeah	46	3	0	<b>49</b>
	%	22.5%	1.5%	0.0%	<b>24.0%</b>
	No	109	42	4	<b>155</b>
	%	53.4%	20.6%	2.0%	<b>76.0%</b>
<b>Total</b>		<b>155</b>	<b>45</b>	<b>4</b>	<b>204</b>
<b>%</b>		<b>76.0%</b>	<b>22.1%</b>	<b>2.0%</b>	<b>100%</b>

\* *Improvements in education*

Source: Own elaboration

## Health

In relation to health, 36.8% of the surveyed population reported improvements in access to healthcare services. These benefits are attributed to opportunities generated by the Maya Train project, such as compensation provided to ejido members for land used in project construction, increased income resulting from job creation and commercial activities, and employment generated directly by the project. These factors facilitated greater access to medications, private medical consultations, and diagnostic tests. Among respondents who improved access [36.8%] 32.0% reside in the municipality of Calkiní, 14.7% in Dzitbalché, 41.3% in Hecelchakán, and 12.0% in Tenabo.

On the other hand, 62.2% of respondents indicated that their access to healthcare services remained unchanged, noting that they and their families had already been actively seeking healthcare prior to the implementation of the project and that they had not experienced a significant increase in illness since then. Additionally, 1.0% reported a deterioration in access to healthcare services.

Regarding perceived improvements in healthcare infrastructure and public health services, 13.7% of respondents reported improvements, particularly in relation to renovations of existing facilities. On the other hand, 83.3% perceived no improvements, a perception that may be influenced by the fact that some respondents make limited use of public healthcare services, suggesting a generalized community perspective rather than direct personal experience. Meanwhile, 3.0% expressed a negative perception, indicating a deterioration in healthcare services.

Regarding the expansion of health services, 12.3% of respondents perceived a significant expansion, indicating that a segment of the population has observed positive changes in service provision. However, 87.7% disagreed, arguing that the absence of notable improvements makes the likelihood of service expansion minimal. Concerning the construction of new clinics or health centers, 3.4% of respondents reported on the creation of new facilities, which may be explained by the relocation or reorganization of hospitals in certain communities. Nevertheless, 96.6% stated that no new facilities had been established.

Finally, although 76.0% of respondents reported an overall positive social impact from the Maya Train project, not all of them experienced improvements in healthcare access. While 36.8% reported improved access to healthcare services, 2.0% within this group indicated that these improvements were insufficient to conclude that the project generated a social impact, stating that they perceived no meaningful change [see table 2].

## Box 2

**Table 2**

Social impact on health

		Social impact			Total
		Positive	Neutral	Negative	
*	It improved	71	4	0	75
	%	34.8%	2.0%	0.0%	36.8%
	It's still the same	84	40	3	127
	%	41.2%	19.6%	1.5%	62.3%
	It got worse	0	1	1	2
	%	0.0%	0.5%	0.5%	1.0%
<b>Total</b>		<b>155</b>	<b>45</b>	<b>4</b>	<b>204</b>
<b>%</b>		<b>76.0%</b>	<b>22.1%</b>	<b>2.0%</b>	<b>100%</b>

\* Access to health services

Source: Own elaboration

## Culture

Regarding culture, 19.6% of respondents indicated that the Maya Train has had a positive impact on cultural preservation and promotion, primarily through project-related campaigns, highlighting a potential opportunity for cultural development. Of this 19.6%, 37.5% are from the municipality of Calkiní, 22.5% in Dzitbalché, 30.0% from Hecelchakán, and 10.0% from Tenabo.

Conversely, 74.5% of respondents reported that the Maya Train has had no cultural impact, which constitutes a significant finding. This perception suggests that, to date, the project has not adversely affected existing cultural practices. However, it is important to note that the project has not yet reached full operational capacity; therefore, these perceptions may evolve over time. The remaining 5.9% of respondents perceived a negative cultural impact, attributing it to the arrival of people from other regions, which provides a relevant perspective on potential cultural tensions.

In relation to the implementation of cultural initiatives, 18.6% of respondents reported that cultural projects associated with the Maya Train have been carried out, particularly activities and handicrafts, indicated a positive cultural effect. Nevertheless, 81.4% reported the absence of such initiatives highlighting a missed opportunity for cultural promotion and community engagement.

As previously noted, 76.0% of respondents perceived the construction of the Maya Train as having an overall positive social impact. Although in this case, this perception is not uniformly associated with cultural outcomes. Some respondents who acknowledged positive cultural effects did not consider them sufficient to define an overall social impact, while others perceived a general social benefit despite reporting no specific cultural impact. This variation underscores the diversity of individual and community perspectives regarding the project's cultural implications [see table 3].

## Box 3

**Table 3**

Social impact on culture

		Social impact			Total
		Positive	Neutral	Negative	
*	Positive	35	5	0	40
	%	17.2%	2.5%	0.0%	19.6%
	No impact	112	37	3	152
	%	54.9%	18.1%	1.5%	74.5%
	Negative	8	3	1	12
	%	3.9%	1.5%	0.5%	5.9%
<b>Total</b>		<b>155</b>	<b>45</b>	<b>4</b>	<b>204</b>
<b>%</b>		<b>76.0%</b>	<b>22.1%</b>	<b>2.0%</b>	<b>100%</b>

\* Preservation and promotion of culture

Source: Own elaboration

## Discussion

The analysis of the impact of the Maya Train construction on education in the communities along Camino Real Campeche revealed that 24.0% of respondents reported improvements in conditions, such as access to school supplies, meals, and other educational necessities. According to Ali [2024], ensuring access to education - particularly quality education - provides individuals with essential skills that enhance employment opportunities and earning potential. In this sense, the Maya Train's contribution to educational access represents a meaningful input to personal, professional, and social development within these communities.

Regarding health, the findings indicate that 36.8% of respondents perceived improvements in access to healthcare services, including the acquisition of medicines, medical examinations and consultations. These improvements were largely associated with increased income derived from compensation to Ejido paid to Ejido members, employment opportunities, and higher sales generated by the project. This finding is consistent with Anwar et al. [2023, cited in De León & Reynoso-González, 2024], who argue that income growth enhances individuals' capacity to invest in healthcare, both through direct treatment and preventive health-related activities.

Furthermore, García-Rodríguez et al. [2017], emphasize that health constitutes a public good of fundamental importance, as it is a key determinant of societal well-being. Together with education, health forms a core capability that supports productivity, economic growth, and human development. Consequently, projects that indirectly or directly generate benefits in these sectors play a critical role in improving community welfare.

Therefore, although the Maya Train was not specifically designed as a health or education initiative, its indirect contributions to these sectors have the potential to translate into improved living conditions for residents along the Camino Real Campeche. As Sen [2000, cited in García-Rodríguez et al., 2017], from a human development perspective, health and education represent basic capabilities that give intrinsic value to human life.

In the cultural aspect, Hernández [2011, cited in Salazar, 2019] argues that "it is through cultural development that human beings are able to unleash their full creative potential and achieve complete cultural development, using this human potential for their own benefit and that of the community. Cultural development promotes social action through culture as the foundation of development." Thus, in this context, the finding that 19.6% of respondents perceived a positive cultural impact - attributed mainly to promotional campaigns associated with the Maya Train - suggests that the project has contributed to cultural visibility and preservation. These cultural expressions play a central role in defining and distinguishing the communities along Camino Real Campeche. However, as emphasized throughout this research, the project remains under construction, and its full cultural impacts have yet to materialize.

## Conclusions

The construction of the Tren Maya project has generated a generally positive social impact on the communities of Camino Real Campeche across the three dimensions analyzed: education, health and culture. More than three-quarters of respondents perceived positive effects distributed across these areas.

Among the three dimensions, health exhibited the strongest positive impact, due to improved access to medical services and products, such as medicines, consultations, and diagnostic tests. Education ranked second, as the economic benefits associated with the project facilitated access to school supplies, educational materials, and daily expenses related to schooling. These benefits were largely derived from compensation paid to ejido members for land use, increased income from employment and commercial activities, and job creation generated by the project. In contrast, culture showed the lowest level of perceived positive impact, with only a small proportion of respondents identifying benefits, mainly through promotional and cultural awareness campaigns.

The analysis of education, health, and culture provides insight into the social conditions experienced by the inhabitants of Camino Real Campeche and highlights the importance of development projects that contribute to community well-being.

Overall, the findings indicate that the construction of the Maya Train has contributed to improving the living conditions of the inhabitants of Camino Real Campeche, despite variations in the magnitude and distribution of its impacts.

### Declarations

### Conflict of interest

The authors declare no conflict of interest. They have no known competing financial interests or personal relationships that could have influenced the work reported in this article.

### Authors' contribution

*Cruz-Doriano, Sacramento*: Contributed to conceptualization, formal analysis, methodology, project administration, supervision, validation and writing - review & editing.

*Chi-Chan, María Teresita de Jesús*: Contributed to conceptualization, methodology, project administration, supervision and writing - review & editing.

*Mex-Naal, Pedro Marcelo*: Contributed to data curation, formal analysis, investigation, resources, visualization and writing - original draft.

*Ávila-Aguilar, Andrés Joel*: Contributed to resources.

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Data are available on request.

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### Abbreviations

CONAPO	Consejo Nacional de Población
CONEVAL	Consejo Nacional de Evaluación de la Política de Desarrollo Social
DOF	Diario Oficial de la Federación

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FONATUR	Fondo Nacional de Fomento al Turismo
INEGI	Instituto Nacional de Estadística y Geografía
WHO	World Health Organization

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#### Basics

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