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Understanding the Social Dimension of Sustainable Tourism in Theory and Practice: A Review of Two Road Infrastructure Projects in Mexico from a Business and Human Rights Lens

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Abstract

While it has been more than 30 years since sustainability appeared in the development agenda, it remains a fashionable concept with an underdeveloped social dimension and no common understanding. In infrastructure, social sustainability is either neglected or limited to positive social impacts related to poverty indexes, disregarding negative social impacts linked to prevention and redress of business-related human rights abuses on workers, supply chains and communities. This article proposes a novel angle to understand social sustainability in infrastructure and integrates sustainability and human rights in the context of road infrastructure developed by businesses and contracted by the State in Mexico.

Introduction

Sustainability appeared in the international development agenda in 1987, when the Brundtland report framed it as the ability to meet present needs without compromising future generations' ability to fulfil their own needs [1, 2]. It was considered an environmental concern based on 'ecological principles and resource efficiency' [3-5]. The 1992 Earth Summit and 2002 World Summit for Sustainable Development advanced sustainable development by presenting its application in infrastructure through the Agenda 21 for Sustainable Construction in Developing Countries [6]. Further on, sustainable infrastructure was acknowledged in the sustainable development goal (SDG) 9 of the 2030 Agenda adopted in 2015, and it's directly or indirectly linked to delivery of 72% of the 17 SDGs [7, 8].

Infrastructure is a core pillar of development that as of the 1980s, together with the advent of sustainability, involved an increasing participation of business. The financial and technical limitations of States to cover infrastructure gaps, alongside with neoliberal principles embedded in the Washington Consensus, constrained the intervention and regulation by Latin American States and encouraged participation of 'more efficient' and 'financially capable' private actors in the design, construction, operation and maintenance of core infrastructure like transport [9-14].

In Mexico, transport infrastructure is developed through public procurement of two main contracting models. Under traditional public works scheme, the State purchases services and works from business suppliers to accomplish transport needs, while assuming all related risks. In contrast, public-private partnership (PPP) schemes allow the State to purchase services from businesses, while transferring to them relevant risks and investment responsibilities. Their investment return is linked to effective management and performance [13].

Sustainable infrastructure is defined as the one 'planned, designed, constructed, operated and decommissioned in a manner that ensures economic and financial, social, environmental (including climate resilience) and institutional sustainability over the entire life cycle of the project' [9, 15]. Infrastructure contracted by States and developed by businesses can impact economies, environment and societies positively. By contributing to one-tenth of the global GDP and creating 7% of the world's employment, it can boost economies [16]. By mitigating carbon emissions and promoting efficient use of resources, infrastructure can protect the environment and address climate change. By providing essential services like energy, water and sanitation, transport and telecommunications, it can enhance people's living standards and alleviate poverty.

But infrastructure can also generate negative social impacts on workers, supply chains and communities' human rights during all phases of the project's lifecycle. Yet, negative impacts have been given little attention in the understanding of social sustainability [17-20]. Workers in supply chains are exposed to inadequate and unfair working conditions, including child and forced labour [21-27]. Communities experience involuntary displacement, land grabbing, harassment and killing of their leaders and defenders when they oppose projects, interference with their access to natural resources, and violation to free, prior and informed indigenous consultation [28-33].

As a response to business-related abuses, including those deriving from large-infrastructure projects, the UN Human Rights Council adopted in 2011 the Guiding Principles on Business and Human Rights: Implementing the United Nations "Protect, Respect and Remedy" (UNGPs) [34]. This framework sets a global standard of expected behaviour for States and enterprises. The UNGPs establish that States have a duty to protect human rights from businesses activities. More specifically, when States contract services and works, they have a purchasing power that can be leveraged over private suppliers to set high standards of compliance and create a demand for sustainability in markets [35, 36]. Businesses have the responsibility to respect human rights throughout their operations, which entails preventing negative impacts on human rights that their activities can cause or contribute to, undertaking human rights due diligence, and redressing negative impacts through operational grievance mechanisms.

If human rights are denied, sustainable infrastructure and development won't be possible. While more than 30 years have passed since sustainability appeared in the international development agenda,

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its understanding in infrastructure projects continues to be unclear, focused only on environmental concerns without addressing the social dimension in a meaningful way, or considering it in a very limited fashion. The 'social' is the stagnant and underdeveloped dimension of sustainability. Whenever considered, social sustainability focuses on social positive impacts, but excludes negative social impacts linked to the prevention and redress of business-related human rights abuses during the planning, construction and operation of infrastructure projects, which jeopardizes the sustainable outcome.

The 2030 Agenda and the UNGPs have developed separately, and little attention has been given to their integration through sustainable infrastructure [37]. Through a literature review and a qualitative analysis of two case studies of road infrastructure projects in Mexico, Paso-Expres and Necaxa Avila Camacho, this paper explores how is the social dimension of sustainability understood in theory and applied in practice in the context of road infrastructure development?

Literature review

Understanding of socially sustainable infrastructure in theory

Sustainability is a popular concept that gained attention in the development agenda in different sectors, including construction of infrastructure. It appeared as a result of climate change. However, it's acknowledged that sustainability is no longer just an environmental concern, but is underpinned by economic and social dimensions [7]. This three-dimension is mirrored into profits, people, and planet [38, 39]. Yet, the application of sustainability in infrastructure is problematic.

First, because there is no common understanding or standard definition for sustainability [40]. Critics highlight that the 'fuzziness' in this fashionable word 'allows anything to be claimed as sustainable' and 'allows business and development interests (and their government supporters) to claim they are in favour of sustainable development when actually they are the perpetrators of unsustainability', which has undervalued the concept [41]. In the construction sector, determining whether an infrastructure project is sustainable, and how and when to apply and weigh each of its components is difficult [39], and measuring non-economic aspects of sustainability is often complex.

Second, sustainability is understood in the context of infrastructure as a concept only connected with environmental degradation and climate change, disregarding the social dimension [42-45]. 'Green' infrastructure is frequently used interchangeably with 'sustainable' infrastructure [20, 44, 46-49]. Yet, they are different concepts with different implications, particularly because green infrastructure is socially blind.

Generally, the common focus of 'sustainable' infrastructure is on energy consumption, including fossil fuel utilisation in the case of transport infrastructure [50, 51]. Kibert addresses sustainability in the extent to which construction projects reduce water and energy use, as well as emissions underpinned by natural and industrial ecology [52]. For example, Green Building Systems' 'sustainable' goals are based on emission and water reduction, environmental protection, energy efficiency, environmentally harmful material elimination and resource conservation; but there are no social considerations.

'Green' infrastructure is environmentally sustainable but socially unsustainable because society and human rights are neglected. Only 7.5% of civil engineers in the US considered social and cultural factors as components of 'sustainable' construction. Similarly, interviewees in Cambodia failed to establish the correlation between social drivers and sustainable construction [2]. Green infrastructure reflects a disarticulation of the three dimensions of sustainability in this sector. The latter are understood as independent variables, rather than co-dependent and integrated elements, which hampers a truly sustainable outcome.

Third, although the social dimension is broadly accepted as a core dimension of sustainability, its meaning hasn't been defined with clarity [53]. Social sustainability is the 'least developed dimension of sustainability' and little attention has been given to develop a broader framework [54-57]. Social sustainability's dynamic and changing features in time and place pose challenges to understand, address and implement it in practice [53, 58, 59].

In the context of infrastructure, social sustainability is simply overlooked or considered in a limited fashion. Constrained to positive social impacts related to poverty alleviation, it disregards negative social impacts linked to prevention and redress of business-related human rights abuses [2]. Indeed, current understanding of social sustainable infrastructure has no human rights approach.

Variables of social sustainability are linked to poverty indexes of wellbeing, such as enhancing or improving employment (including job creation and fair and decent working conditions) [19, 60-65]; market inclusion of certain groups like aboriginal-owned and black-owned businesses [60, 62, 57]; and local supply [66, 67]. Job creation and inclusion has been used by governments through public procurement to reinforce law provisions on human rights or go beyond them, demanding private suppliers to take actions that otherwise they wouldn't take [68]. The origin of these social procurement measures is found in the US and the UK in the 19th century, to secure working hours and fair wages. Later on, they were used to favour labour conditions and tackle unemployment, as well as racial, gender, and ethnic discrimination [62]. Notwithstanding, the social dimension of sustainable infrastructure goes beyond labour standards and job creation.

Other social sustainable variables are related to enhancing education, health [3, 19, 39, 57, 61, 69, 70] and living standards [8, 55]. Improving living standards through road infrastructure entails not only the construction of a new or better communication path, but also physical and economical accessibility to the transport service for everyone, including the poor, disabled and women [53, 54, 71, 72].

Few authors acknowledge that 'social sustainability' involves social negative impacts [53, 73]. Yet, human rights are not conceptualised as an impact [74]. While consideration to infrastructure project's positive social impacts is important, it's not enough to achieve a socially sustainable result. It will be hard to achieve sustainable infrastructure in the absence of the recognition that sustainability needs to be a core part of businesses activities and participation in planning, constructing and operating infrastructure.

Human rights need to be respected by business contractors in all activities and value chains to obtain sustainable outcomes [75]. In the specific context of public procurement to develop infrastructure, they should at least have a responsible business conduct in all activities that derive from the contract. A single consideration of the positive social impacts –poverty-related– alongside denial of the negative social impacts can lead to unsustainable development pathways [57, 76].

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Yet, literature hasn't integrated social sustainability with human rights. The UNGPs shed light on why, who, how and when negative impacts on human rights should be addressed in socially sustainable infrastructure delivered by business. This framework further establishes an additional burden for States to protect human rights abuses from businesses with which they have a contractual relationship or a State-business nexus, including procurement of works to develop infrastructure. However, the UNGPs have had little impact in developing countries that require these rules to be enforced the most [77].

Businesses should prevent negative human rights impacts through human rights due diligence. The latter involves four key steps, involving 1) assessment and identification of human rights adverse impacts that corporate activities may cause or contribute to; 2) adoption of appropriate measures to address impact assessment findings; 3) effective follow-up of implemented measures; 4) and communication of how impacts were addressed [78]. Furthermore, businesses should redress human rights negative impacts through implementation of operational-level grievance mechanisms administered by business and cooperation of grievance mechanisms administered by the State. The UNGPs establish eight core features that such mechanisms should comply with, which include to be legitimate, accessible, predictable, equitable, transparent, rights-compatible, a source of continuous learning and based on engagement and dialogue. Yet, the ways in which responsible business conduct can be implemented and enforced by States throughout development of infrastructure, which often occurs with great participation of businesses, hasn't been comprehensively developed in theory and practice.

Research design

Research methodology

Through a literature review, this paper frames how the sustainable component of infrastructure is understood in theory and applied in practice and brings attention to the existing human rights gap in the social dimension of sustainability through the study of two case studies of road infrastructure in Mexico: Necaxa-Avila Camacho and Paso-Expres.

These cases were selected because both respond to road transport infrastructure, developed in Mexico by Spanish and Mexican companies, with similar cost, procured by the Mexican Ministry of Communication and Transport (SCT). Yet, they have opposite social outcomes in terms of sustainability.

Alongside with a secondary sources analysis of both project's contracts, concessions, environmental impact assessment (EIA) and reports, a further qualitative analysis is undertaken through an 'elite interviewing' in Spanish to eight relevant stakeholders. The selection criteria are based on the interviewees' involvement in the development of the road projects or their relevant knowledge of the topic. Interviewees 1-4 were related to Necaxa-Avila Camacho and 5-8 to Paso-Expres. They are independent experts or people that work in business, government or international development agencies. This approach is undertaken through open-ended questions to better understand, from the elite's views and perspectives, how the social dimension of sustainability was understood and applied in the construction of both projects and the role that human rights play in such understanding.

Research limitations

The design has limitations. The findings are limited to the perception of a low number of interviewees, to a certain type of transport infrastructure, and to the social dimension of sustainability. The environmental dimension is outside the scope of this research. In addition to interviews, the analysis is based on secondary sources. Therefore, it's constrained to individual perspectives, and important information could've been disregarded or poorly addressed. Although only two case studies are addressed, the results can be generalized to other road transport infrastructure projects in Mexico, but they might be also too ambitious for small road projects.

Finally, this research takes the UNGPs as the basis and reference of the analysis. It identifies compatibility and alignment of State and business' actions, measures and plans with what the UNGPs call for, regardless of the terminology that is used. Particularly because one of the analysed projects started and ended before the adoption of the UNGPs, so this represents another limitation to the research. Therefore, projects might include some business and human rights considerations such as operational level grievance mechanisms or right to access water without using such terms. In that sense, the author identifies these concepts and provides a business and human rights language.

Research results

Road projects overview

The highway Nuevo Necaxa-Avila Camacho (Necaxa) consisted in the construction of 36.6 km of road connecting Puebla and Veracruz involving four lane roads, six double tunnels and 12 bridges as seen in Figures 1 and 2. It's a road section of a larger project connecting Mexico City with Tuxpan, one of the main ports of the

Figure 1: Highway Nuevo Necaxa-Avila Camacho.

Figure 2: Highway Nuevo Necaxa-Avila Camacho.

country. It aimed to boost trade and reduce travel time from 5.3 to 2.5 hours [79].

The project involved positive and negative considerations to social sustainability and won the Infrastructure 360º award given by the Inter-American Development Bank in coordination with Harvard University to outstanding sustainability practices in infrastructure investments in the region. Necaxa is a 75 million dollars project contracted by the Ministry of Communications and Transport (SCT) through a PPP scheme with a private consortium constituted by ICA, a Mexican company, and FCC Construction, a Spanish company. The PPP scheme involved transferring risks to the developers and private financing of the project. The works started after July 2007, years before the adoption of the UNGPs, and finished in April 2012 (Figures 1 and 2).

On the other hand, Paso-Expres highway involved a six-lane addition to a high-speed motorway of four lanes connecting Mexico City and Cuernavaca, with a total length of 14.5 km, and ten lanes as seen in Figure 3. However, the project's design first considered a total of 8 lanes that was modified during the procurement process to 10 lanes. It aimed to address road network saturation and promised low-maintenance rates and life durability of over forty years.

Due to excessive water pressure and waste in the drainage pipeline system crossing under the motorway, it collapsed three months after its opening. Two people driving to work fell inside an eight-meter in diameter sinkhole that opened in the middle of the road and died of asphyxiation. Other human rights abuses were evidenced throughout different stages of the project. Paso-Expres was a 75 million dollars project, the same amount as Necaxa but half of its length and complexity, contracted by SCT through traditional public works scheme with a consortium of two enterprises, Aldessa-Epccor (Spanish and Mexican, respectively). This scheme involved public funding, and SCT assumed all the project' risks. The works began in November 2014 and finished in April 2017, so after the adoption of the UNGPs (Figure 3).

Understanding of socially sustainable infrastructure in practice

In contrast to literature review findings, all interviewees (except one) understood sustainability as a concept that entailed economic, social and environment dimensions, and more than half linked it to the environmental impact assessment (EIA). Yet, the legal framework in Mexico for road infrastructure projects requires that all EIAs include an environmental assessment, but no social evaluation. The understanding of social sustainability in both infrastructure projects entailed not only positive social impacts as literature review reflected, but also negative social impacts. As seen in *Table 1*, Necaxa considered many more aspects than Paso-Expres in both positive and negative aspects of social sustainability.

Figure 3: Paso-Expres Highway.

Positive social dimension: addressing users' communication and transport needs.

All interviewees (except one) considered the positive social aspect of both projects was related to benefits for transport users deriving from fulfilling their mobility needs and reducing their commuting time and costs. However, there is an economic domination of the concept because the social benefits are considered in the extent to which they can be quantified in monetary terms and represent economic savings.

Interviewees 1-4 expressed Necaxa was beneficial to society because it connected and enhanced the pathway of communication between two key cities in the country. The previous road was inefficient and dangerous due to many curves, heavy rains and fog that provoked multiple accidents, blocking traffic flows for hours. Interviewee 2 mentioned socio-economic assessments were undertaken to determine whether the project was *'socially profitable, this is that benefits the society as a whole'* because it reduces vehicular operation, maintenance and commuting costs and time.

Likewise, interviewees 5, 7 and 8 mentioned Paso-Expres was a project that produced social benefits because it addressed heavy traffic jams in that section of the road. During holiday season, the road was saturated and limited mobility of local and foreign flows going from Mexico City to Acapulco, a popular tourist destination. Interviewee 7 replied that Paso-Expres enhanced *'traffic flows' and 'travel time' 'so it seems it accomplished its aim'*.

Positive social impacts: creating employment and enhancing education, health, and living standards

Private developers in Paso-Expres limited social sustainability to benefits for transport users. No findings or mentions to any additional positive social impact or poverty-related enhancement were found. In contrast, private developers in Necaxa included positive social impacts benefiting communities living in neighbouring areas to the project. ICA had within its corporate policies a 'Handbook for Implementing Social Responsibility in Projects' that outlines measures to identify and address enhancement of communities' employment, education, health and living standards, which were tailored to particular local needs through local engagement and participation. This understanding coincided with those found in literature review, but further contributes by including bottom-up agency-based approaches of local benefits within design and implementation.

Concerning employment, direct recruitment of local workers in Necaxa permitted the company to have *'more access'* to the communities and of communities to the company. The community was continuously informed about the project through workers and community radios. At the same time, the company saved on relocation expenses of foreign workers and harnessed workers' local knowledge in benefit of the project. As interviewee 1 said, they *'give another point of view, because only they know how things are handled there'*.

Indirect employment was created through new culturally based sources of income, local supply of food and drinks, and royalties with a long-term vision of poverty alleviation. Interviewee 1 mentioned

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Table 1: Social Sustainability Elements.

Dimension of social sustainability	Social group	Social sustainability elements	Necaxa	Paso-Express
Positive dimension	Transport users	• Addresses users' communication and transport needs	Present	Present
	Neighbouring communities	• Creates direct and indirect employment	Present	Absent
		• Enhances education	Present	Absent
		• Enhances health	Present	Absent
		• Enhances living standards	Present	Absent
Negative dimension	Neighbouring communities	• Obtention of rights of way	Present	Present
		• Prevention of negative human rights impacts	Present	Absent
		• Redress of negative human rights impacts	Present	Absent

that while business personnel was having lunch with members of the 'Cuaxicala' community, the latter described how previous generations used a certain type of tree to produce crafts, but they didn't have that income anymore because those trees disappeared. By learning this, ICA integrated these trees to the reforestation programme to bring back this ancient and lost livelihood with a socio-environmental approach.

Locals supplied food and drinks. An interviewee referred that a well-known man who sold lollipops on the road *'described how thanks to the project and to a fixed market with the workers of the project he was able to buy a piece of land'* because he was able to have a fixed income during the three years that the construction lasted.

Necaxa's EIA established 'fair payment of royalties' to benefit owners of land where the road crossed. This is an economic benefit-sharing scheme where landowners sell their lands for a fixed price but in addition, they withhold rights to obtain a certain percentage of the profits the project generates. However, none of the interviewees mentioned this aspect.

Regarding health, a vaccination programme against flu virus, intestinal parasites, tetanus and influenza was launched by ICA. As a result, a total of 221 workers and staff benefited from this scheme [79].

Education also had a long-term perspective, by providing skills to local people that wouldn't be limited to the project's duration. On the one hand, a programme for local worker's education was implemented through partnership with the National Institute for Education of Adults, that certified unskilled workers in primary and secondary education [79]. On the other hand, interviewee 1 stressed that works required skilled labour force too. A two-sided partnership between businesses and local universities was built to include local engineering students as interns to the project, addressing business' needs of specialized workforce and universities' need of students' professional training.

The enhancement of living standards was considered in Necaxa in a broad fashion, including physical and economic accessibility of surrounding poor communities to the transport service, which didn't happen in Paso-Expres. Interviewee 4 mentioned SCT assessed social income and travel patterns of local communities to determine which road sections of the entire project Mexico-Tuxpan would involve a fee and which ones didn't, as well as determination of entries and exits within the road design. Locals' low-income and short-distance trips determined that the section Necaxa-Avila Camacho needed to be free of charge, to guarantee accessibility to poor surrounding communities, so businesses operating that road section after construction couldn't charge any fee.

Moreover, social vulnerability and resilience were also addressed, which has a direct impact in living standard of communities. Through an agency-based approach, Necaxa's private developer enhanced peoples' knowledge, skills and capacities to cope with hazards at the same time of addressing structural constraints that keep people vulnerable like lack of infrastructure. For example, a retention wall was built as a result of raised concerns about floods by the community of Teteloloya. A training scheme was implemented and equipment like first kit aids, fire extinguishers and walkie talkies were donated to improve communities' skills in responding to fires. During the construction, private developers supported local communities affected by Arlene hurricane with 80 emergency food packages [79]. Community resilience turns to be an innovative approach to impact and improve people's living standards.

These actions were implemented through continuous and intensive participation, engagement and partnership-building between private developers and local communities. Business learned about local needs, livelihoods, concerns and interests, culture and values, which were harnessed to boost the project's social impacts and secure its healthy development without setbacks. Interviewee 1 said that when local people are integrated *'they feel really listened and have a sense of belonging to the project'*. This is very important, but according to her, it can only be achieved when developers are physically in the communities during the construction works, rather than on early design.

While direct employment and enhancement of living standards constituted specific requests from SCT to private developers, education and health, but particularly local engagement and participation, were a voluntarily initiative coming from business developers, '*because within the structure of SCT there are not yet so much these social schemes during the construction, except for the liberation of the right of way'*.

Interestingly, some positive social impacts in Nexaca were directly linked to the road project like users' communication and transport needs, local mobility and communication and direct employment of local communities for construction works. However, other social positive actions and impacts that were not strictly related to the project can be found such as indirect employment through local supply, health, education and resilience programmes. These actions suggest there are big opportunities in which infrastructure can add social value in cases when it addresses social needs that are related to the project, but also in those cases in which social needs aren't related at all.

Negative social impacts: obtention of rights of way

More than half of the interviewees considered the acquisition of

the rights of way was strongly linked to social sustainability of both road projects. Every road project needs land where to be physically installed, which always involves land acquisition either by negotiation or by public expropriation. Some interviewees –5, 6 and 7– didn't mention the rights of way as part of the social result of the road project. Others –3 and 8– limited the project's negative social impacts to this aspect. The latter stressed *'the negative impact disappears when they* [landowners] *accept* [the works] *to be done with the corresponding payment* [of their land]'.

In both case studies, the obtention of rights of way was based on informing landowners about the project and its benefits, as well as negotiating the price of their lands to be bought by SCT. Interestingly, none of the interviewees mentioned whether communities were informed about the potential negative impacts of the project to their livelihoods or their social, economic or cultural activities and the corresponding measures that business would undertake to mitigate or eliminate them when constructing and operating infrastructure.

A notable difference was identified in Necaxa from Paso-Expres. The acquisition of rights of way involved local engagement through local authorities so they could provide inputs of involved communities' specific needs to include them in compensation of land acquisition. Interviewee 4 mentioned that SCT was aware that 'ejidatarios' or landowners are culturally entrenched to their lands, and these are essential sources of livelihoods. Therefore, buying from them requires a *'very intense work of social sensibility'*.

Interviewee 4 further mentioned acquiring the rights of way needs to involve more actions than *'just buying their lands'*, even for a higher price. Rather, it must *'explore the communities' needs to understand the solutions'* and address the negative impacts. Some landowners expressed concerns about negative impacts that would derive of selling their land, like dividing their property and having difficulties to fetch water or access their wells found on the other side of the road. Thus, he stated it's not enough to listen to communities' needs in relation to their land in economic terms, but also in non-economic terms regarding education, health, tourism or mobility.

Notably, no interviewee from any of the two road projects mentioned any reference to gender considerations in land acquisition, despite the strong masculinity of landowning in Mexico, where more than 80% of 'ejidatarios' are men and less than 20% are women [80].

Negative social impacts: prevention of human rights abuses

Six interviewees related human rights abuses to social outcomes of the project. Paso-Expres limited the understanding of social negative impacts to the obtention of rights of way, disregarding prevention of any other adverse impacts to communities, workers or supply chains. No EIA was undertaken because the legal framework provides in some cases that EIA can be exempted. On the contrary, Necaxa included prevention of human rights abuses (focused on communities and workers) through a 'constrained human rights due diligence'. Although Necaxa started before the UNGPs even existed so information related to the project doesn't use UNGPs terms, the analysis is based on guiding provisions set within this framework for responsible business conduct.

Human rights due diligence in Necaxa was based and limited to the EIA that addresses identification and mitigation measures of some social adverse impacts against communities and workers but fails to address supply chains. Supply chains are considered in the extent to which they are linked to delivering works effectively, but without a human rights perspective. For example, an interviewee said the company could subcontract *'but the responsibility and obligation with the contracting authority was only of the awarded company'*.

While the EIA doesn't mention explicitly the words human rights, considerations to them are found within the document. The EIA included a social impact assessment and considered three mitigation measures, even though the legal framework didn't require it. According to the contract, the EIA was undertaken by SCT because it was part of the obligations and risks the public entity assumed, and compliance to the EIA was established as a contractual obligation for private developers when conducting the works.

The first measure the EIA established was compliance with the applicable legal framework regarding noise limits for machinery and construction equipment, which reflects alignment with guiding principle 23. Private developers mitigated noise levels with noise-reducing equipment, and they were regularly monitored during construction. Noise pollution was also reduced by half. Secondly, the EIA established as mitigating measure to negative impacts to restore access to local pathways. Interviewee 4 highlighted the impacts to people's livelihoods, and mobility patterns of pedestrians, and vehicles and livestock were addressed to avoid interruption of local communication. 'The Locality of Plan de Ayala received improved roads [by private constructors] while Teteloloya also secured paths across the highway to connect to the agricultural fields and other localities' [79]. This element is further compatible with international human rights standards on right to adequate living established in the International Covenant for Economic, Cultural and Social Rights as guiding principle 12 calls to consider.

Yet, it is to note that Mexico ratified ILO conventions regarding indigenous consultation (169), equal remuneration (100), prohibition of child labour (182) and forced labour (105). The last three mentioned are part of ILO core conventions that guiding principle 12 establishes have to be part of the responsibility of business enterprises to respect human rights. Especially because this legal framework was enforceable years before the publication of both projects' bids. However, it was overlooked. Necaxa's EIA identified indigenous groups surrounding the project site, and indeed the project crossed many indigenous communities, yet, there was no free, prior, and informed indigenous consultation *'because it wasn't required, there was no need'*, according with interviewee 3 and 4.

Moreover, there was no consideration to equal salaries child and forced labour of direct private developers nor their supply chain, even though it is clear these could be adverse impacts on worker's human rights deriving from the project. Indeed, two interviewees stressed labour rights considerations were important within social sustainability of an infrastructure project.

Third, the EIA provided adequate signage to prevent accidents for workers and local people. Developers implemented 'traffic-calming and evacuation route signage in and around the project sites and the local communities' [79]. Measures identified within the EIA during the planning stage were adapted by business during the construction phase to address local concerns, and to include local knowledge through continuous engagement with communities.

Human rights due diligence includes four key steps. The two first steps involve identifying and mitigating human rights risks that could derive from businesses' operations. While EIA was not conducted with a human rights lens nor by the private developer itself, it includes identification of adverse social impacts and the

measures to address them, and some of these impacts are related with human rights even though they are not referred as such. On the other hand, the EIA didn't include follow-up plan with measurable indicators and communication of the process as the UNGPs call for human rights due diligence to have. Tracking business responses and communicating how impacts are addressed are two key steps in human rights due diligence and the core difference between the latter and the environmental and social impact assessment.

In contrast, the lack of EIA and a human rights due diligence process in Paso-Express led to severe negative impacts. Human rights abuses deriving from private contractors' activities. Harms included damages to water pipelines that affected diverse communities in their access to drinking water for several days; poor water management that caused flooding of sewage of neighbouring communities and contamination of irrigation channels used for crops and nursery; poor waste management that violated the right to sanitation and adequate housing; road-blocking without prior notice; and violations of the right to life of more than a hundred people. Interviewee 8 said business gave notice to people of road-blocking which was held 'in sections' to avoid impacts to local traffic.

Yet, modifications to old walking pathways alongside inadequate signage during construction turned dangerous to cross from one side of the road to the other for pedestrians and to circulate through that road section for vehicles. As a result, two pedestrians walking through the pathways fell and died and 130 people died as a result of over 100 car accidents; people started to call it *'The Death Passage'*. Amongst these 130 people were a father and a son that while driving through Paso-Expres fell inside an 8 meter in diameter sinkhole that opened in the middle of the road three months after its opening, and died of asphyxiation.

Moreover, an EIA exception was granted in October 2014 by the Ministry of the Environment and Natural Resources. However, such exception was not based on the final 10 lane design, but on the previous design of 8 lanes. The SCT undertook consultations on whether there were impacts to water crossings a year after works started. This reflects an important weakness in the technical planning and design of the project. Before the works were finished, the motorway already presented scours and flows.

The SCT and businesses were aware that pipelines wouldn't resist water flows and would eventually break. Yet, no action was taken by either and three months after the motorway started to operate, it collapsed and caused the death of two more people. Interviewee 6 said *'minimization of the affectation to their livelihoods should be a natural component of the project, as important as cement or steel that is used for the infrastructure. And that wasn't considered'*. He further mentioned social aspects are considered as 'an annoyance' rather than essential elements of any project.

Finally, prevention of adverse human rights impacts on workers and supply chains was neither important nor addressed by the authority and contractors in Paso-Expres. Interviewee 8 mentioned: '*There is no investigation* [during the selection of the contractors] *by the contracting authority on whether the company complies with paying decent salaries to their workers. There is no interest if they pay them well or badly'*. The only interest is whether contractors have enough workers and the technical capacity to perform the works.

Negative social impacts: redress of human rights abuses

Five interviewees related redress of human rights impacts to the social outcomes of the road projects. Redress was absent in Paso-Expres and present in Necaxa.

In Necaxa, redress of human rights impacts took place through operational-level or corporate grievance mechanisms. Interviewee 1 mentioned ICA's Handbook established grievance mechanisms administered by the company to address concerns related and unrelated to the project. For example, concerning issues with trucks transit, the company verified whether trucks were circulating through the established areas and rectified immediately in case they didn't.

Other were unrelated to the project's works. For example, a complaint regarding land impacts found that they weren't caused by the road works, but by a simultaneous pipeline that was constructed by another company nearby. Necaxa's private developers provided community support by channelling the affected people with the corresponding enterprises of the other project. Likewise, communities filed requests of support on specific issues, for example to replace a weakened pipeline or lend a trunk for the patronal feast. The company assessed the possibility to support usually through in-kind support with its own materials or human resources, rather than money.

The way in which grievance mechanism operated in the field contributes to the understanding of UNGPs' Pilar III in the context of infrastructure because they were used not only to redress as the framework calls for, but also to provide information of the project or address other concerns raised by the community, which builds trust between stakeholders. Therefore, understanding and implementation of non-state-based grievance mechanisms in complex contexts like developing large-infrastructure projects should encompass much more than what the UNPGs suggest.

The operational-level grievance mechanism complied with several criteria established by the UNGPs. It was legitimate because stakeholders trusted them. It was accessible and based on engagement and dialogue, because all stakeholder groups knew it existed. Moreover, the ways to access the mechanism were defined on an ongoing basis by local people. Interviewee 1 mentioned people approached ICA's personnel directly or left written complaints in the company's facilities located in the middle of the project working site.

The company didn't establish a 'front desk' to address exclusively these issues, but rather left locals to determine how to approach them. Locals knew who the project leaders were because someone from their family or community worked on the project and identified where the business offices were located. However, further research needs to be undertaken to analyse whether this scope and approach provided enough predictability and transparency to the grievance mechanism and the ways in which it was fed to identify lessons and improve mechanisms to prevent future grievances and harms in the future.

Local recruitment alongside a grievance mechanism facilitated business communication with communities, and enabled works to be performed better because it prevented social conflict, which can lead to works suspension. *'There are construction works that have been interrupted for maybe one or two years because at the time they [social concerns] weren't adequately addressed…because communities didn't feel they were being listened to or cared for'*.

In contrast, businesses in Paso-Expres didn't implement an operational-level grievance mechanism nor addressed impacts according to three interviewees. Interviewee 5 said there was a

'divorce between the businesses and the community'; businesses *'had deaf ears'* to individual and collective impacts. *'If the company implemented these mechanisms, it is very clear that we would've avoided many [social] problems'*. For example, it was well documented that constructors didn't pay nor repaired damages to pipelines, which limited access to water for multiple neighbourhoods for days. Rather, it was solved by the municipality by purchasing provisional waterpipes, which increased the project's budget. *'If the company had implemented these mechanisms, it is very clear it would've avoided many [social] problems'*. Interviewee 6 and 7 coincided there was no appropriate redress, including for the people who died in the car accident. Interestingly, from interviewee 8's point of view, redress to the project's social impacts was fulfilled by paying the agreed amounts to landowners to buy their lands during the purchase of the rights of way.

Moreover, a complaint regarding the death of two people in the car accident was filed before the National Human Rights Commission who requested involved businesses to provide records and information, but they refused to collaborate, hampering the grievance process and remediation for victims. The UNGPs set clearly within Pilar III the important role that National Human Rights Institutions have to redress victims. Businesses should not only implement effective operational level grievance mechanisms, but also to participate on state-based judicial mechanisms. This responsibility includes not only to avoid placing barriers for effective remediation these mechanisms can provide to victims but also to actively collaborate with them through all their possible means, but neither of them were present in this case.

Concluding Remarks

While not perfect, Necaxa is an example of a socially sustainable road project. It reflects that positive impacts of social sustainability go beyond reduction of user's travel time and cost. They include addressing social needs that are both related and unrelated to the project. Indeed, positive social impacts should comprise, or at least consider the feasibility of including, benefits for communities through direct and indirect local employment and enhancement of their education, health and living conditions with a long-term vision of poverty alleviation. A comprehensive understanding or enhancement of living conditions includes tackling communities' vulnerability through bottom-up, agency-based and structural approaches to resilience.

This case study also reveals that boosting positive social impacts isn't enough for an integrated socially sustainable outcome. Consideration to negative impacts is essential to develop socially sustainable infrastructure, and these include prevention and redress of human rights. If infrastructure neglects workers and communities' human rights through bottom-up participative and locally inclusive approaches, the socially sustainable outcome can be jeopardized, like it happened in Paso-Expres.

The negative social impacts go beyond the obtention of rights of way or the acquisition of land rights like it is commonly understood and like it was applied in practice in Paso Expres. In the project Necaxa prevention of busines-related human rights abuses was addressed by private developers through (a limited) human rights due diligence and redress of those abuses through operational-level grievance mechanisms. The outcome of both considerations set within the UNGPs not only benefited the community, but also the company and the project itself. While some gaps regarding gender, labour rights in supply chains and indigenous peoples' rights were identified in Necaxa, the way in which social sustainability was understood and applied in practice provides elements to build stronger grassroots and foundation for socially sustainable road infrastructure implementation.

Finally, this paper contributes in two different ways. On one hand, by developing sustainability in the context of infrastructure as a concept that goes beyond environmental-only concerns. It clarifies that 'sustainable' infrastructure can't be exchanged with 'green' infrastructure. If infrastructure is socially blind and human rights are not respected during the project's lifecycle, infrastructure can't be legitimately called sustainable. On the other, it adds value by proposing a new and comprehensive way to understand and apply social sustainability, based not only on the positive social impacts, but also on the negative social impacts that can result from business developers' activities. These negative social impacts include prevention and redress of business-related human rights abuses. Clustering and shedding light on content of negative and positive social impacts of a project constitutes a novel understanding that integrates sustainability and human rights, that have developed separately, into one single agenda.

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