Interconnection or disconnection. The case of a road in the Peruvian Amazon

A Research Paper presented by:

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(Peru)

in partial fulfilment of the requirements for obtaining the degree of
MASTER OF ARTS IN DEVELOPMENT STUDIES

Major:

Agriculture. Food and Environmental Studies
(AFES)

Specialization:

Environment and Sustainable Development

Members of the Examining Committee:

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The Hague, The Netherlands
December 2020

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List of Acronyms

AIDESEP	Asociación Interétnica de Desarrollo de la Selva Peruana
BANCOEX	Banco de Comercio Exterior
BASA	Banco da Amazonia
BNDES	Banco Nacional de Desenvolvimento Econômico e Social
CAF	Banco de desarrollo de America Latina
FENAMAD	Federación Nativa del Río Madre de Dios y Afluentes
FTTA	Free Trade Area of the Americas
IDB	Inter-American Development Bank
IIRSA	Iniciativa para la Integración de la Infraestructura Regional Suramericana
MINAM	Ministerio del Ambiente de Perú
OSINFOR	Organismo de Supervisión de los Recursos Forestales y de Fauna Silvestre
OSITRAN	El Organismo Supervisor de la Inversión en Infraestructura de Transporte de Uso Público
TIPNIS	Territorio Indígena y Parque Nacional Isiboro-Sécure

Abstract

This research will concentrate on assessing the justifications used for the implementation of the Southern Interoceanic Road, an ambitious corridor that aims to interconnect the Atlantic and Pacific coasts through the Peruvian Amazon. The project generated great expectations and popular support and concerns and resistance due to the environmental impacts and social tensions in a socio-ecological context as particular as Madre de Dios. Then, given extensive criticism from different fronts within Peru and lessons from other contexts, the present paper contributes answering the question why and how these large investments are justified. The issue is approached from two angles: applying classic economic methods to discuss the benefits and costs involved with the implementation of the road, and from the political economy/ecology way of thinking to decompress the different tensions arisen because of such infrastructure. By using secondary data and a recapitulation of historical facts, the analysis shows that roads (and to some extent, large scale infrastructure) are not only a means of transportation. They are also a policy that brings along structural values that configure and transform the history and social dynamics in a certain area. It is a means of colonization and part of a capitalist paradigm replicated wherever possible to expand the presence of the Sates and the hegemonic way of thinking. Therefore, it is necessary to go beyond apolitical technical arguments and develop conceptual frameworks towards a vision and definition of development that captures the aspirations and knowledge of the actors on the ground and integrating the social and ecological constrains.

Relevance to Development Studies

While that focus is relevant for the debate on rural development, particularly in the Amazon, this research will assess the justifications used for implementing the Southern Interoceanic Road. This ambitious corridor aims to interconnect the Atlantic and Pacific coasts through the Peruvian Amazon. The project generated great expectations and popular support and concerns and resistance due to the environmental impacts and social tensions that were expected in a socio-ecological context as particular as Madre de Dios. Then, given extensive criticism from different fronts within Peru and lessons from other contexts (Moreira & Palomino-Schalscha, 2020; McCall, 1977; Robinson et al., 2010; among others), why and how these large investments are justified? My argument is that roads (and to some extent large-scale infrastructure) are not only a means of transportation. They are also a policy that brings along structural values that configure and transform the history and social dynamics in a certain area. It is a means of colonization and part of a capitalist paradigm replicated wherever possible to expand the presence of the Sates and the hegemonic way of thinking. By looking at this case, the research also seeks to offer insights into how these kinds of infrastructures, mainly in particular biomes as the Amazon, can be better conceived in the future in order to benefit local communities sometimes hidden behind top-down decisions and technocratic perspectives.

Keywords

Roads, large-scale infrastructure, development, environmental losses, benefits and costs, political ecology.

Chapter 1 Introduction

According to Bennet (2018, p136), infrastructure transportation at global level such as rails and roads network will be increased on 60% approximately between 2010 and 2050. Indeed, for certain points of view, roads and public infrastructure, in general, are fundamental to achieve the so-called development (Harberger, 1971; De Veen, 1980; Harvey and Knox, 2015; Howe & Richards, 2019; Gwilliam & Shalizi, 1996). Recently, much academic research has focused on assessing roads in terms of social and environmental impacts (Alamgir et al., 2017; Moran, 2016; Vilela et al., 2020) and how these kinds of investments can lead to more inequalities and social differentiation through land grabbing processes given the existing power relations among social groups and the socio-ecological landscape in general (Mäki et al., 2001; Bryceson et al., 2008; Pieck, 2011)

While that focus is relevant for the debate on rural development particularly, in the Amazon, this research will concentrate on assessing the justifications used for the implementation of the Southern Interoceanic Road. This ambitious corridor aims to interconnect the Atlantic and Pacific coasts through the Peruvian Amazon. The project generated great expectations and popular support and concerns and resistance due to the environmental impacts and social tensions that were expected in a socio-ecological context as particular as Madre de Dios. Then, given extensive criticism from different fronts within Peru and lessons from other contexts (Moreira & Palomino-Schalscha, 2020; McCall, 1977; Robinson et al., 2010; among others), why and how these large investments are justified? My argument is that roads (and to some extent, large scale infrastructure) are not only a mean of transportation. They are also a policy that brings along structural values that configure and transform the history and social dynamics in a certain area. It is a means of colonization and part of a capitalist paradigm replicated wherever possible to expand the presence of the Sates and the hegemonic way of thinking.

The research paper proposes two angles to contribute to the understanding of the problem: on one side applying classic economic methods and mainstream point of view to discuss the benefits and costs involved with the implementation of the road (see, for instance, Belli et al., 1998; Hanley et al., 2009; Rubio, 2017). Furthermore, on the other side, from the political economy/ecology way of thinking to decompress and analyse the different tensions arisen because of such infrastructure. These two gazes can contribute to the discussion about the enabling conditions that make these projects happen. And appraisal frameworks of large infrastructure projects in academic and political arenas. Simultaneously, the approach will contribute to a broader query related to the assumptions behind the promotion of these kinds of investments in rural areas.

By looking at this case, the research also seeks to offer insights into how these kinds of infrastructures, mainly in particular biomes as the Amazon, can be better conceived in the future in order to benefit local communities sometimes hidden behind top-down decisions and technocratic perspectives.

1.1 Structure of the paper

The research paper includes five chapters. The first one is an introductory part that contains a brief recapitulation of the relationship between the State and the Amazon. Chapter two presents a description of the case and context and the paper's questions to contribute to answering. The second chapter is a compilation of literature related to the intersection between roads and development and how these infrastructures can impact indigenous livelihoods and result in severe environmental losses. The third chapter shows the methodological approach proposed to analyse the case and the data used to do that. Then, chapter four includes the principal results and analysis. Finally, chapter five finishes with a brief discussion of findings and a series of conclusions based on the different angles applied to answer the research questions proposed in the present paper.

1.2 The Amazon and development

The Amazon has been (and is) a challenging space for countries States consolidation that shares it. In history, it can be found different attempts to colonize and occupy what, for some, is an inhabited and underused space due to the range of natural resources it offers and the vast space it represents. From independence attempts at the beginning of the 20th century when the State of Acre (now Brazil, but at that time shared by Peru and Bolivia) sought to establish itself as an independent State promoted by the rubber rush and droughts in Brazil (Dourojeanni, 2006, p29). To the advance of road networks to achieve a more significant presence of the State under a centralist approach that aimed to connect the country with Lima, the capital. Here a synthesis of the main developmental events and discourses from the 1960s used by the Peruvian State to occupy the Amazon biome.

During the 1960s, the second government of President Manuel Prado was the one that started the first road initiatives in the Amazon with an eye on growing market demand and promoting the accumulation of land for agriculture. This trend is evidenced by the law that assigned 10 Ha of land to all natives older than five years, following the land accumulation model initiated in the 1920s by previous governments (Greene, 2009; Glave & Barrantes, 2019). It is from 1963, in the Belaunde's government, when perhaps the most intense process begins to expand the presence of the State in the Amazon. He already said it in his book "The conquest of Peru for Peruvians" (Belaunde, 1959, p80):

> "A country that is occupied by forests in more than half of its territory could aspire to be an exporter and not an importer of wood and paper. However, we spend ninety-three thousand soles a year to buy wood abroad and one hundred and eighty-seven million to import different papers and their fabrics, of which sixty-one 80 million correspond to the staple product that constitutes newsprint. A road policy and industries based on wood constitute starting points for an economic development program that, if well underway, would be welcomed by international credit institutions ".

This perspective was consistent with his discourses oriented to the (according to him) agricultural potential of the Amazon to supply the coast's urban centres in constant growth due to institutional centralism and migration from the Andes. The narratives reached such a scale of ambition that in 1963, Belaunde proposed to the congress to create a colonizing group conformed by Military Forces to advance towards the occupation of the Amazon

(Glave & Barrantes, 2019, p26). The second stage of this plan was the road expansion, accompanied by a series of economic measures to expand agriculture. As a result of this, the Marginal de la Selva road that connects the central Peruvian Amazon with the coast (a project that Belaunde compared with the Panama Canal (Glave & Barrantes, 2019)), among other roads; and tax exemptions to encourage investment in large tracts of land. To date, the construction of the Marginal de la Selva is a historic milestone in the country.

After Belaunde, the Military governments came. First, President Velasco, who with a different vision but not radically opposed to the previous government, promoted the occupation and industrialization of the Amazon through oil extraction led by the State. This policy reached an important economic impact, mainly in the Loreto region (Santos & Barclay, 2002). In parallel, Velasco began the Agrarian Reform process, which (among other things) recognized the ownership of land by indigenous peoples (Glave & Barrantes, 2019), law that was modified by the following Military Government in 1978. The modification added that the law's objective was social, economic, and ecological profitability of the land use. This switch relaxed the sense of ownership of indigenous territories and terms such as "transfer in use" began to be used for agricultural or forestry purposes (Glave & Barrantes, 2019).

In the first part of the 1980s, Belaunde returned to power after the Morales Bermudez Military Government's failure. With this, the idea of integrating the Amazon with the rest of the country was taken up again. The colonization process that Bealunde began was already showing effects with the creation of the first populated centers due to the migration from the Andes. This process was accompanied by promises to continue expanding the road network. For instance, the first discourses on integration with Brazil began through the Pucallpa - Cruzeiro do Sul route, a promise taken up 25 years later by the Government of Humala, which failed to gain a foothold given the opposition of indigenous people and environmentalists.

Starting in 1985, the development discourses and policies applied to the Amazon maintained a similar trend based on extractive activities and with some relevant milestones. The Government of Garcia intensified the National oil exploitation that was decimated by the fall in international prices. Then, in the 1990s, the Government of Alberto Fujimori, and its neoliberal ideology, changed the discourse towards attracting foreign capital and modifying the laws on land ownership (Glave & Barrantes, 2019). He was also the one who promoted a law that made it compulsory to pay for land not exploited by mining in Madre de Dios. Toledo promoted public-private partnerships, being the main one the IIRSA North. The second Garcia's government, with ambivalent discourses, on the one hand creating the Ministry of Environment (as one of the conditions for signing the Free Trade Agreement with the United States) and on the other, using discourses calling "Dog in the Manger" to anyone who opposed the privatization and titling of land in the Amazon.

Therefore, the Amazon has been historically treated as an appendix of the country, where different top-down perspectives have been implemented without considering the aspirations and values of the ethnic groups settled there for centuries. Indeed, roads and new means of access were already an instrument to expand a capitalist ideology that reshaped the socio-ecological context, creating tensions and clashes among classes usually dominated by the owners of the capital, hegemonic knowledge, and the States (Schmink & Wood, 1992). Moreover, that was a trend in the region. For instance, in Brazil, the mines

and ranch corridors encouraged by new roads created in Rondonia and Mato Grosso brought a series of social and environmental impacts (Campbell, 2014, p242). A series of tunnels and roads built in Antioquia region, in Colombia. The new routes opened in Santa Cruz and Beni, in Bolivia, implemented to promote sunflower expansion, among other cases.

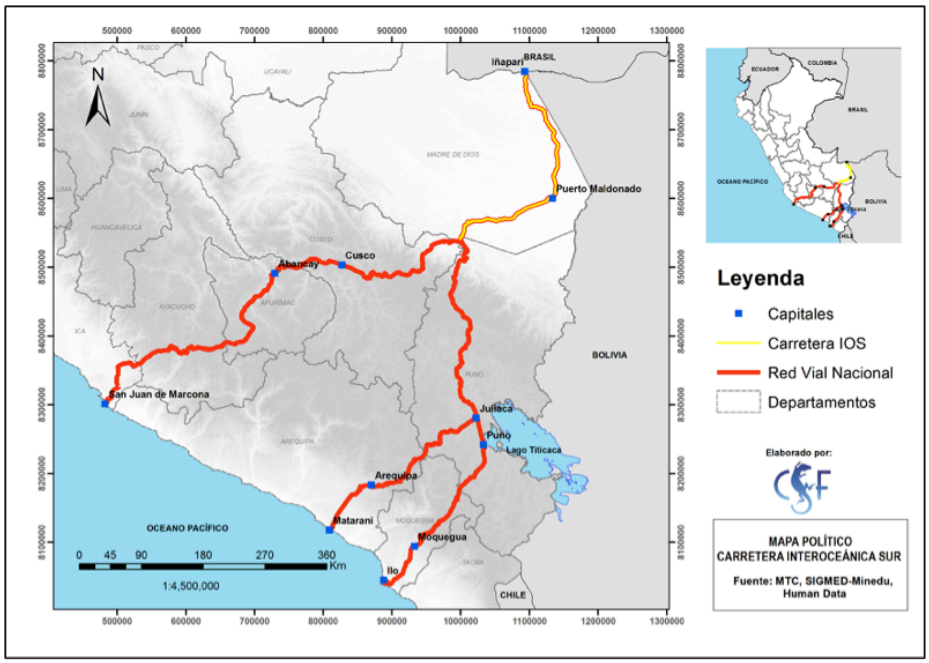
1.3 A white elephant in the Amazon Rainforest

In the case of Peru, the Amazon represents the fourth country with the largest portion of tropical forest globally (FAO, 2011), and with more of the half remains untouched (Bahamóndez et al., 2009). On the other side, Peru faced explosive economic growth in the last decade based on an extractive model (IMF, 2013), pushing for more natural resources and environmental degradation. One of the most critical threats to this are large-scale infrastructure projects. Estimations show that around 91% of the entire tropical forest in Peru will be lost in less than 30 years if the series of planned infrastructure is implemented in the following years (Dourejeanni et al., 2010, p108).

One of these projects is the Southern Interoceanic road. This interconnection dream dates back to the 1980s when the first agreements were signed between Peru and Brazil to integrate these countries through the central and southern Amazon, with the Pucallpa - Cruzeiro do Sul and Puerto Maldonado - Rio Branco roads, respectively (Dourojeanni, 1988, p178). The Interoceanic route began in the 1940s as a small dirt road used by rubber extractors (mainly migrants) that was progressively opened until the 1990s. At that time, the State, led by the government of Alberto Fujimori, began to intervene by improving the road and implementing related infrastructures such as the Billingurst Bridge in Madre de Dios (Dourojeanni, 1988; Chirif, 2019). Meanwhile, Brazil did the same alongside the bridge Assis - Iñapari (Dourojeanni, 1988, p178).

Given the globalization process and the opening of China to the market and its great demand for raw materials (Raez, 2009), from 2000, the vision of this route was expanded to a mega-infrastructure. That project aspired to not only integrate the border area between Peru and Brazil, but to unite the Atlantic Ocean with the Pacific within the framework of a South American integration platform called Initiative for the Integration of the South American Regional Infrastructure (IIRSA for its acronym in Spanish). IIRSA South aims to put through to an already existing opened route in Brazil to attain a cross-country mega-road from the Pacific to the Atlantic Ocean. This initiative was one of the foremost ambitious projects advanced by the Peruvian State. The infrastructure of 2,592 Km runs through seven regions within the south of Peru, counting distinctive geologic conditions to Brazil's boundary (Bravo, 2013) (Map 1.1).

Map 1.1
Location Map of the Southern Interoceanic Road



Source: Escalas et al (2017)

Given the scale of the project, the Research Paper is going to focus on section 3 of the road, in Madre de Dios, one of the most biodiverse places in the world (Olson & Dinerstein, 2002), and also some of the most attractive areas for extractive activities such as gold and hydrocarbons (Farias, 2016).

1.4 Research questions and objectives

The research objective is to assess the technical justification used for the approval of the road and show some of the social clashes and environmental impacts after the implementation of the new route. Through this process, I also want to explore the reasons behind these large-scale infrastructure investments as a means for development. The research questions are:

- What are the conditions (or interests behind) that make possible the implementation of projects such as the Southern Interoceanic?
- What are the economic benefits and costs associated with the road?
- What are the social actors, institutional arrangements and economic dynamics that justify such investment?
- Who is going to benefit of the road, and what are the social and environmental trade-offs associated?

Addressing these questions, my purpose is to build a puzzle to demonstrate the hypothesis behind the present research: the arguments and technical information used to justify the construction of the Southern Interoceanic road have not been translated in development to the indigenous ethnics in that particular area. With or without development, roads in areas like Madre de Dios are an expression of (geo) political hegemony and power.

They can be understood as means of presence of the State and capital, which will allow keeping the wheel moving in a capitalist society.

Chapter 2 Literature review

To understand the case of the Southern Interoceanic road, particularly in the section located in Madre de Dios, it is fundamental to review what previous researchers have said about infrastructure development in the Amazon and worldwide. Mainly in terms of social development and roads, and the trade-offs and socio-ecological transformations involved in these kinds of initiatives. The following section presents relevant studies related to the case.

2.1 Roads and development

From a capitalist perspective, roads are a means to expand the ideological presence, and reproduce its values in terms of infinite accumulation. This paradigm is a key element for the permanent reproduction and evolution of capital (Harvey, 2014, p149). Therefore roads are used to boost the economy, which sometimes ends on positive effects in rural areas through income increases given the new access to markets and services such as health and education. National transportation plans and public policies aimed to promote new transport infrastructures measure their objectives in terms of kilometres built. This apolitical assumption leaves aside the dual effect that these projects can represent as integrating and fragmenting the landscape and forgetting the transportation system's role in a potential unequal development (Flores, 2015). For instance, roads will come with cost reductions for trading from the farm to significant markets. They also bring time savings and reduction in operation costs for transportation resulting in larger profits for traders and (or) more free time to work in other activities and for leisure. However, at the same time, roads come along with disorderly social migration processes, land grabbing, and environmental degradation.

The role of the States is central in the synergy among roads, capital, and development. In response to a hegemonic class, the Capitalist States will create the conditions to facilitate the circulation of capital. First, it facilitates access to the means of production within a particular area; and second, to avoid the depreciation of capital, interconnecting regions to reduce transportation costs (Harvey, 2014).

The second one is the argument usually used for the States to open new routes as a way to make the economy grow in rural areas, primarily in those where the agriculture sector is or possibly can be a vital source of income (Farias, 2016, p5). That is the argument in the Southern Interoceanic and the IIRSA South initiative in a broader perspective. To interconnect the confined Madre de Dios to the Peruvian coast and Brazil and Bolivia to increments the chances to get to prominent markets what should lead to a positive transformation in terms of development in that specific context. Subsequently, in principle, the point of the road was not to harm the environment or uproot indigenous ethnics; on the opposite, the state executed a commonplace procedure to bolster local progress and in some cases in reaction to claims and needs for modernization and to have more presence of within the area (Harvey and Knox 2008; Arsel et al., 2019).

However, development is not always a natural consequence of roads building. The assumption behind the equation roads equal to markets equal to income increases equal to development is not necessarily achieved in small-scale production areas. What happens

with subsistence farmers such as those in the countries of the Global South? What is the advantage of a road for people who cannot satisfy the scale of the market's demands? The answer is not as automatic as in places where an existing supply of goods is already in place (Bryceson, Bradbury, and Bradbury 2008). Other factors, such as social structures and land concentration besides physical and ecological conditions, determine how beneficial a road is in certain areas (Bryceson, Bradbury, and Bradbury 2008; Hemamala, 2006). Even more, considering that the level of vehicles' traffic measures the economic feasibility of a road in terms of time and operation costs savings when in rural areas the demand for vehicles is meagre and with that the probability to take advantage of a new penetration road (Ellis, 1997, p8). This approach focuses on the transported subject, leaving on a side the object (the infrastructure) and its relation with the context (territory or environment). (Flores, 2015; Blanco, 2010).

Therefore a road is not only a means of transportation. It is also a policy that brings along structural values that configure and transform the history and social dynamics in a specific area. Roads can also be understood as one of the institutional pillars of a capitalist perspective (Scott, 2006, p12), where physical infrastructure is fundamental for appropriating means of production such as land and labour and keeping accumulating capital. These structuring effects bring a series of consequences in terms of the landscape, economic activities (Blanco, 2010, p172), population settlements, and development in general (Dobruszkes, 2006).

2.2 Indigenous territories and roads

Then roads are a first step to set up particular landscapes to play in favour of capital circulation and reproduction. In some contexts, like remote areas, that will imply a process of colonization and imposition from hegemonic classes over other social groups. This transformation of the socio-ecological context will evolve; creating new rules that will leave others out of the picture (Harvey, 2014, p149), for instance, indigenous people. Examples of this trajectory are easy to find worldwide. In Guatemala, the Peten indigenous ethnic that was 'massacred' by the consequences of the Network of Mesoamerican Highways in terms of land grab processes and militarization of the area (Walford et al., 2013, p249).

Again, the role of the capitalist States in this trajectory is crucial. First, promoting and providing the conditions for the circulation of capital, making alliances with international banks and corporations, and second, giving to the market decide who should own the land and other resources. These Sates' types open new routes to make the capital more profitable (Harvey, 2014, p150) and allow Banks to keep investing their capital under risk of devaluation if it is not used (Harvey, 2004, p152). As IIRSA in Peru, there are other samples of this triangulation among Sates, capital, and multinationals: the Puebla to Panama Plan between this country and Mexico, China's Belt and Road Initiative, the Trans-African Highway, among others.

Roads and infrastructure, in general, are means to achieve economic growth locally and in larger regions. However, there is not a substantial body of knowledge to understand when these kinds of investments can benefit the most needed (Rigg, 2002). Some scholars are starting to approach this issue (see Robinson & Stiedl, 2001; van de Walle, 2002), but it is still much more to say and explore to explain the arisen social tensions, undermining

fragile livelihoods and dispossession processes. Events are usually related to giving access to rural areas (Wilson, 2004), particularly the Amazon.

Literature offers the pros and cons of roads building. Fairhead (1992) focuses his analysis on these strategies' nefarious effects on achieving interconnection with rural areas. He argues that market integration through road-building in rural areas can change local groups' wealth (Fairhead, 1992). Therefore the implementation of roads must consider how it will alter the markets for land and labour, the availability of resources for local actors, and the social structure in general (Fairhead, 1992, p34). That is the case of roads development in Zaire and its consequence expanding the demand for large areas of land during the 80s (Fairhead, 1992). This expansion resulted in more infrastructure investments (Schoepf & Schoepf, 1987), transforming the whole socio-ecological context. The new roads pushed farming and other activities to orient their production to cattle ranching and allowing big capitals to gain control over land and consequently, over labour (Fairhead, 1992).

On the other side, Porter (2002, p296) analysed the costs of "isolation" of certain communities who have to face a lack of interconnection to urban areas or the market. That also happens in areas where agriculture intensification is starting, so access becomes fundamental to achieve competitiveness and (at some point) poverty alleviation (Bebbington, 1999:2022; Wilson, 2004).

In practice, facts show that the roads' effects in rural areas are ambiguous (Rigg, 2002, p630). It is not only because of the material consequences of the initiative in terms of incomes, costs, environmental degradation, land use changes, among other impacts. But also according to the values and ideologies behind the evaluation of the project and the infrastructure. The justifications in terms of development and poverty alleviation have to be assessed in a case-by-case basin, and the approaches and assumptions to appraise the project could vary according to the positionality of the observer (Farias, 2016; Wilson, 2004). Some of them bring progress and wellbeing, and others just come with impoverishment and affecting sovereignty (Wilson, 2004). Even more, roads can be explained from a temporal perspective. For instance, in Chachapoyas, the northern Peruvian Andes during the 20s, the inhabitants claimed for roads looking forward to taking more attention of the State and to be more connected to the rest of the country. However, in the mid-1980s, people rejected roads because of the increasing migration and violence happening in the town (Nugent, 1997).

2.3 Roads evaluation: assumptions and gaps

Considering the different possible results after a road building and the resistance from social groups before and after implementing the infrastructure, technical arguments to justify the investment in a new route are necessary. From mainstream economics perspective the pertinence of building a road (and the provision of any good or service in general) is measured by the willingness to pay (WTP) for the infrastructure. The assumption behind this is that individuals are rational and always look for utility maximization (Becker, 1976; Hausman, 1992). Therefore, building or not a road is quantified by the consumer surplus monetization (Sen, 2000). That is the difference between the travel cost (or the unit price to use the road) and the willingness to afford the use of the route. In other words, a new road (or the improvement of an existing one) should result in an expansion of the consumer surplus given the cost savings, which means an economic benefit. To do this, one of the

most applied and straightforward techniques for investment appraisal is the Cost-benefit Analysis (CBA) (Nijkamp et al., 2002). A CBA is a comparison between a projection of monetized benefits and costs as a consequence of the implementation of the project or intervention (Jenkins & Harberger, 1997; Rubio, 2017), in order to show the different trade-offs involved in a particular decision, for instance, transport investments (Nijkamp et al., 2002). In private investments, the company should choose the alternative that offers a positive Net Present Value[1]. For the public sector, the variables to make a decision are slightly different. Instead of profit maximization, an appraisal of public investment should focus the analysis in terms of welfare for the society as a whole[2] (Nijkamp et al., 2002).

Several reviews on CBA in transportation are available in the literature (Nash, 1993; Rose-Ackerman, 2010; Atkinson & Mourato, 2008; Hanley et al., 2009). The main components of the tool discussed by these and other scholars are 1) the scenario analysis to quantify the differences between situations with and without the project and their temporal implications, 2) the valuation of these effects in economic terms, 3) the discounting factor to bring benefits and costs to the present in order to make the alternatives comparable, and finally, 4) the aggregation of the calculations through the Net Present Value (NPV) to conclude about the feasibility of the intervention. Currently, that approach has been expanded to other types of policies and projects such as health, education, and environmental issues, sectors where the assumptions and the monetization of the benefits and costs estimations are less explicit than private investments. An example of this is what Viscusi (1998) calculations about tobacco policy in the United States. He concluded that the states could save resources by opening the tobacco market, estimating the statistical value of life, and considering that the health system will save money because people will die in early stages (Ackerman & Heinzerling, 2002).

As it is evident, a CBA is a simplistic approach to evaluate a project or policy. Terms such as society as a whole, benefits, and costs without considering who gain or who pay the costs and the secondary effects, projections and assumptions, etc.; are a framework with lack of capacity to understand the multiple complexities of human well-being, and the tensions and aspirations among social groups involved in the decision. In practice, the costs and benefits of investments and infrastructures as roads are unequally distributed depending on the power relations among the diverse actors that are part of the influence area (Bryant & Bailey, 1997). Besides, other values cannot be calculated in terms of price, for instance, human life, beliefs, or environmental attributes (Wagner & Pascual, 2011). Although transportation ventures have played a central role in giving open access to resources and generating incomes, it is also a cause of social conflicts and opposition among classes (McCall, 1977).

2.4 Roads and environmental impacts

While it is true that roads implementation (beyond being a mechanism of interconnection and transport that probably seeks social development) is also an element loaded with symbolism and ideological fundamentals that could be explained from the perspective of hegemonic historical structures (Cox, 1983). However, this way of thinking may be insufficient when analyzing how an infrastructure project is related to the ecological dimension, undoubtedly finite. Ecological processes and social dynamics, or ecosystems as defined by Kay et al. (de Roo, 2011), are permanently intersected and, to some extent, indivisible. Therefore, development initiatives must take into account the biophysical

composition of the environment, as well as the interests and aspirations of the social actors that depend on the exploitation of natural resources (Raez, 2009).

Among other things, a common element between the social and the ecological is uncertainty. Given the natural complexity of both systems, it is not possible to predict exactly where and when the results of a determined policy will be seen or how a particular phenomenon will occur. The plausible thing is to identify future trajectories or calculate probabilities conducive to transformations of some kind (Fairhead, 1992). This uncertainty often results in a gap between the social and the ecological that ends up arriving too late for action to remedy it (Raez, 2009). Climate change and laxity to avoid it is an example of this. Another is the roads in fragile ecosystems such as the Amazon, which carry a series of impacts typically known, but rarely addressed in practice.

Penetration roads usually come with environmental degradation; biodiversity losses, fragmentation of the landscape, and habitats are typical effects of roads building and persist in the long term (Laurance et al., 2009). That is the case of the "development corridors" in Africa affecting protected areas that cover unique biodiversity values, in particular, the Cross River National Park where a US$ 2.5 billion "superhighway" has been proposed putting at risk the habitat of 18 primates, including the endangered Cross River Gorilla (Mahmoud et al., 2017).

Roads also come with the so-called fishbone effect. This impact is an indirect network of roads due to the new access and sometimes with environmental impacts even more extensive than the primary infrastructure (Delgado 2008, Perz et al. 2010). This new web of illegal or informal roads results in new access for mining, logging, migration, and occupation of new areas (Perz et al. 2008; Farias, 2016). Therefore, roads can have a tremendous influence on the deforestation pattern in certain areas. In Peninsular Malaysia, for instance, Clements et al. (2014) run a survey finding that around 90% of snares and poaching activities increase because of and are located 5 km from both sides of a new paved road.

The directions on the ground after the execution of a road are different and are not necessarily a driver of local development. There are other contemplations to be considered when planning and executing an infrastructure of this kind. It is essential to understand the power relations, social dynamics, and social structure as a whole to get an idea of the effects and social tensions that new access can generate. The latter is particularly relevant when we speak of indigenous peoples, who are more exposed to social tensions due to a transformation of the socio-ecological context due to the influence of a new road. On the other hand, the feasibility assessment tool for this type of project, the CBA, offers useful information about the trade-offs associated with the construction of a new road. However, the starting assumptions it uses do not allow identifying how the benefits and costs are distributed as a consequence of the project and much less the clash between classes.

Finally, the environmental impacts associated with new roads are evident and undeniable, first, due to the direct impacts related to the paving of the road, and secondly, with indirect impacts such as migration and expansion of anthropogenic activities that further exacerbate the degradation of ecosystems.

Chapter 3 Methodology and descriptive analysis

To develop the present research paper's hypothesis, it proposes to start from the official Feasibility Study of the project used for its approval and subsequent implementation of the road and to analyse it from two points of view. First, evaluate the study from the point of view of its technical rigor and proper use of assumptions, comparing it with standards and good CBA preparation practices. And second, from a political perspective that offers a wider view of the different social tensions and trajectories occurred with the road's construction. These two lenses are complementary and will contribute to a broader discussion of the process, the role of the instruments typically used for the approval of infrastructure projects, and of the institutional and social arrangements that are generated, on one side for their facilitation and on the other to respond to them.

For the first component mentioned, a series of criteria taken from the literature were chosen. Evaluations carried out by the World Bank (World Bank, 2013) and the European Union (Sartori et al., 2014) is the basis for selecting and evaluating these aspects. The analysis is concentrated on the most important components of a CBA to determine the viability of a project. The criteria that were applied are summarized in Table 3.1. It was first evaluated whether the analysis considered the criterion in question and how it was approached compared to what is recommended by the best practices in project appraisal from a mainstream economics perspective.

Table 3.1

Criteria applied to analyze the Southern Interoceanic Road feasibility study

Criteria		Yes: 1/No: 0	Analysis/comments
Definition of the problem and scenario analysis	Description of the context		
	Scenarios modelling and assumptions		
Economic values: Benefits and costs estimation	Benefits calculations		
	Costs calculations		
	Net Present Value		
Risk analysis	Sensitivity analysis		

On the other side, from the political economy/ecology perspective, this paper aims to contribute to the body of knowledge about roads buildings' impacts on the socio-ecological and political dimension. To do that, I propose a political approach combined with secondary data related to land use change within the Southern Interoceanic area. In this case, besides research produced by other scholars, literature, blogs, and videos are fundamental to capture information from an academic point of view and from voices on the ground such as indigenous people who faced the road's effects. Following Wainwright et al. (2014), this analysis is going to focus on two perspectives. First, a regional dimension considering the role played by the Peruvian and Brazilian States promoting and encouraging the implementation of the infrastructure claiming benefits in terms of trade, regional integration, and de-

velopment in general. And second, the political aspects in relation to the land tenure and the tensions and struggles arisen after the new route opened in Madre de Dios.

Chapter 4 Results and analysis

In this chapter, I present the main findings after applying the two approaches described in the previous section. First, analysing the feasibility study's assumptions and technical rigor used to approved the implementation of the Interoceanic road. And then exploring how the completion of the new route has transformed the socio-ecological context in that particular area in Madre de Dios.

4.1 Feasible because it is feasible

Due to the scale of the costs included within the Southern Interoceanic road's investment and operation, the initiative was subject to 9 assessments of its profitability between 1999 and 2008. This examination is based on the final one elaborated by Bonifaz et al (2008), which is focused on the road's financial benefit and on which the ultimate designing plans are based. It is worth specifying that this project was established by law as a priority of national interest, which absolves a set of technical stages and to be evaluated through the National Public Investment System.

4.1.1 Definition of the problem and scenario analysis

The first step in the correct application of the CBA for evaluating a project is a narrow definition of the subject in question, in this particular case, a road. Following the guidelines of the European Investment Bank (EIB) on the evaluation of investment projects (2013), the definition of the study area must be as small as possible in order to achieve robust and consistent results, and at the same time, it must be of sufficient size to capture the effects of the new infrastructure on other existing routes. Furthermore, when it comes to large-scale infrastructure projects, it is suggested to divide the road into sections considering the differentiated effects that may occur in different sections of the road given the economic, social, and environmental differences between regions (Sartori et al., 2014).

In the feasibility study used to approve the construction of the Southern Interoceanic road (Bonifaz et al., 2008), the project and the problem are described but under different premises than the recommendations already shown. First, the project's effect at the macro-economic level and by region is evaluated, applying regional input-output tables to estimate the impact at much smaller spatial scales. This approximation is questionable, first because it applies a gross weight built for a broad jurisdiction such as the regions; and secondly, it is based on an indicator of economic impact, not one that allows estimating welfare changes.

On the other hand, the Southern Interoceanic road is a mega-infrastructure that runs through nine regions in the South of Peru. In the analysed CBA, these 2,600 km of route are evaluated as a whole, leaving aside the social and productive characteristics of each of the regions included. This practice, in addition to not complying with technical recommendations such as those offered by the EIB (2013) and Sartori et al. (2014), given the tremendous scale of analysis, falls into assumptions and estimates that are difficult to support on the ground. For example, in Bonifaz et al. (2008), agricultural and livestock expansion is considered one of the potential benefits of constructing the road, concentrating their analysis on sugar cane production, soybeans, citrus fruits, corn, rice, pineapple, and papaya. None of these crops are produced on a relevant scale in Madre de Dios, the road's section

under analysis in the present investigation. Therefore, the feasibility study is blind in terms of local realities as well as its potentialities and productive dynamics, choosing to give preferences to gross calculations that, on average, may look promising.

Another missing element in the Feasibility Study is the evaluation of other investment alternatives. According to the EIB (2013) and World Bank (2013), this stage is fundamental within the evaluation of projects to really understand whether other investment options can maximize benefits, minimize costs, and reduce risks. In the particular case of the Southern Interoceanic route, other options were not considered, such as multimodal transport, waterways taking advantage of the typical mean of transportation in the Amazon (Dourejanni et al., 2010), subsidized flights, or not even a smaller road that favours the control and monitoring of its side effects. Being categorized as a national priority, the Southern Interoceanic road avoids this technical step and advances like a horse without looking to the sides on a decision already made: the construction of a road of an unprecedented scale in Peru and with unpredictable impacts.

4.1.2 Economic values

The economic values refer to the benefits and costs generated by the implementation of the project. The consideration of these values is based on the economic welfare's three principles postulated by Harberger (1971). These are:

i) The price of one additional unit of any good in a competitive market represents the economic value for the demand; in other words, it is an economic benefit.

ii) The price of one additional unit of any good offered in a competitive market represents the economic value for the supply; in other words, its economic resource cost.

iii) The sum of costs and benefits represents the net value of the incremental situation without regard to who wins or loses.

In the specific case of the evaluation of road projects, the building's direct benefits are reflected in cost savings. Under better roads, less spending on vehicle maintenance, less gasoline, less tire replacement, time savings, potentially fewer accidents, etc., are expected. Therefore, traffic is the great driver of change to evaluate consumer surplus expansion in a situation with a project (Jenkins et al., 2014). Another alternative to measuring the benefits is when the new route involves agricultural expansion. In that case, it is possible to assume that this growth occurs on public lands with no economic value at present. Then the benefit of the road could be estimated by increasing productivity in agricultural activities by subtracting the costs necessary for said expansion (fertilizers, electricity, labour, among others). It must be mentioned that these are two exclusive alternatives to determine the benefits (Jenkins et al., 2014).

In the evaluation made for the South Interoceanic road's approval, the methodology does not consider the technical elements presented in the previous paragraph. The feasibility study fails again applying regional macroeconomic indicators to a study area of a different scale, such as the project's area of influence in Madre de Dios. In fact, the study recognizes that given the inexistence of the route, most of the traffic will be generated in other sections of the project, specifically in Puno, Arequipa, and Cusco regions (Bonifaz et al., 2008). So, if the 2,600 km project is considered as a whole for its evaluation, an additional vehicle in Puno that continues to Madre de Dios is also counted as an additional car in the

latter region? This assumption represents an overestimation of traffic and the benefits that the road would bring. Furthermore, Bonifaz et al. (2008) project an average growth in traffic of 4.38% per year between 2010 and 2020. The evidence shows that in the section of Madre de Dios, traffic has grown only 2.2% (Gestion, 2017).

This lack of vehicle's circulation was expected before the construction of the road. One of the arguments for its implementation was the hope that soy produced in Brazil and exported to China from the Atlantic will take advantage of the new route to the Pacific. However, it is unfeasible for large trucks of more than 30 tons loaded with soy to go up to more than 4,000 m.a.s.l through the Peruvian Andes to trade from the coast of Peru (Fowks, 2017).

In addition to the obvious questions about the estimated traffic in a scenario with a road, the feasibility study adds the value of agricultural expansion as benefits before the paving of the new route. To do this, Bonifaz et al. (2008) make an analysis of the exportable offer to cities near the border with Brazil, such as Acre and Rondonia. From this diagnosis, the export potential of garlic, olives, onion, and potatoes stands out. This potential was projected using macroeconomic growth indicators at the regional level, reaching an estimate of almost US $ 22 million. However, under the understanding that traffic growth already captures the dynamism of trade, and the economy in general, why add these values as part of the benefits? Again, this represents a double counting of the benefits favouring the feasibility of the construction of the infrastructure.

On the other hand, Madre de Dios does not produce these "flag crops" that the feasibility study highlights as potential for development of the area. In fact, according to meetings established between Peruvian and Brazilian investors in Puerto Maldonado, they showed their lack of interest in exchanging because they produce similar products (Dourojeanni, 2006). Therefore what is left for this section of the road that is of interest in this research? Again, the study fails to evaluate a transnational road as a whole and not by sections as suggested by international standards and best practices in project appraisal (World Bank, 2013; Sartori et al., 2014). These elements were also reviewed by Guerra García (2005), who argued against the dimension of the available agricultural land assumed in the feasibility study.

On the side of costs, for evaluating projects, they are usually divided into investment costs and operation and maintenance costs (Sartori et al., 2014). The investment stage considers the acquisition of assets and financial aspects related to the proposed investment (Jenkins et al., 2014). This investment plan must consider the different scales of the project and regional contexts, and this estimation must be as realistic as possible in terms of the expected level of demand, the availability of labour, limitations of the local economy, the technical characteristics of the infrastructure (Jenkins et al., 2014). In this regard, Sartori et al. (2014) suggest (among other things) that for the estimation of investment and costs in general, the following are considered: 1) the estimates of other projects in similar contexts, and 2) the cost of the measures of environmental protection.

In the Southern Interoceanic case, and specifically for section 3 located in Madre de Dios, an investment of almost US $ 300 million was estimated (Bonifaz, 2008). This amount, on average, represents little more than US $ 740,000 per kilometre built. However, the evidence indicates that, on average US$ 14,000 per kilometre built is invested in the

Peruvian Amazon roads, according to a sample of 12 projects obtained in Vilela et al. (2020). This evidence shows a tremendous difference in the level of investment, especially considering a road that so far does not reach the expected traffic. Besides, although there is no available information about section 3 of the road, it is demonstrated that the final investment on the entire road was US $ 4,500 million, an exorbitantly higher figure than that used to assess the feasibility of the project.

4.1.3 Uncertainty evaluation

The economic assessment of a project implies the projection in time of the benefits and costs that would happen in a situation with the infrastructure's implementation. This forecast makes it vital to accept an arrangement of abstractions of the future that brings uncertainty and risks in the parameters applied that must be assessed to validate the outcomes and examine the conclusions' robustness. In this manner, the choice of the pertinence of a certain project does not have to be based only on the financial modelling deterministic values. The likelihood that these results vary in reality should also be taken under consideration (Jenkins et al., 2014).

There are several reasons to run an uncertainty appraisal before an infrastructure construction or to any investment in general. In the first place, to minimize the bad project endorsing likelihood from an economic perspective (Jenkins et al., 2014). Second, once the risks are understood or identified, the possibilities to improve the project are expanded through design adjustments or institutional arrangements that make the initiative viable (World Bank, 2013; Jenkins et al., 2014). And third, the recognition of risks opens opportunities to obtain more data that allow making the most robust estimates (Jenkins et al., 2014).

For this, there are a series of steps or technical tools that allow evaluating the risk and uncertainties around any project evaluation (Sartori et al., 2014). The most used are sensitivity analysis and probabilistic risk analysis. The first departs from the critical variables that significantly impact the project's economic performance (Sartori et al., 2014). To do this evaluation, the sensitivity analysis calculates the NPV for different levels of certain variables through percentage variations selected based on historical information and primary information that can guide the possible sense of the change in such a way as to have an idea about the robustness of the net benefits. In other words, it is representing extreme situations of reality to test the behaviour of the NPV according to these possibilities (Rubio, 2017).

The risk appraisal is a somewhat more complex statistical exercise. This analysis starts from the probabilistic distribution of the critical variables identified in the sensitivity analysis (Sartori et al., 2014), and through a large number of iterations, it is possible to determine the probability that the estimated value is close to the expected value (Jenkins et al., 2014).

From what has been shown so far, it is clear that the Southern Interoceanic project is plagued with uncertainties. Being a new route, project traffic based on potential increases in trade and economic dynamics, in general, requires different assumptions. The estimation of construction costs in terrain as complex as the low Amazon in Peru also implies a certain margin of error that must be evaluated. Environmental mitigation measures in a social and

environmental space whose reaction to the new infrastructure is difficult to predict, among other reasons, are a few justifications for requiring an exhaustive analysis of the risks associated with the robustness of the results. However, the feasibility study with which this project was approved, although the reasons already mentioned, does not present this highly relevant stage. It is worth specifying that in 2005 the Southern Interoceanic was exempted from the application of the National Public Investment System technical standards, which permitted it to skip a series of steps, including the risk appraisal related to the assumptions, parameter, and results obtained by the feasibility study[3].

A synthesis of the findings discussed in this section is shown in Table 4.1. On the one hand, it was found the application of economic models with calculation factors of an immense scale compared to Madre de Dios, and on the other, a potential overestimation of benefits and underestimation of costs, just to mention some of the results. All these findings without considering the CBA's limitations to capture particularities and impacts in a complex social relations network and ecosystem functions. The following section describes the political dimension of the case to offer a broader look at the relevance of the Southern Interoceanic road.

Table 4.1

Synthesis of the analysis of the feasibility study of the Southern Interoceanic Road

Criteria		Yes: 1/No: 0	Analysis/comments
Definition of the problem and scenario analysis	Description of the context	1	The study area in which the analysis is concentrated is on a larger scale that does not allow estimating the particularities of the economic dynamics in a space such as Madre de Dios, which is different from the Andean regions where the other sections of the Southern Interoceanic are located. The section under analysis is nearly 400 km compared to the total magnitude covered by the transoceanic project (2,500 km).
	Scenarios modelling and assumptions	1	It exists in the evaluation exercise the scenarios with and without the road however, other interconnection alternatives are not presented considering the geography, social needs and environmental conditions of the area.
Economic values: Benefits and costs estimation	Benefits calculations	1	The feasibility study applies macroeconomic factors to calculate the traffic that would be generated by the project. This is too gross calculation factors for an area like Madre de Dios whose economic potential is different from other regions. Additionally, there is a risk of double counting and overestimation of traffic based on commercial attributes that do not exist in Madre de Dios. This is evident in the reality in which so far

			only half of the promised traffic has been evidenced.
	Costs calculations	1	Investment costs were underestimated. The subsequent results of the road construction show that the final investment in the project far exceeded the figures used for the evaluation of the project's feasibility.
	Net Present Value	1	The analysis present s the Net Benefit. However it could be overestimated considering the assumptions included in previous steps of the CBA.
Risk analysis	Sensitivity analysis	0	The study does not present a risk analysis.

4.2 From the political perspective

This section seeks to deconstruct different elements around the construction of the road both for the promotion of its construction, as well as other consequences in light of the effects of the opening of the new route. First, part of the institutional arrangements between the States of Peru and Brazil, among other institutions to encourage the project's implementation, are described. A successful triangulation was achieved between the two to reach the construction of the Southern Interoceánica. This research seeks to systematize existing secondary information to describe said interrelation.

Additionally, the effects of infrastructure on indigenous territories are analyzed. Given the intense migration generated by the road, there was a profound transformation of the social landscape in which indigenous peoples were one of the most affected. Something similar to the environmental perspective. The unstoppable expansion of illegal mining and other extractive activities continues generating forest losses at an alarming rate. This topic will also be addressed in this section by describing some of the evident environmental impacts in the road's area of influence.

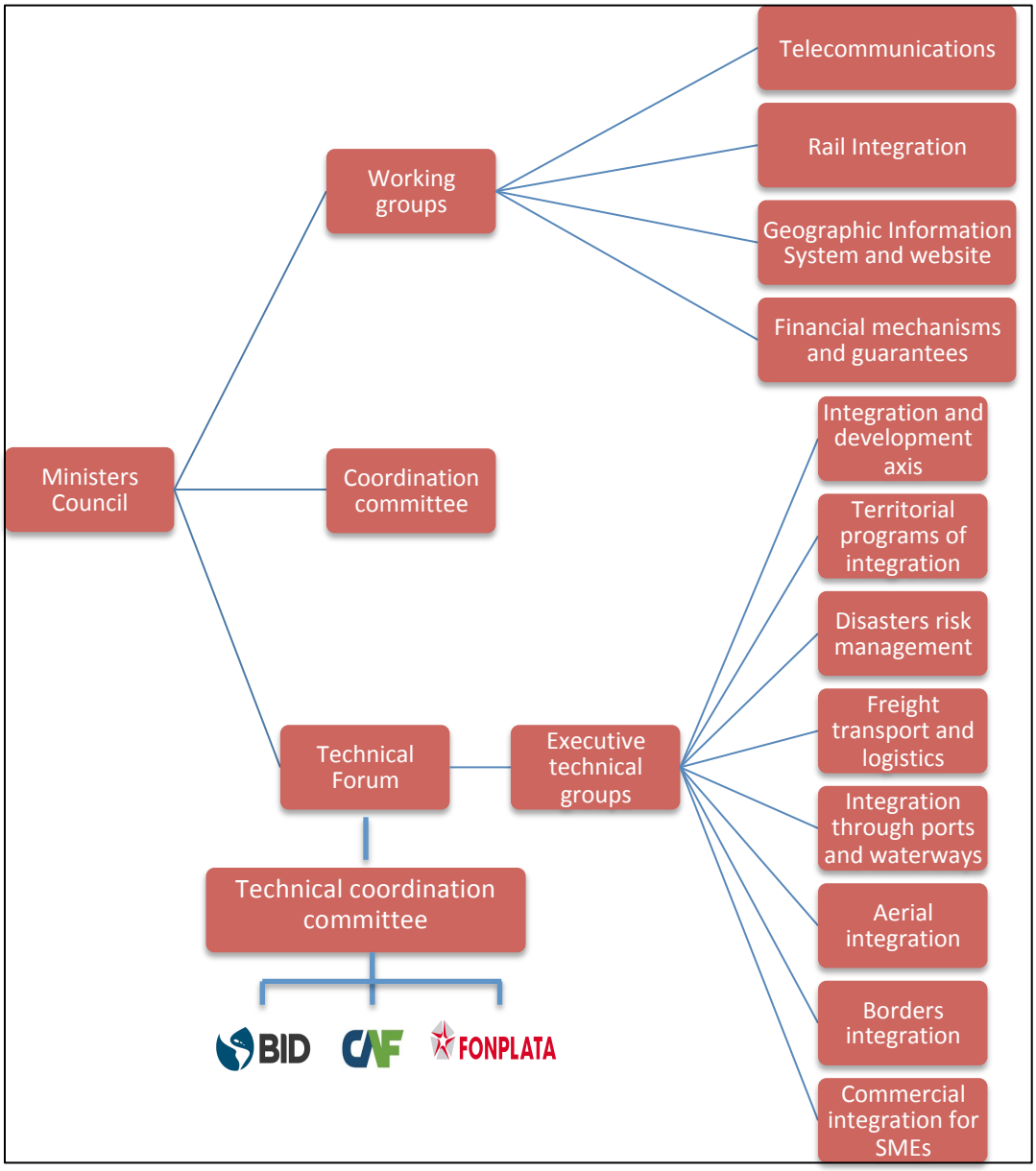
4.2.1 All for one and one for all: The states and institutions

The actors behind the Southern Interoceanic promotion and design are part of the Initiative for the Integration of Regional Infrastructure in South America (IIRSA for its acronym in Spanish). IIRSA is a coordination platform of 12 countries in South America created in 2000, which aims to integrate the region in terms of transport, communications, and energy, thus becoming more competitive as a single region (Mego, 2007; IIRSA, 2002). Behind this initiative were multilateral banks. The IDB, CAF, and Fonplata were the ones that initially encouraged the creation of this integration umbrella, and it was they who also contributed with resources for its institutionalization (Vega, 2002). Figure 4.1 shows how IIRSA is organized and the prominent spot of the banks in that setting. It is also important

to notice the absence of representatives of indigenous organizations, civil society, academy, among others that probably have something to say in this table.

Figure 4.1

IIRSA organization chart



Source: IIRSA website

In practice, the IIRSA was nothing more than the compilation of a series of old projects that each country already had. Some of them were updated towards a concept of regional integration and discourses of economic development. However, this new "regional" portfolio of projects meant vast amounts of investment. In total, there are 335 infrastructure projects equivalent to US $ 37.5 billion (Dourojeanni, 2006, p19), a goose that lay golden eggs for development banks that had been encouraging South American integration.

On the side of the Peruvian State, the position was massively unanimous: there was consensus to promote and encourage the completion of the road (Dourojeanni, 2006). The main institutions and organizations involved were the following: the Presidency of the Republic, the Ministry of Transport and Communications, Regional Governments, municipalities, and of course, the Congress of the Republic. Two other agencies played a crucial technical role in this institutional scheme: the Investment Promotion Agency, Proinversión, headed by the Ministry of Economy; and the Supervisory Agency for Investment in Public Use Transport Infrastructure (OSITRAN for its acronym in Spanish), which served as the technical arm of the Ministry of Transport and is responsible for the administration of the contracts. These institutions, plus others of lesser relevance within the framework of IIRSA, were aligned to support the execution of Southern Interoceanic. Probably a unique event in the republican history of Peru.

The unison endorsement of the project by the Peruvian State and Development Banks, such as CAF, was reflected in the discourses used to pave the way towards achieving the project (Vega, 2002). At that time, it was heard almost like a mantra in the media that integration was fundamental for national development. Road integration will make us more competitive for business in markets, live borders, cross-cutting development, and new investment opportunities (Dourojeanni, 2006). An example of this are the words of the Minister of Foreign Affairs at that time, Allan Wagner:

> *"*Our countries have finally become convinced that the only way to bring **well-being** to their border regions is through the integration of regional economies, and the creation of the political, social and cultural support necessary to bring people closer. The imperative of integration to ensure political autonomy and negotiation capacity is well described in the following statement: The current international panorama, in which the powers seek to consolidate their spheres of influence while competing for political supremacy and global economic power, is reflected on the dynamics of hemispheric relations through the new mechanism of the Summits of the Americas and the Free Trade Area (FTAA). This would tend to deepen dependency and not to create relationships of interdependence and mutual benefit, to the extent that South American countries do not establish close ties with each other, in order to strengthen the bases of greater **autonomy** in the process of international insertion and also: Integration represents the valid alternative to gain the necessary political autonomy in order to strengthen **democratic governance** based on development with social equity, and at the same time generate a capacity for international negotiation that allows us to face the challenges presented by the hemispheric context and international" (Wagner, 2002, p24).

This discourse is a sample of how capitalism embeddedness within the State reaches a level that their ideology reduces its capacity to see beyond the facts. Wagner mentioned three keywords: well-being, autonomy, and democratic governance. But for whom?. As it was already showed, social actors directly involved with the project, such as indigenous organizations and civil society, were not part of the road's political discussion. This approach is a typical top-down decision-making process where a hegemonic class replicates their beliefs in different contexts, assuming that it will bring positive results in terms of development, denying the presence of other values and ways of understanding development.

All this narrative machinery coincided with a popular need for public interventions to achieve greater development opportunities, achieving significant support from the public, again with the exception of some hidden voices such as indigenous peoples and some civil

society organizations that warned the environmental and social impacts that this infrastructure could mean mainly for Madre de Dios. This project selling policy in terms of development, populist in a way, reached such a level that some regions as Cusco and Puno ended up in conflict to get the route to cross those territories. That was resolved (again in a populist way) by duplicating the route to Puno and Cusco (Dourojeanni, 2006). So much was the popular pressure that some congressmen did not dare to contradict it. That is the case of the congressman representing Puno, Yonhy Lescano, at that time:

> "We were not going to vote against a road that my region was asking for, in addition, the report presented by the colleagues who technically investigated said that there was no irregularity" (Florindez & Desautez, 2018).

On the Brazilian side, the institutional arrangement was quite similar in Peru, with the difference that Brazil had the bargaining power of an economy that aimed to be the sixth in the world (BBC, 2011). Those involved were the Presidency of the Republic, Ministries of Transport and Communications, Foreign Relations, the governments of the States of Acre and Rondonia, and municipalities. Of course, the banks. The National Bank for Economic and Social Development (BNDES), which fulfills a role similar to that of the CAF, the Bank of Foreign Trade of Brazil (BANCOEX), and the Bank of the Amazon (BASA).

The narrative used in Brazil was the same as in Peru. Promises of development and integration promoted even at the presidential level. President Lula da Silva in the company of Alejandro Toledo, the Peruvian President, already said it at the inauguration of the Acre bridge between Peru and Brazil:

> "We are turning the immense potential for cooperation into reality… we are working to ensure that the Amazon does not remain a marginalized region" (Connectas, no date).

Almost every mention of the South Interoceanic was accompanied by ingredients for its promotion, arguing that it was a fundamental need to achieve greater efficiency and capture Asian markets through the new access to the Pacific (Silveira, 2002). The question here is marginalized of what, the reproduction of a capitalist pattern?. In practice, the Amazon inhabitants were also marginalized by the decision about the road. And they are still victims of the impacts in terms of migration, displacement, and land grabbing.

This political romance around the South Interoceanic had the necessary actors. Two promoters States agreed on the initiative, part of the population waiting for this mega-project that would bring development and prosperity to the country but lack the resources. The Brazilian route section had already been built years before, but Peru did not have the necessary funding to complete its part of the project. It is in this scenario that banks appear. The Brazilian State contributed US $ 300 million through BNDS and CAF added a US $ 200 million quota to the bag. This sort of coalition forced the Peruvian State to guarantee the execution of the project. That means to guarantee any additional cost, besides handing over the road operation to the concessionaire of the construction, coincidentally a series of Brazilian companies that appeared to obtain the project's concession. Companies such as Andrade Gutierrez, Conirsa, Odebrecht and Camargo Correa won the award of sections 2 and 3 of the infrastructure (Dourojeanni, 2006, p14). This triangulation is clearly denoted in a confidential diplomatic communication sent by the

Brazilian ambassador in Peru at that time, Luis Augusto Araujo, to his Brazilian peers. This after a conversation with Jorge del Castillo and Verónica Zavala, Prime Minister and Minister of Transport in 2007, date of the conversation:

> "That they were very concerned with the possibility that none of the four companies present their proposals until the end of the term […] They indicated that they were aware of some dissatisfaction in the Brazilian companies with the conditions presented for the two tenders. However, they indicated their willingness to talk with their representatives to examine the possibility of introducing changes that could make their participation in the competition viable " (Florindez & Desautez, 2018).

Therefore, the level and noise achieved by the race to the Southern Interoceanic reached a point, for many, without the possibility of turning back. From geopolitical pressure, through populism to the desire to obtain a few votes, they promoted, from the States, the realization of the project beyond the technical and financial doubts that some actors tried to highlight without success.

4.2.2 From the indigenous and civil society perspective

The discourses, massive information in the media, and political pressure achieved a relatively favorable general position in the population about the project. Regions like Cusco, Arequipa, Puno, and even a part of the population in Madre de Dios applauded and hastened the execution of the project. This perception was to be expected considering the great advertising campaign that promoted the road without showing the other side of the coin and the almost religious belief that roads are necessary and positive for development (Dourojeanni, 2006).

However, there were always hidden voices that were not necessarily taken into account, even though, in many cases, the Southern Interoceanic would impact their lives and beliefs directly. In some cases, these voices were represented by grassroots or civil society organizations. In others, they simply could not make themselves to be heard. In the area of influence of the road, there are indigenous territories of ethnic groups such as Amarakaeri, Machigenga, Ese'Eija, Amahuaca, and Mashco Piro (Dourojeanni, 2006; Chirif, 2019). It is also a settlement site for Shipibo-Conibo, Quichua, Ashaninka, Cocama, and Huitoto, indigenous peoples who were forced to migrate from other regions due to the rubber rush (Brack & Yañez, 1997). Some of these people organized to face what appeared to be a threat to their territories. So grassroots organizations such as the Inter-ethnic Association for the Development of the Peruvian Amazon (Aidesep for its acronym in Spanish) and the Native Federation of the Madre de Dios River (Fenamad for its acronym in Spanish) were empowered. Additionally, another particular social agent of the resistance was the illegal coca leaf producers located in the area whose main concern was the State's greater presence thanks to the new access (Vecco, 2005). The truth is that this opposition did not reach the expected resonance, despite the relevance of its claims. A sample of the position of the indigenous people who saw how decisions were made within the framework of IIRSA (despite not being related to the Southern Interoceanic in concrete) is the claim of Guillermo Tascon of the Indigenous Organization of Antioquia, Colombia:

"The gold and silver rush of the first conquest made them not see the forests, the water, the knowledge; suddenly greed saved many of us, because they took only what was most visible and what was valuable at that time. But now everything can be turned into gold, into money. They even come for the scents of the plants, for the beautiful words of the grandparents and grandmothers… On our territories the businessmen and the State paint maps of natural resources where an Indigenous never appears, and they speak of the lands as if they were wastelands; again we have no soul, we are not human beings ... "(Jiménez, 2018).

This manifestation denotes the frustration of those who in this scenario appear as the unheard, when in many discourses they are used (indigenous peoples) as the beneficiaries of said interventions. In one of the public hearings for the approval of the Southern Interoceanic and transcribed by Raez (2009), Mrs. Felicia Amado Chávez from the National Confederation of Communities Affected by Mining raises her perception of the complexity of the problem in relation to the Southern Interoceanic:

"... I want to ask you as to whether the residents were consulted to make concessions, if they agreed with this infrastructure development. A point. Other: With what financing are these concessions made and for what time? Other: (Now, from experience, I'm just going to tell you). In Ancash, with the penalty of the mining company Antamina, the road from [unintelligible] to San Martin was made. This also gave insurance to a consortium, very qualified, highly evaluated. Today, that road is worth nothing, not at all! The clearings ruined the adjacent territory ... There were also housing problems, the people who lived on the edge of this road. Well, it is true that you say that they have made a survey of these houses; but how do they do it? Exactly how it's measured, they don't even beat it! This is how they deliver to the gentlemen who live next to the river ... Just the same, they don't even give you a ... When you relocate, what you have been, the same [they give you]. If they can improve, then people are content with that development; rather, she is not thinking that she is injured. Then, they do not compensate, as it should be. They are deceived. Now, as for that work, I am not against it; but you have to be realistic: There is a lot, a lot of pollution. And these contaminations are not mitigated at the moment. Therefore, currently there is global warming; that we Peruvians may live more than fifty years our territory is going to disappear (...) Now, it says that there are those who supervise these jobs, right? But these supervisors are friends of those who work who do not see how they are throwing this material, if they are doing as they have presented in their project. And that is why when the rain comes; everything opens up what they have done (...) So, today, for me it would be I DO NOT ACCEPT road. Let people walk with their horse [unintelligible, laughs] ... and live happily. This mode of development must not change, it must not impact, why, if poverty comes more instead of being better, why, [having] roads now have to be paid for and from where if there is no work today, yes There is no work for the peasants, where do they have money ... Now: As for the audiences that you have. These hearings that say that it has been consulted, are sudden hearings ... They arrive, they say this is legal. They sign the assistance, but it has been protested that they do not want that mining concession; they do not want that highway. But since he has already signed, it is already said, he has already signed up, it has already been accepted. And those things are that you as a Ministry must be very jealous to see, you do not have to think about anything more than giving investments to strange companies that come just blackmailing. Other: You must make these inquiries, firstly preparing the citizen, the peasant, and native, first educating him. Before, educate him; Before letting them know about international treaties, our Political Constitution of the State also says in Chapter II of Human Rights, citizen positions must be respected ... Then, those audiences or the facilitators, as [also] who is going to present, must give in their own mother tongue of each locality where it will take place. With this no, I am not against; but [unintelligible] natural resources must be taken care of and one must not predate. Thank you." (Raez, 2009, p4).

This quote largely represents the great claim of indigenous peoples. His position is not part of the decisions, even though the official discourse says everything is for their development. The resentment of a historical State's abandonment is reflected in doubts validated by a lack of communication between the State and the actors on the ground. Therefore, conflict and resistance are a natural consequence of visions to some extent antagonistic fed by ethnocentric visions of decision makers in the capital and the mistrust of peoples little heard in the past.

Finally, in the context of Goliath versus David's story, some of the impacts observed to date on indigenous territories are the invasion of indigenous territories that were already under constant threat by loggers and miners. That is the story of the Amazon. Historically, the indigenous peoples of Peru, Brazil, and Bolivia have been forced to give up their territories in the face of violent incursions of invasive activities or under the State's protection, assigning forestry or mining concessions. With the opening of the Southern Interoceanic, this situation has only worsened. Between 2007 and 2008, for example, and given the explosive increase in gold prices worldwide, indigenous territories were the victims of a massive occupation by informal miners. The Arakbut, Arasaeri, and Korsimba, as well as protected areas such as Tambopata and Baguaja-Sonene were among the most affected (Moore, 2019). In total, this meant more than 50,000 Ha of forest deforested from 2008 to 2013 (Asner et al., 2013), and more than 18,000 Ha only in 2017 (Sierra, 2019). According to data from the Agency for the Supervision of Forest Resources and Wildlife (OSINFOR, for its acronym in Spanish), of the total deforestation that occurs in Madre de Dios, 17% is located in indigenous territories (OSINFOR, 2016) (Table 4.2).

Table 4.2

Deforestation from Mining in Madre de Dios to 2014

Description	Total Area (Ha)	Deforested Area	%
Territorial Reserve	869,074.34	-	0.00%
Permits on private land	45,194.39	6.86	0.01%
Natual Protected Areas	3,800,493.27	91.18	0.19%
Forest without concessions	170,612.41	4,182.54	8.86%
Native communities	398,119.64	8,236.11	17.46%
Forestry concessions	2,505,871.21	11,532.41	24.44%
Uncategorized areas	673,209.49	23,135.51	49.03%
Totals	8,462,574.75	47,184.61	100%

Source: OSINFOR (2016)

This land use change reflects the laxity of the Peruvian State, first to adequately manage the operation of the Southern Interoceanic in such a way as to avoid these social and environmental impacts, and secondly, to defend the rights of the most vulnerable actors, in this case, the indigenous people. However, there are some attempts by the State to stop this accelerated land-grabbing process. In 2012, the use of dredgers in the area was prohibited under the argument that this was the significant problem that generates environmental degradation, which does not address the issue of land dispossession and, in fact, only led to the leakage of mining to other new areas of forest. The supply of inputs for mining, such as gasoline, was also prohibited. This measure ended up hurting small farmers and indigenous people who need this input for their daily activities. It practically did not affect the miners who had the resources to pay a few bribes and obtain the inputs they needed. Sporadic military interventions were also implemented that only resulted in generating violence, death, and migration of mining to other territories (Moore, 2019). About this last measure, the Native Federation of the Madre de Dios River and tributaries (FENAMAD for its acronym in Spanish) which groups the indigenous peoples Arasaire, Shiringayoc, San José del Karene, Kotsimba, El Pilar, Tres Islas, San Jacinto, and Boca Inambari, they demonstrated energetically against the military interventions. Here are two points of the five included in a formal pronouncement entitled "With military intervention are false solutions to mining activity" (FENAMAD, 2011):

> "That, the military intervention aimed to destroy the dredgers and similar devices that operate in the rivers, lakes and streams of our region puts our communities and the population of Madre de Dios at risk, and at the same time, has been generating serious environmental impacts and pollution (oil spill, mercury, death of fish due to the explosion when destroying the dredgers), effects that we demand that those responsible be evaluated and punished".

> "That, we reject this type of military action because it seems to us incompatible in democracy, with an apparent imposition of authority by MINAM, a central government that comes with false solutions to a problem that has a social and economic root, given the inability to provide an opportunity to work to social sectors".

Once again, the State fails proposing short-term solutions that do not address the underlying issue, in this case, the occupation of indigenous lands by illegal miners and the violation of their rights as Peruvian citizens and their autonomy as owners of the land.

In this regard, there is a case that could be a paradox and is well documented by Moore (2019). One of the state's legal instruments to stop the advance of illegal mining in Madre de Dios was the Instrument for Corrective Environmental Management (IGAC). This document required the mining companies to formalize themselves through a series of commitments on good environmental practices. Until 2018, no miner had complied with any of these commitments. However, the native Kotsimba community, a branch of the Harkbut people, decided to play by State's rules. This community has been engaged in small-scale mining on their lands since the 1970s. The community chose to prepare the IGAC, invested resources and specialists, and presented the document to the Ministry of Energy and Mines of Peru. The State rejected the proposal, arguing that mining activity is prohibited in indigenous territories, making the Kotsimba illegal and incapable of exercising their autonomy in territories that belong to them, and for an activity carried out long before all the mining migration that had threatened and destroying their lands. This

paradox is just one example of what kind of development the opening of the Southern Interoceanic offered and for whom. They say that the road will bring more trade opportunities, and when I want to take advantage of my house and its resources, they tell me that I have no right. However, the State buys the gold from other miners out of control and without any legal nor ancestral rights on the territory.

4.2.3 What are the enabling conditions for a perfect storm?

Some ideas can be extracted through the Southern Interoceanic case about what conditions must exist for an infrastructure project. Not only for roads but also applicable to hydroelectric plants, dams, trains, and even other large-scale productive activities such as agribusiness, make to be achieved beyond the social tensions and environmental risks that are obvious and all under the slogan of development. What was seen in this case is an almost perfect coincidence of political decisions at the level of several States. In particular, Peru and Brazil, and also others such as Bolivia and Chile that also sought to join this transcontinental corridor; the technocracy generating evidence supporting the decision based on a series of assumptions to some extent convenient for the project; the need of much of the population for opportunities for economic growth and development; banks and the private sector offering resources and facilities to make the dream of interconnection come true; and a massive discursive campaign that supported the initiative and at the same time overshadowed other voices and points of view that, in light of the events, should have been heard.

Stories of this type, we can find several around the world. For example, the 306 km highway designed to link Villa Tunari and Santiago de Moxos in indigenous territories, and Isibiro Securé National Park (TIPNIS for its acronym in Spanish) (Flores, 2015, p13). Again, this project, signed by Presidents Evo Morales and Lula Da Silva was accompanied by development and integration discourses with larger cities such as Cochabamba and Beni (Flores, 2015, p13). This setting was accompanied by resources from the National Bank of Brazil (BNDES) and companies from the same country, such as OAS Ltd, despite resistance and warnings about social tensions and environmental disasters that this infrastructure would mean for the landscape (Molina, 2009).

The Pekanbaru-Dumai highway in Indonesia promoted by The California Texas Oil Company (Caltex) due to the discovery of new oil deposits; accepted and promoted by the State in that colonial era (Colombijn, 2002, p747). The opening of this route brought a successive chain of exploitation of natural resources that resulted in the loss of millions of hectares to date unstoppable (Colombijn, 2002). All of this was, of course, accompanied by uncontrolled migration that displaced native groups like Malays and Sakai. Nowadays, these ethnic groups no longer appear in national censuses (Colombijn, 2002).

In Africa, we can find the proposed Cross River superhighway in Nigeria. This project is a 260 km road that would connect the southeast coast with Abuja, its capital (Laurence et al., 2017). This US $ 2.5 billion initiative would be financed by an alliance between the State and a company of Israeli and British capital who would contribute with around 500 million Euros (Akpan, 2016). For now, this project, still in design, has expropriated lands from 42 communities located along the route that will be auctioned for forestry and mining purposes (Laurence et al., 2017). It is quite a scandal promoted by the Governor of the State of Cross River, Ben Ayade (Alert, 2016).

And so on, we can continue telling stories with this pattern of intervention for the implementation of mega-infrastructures: The State - private capital - discourses - and actors on the ground refused to participate in the decisions. Therefore the explanation goes beyond the search for development and social welfare. These arrangements go beyond conditions to promote infrastructure as an automatic response to boost the economy and development. These are processes of capital reproduction, and a result of a capitalist ideology and values deeply embedded in hegemonic actors as States, banks, and companies. Following Harvey (2004), these stories are probably a natural consequence of the process of capitalist self-destruction and re-invention. By this, geographic expansion and spatial reorganization appear as an option to mobilize the excess of existing capital after a historical process of accumulation. If we think about over-accumulation of means of production as the basis of the problem, then that would explain the impetus for the construction of these immense infrastructures (mainly in countries of the Global South), where there are still available spaces to intervene and "unused lands," in rural areas characterize like the Amazon. This interpretation would also mean that almost all acts of resistance are useless against the great capitalist machinery that needs to continue reinventing itself and permanently relocating its surpluses as a circular process. It is like a never-ending wheel with little chance of being stopped by those disadvantaged of less access to the means of production.

Chapter 5 Conclusions: The never ending story

The case of the Southern Interoceanic road seems like one more chapter in a never-ending story. What have been seen to this date within the area of impact of the Southern Interoceanic road is environmental degradation at an exponential rate (the deforestation rate was multiplied after the road building (Alarcon et al., 2016)) and the dynamization of illicit economies that are hurtful to the social and natural setting that has came along with indigenous territories invasion, land speculation and a arrangement of exceptional human rights violation in Madre de Dios (Dourojeanni, 2006).

As has been shown in this research, there are diverse examples like this worldwide, and with similar consequences from the point of view of social tensions and environmental impacts. However, its review is useful to discuss the relationship between capital injection and the implementation of large-scale infrastructure and development. Additionally, it is relevant to show the technical and institutional arrangements that usually occur behind these types of initiatives until they become a reality.

For this, the analysis approached the case from two points of view. First, analysing from the technical-economic perspective reviewing the Feasibility Study used for the project's approval. And second, from the political point of view, characterizing the entire process of realization of the road from a broader perspective; showing the different actors involved and their role in this story full of discourses in favour of the project, and irregularities and voices usually not heard that end suffering from, in principle, dubious decisions in terms of local development.

Technically, it is clear that the Southern Interoceanic road was based on a series of debatable assumptions compared to standards and good practices for project evaluation, and also in light of the facts, after more than ten years, infrastructure was built. On the side of the estimated economic benefits, there is evidence that suggests that these were overestimated. Assumptions about the traffic that the route expansion would generate were too optimistic, to say the least. What has been seen in practice is that only half of the expectations identified in the Feasibility Study have been met to date.

On the side of the costs calculated for the project, the Southern Interoceanic represents an investment per kilometre without precedence in Peru, well above other roads projected in the country. This considering what was raised in the official evaluation of the project. Besides, as if to add more doubts about the viability of the project, in practice it costs more than triple what was expected and the State has sued three presidents of the country for corruption, and another committed suicide after being cornered by the accusations.

Therefore, we are facing a project with overvalued benefits and underestimated costs, which is reflected in the absence of a consistent risk assessment that shows these probabilities of failure. All this thanks to the project was declared of national interest that excuses it from a more in-depth evaluation. Then, what is the purpose of approaches such as the CBA? This case shows that such methods are used to justify decisions already taken, based on assumptions sometimes very far from reality in the ground. Besides, tools like these are blind capturing particularities and social trajectories that go beyond monetary trade-offs.

From the political point of view, the triangulation between States (Peru and Brazil), banks, and the private sector was shown, and the popular need for concrete actions to access greater development opportunities; all this accompanied by an advertising machine and narratives in favour of the project. And this is not new. It was shown that this pattern of capital expansion and colonization has been applied in Peru since the 1960s, and probably before. That pattern reflects how embedded are the capitalist ideology and paradigm in the State, which results in an almost automatic response to promote development. However, this top-down institutional arrangement omits the actors on the ground vulnerable to the transformation that the infrastructure would bring: indigenous peoples. They are the ones who tried to resist a project practically imposed by the State and whose decision already seemed taken many years ago, but this time triggered by the availability of financial resources and an (apparent) aligned social and political context for the implementation of the road. Even in the case of the Kotsimba community's paradox, an indigenous group that wanted to join the train of opportunities offered by the project. They were denied to exercise their sovereign right over the territories they possess by right; however, illegal miners migrating from the Andes have displaced them, advancing without stopping with gold extraction.

Nevertheless, as shown throughout the text, different actors noticed in advance many of the impacts now observed on the route in Madre de Dios. What ingredients are needed so that, despite the red flags, large-scale infrastructures are built not only in unique spaces such as the Amazon, but also in the world? The answer goes beyond development. Roads (and large infrastructure in general) in cases like these are part of a capitalist public policy aligned with an ideology and ethnocentric perspective imposing their beliefs over "the others". Moreover, using the logic proposed by Harvey (2004), there is a tremendous abundance of capital that cannot stop being mobilized and invested. The opportunity cost of keeping these resources immobilized is so high that there is a tendency for those, who have control of the means of production, to place them in spaces that are (apparently) untouched or with the possibility of being intervened for different reasons such as their relative isolation, social needs that demand shares, "idle lands", among others. Although it cannot be said that these projects do not bring with them some kind of development for some (probably at the expense of others), it seems reasonable to think that it is not the underlying reason that promotes them. The initial motivation is the mobilization of historically accumulated capital that, according to the proponents, will trickle down to those who have the least. This never-ending story ends up being a circular reference that results in a resources accumulation machine that overwhelms those who do not have access to the means of production.

However, it does not mean that there is a master of puppets conspiring to reproduce this capitalist reproduction pattern. But yes, it is a result of historical progress that has embedded a series of values and a dominant paradigm (at least from capitalist States) almost impossible to propose different development alternatives. The expansion and flow of capital through (in this case) infrastructure projects is an automatic response to colonize and deploy a machinery that, unfortunately, is blind to social heterogeneities that do not fit with the model and the assumptions behind it.

In consequence, although these structural beliefs, and at least for rural areas with little intervention, it is necessary to go beyond apolitical technical arguments exposed to assumptions that, in many cases, deny the existence of social and ecological relationships. Therefore, it is essential to develop conceptual frameworks that allow first to advance towards a

vision and definition of development starting capturing the aspirations and knowledge of the actors on the ground and integrating the social and ecological dimensions of the landscape.

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Notes

[1] Discounted benefits minus costs of a determined cash flow (Sartori et al., 2014).

[2] According to Pareto's definition in 1938, the social welfare of individuals increases when at least one of them increases their level of utility, without this implying losses for the other economic agents (Pareto, 2014). However this agregate definition of welfare can be arguable consideting the existing different values and interests among social groups.

[3] Supreme Decret Nº 022-2005-EF