



# ***Ordenamiento Territorial: Land-use planning in Ancash, Peru***

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# Glossary

	<b>Campesino</b> : Farmer
	<b>Canon</b> : Mining tax
<b>CEPLAN</b>	<b>Centro Nacional de Planeamiento Estratégico</b> : National Center for Strategic Planning
	<b>Comisión Técnica de ZEE-OT</b> : ZEE-OT Technical Committee
	<b>Comunidad campesina</b> : Farming community or indigenous community
<b>CISAL</b>	<b>Comunidades inclusivas y sostenible en América Latina</b> : Sustainable and inclusive communities in Latin America
<b>CONAM</b>	<b>Consejo Nacional del Ambiente</b> : National Environment Council
	<b>Decreto Legislativo</b> : Legislative decree
	<b>Decreto Supremo</b> : Supreme decree
<b>DIT</b>	<b>Diagnóstico Integrado del Territorio</b> : Integrated Territorial Diagnostic
<b>DGOT</b>	<b>Dirección General de Ordenamiento Territorial</b> : General Department of Land-Use Planning
<b>ETM</b>	<b>Equipo Técnico Multidisciplinario</b> : Multi-disciplinary Technical Team
<b>EE</b>	<b>Estudios Especializados</b> : Specialized Studies
<b>FCM</b>	<b>Federation of Canadian Municipalities</b>
<b>FIP</b>	<b>Fundo Ítalo Peruano</b> : Italian-Peruvian Fund
<b>GRRNMA</b>	<b>Gerencia Regional de Recursos Naturales y del Medio Ambiente</b> : Regional Department of Natural Resources and the Environment
	<b>Hacienda</b> : Large farm
	<b>Instituto de Montaña</b> : Mountain Institute
<b>INEI</b>	<b>Instituto Nacional de Estadística e Informática</b> : National Information and Statistics Institute
<b>INP</b>	<b>Instituto Nacional de Planificación</b> : National Planning Institute
<b>IP</b>	<b>Inversión Pública</b> : Public investment process
	<b>Ley</b> : Law
<b>MANFORS</b>	<b>Mancomunidad del Valle Fortaleza y del Río Santa</b> : Municipal Association of the Fortaleza Valley and Santa River
	<b>Mancomunidad municipal</b> : Municipal Association
<b>MEF</b>	<b>Ministerio de Economía y Finanzas</b> : Ministry of Economy and Finance
<b>MINEM</b>	<b>Ministerio de Energía y Minas</b> : Ministry of Energy and Mines
<b>MINAM</b>	<b>Ministerio del Ambiente</b> : Ministry of Environment
<b>MVCS</b>	<b>Ministerio de Vivienda, Construcción y Saneamiento</b> : Ministry of Housing, Construction and Health
	<b>Municipalidad</b> : Municipality
<b>OT</b>	<b>Ordenamiento Territorial</b> : Land-use planning
<b>PAT</b>	<b>Plan de Acondicionamiento Territorial</b> : Territorial Development Plan
<b>PDC</b>	<b>Plan de Desarrollo Concertado</b> : Concerted Development Plan
<b>POT</b>	<b>Plan de Ordenamiento Territorial</b> : Land-use Plan
	<b>Plan Operativo</b> : Operations Plan
<b>PCM</b>	<b>Presidencia del Consejo de Ministros</b> : Presidential Council of Ministries
	<b>Provincia</b> : Provincial municipality
<b>PIP</b>	<b>Proyecto de Inversión Pública</b> : Public Investment Project
	<b>Reglamento</b> : By-law
	<b>Resolución</b> : Resolution
<b>SENACE</b>	<b>Servicio Nacional de Certificación Ambiental</b> : National Service for Environmental Certification
<b>SENAMI</b>	<b>Servicio Nacional de Meteorología e Hidrológica</b> : National Service of Meteorology and Hydrology
<b>SNPE</b>	<b>Sistema Nacional de Planeamiento Estratégico</b> : National System of Strategic Planning
<b>ZEE</b>	<b>Zonificación Ecológica y Económica</b> : Ecological and Economical Zoning

# Introduction

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On January 25th, 2019, a mining dam in Brumadinho collapsed, burying more than 150 people with a mixture of mud and solid by-products of ore mining. This was the second deadly failure in Brazil in the last three years. According to the New York Times, more than 100 000 people are still in risk areas all over the country (Darlington and al. 2019). This disaster sheds light on many issues concerning the possible negative impacts of a powerful mining industry in South America which, in a context marked by a lack of regulation, continues to promote and invest in its economic development.

Many solutions have been proposed to reduce these negative impacts. One such solution gaining popularity in South America is land-use planning. According to the Canadian Institute of Planners, land-use planning is “the scientific, aesthetic, and orderly disposition of land, resources, facilities and services with a view to securing the physical, economic and social efficiency, health and well-being of urban and rural communities” (Canadian Institute of Planners, 2019). However, this governance tool is still at the beginning of its implementation in South America. According to CEPAL, *Comisión Económica para América Latina y El Caribe*, a United Nations commission, land-use planning is one of the major issues facing South America preventing social and economic development (Vallejo Castello, 2015 : p.1).

The main research question explored in this paper is: **How can *Ordenamiento Territorial* (OT), a land-use planning approach, be used by small agricultural municipalities affected by mining to improve living conditions?** This research was carried out in collaboration with the CISAL program, Sustainable and inclusive communities Latin America, which is funded

by Global Affairs Canada and administered by the Federation of Canadian Municipalities (FCM). This program aims to strengthen local governments located within the influence of the mining industry in Colombia and Peru. It is a demand-based program, where priorities are determined through discussion with the FCM team and local governments. The program has two lines of action: local governance and local economic development. This research focuses on the governance branch.

The territory studied includes three small municipalities which are part of a confederation of 11 municipalities, *Mancomunidad del Valle Fortaleza y el Río Santa* (MAN-FORS) in the Ancash region of Peru. The CISAL program and local actors have identified developing and implementing *Ordenamiento Territorial* (hereafter OT) as a priority. Preliminary studies of the second step of the OT process called *Zonificación ecológica y económica* (ZEE) have been done with the *Fundo Ítalo Peruano* (FIP). This investigation will build on these studies.

First, we will begin with a contextualisation of our study territory, the mining industry, and its impacts. Secondly, we will define *Ordenamiento Territorial* as a concept and process, to explain its significance within territorial planning tools in Peru and its implementation in our study territory. Thirdly, we will enumerate the various barriers to the implementation of OT within our study territory and at a national level. Lastly, we will give recommendations to improve the implementation of certain aspects of OT.



# Introduction



Figure 2 : Location of Ancash in Peru



Figure 1 : Location of Peru in South America

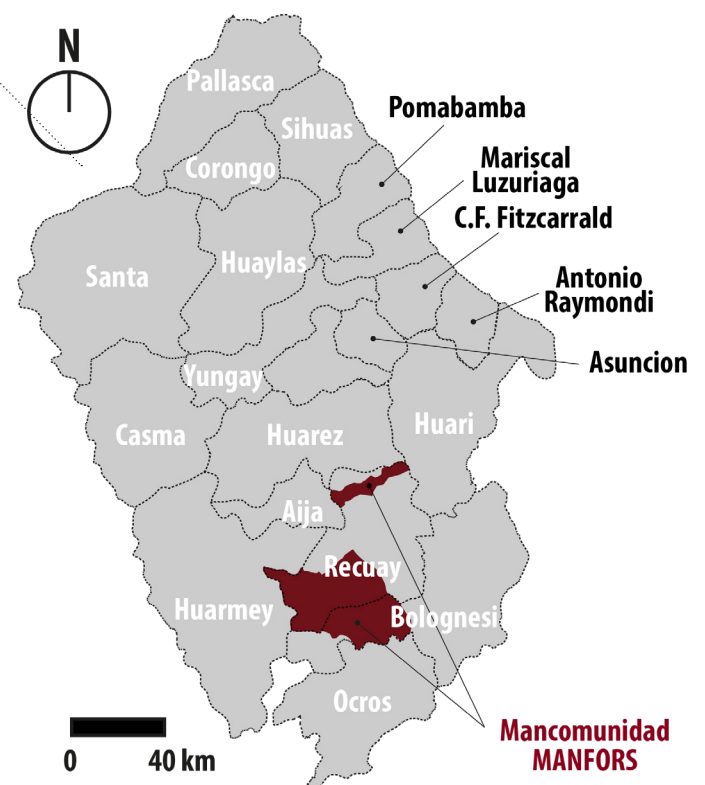


Figure 3 : Location of MANFORS in Ancash

Source : L'Heureux, 2019  
Production : Bertrais, 2019

# Introduction

## ➤ Methodology

As the question of OT implementation in our territory has not been studied, we have employed a research methodology that combines two approaches: a case study and action-research. The objective of a case study is to better understand the complexity of a specific case. It analyses various factors: politics, economics, ecology, and history. The objective of action-research is to link theoretical research to intervention. Since this research is part of the CISAL program, it aims to be practical. This research investigation strives to strengthen local government capacities and to become, in itself, a tool that can be used by current and future administrations (Mongeau, 2009: 84-86).

In both these approaches, we used the following tools to collect qualitative data in the field: interviews, participation workshops, presentations to validate data, and participation in a regional working group. Once collected, this data was transcribed and cross-referenced to identify common and divergent interpretations concerning the diagnostic of a territory. For example, during the presentation of the FIP studies, we found differences in the number of comunidades campesinas according to local citizens versus data produced by the consultants of FIP. As the main researcher, I collected data in Peru for three months, from April 2018 to June 2018.

### • Interviews

All interviews (see annex 4 for three examples) were semi-directed, which allowed me to focus questions topically while giving the interviewee the liberty to discuss other relevant subjects (Mongeau, 2009: 97). Three types of interviewees were targeted to collect different types of data. Experts included CISAL employees and consultants, academics and professionals. Decision makers included elected officials and civil servants from all three levels of government and from different ministries. As for mining representatives, we were only able to interview one from Antanima, the mine located within our territory (see figure 7).

Table 1 : Number of interviews according to type of interviewee

Type	Numbers
Experts	11
Decision makers	7
Mining representatives	1
<b>Total</b>	<b>19</b>

Source : L'Heureux, 2019

### • Participatory workshops

The main researcher also animated three participatory workshops with local citizens and leaders. Each workshop was elaborated in collaboration with municipal governments and were held at city hall of each municipality. The main objective was to allow citizens to make a diagnostic of their own territory. Maps were printed of each municipality and participants were asked to draw the limits and potentials. Questions were asked to guide the process. As we can see from table 2, participation varied greatly. This was influenced by mayoral leadership and time of day.

Table 2 : Number of participants in workshops

Workshop	Numbers
Workshop 1	10
Workshop 2	17
Workshop 3	28
<b>Total</b>	<b>55</b>

Source : L'Heureux, 2019

### • Presentation to validate technical data

In one of the municipalities, we were able to present data produced in technical studies financed by the *Fundo Ítalo-Peruano* (FIP). Our objective was to compare this data with community knowledge and identify discrepancies.

### • Regional working group

The *Gerencia Regional de Recursos Naturales y Del Medio Ambiente*, the Regional department of natural resources and environment, is currently elaborating its own OT policy. Their main objective is to simplify the OT process and include a more community-based approach. I participated in the working group meetings. During this time, I was able to discuss definitions, concepts and approaches of OT.

# Introduction

## > Study territory

This study will focus on three municipalities within the MANFORS territory : Cajacay, Antonio Raymondi-Raquia and Marca (See figure 4, they are highlighted in orange). We selected these municipalities (out of eleven potential research sites) for three reasons. First, I build on the conclusions of a study mandated by the FCM and conducted by the *Instituto de Montaña*, the Mountain Institute, concerning water resources within the MANFORS territory. This study concludes that further studies should adopt a river basin approach (Instituto de Montañas, 2017: 33). The three munic-

ipalities studied are all within the river basin of the *Rio Fortaleza*, the Fortaleza River. Second, certain mayors lack political will to work within the MANFORS institution. The three municipalities are part of the few who are actively engaged in the elaboration of ZEE studies with FIP. Thirdly, due to time constraints and topography, we could not investigate all the municipalities. Since the three municipalities border each other, access and organizing interviews were facilitated.

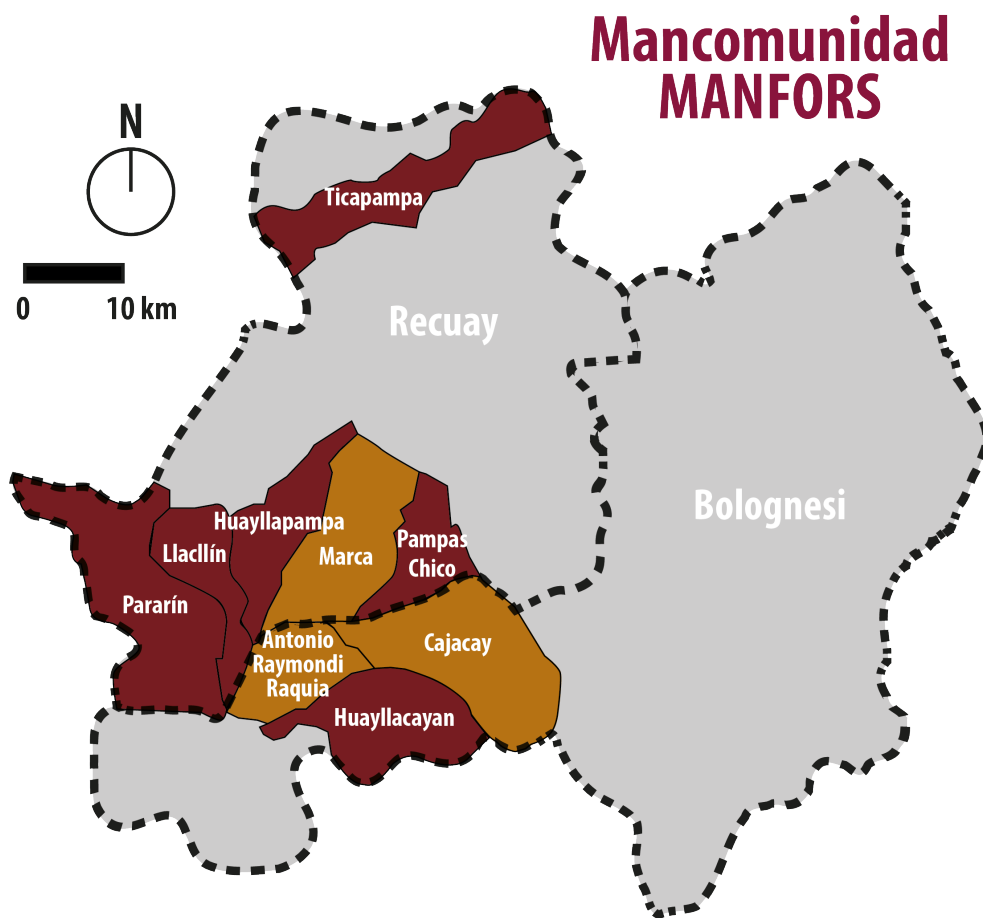


Figure 4 : Map of municipalities within MANFORS  
Source : L'Heureux, 2019  
Production : Bertrais, 2019

# 1. Context

To better understand how *Ordenamiento Territorial* can be used to improve living conditions, explaining the current territorial and political context in Peru is important. This section also includes a description of MANFORS, the legal entity of 11 municipalities where our study is based, the historical context of mining as well

as its various impacts on the country and region. This section will elaborate on the key aspects that will become a basis for understanding the potential impact of *Ordenamiento Territorial*.

## > Territorial and political context

### • Political organisation in Peru

As we can see in figure 5, there are three levels of government. The CISAL program aims to strengthen municipalities at the local level. However, Peru is a very centralized state politically and economically and imposes a vertical governance structure. This results in high levels of inequality and social exclusion, and wealth being concentrated in the capital Lima (Bersh, 2005: 106). According to a governance expert, seventy-five percent (75%) of national public investment goes to Lima (Interview 1).

As we will explore in more detail throughout this paper, this vertical structure has many consequences on the ability of municipalities to act and implement development policies. An important aspect to understand is that regional governors and municipal mayors are restricted from running for a second consecutive term. In other words, governors and mayors are limited to a four years mandate. Therefore, every four years, there is a political and administrative transition. This was adopted in 2014 and enacted in law with modifications to *Ley 27683 – Ley de Elecciones Regionales, Regional election law*, and *Ley 26864 – Ley de Elecciones Municipales, Municipal election law*.

#### Ley 29029 - Article 2 – Objectives

1. To promote and execute projects that, for the magnitude of the investment and operation, supersedes the jurisdiction of each municipality.
2. To execute common actions and projects between municipalities within the same river basin, transport and tourism corridors, and ecological zones.
3. To elaborate, manage, promote and implement national and international projects.
4. To improve efficiency of local governance through transparency, accountability, and access to information.
5. To develop plans for capacity training and technological research, in collaboration with universities and other public and private educational institutions.

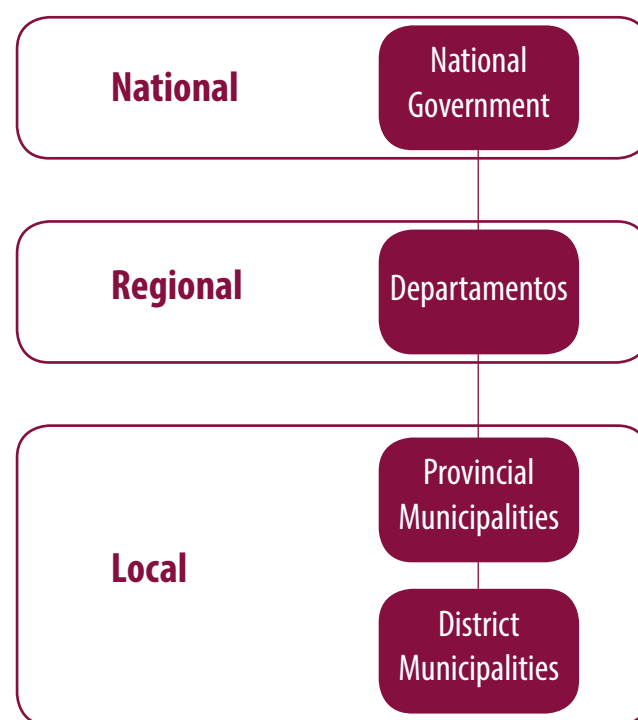


Figure 5 : Territorial administrative organization in Peru  
Source : L'Heureux, 2019

### • Mancomunidad Municipal

In Peru, there are more than 1,874 municipalities at both the provincial and district levels (Ferrerros and Pantoja, 2017: 3). Most of these municipalities have less than 2,000 citizens, weak institutions, and economies based on agriculture. These small municipalities were supported during the decentralisation process. In areas affected by mining, municipalities received significant amounts of revenue through a mining tax. According to an expert, in 2007, the central government created a mechanism, a *Mancomunidad Municipal*, that would allow these small municipalities to pool together financial resources to invest in collective projects at a regional scale (Interview 1). This municipal association is a voluntary agreement between two or more municipalities (Interview 1). The competencies of this legal entity are dictated by *Ley N°29029 - Ley de la Mancomunidad Municipal*. As of 2017, there were 202 *Mancomunidades* in Peru, 14 of which were in Ancash (PCM, 2017: 39).

# 1. Context

Being part of a *Mancomunidad* has financial advantages for municipalities such as being given priority for certain government programs. Projects who apply for funding through *Inversión Pública*, the national public investment system, have priority during the evaluation phase. Most importantly, according to a legal expert, municipalities within a *Mancomunidad Municipal* can legally

pool together their financial resources, which is not permitted otherwise (Interview 7).

## • MANFORS: *Mancomunidad Municipal del Valle Fortaleza y del Río Santa*

*Mancomunidad Municipal del Valle Fortaleza y del Río Santa* (MANFORS) was created in 2011. As demonstrated in figure 4, it is comprised of 11 municipalities, 2 at the provincial level and 9 at the district level.

Contradictory information and lack of documentation has made it difficult to determine the reasons why MANFORS was created. According to an Antamina representative, the copper mine within our territory, claims that MANFORS was created by itself, with the political will of the mayors (Interview 16). However, some experts have contradicted this claim by stating that MANFORS was pushed by Antamina to facilitate negotiation for compensation, as was the case with a major pipeline spill in 2012 in Santa Rosa, a small town in the district municipality of Cajacay (Interview 14 and interview 15). Therefore, the reasons why MANFORS was created remains unknown. However, whatever the reasons for its creation, MANFORS, due to its legal structure, has the potential of

being an important regional actor.

There are many issues within MANFORS. These will be elaborated in more detail in our Limits section. Nevertheless, two factors are important to note here. First, the MANFORS territory is vast and diverse, both culturally and environmentally. The two provincial municipalities are in different climate zones dictated by their altitude. This in turn has major effects on crops and local cultures. Furthermore, there are three river basins, all with different ecosystems. These differences contribute to the second factor: lack of political will. According to an expert and a municipal mayor, each municipality has its own priorities dictated by its unique climate and culture (Interview 11 and interview 14). The same expert believes that this lack of political is demonstrated by non-existent annual meetings (Interview 14). Due to these factors, MANFORS does not fulfill the objectives set out by law for *Mancomunidades Municipales*.

## > Mining context

### • Modern history of mining in Peru

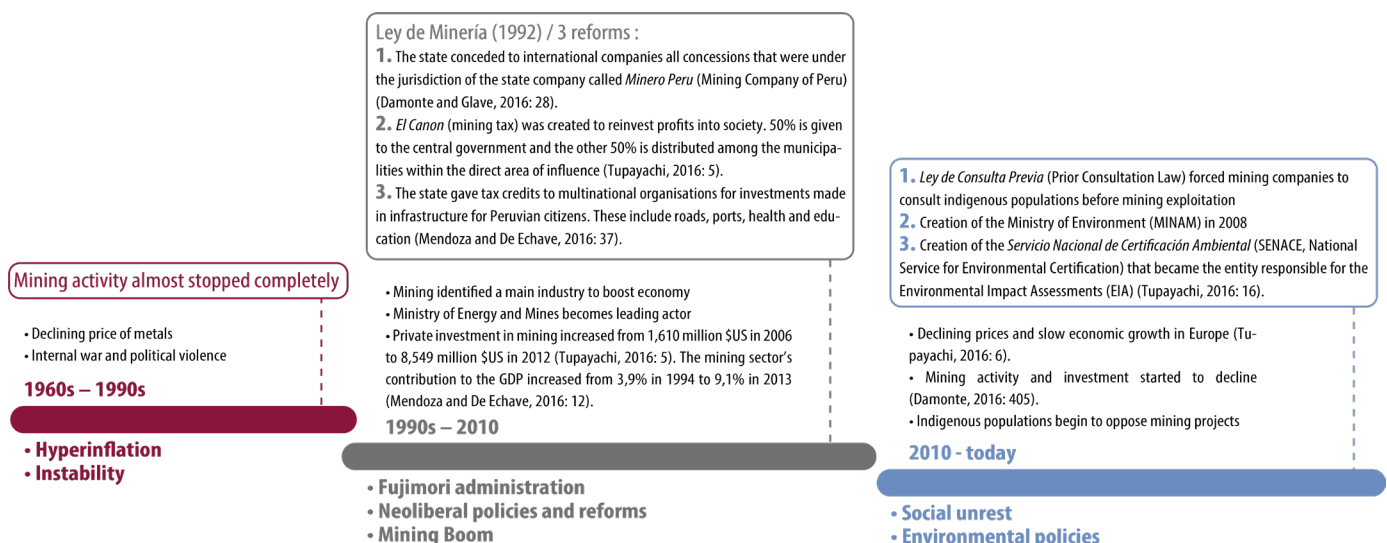


Figure 6 : Timeline of modern mining history in Peru  
Production : Bertrais, 2019

# 1. Context

## • Antamina

Located in our study territory is Antamina, the second biggest mine in Peru. In 1996, mining concessions were granted to two Canadian companies, Rio Algom Ltd. and INMET Mining Corporation. That same year, these two companies created the Peruvian consortium *Compañía Minera Antamina* (CMA). It commenced operations in October 2001 (World Bank, 2010: 93). In 2010, an expansion project was announced that would increase production by 30% (Antamina, 2016: 9). In 2016, Antamina had net sales valued at over 2 billion US\$ (Antamina, 2016: 7) and had the capacity to produce 430,000 tons of copper a year (MCCOPA, 2017). Today, the ownership structure of the mine has changed. There are now

four owners: Glencore (33.75%), BHP Billiton (33.75%), Teck (22.5%) and Mitsubishi (10%) (Antamina, 2016: 7).

To export towards international markets, Antamina built 210 km of roads and a 300 km pipeline that runs along the *Rio Fortaleza* and ends in the port city of Huarmey. The pipeline runs through the MANFORS territory. Municipalities in the *Valle Fortaleza* are considered part of the indirect area of influence. Thus, these municipalities receive a much smaller percentage of the mining tax than those within the direct area of influence.

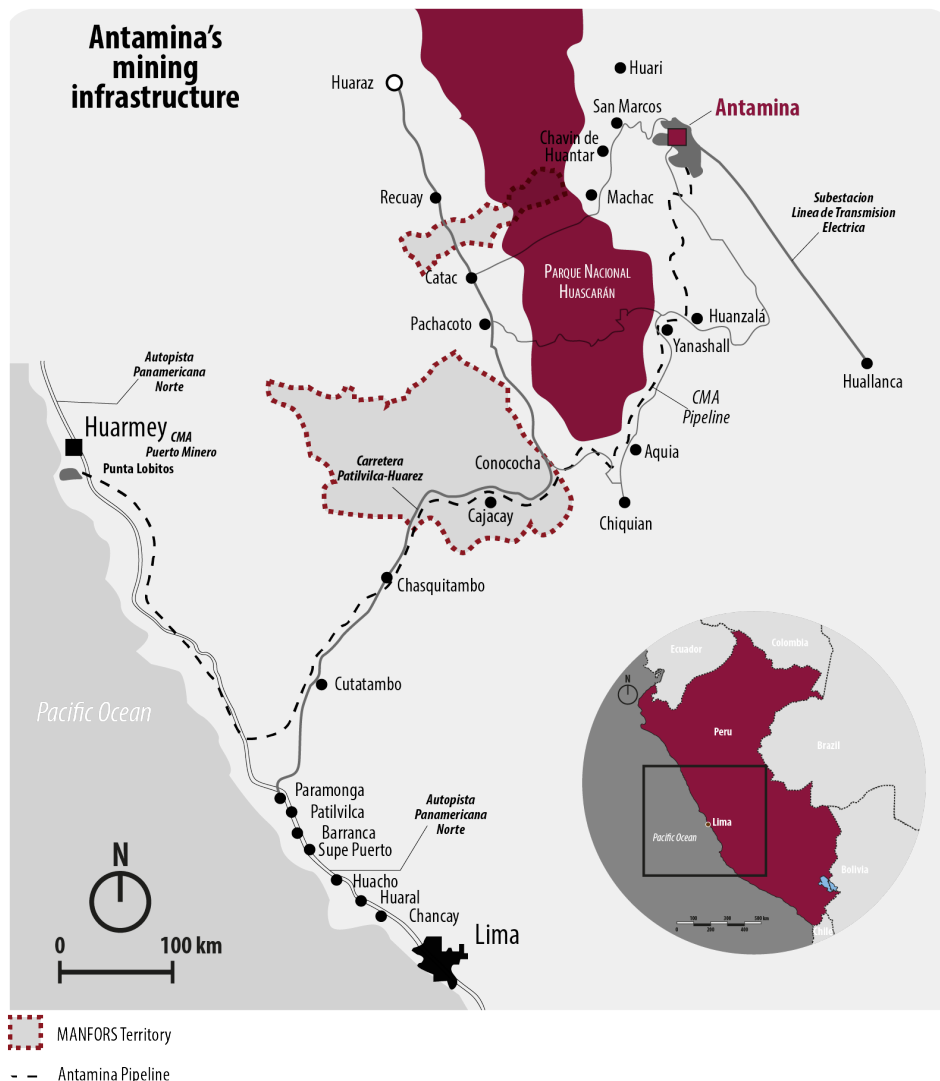


Figure 7 : Map of Antamina's mining infrastructure  
Source : Antamina, 2016  
Production : Bertrais, 2019



# 1. Context

## • Mining Impacts

### ECONOMY

1. Nationally, mining has sustained economic growth (Bebbington and Bury, 2009: 17297). Peru's mining exports were valued at 22,296 million US in 2012 (Mendoza and De Echave, 2016: 14). Between 1990 and 2007, the country received US\$12.35 billion of foreign investment for mining (Bebbington and Bury, 2009: 17298). In 2015, it was the world's third largest producer of copper and silver and ranked sixth for gold (KPMG International, 2016: 1).
2. Locally, municipalities receive a percentage of the mining tax. Municipalities within the direct area of influence receive a much higher percentage. This area is defined by the Ministry of Energy and Mines. Although municipalities in MANFORS are considered within the indirect area of influence, they still receive a significant amount. In 2014, this tax represented on average 43% of the 9 district municipalities in MANFORS' annual revenue (CISAL, 2016: 41).
3. 80% of mining jobs are guaranteed to Peruvians as labor laws puts a 20% ceiling on the foreign workforce that international companies can hire (KPMG International, 2016: 21). In 2009, Antamina employed over 1800 workers directly and another 35,000 indirectly (World Bank, 2010: 94). In 2016, this number dropped to 2,812 indirect employees (Antamina, 2016: 49).

### SOCIAL

1. Social conflict caused by mining has increased significantly between 2004 and 2010 (Damonte and Glave, 2016: 29). In 2013, 48% (107 cases) of all conflicts managed by the *Defensoría del Pueblo* (Neighbourhood Defense), were mining related (Tupayachi, 2016: 7). The concerns driving these conflicts are mostly securing livelihood and environmental degradation.
2. Urbanization increased in the municipalities within the influence of a mine for two reasons. Firstly, technical advances reduced the demand and cost for manual labor. Multinational mining companies began to employ significantly fewer workers. *Campesinos* would get hired temporarily as they are not considered educated labour. The offer of higher income, although temporary, pushed families to diversify their income sources and move towards city centers located near mines. Secondly, access to funding and social programs initiated by the mines improved social infrastructure such as education and health in urban areas. Families chose to move closer to these infrastructures, fueling the urbanization process (Damonte and Glave, 2016: 28-33). According to a legal expert on local indigenous rights, one of the consequences of this urbanization is that many people do not live permanently in the small communities where they come from and there is a lack of manual labor for agriculture (Interview 17).

Figure 8 : Mining impacts  
Production: Bertrais, 2019

# 1. Context

## • Mining Impacts

### ENVIRONMENT

1. Water contamination is the main issue since most mines are located near the source of rivers. Road building, mineral exploration and extraction bring arsenic and heavy metals to the surface that are washed into the rivers. This pollution is blamed for stream acidification and reduction of vegetative cover within the *Huascarán* National Park located near our study territory (see figure 7) (Lych, 2012: 367).
2. There are also issues with water scarcity. Studies have shown that in terms of water quantity, the *Rio Fortaleza's* offer greatly exceeds its demand (Fundo Ítalo Peruano, 2017: 126). Water scarcity is instead created by difficult access due to the steep topology of the land. According to an expert in rural development, this scarcity has created conflict between economic sectors, especially between mining and agriculture (Interview 15).
3. This competition is aggravated by climate change, manifested in shrinking glaciers. In the last 25 years, the mountain glaciers of Ancash have shrunk by 15 percent (Lynch, 2012: 364). Glacial retreat can cause avalanches and mudslides, but in the long term, demand during dry season will probably exceed volume of the river (Lynch, 2012: 364).
4. As mentioned previously, there was a pipeline spill in 2012 in Santa Rosa, a small *campesino* village within our study territory. There are no studies that explore the possible environmental impacts of this spill. However, according to a local expert, it took 2 days to fix the leak and that high concentrations of copper were found in the *Rio Fortaleza* (Interview 14).
5. Another source of contamination is the main road that leads from Lima to the Antamina mine. There are convoys of trucks carrying dangerous materials. Dust from their continuous presence greatly increases air contamination. Furthermore, with low road quality, accidents are very likely. As mentioned during workshops and emphasized by a local mayor, these accidents could contaminate the river basin (Workshop 1 and Interview 11).

### TERRITORIAL GOVERNANCE

1. Territory under mining concessions, that give rights for exploration and exploitation, increased from 9.3 to 25.8 million hectares between 2004 and 2012 (Tupayachi, 2016: 5). This represents 20.72% of the national territory (Grupo Propuesta Ciudadana, 2014: 7). Since concessions are given by the *Ministerio de Energía y Minas*, Ministry of Energy and Mines, an institution of the central government, they do not consider land-use rights accorded by the regional and local levels of government (Grupo Propuesta Ciudadana, 2014: 7). Many of these concessions are superposed with agricultural land and protected areas (Tupayachi, 2016: 6).
2. There is a lack of transparency and information on mining activities, especially concerning water contamination and rights (Jeronimo and Gutierrez, 2016: 49). For example, maps of concessions are not readily available. According to one of its employees, non-profit organization *Cooperación* is the only institution who produces and publishes these maps (Interview 7).
3. Mining companies have replaced the state in terms of development (Grupo Propuesta Ciudadana, 2014: 7). An expert in negotiating social responsibility programs with mines stated that these companies are better than local governments. They have financial sources, technical capacities and are better organised (Interview 17).

### CONCLUSION

We can conclude that the Peruvian territory in the mining context is characterized by inadequate land occupation, environmental degradation, social conflicts and unequal development (Grupo Propuesta Ciudadana, 2014: 9). The Peruvian territory is disorganized and fragmented, which complicates and renders inefficient the vertical governance structure. Decentralizing efforts have been made to solve some of these issues such as the creation of *Mancomunidades Municipales*. However, as we can observe with the MANFORS example, these efforts have not fulfilled their objectives. Furthermore, we can also observe the superposition of land-uses, especially between mining, imposed by central government, and agriculture or conservation areas, dictated by local governments (Ministerio del Ambiente, 2015: 23). This superpositioning causes tensions between levels of government and local populations. Faced with all these issues, *Ordenamiento Territorial* has been identified as a solution as it implements a land-use approach to development. We now turn to a discussion of this tool.

Figure 8 : Mining impacts  
Production: Bertrais, 2019

## 2. Ordenamiento Territorial

In this section, we will define the concept of *Ordenamiento Territorial* and how this tool evolved within the history of territorial planning processes. We will also describe its methodology and steps, elaborated by the *Ministerio del Ambiente* (MINAM), the Ministry of Environment, responsible for implementing this tool. We will conclude this section with a quick overview of the *Ordenamiento Territorial* process in MANFORS, a process that was initiated before the period of study.

Since 2008, MINAM has invested more than 23 million soles (9 million CAD\$) to offer technical support (MINAM, 2015: 12). However, the implementation of OT as a tool is not very advanced in Peru (Postigo De La Motta, 2017: 3). Governments who have initi-

ated the implementation of OT have only done so up to the second phase, *Zonificación Ecológica y Económica* (ZEE). Only 11 regional governments have a ZEE plan approved. Furthermore, there are 120 ZEE in process at the provincial and local levels (MINAM, 2015: 13). In 2014, there were 194 public investment projects for ZEE. They were valued at more than 280 million soles (111 million CAD\$) (MINAM, 2015: 11). The reasons for this will be explained in the Limits section.

On a final note, the reader will observe a lack of information concerning the phases following ZEE. This is due to the limited implementation of these phases and a detailed methodology has been elaborated for ZEE, but not for the entire OT process.

### ➤ Definition and concept

*Ordenamiento Territorial* (OT) is the equivalent of a land-use planning tool defined in our introduction. It is the main planning tool used by the *Ministerio del Ambiente*, Ministry of the Environment (MINAM). It “gives geographical expression to the economic, social, cultural and ecological policies of society” and the “projection of public policies in space.” (Bersch, 2015: 104) According to MINAM, it is a state policy, a political process, a scientific discipline and an administrative process (see table 3).

Its objective is to attain balanced development by reducing the negative impacts that human activity has on the territory (MINAM, 2015: 8). In other words, *Ordenamiento Territorial* aims towards sustainable development. Within the mining context, OT aims to incorporate the diverse components of territorial occupation to extract resources in a sustainable way and maintain a productive economy (MINAM, 2015: 10). To achieve these goals, OT needs to be an integrated and efficient process that is based on scientific data. It also needs to incorporate processes of public participation and dialogue (Grupo Propuesta Ciudadana, 2014: 10). OT is not mandatory and does not exclude certain uses. It only

indicates possible uses and activities that would lead to a more sustainable development of the territory (MINAM, 2015: 14).

#### Potential benefits of OT

1. Corrects the fragmentation of Peruvian territory and environmental degradation.
2. Empowers regional and local governments in territorial governance.
3. Integrates sectorial planning processes into one tool, OT.
4. Implies a process of negotiation between key actors towards a common vision of sustainable development.
5. Contributes to a better distribution of development opportunities and benefits
6. Reduces vulnerabilities and facilitates risk management strategies.

(Grupo Propuesta Ciudadana, 2014 : 10)

Table 3 : Aspects of Ordenamiento Territorial

Aspect	Description
State policy	A governmental development practice and decision making tool
Political process	Decisions and agreements are made by consensus building between actors with diverging interests
Scientific and technical	Needs data to identify potentials and limits while considering the territory's diverse dimensions
Administrative process	Orients the regulation and promotion of the localization of land-use within a territory

Source : MINAM, 2015 : 5

## 2. Ordenamiento Territorial

*Ordenamiento Territorial* is a distinctive process within the scope of territorial planning. Territorial planning is the articulation of policies with a territorial approach that have the goal of integrated development. Other territorial planning processes in Peru include territorial demarcation, urban development, land registry and mining concessions. These processes are all under different ministerial jurisdictions (MINAM, 2015: 9). We have enumerated them in Annexe 3. It is important to note that OT is the only tool that mandates the creation of technical data.

*Ordenamiento Territorial* can be applied at three different scales. In law these are used for *Zonificación Ecológica y Económica* but can be applied to the entire process.

Table 4 : Objectives of OT according to the different scales of application

Type	Map Scale	Administrative territory	Objectives
<i>Macrozonificación</i>	1:250 000	National and departamental	- Define policies and plans
<i>Mesozonificación</i>	1:100 000	Provincial municipalities, River basins and, Mancomunidades	- Define policies and plans - Identify and promote specific development projects
<i>Microzonificación</i>	1:25 000	District municipalities	- Identify and promote specific development projects - Contribute to urban and rural development plans

Source : Article 4, Decreto supremo N° 087-2004-PCM

Depending on the scale and territory, different approaches can be employed. The approach taken is decided by key actors and is based on priority issues (see annex 2 for a detailed account of key actors).

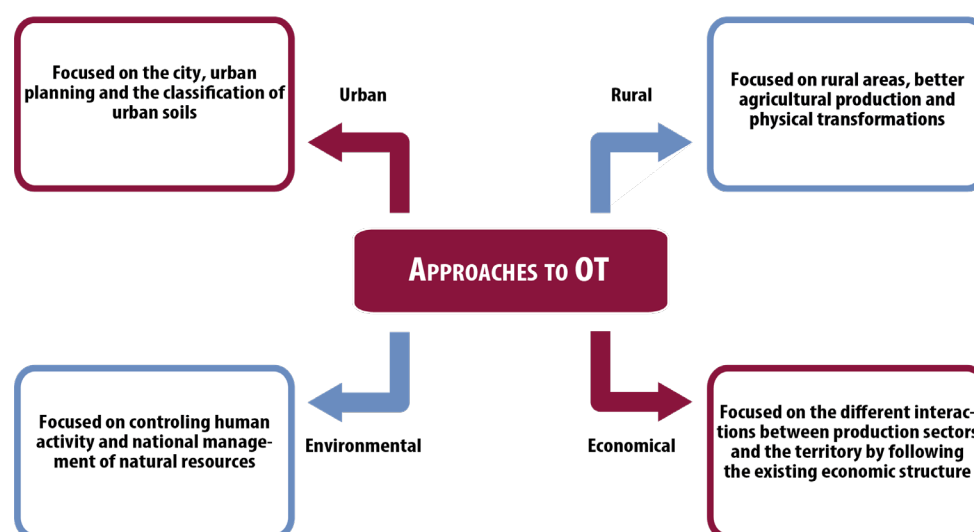


Figure 9: Different approaches to OT

Source : Grupo Propuesta Ciudadana, 2014: 11

## 2. Ordenamiento Territorial

### > History of territorial planning in Peru

As we mentioned, OT is one of many territorial planning tools. It has evolved from a long history of formal and informal territorial planning. This approach is well developed in North America. However, in Peru, it is relatively new. The following timeline explains the different territorial processes throughout history in Peru.

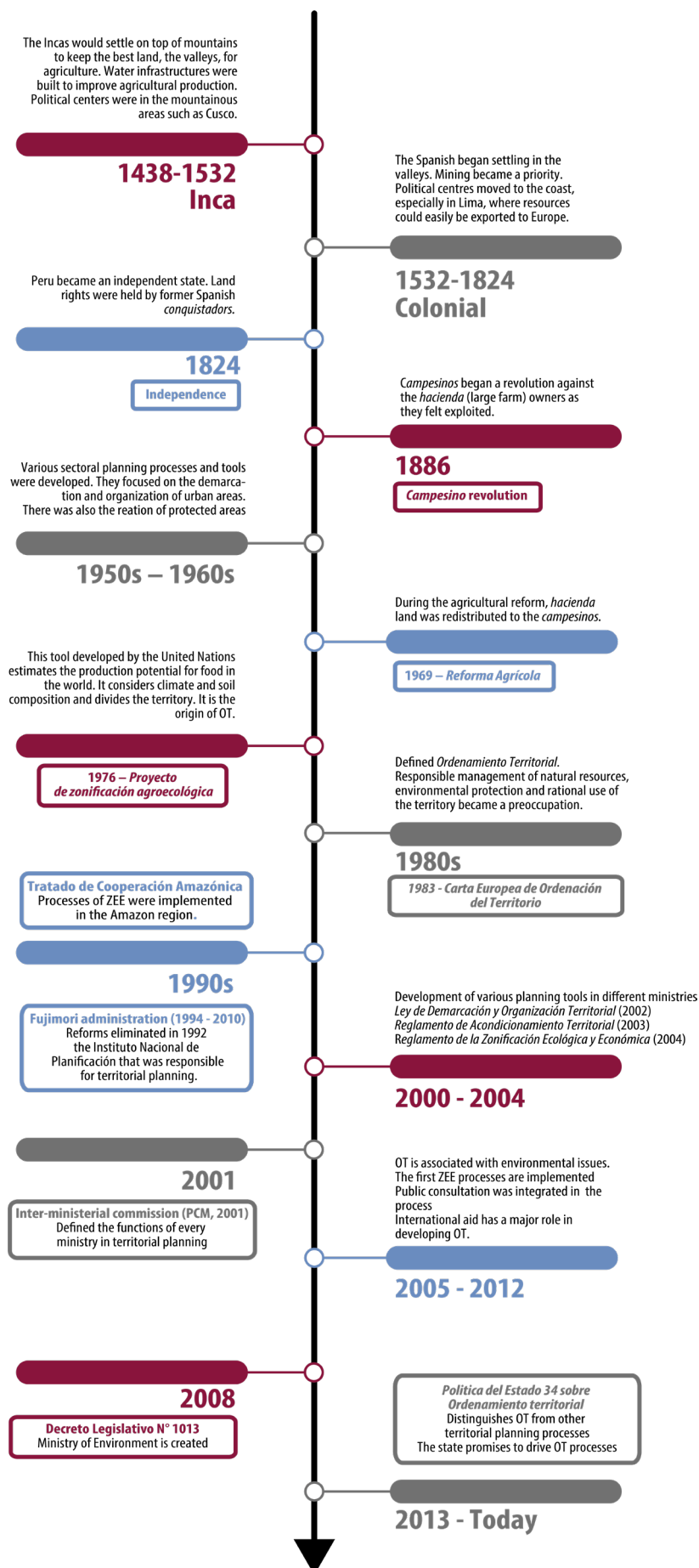


Figure 10 : History of territorial planning in Peru

Source : MINAM, 2015: 7; Chirinos, A. and al., 2013: 22.; Grupo Propuesta Ciudadana, 2014: 4-5.

## 2. Ordenamiento Territorial

### > OT process

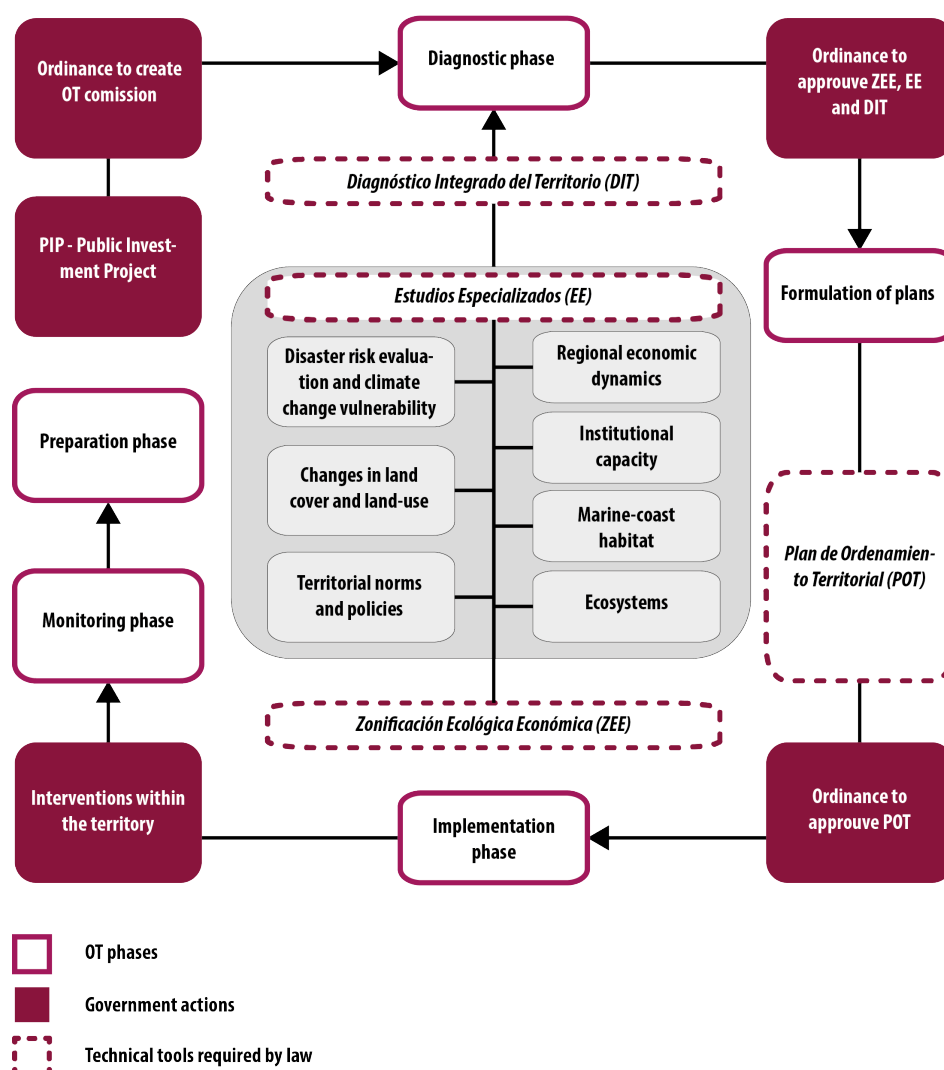


Figure 11 : OT process  
Source : MINAM, 2015 : 38

### 1 - Preparation phase

To initiate the OT process, the regional or municipal authority must institutionalize their decision to proceed by passing an ordinance that declares OT as a priority. Governments must elaborate a working plan that includes objectives, a timeline, a communication strategy, and the identification of key actors. They must also create the organisational structure that determines the people responsible for implementing the process. Within this structure, the law requires two technical teams: the *Equipo Técnico Multidisciplinario* (ETM, the Multidisciplinary Technical Team) and the *Comisión técnica de ZEE-OT* (ZEE-OT technical commission). Both these teams should receive training in the preparation phase (MINAM, 2015: 23-24).

Most importantly, governments need to identify sources of fund-

ing. One option is to develop a *Proyecto de Inversión Pública* (PIP, Public investment project), which, if approved by the *Ministerio de Economía y Finanzas* (Finance Ministry), will be funded with public funds. Another option is funding from international organizations (Chirinos and al., 2013: 111). This is the case for MANFORS, which has received funding from FIP, the *Fundo Italo Peruano*. According to a local expert, successful examples of ZEE implementation benefited from international support (Interview 1). These organisations bring technical assistance, elaborate awareness material and facilitate workshops. Furthermore, they bring financial support that is much needed for a long and costly process. They also help with field work and elaborating work plans (Valenza, 2018: 39).



## 2. Ordenamiento Territorial

### 2 - Diagnostic phase

The diagnostic phase establishes what currently exists in the territory by identifying its potentials and limits. Municipalities must develop three tools: *Zonificación Ecológica Económica* (ZEE, Economic and ecological zoning), *Estudios Especializados* (EE, Specialized studies), and *Diagnóstico Intergrado del Territorio* (DIT, Integrated Diagnostic of the Territory).

It is important to note that for all three tools, the *Dirección General de Ordenamiento Territorial* of MINAM (General Department of Ordenamiento Territorial) will revise the documentation and give recommendations that the government will need to integrate in the final plan. Once integrated, MINAM will give a favorable opinion. This favorable opinion is mandatory to commence the following step (Grupo Propuesta Ciudadana, 2014: 21).

#### ZEE

The main objective of ZEE is to identify alternatives and sustainable uses of the territory. It is based on an evaluation of potentials and limits with various criteria such as physical, biological, social, economical and cultural. The elaboration process is collaborative, between all levels of government, the private sector and civil society (Vallejo Castello: 4). The tool is dynamic, meaning that it is flexible and can integrate new data.

The creation of the ZEE technical committee, which is composed of various actors mentioned in annex 3, is mandatory. It is responsible for driving the ZEE process and for analyzing, evaluating and

validating the results (MINAM, 2015a: 21-23).

In the analysis phase, the following zones are identified. These zones are the basis of the OT process. Maps are generated to simplify the use of this tool.

#### 1. Productive zones

Agriculture, livestock, industrial, fishing, forest, tourism and mining

#### 2. Protected ecological zones and conservation zones

Protected natural areas, steep slopes, humid ecological zones, headwaters and riverbeds

#### 3. Special treatment zones

Historical and cultural areas, archaeological sites, indigenous populations, zones for national security

#### 4. Recuperation zones

Degraded ecosystems

#### 5. Urban and industrial zones

Actual and possible expansion

(Grupo Propuesta Ciudadana, 2014 : 10)

#### EE

The EEs are technical studies that complement ZEE by detailing the evolution of socio-environmental dynamics (MINAM, 2015: 36). They update, or in some cases create for the first time, essential technical data for the territory covered by OT (R.M. N°135-2013-MINAM). Governments are required to conduct seven studies. They are prioritized according to the information provided by ZEE and the geographical context (MINAM, 2015a: 7-19).

Table 5 : Specialized Studies

Study	Objectives
Regional economic sectors	<ul style="list-style-type: none"> <li>- To identify and characterize economic sectors</li> <li>- To identify connections between regions and market, both urban and rural</li> </ul>
Territorial norms and policies	<ul style="list-style-type: none"> <li>- To analyse norms and policies with a territorial approach</li> <li>- To determine their levels of implementation</li> </ul>
Institutional capacity	<ul style="list-style-type: none"> <li>- To analyse governmental competencies</li> <li>- To determine current operating conditions</li> </ul>
Changes in land cover and land use	<ul style="list-style-type: none"> <li>- To understand historical changes using satellite images</li> <li>- To determine factors that initiated these changes</li> </ul>
Marine-coast habitat	<ul style="list-style-type: none"> <li>- To understand littoral dynamics</li> <li>- To understand oceanography and anthropogenic processes</li> <li>- To evaluate erosion</li> </ul>
Ecosystems	<ul style="list-style-type: none"> <li>- To identify and analyse ecosystems</li> <li>- To determine means for conservation</li> </ul>
Disaster risk evaluation and climate change vulnerability	<ul style="list-style-type: none"> <li>- To identify and analyse disaster vulnerabilities</li> <li>- To determine possible climate change impacts</li> </ul>

Source : MINAM, 2015 : 46

## 2. Ordenamiento Territorial

### *Diagnostico Integrado Territorial (DIT)*

The DIT is the combination of ZEE and EE. It is a complete portrait of the environmental, social and economic dynamics of the territory covered by OT. It highlights the key variable that determine land-use. It also determines the favorable and unfavorable conditions encountered (MINAM, 2015c: 37). During this process of combining the ZEE and EE, MINAM is available to offer technical support (MINAM, 2015a: 12). The finished product is a complete diagnostic document that includes many different maps. Once this document has been approved, the government entity can proceed to the next phase.

### 3 - Planning phase – *Plan de Ordenamiento Territorial (POT)*

POT is a tool that projects the vision, politics and strategies for development with a territorial approach. To elaborate this vision, POT is based on information generated by the DIT. It is elaborated with a process of negotiation and concertation with key actors. It aims to promote and regulate sustainable management of economic, social, cultural and environmental development. It is important to note that POT does not define uses and does not exclude uses such as mining (MINAM, 2015a: 37).

POT is subjected to a vertical governance structure. It is executed at the regional and local levels within the functions defined by law. However, it needs to follow national guidelines. Furthermore, at the local level, POT needs to integrate national and regional policies. Therefore, just as in the diagnostic phase, it is mandatory for POT to receive a favorable opinion by MINAM. In the case of local governments, it also needs regional approval (Vallejo Castello, 2015: 5).

### 4 - Implementation phase

In the implementation phase, policies, actions and projects elaborated in POT are implemented. Here are a few previous actions necessary to ensure the efficient implementation of POT (MINAM, 2015c: 39).

- Improve institutional capacity and organisation
- Strengthen capacities of public employees
- Integrate OT in administrative and operative tools
- Integrate OT in processes of development
- Improve social organisation
- Strengthen coordination mechanism between levels of government

### 5 - Monitoring phase

During the monitoring phase, effects and impacts of OT are analysed. This phase accompanies the implementation phase. Together, these phases last many years. Ideally, there is a permanent review of plans and strategies. These reviews are important to update policies and strategies to improve the implementation of OT (MINAM, 2015c: 39).

### ➤ OT process in MANFORS

It is important to note that the terms of reference between FIP and MANFORS did not include all the studies needed to complete the ZEE process. Therefore, MANFORS is left to find funding for the most expensive studies including a soil study that is very useful for agricultural municipalities. Furthermore, these studies, conducted at a mezzo scale, have produced data that is difficult to be used by municipalities who develop and implement processes at a micro scale.

Finally, much criticism can be brought to the actual studies. During a presentation that explained the studies to local population and officials, many contradictions were evoked. We can attribute this to methodology, with a lack of field work and public consultations. Furthermore, the format of these studies is not adapted to the context of small agricultural communities. They were given to mayors in PDF and in shapefile (for geolocalisation software). However, most of the municipalities in MANFORS do not have the equipment to consult these studies. A concrete example are the maps created. The information projected unto these maps are too small to properly analyse. They would have to be recreated using GIS software that is not available to these communities. To conclude, these criticisms call into question the value of the FIP studies and their ability to be properly used by municipalities.

#### Studies conducted by FIP

1. Base map (GIS data)
2. Geology (Mining potential)
3. Geomorphology (Erosion, risk management)
4. Geography (Soil quality)
5. Climatology (Rain and temperature)
6. Hydrology (Water)
7. Socio-economic (Poverty indicators, economic potential)
8. Socio-cultural (Indigenous communities)
9. Tourism (Archeological sites, services)

#### Studies missing

1. Biology
2. Soil
3. Alternative uses

## 2. Ordenamiento Territorial

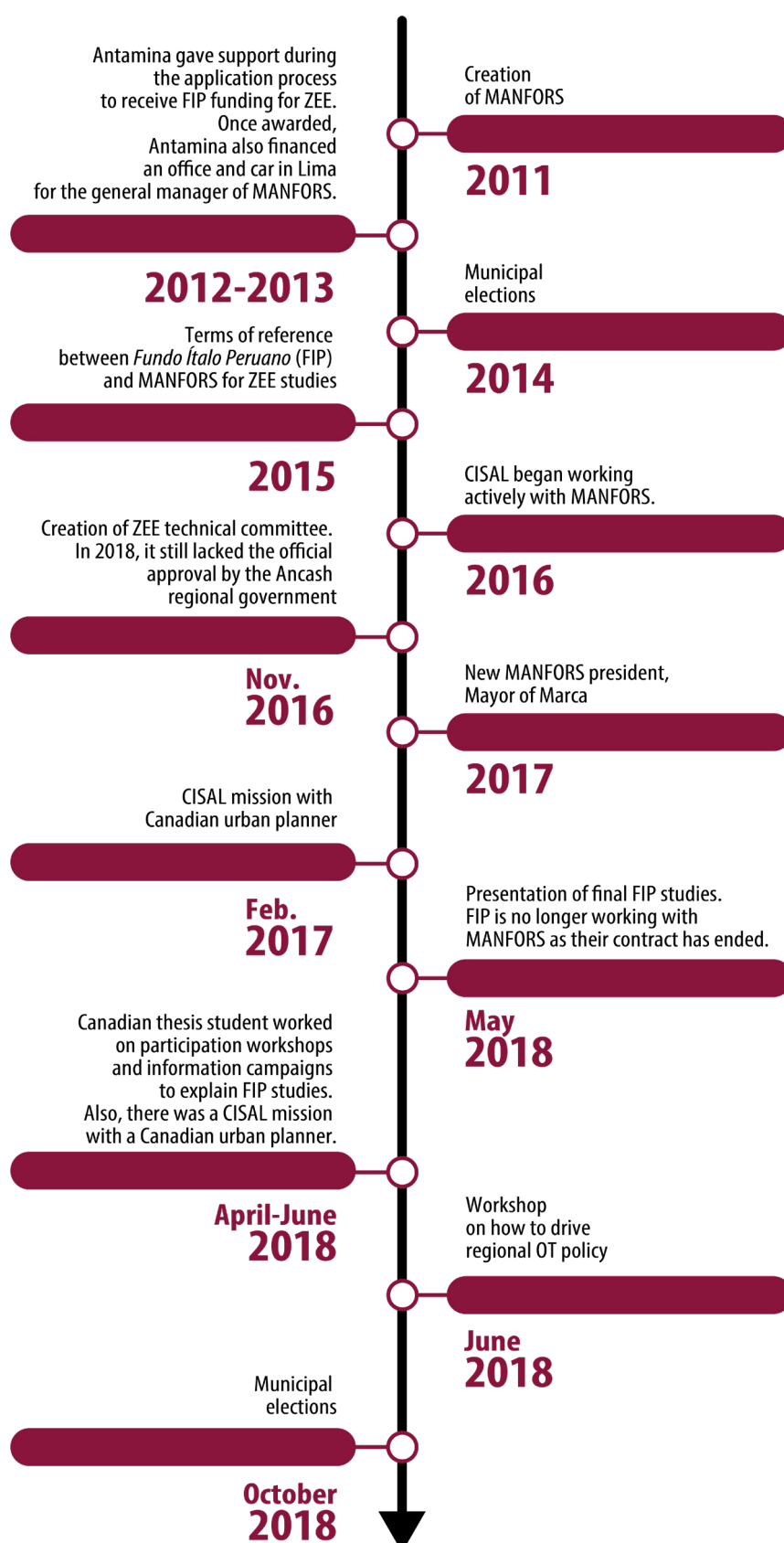


Figure 12 : Timeline of ZEE implementation in MANFORS  
Source : L'Heureux, 2019

### 3. Limits to implementation

In this section, we will explore the various limits that have prevented the implementation of OT in Peru.

#### 1 - Sectorial approach to territorial planning

The Peruvian government's approach to planning and development is both sectorial and centralized. The lack of communication between the central government and its ministries as well as the different levels of government has had negative consequences. Each entity has its own vision of development for the same space (MINAM, 2015: 8). This approach exacerbates the issue of land rights superposition within the same territory discussed earlier (Grupo Propuesta Ciudadana, 2014: 7).

According to a mining legal expert, when mining concessions are given, the *Ministerio de Energía y Minas* (MINEM, Ministry of Energy and Mines) does not consult other ministries or other levels of governments (Interview 7). This can be explained in part by a conflict of power between MINEM and MINAM. These two ministries have jurisdiction over their own planning tools. The conflict is mostly based on perceptions of legitimacy rooted in years of existence. MINEM was created in 1968 and holds much legitimacy within the central government. Meanwhile, MINAM was only created in 2008. It was built on the foundations of the *Consejo Nacional del Ambiente*, CONAM (National Environmental Council) that was created in the 1990s after the Rio Summit of 1992. MINAM is considered a new ministry, and therefore, it is less legitimate (Chirinos and al., 2013, p.110) and struggles to impose policies (Bersh, 2005: 110).

We can also observe a lack of communication and confusion concerning the separation of OT responsibilities between levels of government (Grupo Propuesta Ciudadana, 2014: 16). Norms establish that regions and municipalities are responsible for driving the process. However, MINAM's authorisation at each step of the process requires national involvement. This approval is seen by many regions and municipalities as a mechanism to prevent their autonomy (Chirinos and al, 2013: 114). According to both a regional civil servant and a local mayor, this poor relationship is also present between the region and municipalities (Interview 11 and interview 12). Within our research territory, the region was not aware of the OT progress in MANFORS. Likewise, the municipalities did not try to communicate with the region.

#### Surplus of planning tools

The Peruvian state has generated an excess of norms and tools for territorial planning (Grupo Propuesta Ciudadana, 2014: 13). The various tools presented in Annexe 3 demonstrate that municipalities are unable to implement all of them and confuse the utility of each tool. One example is the similarities between POT and PAT, *Plan de Acondicionamiento Territorial* (Territorial development plan) that is under the jurisdiction of the *Ministerio de Vivienda, Construcción y Saneamiento* (Ministry of Housing, Construction and Health) (Postigo De la Motta, 2017: 12). PAT is a tool that orients and regulates the spatial aspect of human activity in rural and urban contexts. It also guides public investment. In legislation, the difference between POT and PAT is not clear. In fact, there is a duplication in the objectives of these tools (Postigo De la Motta, 2017: 12). This duplication of tools necessitates many resources (financial, human, and technological) which limits resources allocated to OT mentioned below (Postigo De la Motta, 2017: 13).

Furthermore, there are no laws that elaborate measures in the case of conflicts between these different tools and interests (Bersh, 2005: 107). Government entities that are supposed to coordinate and integrate all these tools are not efficient. The *Centro Nacional de Planeamiento Estratégico* (CEPLAN, National Centre for Strategic Planning) aims to lead strategic planning in the country and to build a consensus between ministries. However, CEPLAN does not have the power to impose laws or recommendations (Bersh, 2005: 109). Furthermore, just as MINAM, it was created recently in 2005 and is perceived to lack expertise and legitimacy (Chirinos and al., 2013: 123).

### 3. Limits to implementation

#### 2 - Municipalities lack financial, administrative, and technical resources

Ferreiros and Pantoja (2017) explain that one of the causes of this lack of capacity is the fragmentation of municipal governments. In many cases, municipalities were created for political and electoral reasons as they would benefit from governmental transfers. Furthermore, they multiplied because of a centralized decision-making process and the lack of attention to local needs. This fragmentation has resulted in small municipalities with very weak territorial planning capacities (Ferreiros and Pantoja, 2017: 3). As an INAIGEM employee remarked (*Instituto Nacional de Investigación de Glaciares y Ecosistema de Montañas*, National Institute for Glacier and Mountain Ecosystem Research), with a lack of financial, administrative, and technical resources, municipalities cannot make OT a priority (Interview 21).

##### Financial resources

Peruvian municipalities have five sources of revenue. First, there is the sales tax at 18%. The central government re-distributes this tax to municipalities according to their population and levels of poverty. This is called the *FONDOCOMUN*. Second, each municipality has the power to impose its own tax. However, many of them don't. Third, there is the mining tax, *el Canon*. Only 50% of this tax is distributed to the area of influence. As mentioned earlier, in the case of MANFORS, municipalities that are not considered part of the direct area of influence receive a very small amount from *el Canon*. Fourth, there is *Inversión Pública*, a centralized funding process where municipalities must apply for national funding for each project. This is another complex process that requires civil servants with a specific master's degree to elaborate the demand. Plus, the *Ministerio de Economía y Finanzas* will take about two years to approve a project. Furthermore, an FCM economic expert told us that environmental projects under the jurisdiction of the *Ministerio del Ambiente* (MINAM), such as OT, are not prioritized within this system (Interview 5). Lastly, there is property tax. However, as many properties lack formal property titles, municipalities cannot benefit from this source of revenue. For example, for the entire Peruvian state, property tax represents only 0.17% of GDP, the lowest rate in South America (Ferreiros and Pantoja, 2017: 7).

Considering this financial context, municipalities do not have financial resources to implement the OT process. In the case of Cajacay, we can conclude that even with the mining tax, its an-

nual income is not enough to finance the entire OT process (CIS-AL, 2016: 41-42). For municipalities without the mining tax, it is impossible to implement the process without funds from the *Inversión Pública* or by pooling resources within the legal entity of *Mancomunidad Municipal*.

##### Example of Cajacay

Annual revenues = 820,000 soles (325,000 CAD\$) of which mining tax represents 50%

Cost for FIP studies = 575,000 soles (228,000 CAD\$)

Source: CISAL, 2016: 40

##### Administrative resources

Regional and local governments lack administrative skills to implement the OT process (Chirinos and al., 2013: 11). According to a local expert, a major issue is the lack of money available to pay staff (Interview 1). Therefore, many qualified individuals work for the private sector or the national government. For example, according to a regional civil servant, in 2018, the Natural Resources Department of Ancash had only two technicians (Interview 12). Some municipalities within our study territory did not have staff that could use georeferenced information systems (GIS). Thus, regions and municipalities do not have enough qualified personnel to implement OT (Valenza, 2018: 61).

A lack of administrative resources has consequences. First, at the administrative level, there is a lack of knowledge concerning the organization and separation of OT functions at the regional and municipal level. In some cases, there are overlaps between departments' responsibilities in OT. This creates internal conflicts (Valenza, 2018: 24). Second, municipalities do not know how to govern with OT tools or how to integrate them in the existing framework. They perceive OT tools as too general and many mayors believe that these tools do not respond to their needs (Valenza, 2018: 38). Third, civil servants of municipalities with approved ZEE plans have different definitions for important concepts such as territory, OT, and ZEE. Many of them thought that OT and ZEE were different processes even though they are in fact, different steps within the same process (Valenza, 2018: 33).



### 3. Limits to implementation

#### Technical resources

Statistical analysis is a problem. Data provided by the 2012 census, produced by the *Instituto Nacional de Estadística e Informática* (National Institute for Information and Statistics), is only available in a complex excel sheet. Much decoding is needed to separate the data per political jurisdictions. Therefore, according to a local expert, because of a lack of technical capacity, municipalities use data from the 1994 census as it is already separated by region. Clearly, this data is outdated (Interview 14).

Another important factor is the lack of infrastructure to collect technical data. One example is infrastructure for climatic data. *Servicio Nacional de Meteorología e Hidrología del Perú* (SENAMI, National Meteorological and Hydrological Service of Peru) recommends having one climate station every 2 km. By 2018, there was one per provincial municipality. According to a local expert, with climate change, more infrastructure will be necessary as data will change quickly (Interview 14).

Another example is the lack of spatial references for registered properties. Fifty-seven percent (57%) of these properties are not located on a map (Delninge and al. 2011: 65). Concerning public lands, less than 30% are clearly identified on maps (Delninge and al., 2011: 62). A final example is the lack of cadaster data. Ninety-five percent (95%) of municipalities in Peru lack geographical information on their cadastre (Delninge and al., 2011: 62).

#### 3 - OT is not a priority for all levels of government

With lack of political will, OT is not a priority and resources are allocated elsewhere. For OT to function properly, each level of government needs political will (Chirinos and al., 2013: 11). Below, I elaborate the priorities at each level of government that receive resources instead of OT.

#### National

At the national level, priority is given to developing an export-based economy. Since the Fujimori administration of the 1990s, neo-liberal policies have been engrained in Peruvian politics. Instead of implementing the OT process, promoting and developing mining is a main priority for the central government. This priority is maintained by the strong mining lobby that sees the OT process as a threat. For them, OT is a tool that questions and prevents their development (Postigo De la Motta, 2017: 10).

For Mendoza and De Echave (2016), Ley N°30230 is a triumph of the mining lobby (Mendoza and De Echave, 2016: 52). The law indicates that OT does not attract investment. It removed the exclusionary clauses of OT that would give municipalities the power to oppose mining in their jurisdiction (Mendoza and De Echave, 2016: 56). One expert believes it was the mining lobby that initiated the law as they have strong influence within the *Presidencia del Consejo de Ministros* (PCM, Presidential Council of Ministries) (Interview 1).

#### Regional

Developing mining is also a priority at the regional level. However, compared to other regions, most of the financial resources in Ancash is lost to corruption. The Ancash region has received the highest level of mining tax transfers but has the lowest implementation percentage (World Bank, 2010: 94). Furthermore, a local expert indicates that the last three regional governors are currently in jail for corruption (Interview 14). Thus, even though economic resources are available, corruption has prevented the regional government to use these resources to adopt and execute development policies such as OT.

It is important to note that corruption has evolved in recent years. Previously, corruption was observed at the individual level. For example, according to the same expert, when a citizen applied for a permit, the administrator would ask for more money. Today, corruption has infiltrated the highest levels of office and is observed during the execution of public projects. Governors and mayors will inflate prices of their projects and retain some of the funding for individual purposes (Interview 14). Thus, now that corruption is a systemic issue among regional governors and high levels of office, we can conclude that those projects that get implemented tend to be those that benefit individuals instead of societal projects such as OT.

#### Local

According to an employee of a recognized research institute, at the local level, most mayors prioritize economic development (Interview 10). Since mayors cannot be re-elected for a second consecutive mandate, they do not want to take major risks. According to one of the mayors, his priorities are creating jobs through economic development, developing tourism, commercializing production and agriculture, building roads, and improving water access and forest conservation (Interview 11). The same mayor told



### 3. Limits to implementation

us that a common project at the local level is the building of roads, as it is simple and creates jobs (Interview 11). These priorities do not include long-term development policies such as OT. According to another expert, mayors will not invest in the OT process as it is a long-term project that covers the span of at least two mandates (Interview 1).

#### 4 - Lack of public participation

Public participation is a fundamental principle of OT and ensures its implementation and legitimization. We can observe a lack of public participation due to the following reasons.

##### **Prioritization of individual gain**

To implement OT, the prioritization of individual gain over a long-term collective project, such as OT, prevents public participation. In 1970, there was a major earthquake in Ancash that caused 67,000 deaths and destroyed most of the infrastructure (Presidencia del Consejo de Ministros, 2014 : 11). Many international not-for-profit organizations participated in the reconstruction and rural development efforts. According to a local expert, the programs implemented by these organizations tended to give citizens objects and money instead of training them to participate in their own development (Interview 14). Today, a local mayor told us that citizens only participate in programs when they are given something (Interview 11). The mining industry, including Antamina, adopted a similar approach which has further developed a community that prioritizes individual gain. As a result, when public participation activities that aim to provide information or training programs are organized, only a few citizens attend them.

##### **Lack of an organized civil society**

An FCM expert told us that *comunidades campesinas* (Indigenous communities) are well organized when it comes to opposing future mining projects and dealing with issues of water quality. These communities will participate in large numbers. However, when it comes to OT, these individuals do not understand the necessity of the tool. They believe that it will restrict their rights to agriculture (Interview 1). Therefore, *comunidades campesinas* do not organise themselves around this issue. This lack of an organized civil society reinforces a centralised decision-making process where the central government and mining lobbies in Lima dominate the public debate on territorial planning without a counter-power to oppose them (Bersh, 2005: 106).

##### **Lack of trust in government**

Lack of trust in government is closely linked to non-transparent actions and corruption. In Peru, according to a MINAM civil servant, municipalities have elaborated many different policies and promises but do not execute or respect them (Interview 4). For example, a fundamental planning tool, the *Plan de Desarrollo Concertado* (Concerted Development Plan), includes a formal consultation process where local citizens present projects to be implemented in the following year. In other words, there is an institutionalized participatory budget process. However, in many cases, only 20% of these projects are executed. Instead, mayors choose their own projects. Thus, local citizens do not trust the government as they do not fulfill their promises (Valenza, 2018: 54). This lack of confidence in government prevents public participation in other formal processes such as OT.

#### 5 - OT process is long and complex

There are three main reasons why implementing OT is a long and complex process. First, the law requires seven specialized studies (EE) to complete the diagnostic phase. More technical studies are useful. However, for many municipalities, these requirements are too costly as they take about 3 years to complete (Postigo de la Motta, 2017: 9). The length of the process prevents better decision making in territorial planning because municipalities are left with no tools to govern (Postigo De la Motta, 2017: 7). For Postigo De la Motta (2017), it is better to approve OT in a reasonable time frame so that municipalities can start making better decisions. Then, they can complement the data with EEs once they have the funding (Postigo De la Motta, 2017: 10).

Secondly, one of the main difficulties is the different methodologies for each of the three scales (*macro, mezzo, and micro*). Each have their own objective, produce different types of data and different levels of detail. These differences contribute to conflicts of interest between levels of government, especially because the national government must approve these plans. Furthermore, for local governments, these differences in objectives at each scale complicate the comprehension of the tool (Chirinos and al., 2013: 30).

Thirdly, in 2017, the central government created the Vice-Ministry of Territorial Governance. This new political organisation complicates the management of OT. The decree dictates that the office will be responsible for territorial development, decentralization,

### 3. Limits to implementation

conflict resolution, territorial demarcation, and the execution of the National Risk Management system. However, according to a MINAM civil servant, many of the terms lack official definitions and there is no clarification on how these functions will be shared with MINAM. The Presidential Council of Ministries (PCM) is currently working on clarifying their new responsibilities but most likely, they will introduce a new methodology (Interview 18).

#### 6 - Lack of professionalism

##### **During political transitions**

Many new mayors begin their four-year mandate with the mentality that the previous mayor has made bad decisions. Most of them change the entire administrative team. This new team is confronted by missing documents and plans, which a FIP employee and a local mayor think proves that the former administration did not want to support the new team (Interview 8 and interview 11). This lack of professionalism during transitions prevents long-term projects and plans, such as OT, to be developed or continued after an election.

##### **Within the MANFORS institution**

The institutional organisation of MANFORS and the lack of professionalism have prevented the implementation of OT, even with the presence of international support. According to the internal constitution of MANFORS, the general manager is assigned by the *Presidencia del Consejo de Ministros* (PCM, Presidential Council of Ministries) and holds most of the administrative power. He is based in Lima where Antamina financially supported an office. According to a FIP employee, since the creation of MANFORS in 2011, the general manager has changed many times. Furthermore, one of them was using money given to him by FIP to buy himself a car. He also organised a first set of ZEE studies without consulting the mayors or MINAM. Therefore, these studies were rejected by MINAM as they did not follow procedures (Interview 8).

#### 7 - Territorial demarcation

In Peru, most administrative limits are not formally recognized. For example, 76.8 % of districts and 89% of provinces lack formal demarcation (Vallejo Castillo, 2015: 8). This makes it impossible for municipalities to receive the mining tax. In the case of Livitaca, a district municipality in Cusco, they have not received their min-

ing tax even though a mine, Hudbay Minerals, has been installed in their territory for many years. According to a local expert, the central government is waiting for formal demarcation (Interview 14). Therefore, without financial resources accorded through the mining tax, these municipalities do not have the funding to implement the OT process.

The same issue is present between *comunidades campesinas*. Without formal borders, communities cannot exert their land rights (Delninge and al., 2011: 61). In the mining context, this creates conflicts during negotiations for rights of passage. For example, in the FIP studies and according to one of its employees, community boundaries could not be presented on maps as there were active conflicts that were not resolved (Interview 20).

The process for formalization is long and costly. Therefore, most conflicts are resolved at the local level after much negotiation. However, these new boundaries are not formalized by the central government and therefore not legitimate. Demarcation is fundamental to OT. One can ask: how can we know who has rights on a certain territory if we cannot even define that territory?

## 4. Recommendations

Considering the limits mentioned above, one must ask if OT is a tool adapted to Peruvian society. Can it really improve living conditions in small agricultural municipalities affected by mining? Within the existing normative framework, I believe that implementing OT is impossible. It is not adapted to Peruvian society. The fact that the entire process has yet to be implemented is further proof. However, I believe that there are some aspects of OT that are still useful for improving living conditions.

**My first recommendation is to integrate OT within an existing planning tool, *Plan de Desarrollo Concertado* (PDC, Concerted Development Plan).** Instead of being produced and implemented as its own process, the territorial approach of OT would become the basis of PDC. In these small municipalities, the territory and their topography determine all other aspects such as culture, agriculture, social conditions and environment. Therefore, it is essential to diagnose the territory as a first step before elaborating development policies. Furthermore, at the implementation phase, POT would become the spatial expression of objectives elaborated in the PDC. It is this territorial aspect of OT that must be preserved. Table 4 explains why I suggest PDC as an all-encompassing tool.

The integration of these two tools will make the implementation of OT (in its new form) more efficient for two reasons. First, consolidating tools will reduce the surplus of planning tools, reduce the elaboration time, and reduce the financial resources needed. This is true for both the diagnostic phase and the implementation phase. Second, both these tools have similar objectives (sustainable use of the territory) and the same steps in their processes (preparation, diagnostic, planning, implementation and monitoring). All these steps need to be updated regularly with new data.

Therefore, the integration would be simplified.

The integration of these two tools is not a new concept. Information generated during the ZEE process has been used to update PDCs (Chirinos and al., 2013 : 124). According to a MINAM civil servant and OT methodology expert, in Tacna, a regional capital in southern Peru, their PDC is a combination of the diagnostic and objectives of OT (Interview 18).

**My second recommendation is to use OT as a tool for these communities to transform local knowledge into quantitative arguments that are more legitimate to formal authorities.** Public participation is another aspect of OT that has the potential for improving living conditions. We observed in the Limits section that there is a lack of public participation in Peru for three reasons: the prioritization of individual gain, the lack of an organized civil society, and the lack of trust in government. Although these are important limits to consider, it is my opinion, and that of many Peruvian experts, public participation is a fundamental democratic principle that Peruvian society should strive for. Empowering communities and improving public participation are intertwined. Public participation can empower a community while knowledge gained through OT empowers a community so that it can better participate. Furthermore, public participation encourages accountability, promotes social inclusion, builds relationships of confidence between actors, and strengthens local and regional identities (Chirinos and al., 2013 : 11). It gives citizens a place in the decision-making process (Valenza, 2018 : 60).

Many formal public participation processes exist in Peru such as the *Presupuesto Participativo*, the participatory mandatory budget process during the elaboration of PDCs. We must note that

Table 6 : Characteristics of *Plan de Desarrollo Concertado* (PDC)

Characteristic	Description
Binding	PDCs are legally binding, which means regional and municipal councils that approve them must implement the vision, objectives, and actions elaborated. Municipalities would become accountable for objectives elaborated with OT.
Permanent	PDCs become a permanent reference for governments. They are constantly being updated with new data and public participation.
Territorial	PDCs are applicable at all levels of government. They can also be applied to territories demarcated by natural characteristics such as river basins.
Political	PDCs are elaborated with a consensus of all actors. They are an expression of a common vision and could be considered as a collective agreement.
Technical	The elaboration of PDCs necessitates scientific data that is produced in the OT process.
Participatory	PDCs are elaborated with the <i>Presupuesto Participativo</i> , an institutionalized public participation process. According to law, recommendations from civil society have to be included in PDCs.

Source : Centro Nacional de Planeamiento Estratégico, 2012 : 12-14

## 4. Recommendations

*comunidades campesinas* are the traditional governance structure in rural areas. According to a local expert, in many small agricultural municipalities, local leaders have more influence than the mayor (Interview 14). Therefore, it is essential that local knowledge be recognized during these formal processes. Their participation legitimizes them (Chirinos and al., 2013 : 110).

However, this local knowledge is not being recognized by governmental authorities or mining representatives. Indicators used by *comunidades campesinas* are typically vernacular and based on everyday observations of the landscape. For mining companies and governments, indicators used are quantitative and based on structured monitoring programs. Furthermore, there are issues of accessing this information. Mining companies often create their own data but do not publish it publicly (Bebbington and Bury, 2009 : 17298). Local communities often distrust quantitative data and do not understand it while mining companies continue to use this data to insist that new technology reduces negative impacts of mining. Furthermore, with climate change that is rapidly transforming the accuracy of local knowledge, *campesino* communities are being perceived by formal authorities as incapable of responding to these challenges (Lynch, 2012 : 370). Therefore, when trying to participate in the decision-making process, communities are left with a lack of data that is not recognized by formal authorities and their arguments are not being considered.

Workshops conducted in the scope of this research is an example on how OT can help transform local knowledge into quantitative arguments. These workshops had many objectives:

1. To explain the OT process and its importance
2. To diagnose, together with communities, their own territory
3. To combine technical data produced by consultants with a community diagnostic
4. To show communities that their knowledge is being considered
5. To allow communities to share their own vision of development
6. To create knowledge at a community level
7. To transform local knowledge into quantitative data

These workshops were organised in two parts. First, I made a brief presentation explaining OT, demonstrating its importance, and giving examples of territorial limits and potentials such as flood zones and agricultural land. Second, we guided participants to draw limits and potentials using maps of their own territory and asked them about their vision for development. Participation and results varied greatly by municipality. In each case, we were able to observe a positive reaction to these workshops.

**My third recommendation is that fundamental technical data be generated at a larger scale (regional or provincial) and that it is used to develop PDCs at the local level.** As we saw in the limits section, Peru lacks essential data collecting infrastructure and a valid scientific database. With a methodology that imposes the creation of this data, OT is uniquely positioned. This data is essential for many other decision-making tools such as water and disaster risk management, local economic development, and climate change adaptation (Chirinos and al., 2014 : 124). However, we must also consider, at the regional and local levels, the lack of financial, administrative, and technical resources. By imposing the creation of technical data at the regional level, this will ensure that governments with more financial resources invest in infrastructure instead of imposing this requirement on local governments.

Following these three main recommendations, I have enumerated more detailed recommendations. These recommendations aim to improve the implementation of OT in its new integrated form by reducing obstacles identified in the previous section. These recommendations concern all levels of government, the private sector, and civil society.

### ➤ National

#### 1 - Empower the *Centro Nacional de Planeamiento Estratégico* (CEPLAN, National Centre for Strategic Planning)

In its current state, CEPLAN is inefficient, does not have legitimacy, and its recommendations are not legally binding. Instead of creating a new institution, the national government could empower CEPLAN so that it becomes the leading actor in reforming the OT process. It could also become an intermediate actor to negotiate between different interests and opposing stakeholders (Bersht, 2005: 112).

1. Review CEPLAN powers to allow binding regulations.<sup>1</sup>
2. Elaborate a strategy to consolidate planning tools and integrate OT within PDCs.
3. Create a communication mechanism that allows the formulation of a common vision for territorial planning between all actors.

#### 2 - Review and simplify OT methodology<sup>2</sup>

OT as an integrated aspect of PDCs brings a territorial approach and eliminates many aspects of the current methodology. In fact,

<sup>1</sup> A civil servant within the Natural Resources department of Ancash mentioned that the PCM is currently discussing making CEPLAN's recommendations mandatory (Interview 12).

## 4. Recommendations

the methodology should be adapted to the different scales of application. It needs to be flexible so that it considers the capacities of each level of government. Furthermore, at the local level, OT methodology should have a more local approach. It should include local leaders and hold participatory workshops.

1. At the local level, eliminate the obligation of conducting *Estudios Especiales* (EE, Specialized studies) during the *Zonificación Ecológica y Económica* (ZEE, Ecological and economical zoning).
2. Clarify the role and responsibilities of the new Vice-Ministry of Territorial Governance.
3. Transfer more powers to regions and municipalities so that they may develop their own strategies to integrate OT within the PDCs. MINAM, along with CEPLAN, should guide the process rather than approve plans at each step.

### 3 - Reform fiscal policy to give more autonomy to regions and municipalities

1. Prioritise OT projects within the *Inversión Pública* (Public investment process). The list of priorities should be modified to include OT projects.
2. Simplify the *Inversión Pública* process to facilitate the approval of OT projects.
3. Allow regions and municipalities to diversify their revenues. They should not have to depend on *Inversión Pública* for funding collective projects.
4. The definition of direct area of influence, that determines which municipalities receive a bigger percentage of the mining tax, should be extended to municipalities adjacent to key infrastructure, such as the pipeline within the MANFORS territory.

### 4 - Invest in data collecting infrastructure and improve census methodology

1. Implement a field-work approach to the national census to improve data.
2. Invest in climatology and hydrology data collecting infrastructure.

### 5 - Drive the demarcation process

1. Make formal demarcation a priority.
2. Simplify the methodology to facilitate the demarcation process.

## ➤ Regional

### 1 - Invest in data collecting infrastructure<sup>3</sup>

- 1 - Invest in climatology and hydrology infrastructure, especially in isolated territories.

### 2 - Invest in capacity training for regional and municipal staff

1. Hire and train people with a master's in environmental management.
2. Invest in georeferenced information systems (GIS) training.
3. Establish a support program to assist municipalities during political transitions.

### 3 - Continue with ZEE-OT working group

The Natural Resources department of Ancash currently has a working group that is writing its own ZEE-OT policy. This working group wants to make OT mandatory for all municipalities of the region. It will use the same methodology established by MINAM but wants to remove some procedures to simplify it. For example, it will integrate *Zonificación Forestal* (Forest Zoning) which is legally binding and mandatory. Furthermore, it will introduce a more communal methodology to ensure the participation of local populations.

### 4 - Modify *Reglamento de Organización y Funciones* (ROF, Organisational By-Law) to create an OT department

1. Create the Department of OT that would be responsible for driving and implementing the OT process within the Ancash territory.

### 5 – Improve communication between regional departments and different levels of government

1. Create an information sharing web platform to facilitate the sharing of technical data.
2. Create an awareness campaign to explain OT.
3. Train staff to present technical information in a simplified and visual manner.
4. Invest in better communication between the regional and municipalities but also with various ministries of the central government.

<sup>2</sup> A high-placed individual within MINAM agrees that there is a pressing need to review and simplify the methodology (Interview 18). This view is shared with many experts within the field.

<sup>3</sup> The region of Ancash is already investing in a project called SIAL. It is a new building complex responsible for consolidating existing data and creating new databases (Interview 19).



## 4. Recommendations

### ➤ MANFORS

#### 1 - Reorganise

1. Reorganise MANFORS administratively according to a river basin approach that considers the political will for developing long-term collective projects.
2. Remove the power of fiscal management and vision development from the general manager. Power should be transferred to mayors.

#### 2 - Find funding

1. Search for funding to complete the 4 missing ZEE studies. Potential sources could be international aid organisations or through the *Inversión Pública*.
2. Fund data verification process by ZEE technical committee.

### ➤ Local

#### 1 - Make OT a priority

1. Pass an ordinance or a declaration of interest that will formalize OT as a priority.
2. Appoint one person to be responsible for driving, coordinating and promoting OT process.
3. Create an OT technical team charged to verify and review data.
4. Create an awareness campaign to explain OT and verify data.

### ➤ Civil society

#### 1 - Drive the OT process

1. Pressure future municipal administrations to continue OT process.
2. Use information generated in OT process during public participation activities.

### ➤ Mining sector

#### 1- Participate in OT process

1. Be active during the OT process.<sup>4</sup>
2. Provide financial resources to complete ZEE studies in MANFORS.

### ➤ Universities

#### 1 - Create urban planning programs for rural development

#### 2 - Teach how to make OT information accessible to all audiences.

1. Teach how to make technical information accessible to all audiences. It needs to be visual and easy to understand, especially for audiences with low levels of education.

<sup>4</sup> In Cajamarca, a region in Peru, the mining sector was part of the ZEE process. They believed that it was better to be a part of the process than to oppose it. A local expert attributes, in part, the success of ZEE in Cajamarca to the active participation of the mining industry (Interview 7).



# Conclusion

Throughout this paper, we have tried to answer the following question: **How can *Ordenamiento territorial* (OT), a land-use planning approach be used by small agricultural municipalities affected by mining to improve living conditions?**

We have concluded that in its current form, OT cannot be used by municipalities to improve living conditions. However, by integrating its territorial approach within an existing tool, *Plan de desarrollo concertado* (PDC), using the technical data created to make better decisions, and to transform local knowledge into quantitative data, OT can be a very useful tool for municipalities.

A major limit to this research was the fact that the main researcher was a foreigner. In the Ancash region, there are countless examples of international aid organisations who attempted to implement development programs without success. One such criticism could be brought to the *Fundo Ítalo Peruano* ZEE studies that are not useful for the municipalities of MANFORS. Although this research was done in collaboration with locals, the researcher had difficulty accessing certain information such as informal planning practices. To access this information, the researcher would have needed more time on the ground to gain trust from local communities. We can question how a foreigner status impacted the information collected and the perception of a western international development program by local communities.

More reflections can be made concerning the differences between western and Peruvian culture. In theory, *Ordenamiento Territorial* is a western concept. We find a similar methodology in Canada. However, considering the numerous limits to its implementation in Peru, we can question if this methodology is adapted to Peruvian culture. The same can be said of the concept of public participation. During the workshops conducted in the scope of this research, many difficulties were encountered. Participants were shy or simply did not want to participate. Again, is our western concept of public participation applicable in Peruvian society? This question becomes more relevant once we consider the ever presence of corruption. This factor was not elaborated in detail during this research. The main reason is that it is a taboo subject and the researcher did not want to scare potential interviewees. However, corruption is an integral part of Peruvian society and cannot be ignored. It has a major impact on political will and public participation, two keys aspects needed for the effective implementation of OT.

In a broader analysis, it is important to question the idea of economic development as a priority for the central government of Peru. Within our global consumerist economy, mining holds an essential role. Peru is well positioned. It has a vast territory filled with quality minerals. However, the central government must

re-evaluate their definition of development. It should include environmental and social goals, not just economic ones. Furthermore, concerning mining development decisions, the central government should consult local levels to fulfill these environmental and social goals.

As a final remark on the applicability of this research outside of Peru, one can look at the limits elaborated. It is my opinion that many of these limits are present in Canada. They are important to understand as we are also a mining country. The Canadian planning process is equally as political, with conflicts of jurisdictions between different levels of government. Furthermore, even though Canadian municipalities have more powers than Peruvian ones, they also lack the financial resources to implement their vision of development. We can also observe a lack of public participation on certain planning issues. The prioritization of individual gain and a lack of confidence in government due to corruption are also present in Canada. And finally, implementing our Canadian plans also encounter push-back from citizens. Let us consider construction in flood zones. Following intense pressure from residents, municipalities allow them to rebuild even though they are at risk. These limits prevent an efficient implementation of the planning process which could have a negative impact on our societies.

In the light of these limits and issues, we must also be grateful for aspects of our planning process that are more developed than in Peru. In Canada, we easily have access to valid data. Our municipal civil servants are very well educated and can execute our long and complex planning process. And even though we lack public participation on some planning issues, we can also observe an active civil society in many of our big cities. Considering these positive aspects, one can understand how a program like CISAL, which is based on sharing knowledge between Canadian experts and local populations abroad, can contribute to improving governance. It is important to share each country's experience so that we, as researchers and professionals, can better understand the planning realities from different contexts, and to identify our own limits and potentials. By learning from each other, we can hope to build better societies.

# Annex 1

## > Normative framework of Ordenamiento Territorial in MANFORS

LEVEL OF GOVERNMENT	ACTOR	APPLICABLE LAWS	YEAR	IMPORTANT ARTICLES
NATIONAL	GENERAL	<i>Constitución Política del Perú</i>	1993	Article 54° • Defines the state's territory as the soils, sub-soils, maritime dominion and aerial space
	CONAM	<i>Ley N° 26410 - Ley del Consejo Nacional del Ambiente</i>	1994	Creates CONAM Article 4° • Responsible for <i>Ordenamiento Ambiental</i>
	GENERAL	<i>Ley N°2682 – Ley Orgánica para el Aprovechamiento Sostenible de los Recursos Naturales</i>	1997	Article 2° • Objective is to promote and regulate the sustainable use of natural resources. Article 11° • Mentions for the first time ZEE as a tool for OT to avoid the superpositioning of titles and inappropriate uses
	GENERAL	<i>Ley N° 26839 – Ley sobre la Conservación y el Aprovechamiento Sostenible de la Diversidad Biológica</i>	1997	Article 5° - literal h • Conservation and ecological protection are part of <i>Ordenamiento Ambiental</i> and OT
	GENERAL	<i>Decreto Supremo N° 068-2001-PCM – Reglamento de la Ley sobre la Conservación y el Aprovechamiento Sostenible de la Diversidad Biológica</i>	2001	Article 24° • ZEE is the base for <i>Ordenamiento Ambiental</i> and OT
	CONAM	<i>Decreto Supremo N° 045-2001-PCM – Constituyen la Comisión Nacional para el Ordenamiento Territorial Ambiental</i>	2001	Creates the National Comision for <i>Ordenamiento Territorial Ambiental</i> Article 3° • Responsible for writing a ZEE policy
	GENERAL	<i>Ley N°27783 – Ley de Bases de la Descentralización</i>	2003	Article 35° literal a) • Gives regions exclusive competencies on integrated development, sustainable use of forests and biodiversity Article 36° • Shared competencies of sustainable management of natural resources and improving environmental quality
	CONAM	<i>Decreto Supremo N° 087-2004-PCM – Reglamento de Zonificación Ecológica y Económica (ZEE)</i>	2004	Defines objectives and methodology of ZEE Article 11° • CONAM is responsible for process

Source: Ministerio del Ambiente, 2015 : 15-23; Chapilliquén, 2017 : 8-12; L'Heureux, 2019

# Annex 1

LEVEL OF GOVERNMENT	ACTOR	APPLICABLE LAWS	YEAR	IMPORTANT ARTICLES
NATIONAL	GENERAL	Ley N°28611 – <i>Ley General del Ambiente</i>	2005	Article 19° • Defines <i>Ordenamiento Territorial Ambiental</i> Article 20° • Objective is to complement economic, social and environmental planning and to orient conservation and sustainable use
	GENERAL	Ley N°28245 – <i>Ley Marco del Sistema Nacional de Gestión Ambiental</i>	2005	Article 6° literal h • <i>Ordenamiento Territorial Ambiental</i> as a tool for environmental planning and management
	GENERAL	Decreto Supremo N° 008-2005-PCM – <i>Reglamento de la Ley Marco del Sistema Nacional de Gestión Ambiental</i>	2005	Article 53° • OT and ZEE as dynamic and flexible processes that are subjected to the environmental policy
	GENERAL	Decreto del Consejo Directivo N° 010-2006-CONAM-CD – <i>Acuerdo Nacional: trigésimo cuarta política de estado en ordenamiento y gestión territorial</i>	2006	Article 34 • National government promises to drive territorial planning and <i>Ordenamiento Territorial</i>
	CONAM	Decreto Consejo Directivo N° 010-2006-CONAM – <i>Directiva Metodología para la Zonificación Ecológica Económica</i>	2006	Refines ZEE methodology
	MINAM	Decreto Legislativo N° 1013 – <i>Creación, organización y funciones del Ministerio del Ambiente</i>	2008	Creates MINAM Article 7 literal c • Responsible for <i>Ordenamiento Territorial</i>
	MINAM	Decreto Supremo N° 007-2008-MINAM – <i>Reglamento de Organización y Funciones del Ministerio del Ambiente</i>	2008	Creates the administrative organization of MINAM
	GENERAL/ MINAM	Decreto Supremo N° 012-2009-MINAM – <i>Política Nacional del Ambiente</i>	2009	Article 11 • To drive OT nationally, to incorporate OT in risk management and PDC, and to use OT as a tool for conflict management.
	MINAM	Resolución Ministerial N° 026-2010-MINAM – <i>Lineamientos de Política para el Ordenamiento Territorial</i>	2010	Establishes objectives, guidelines, methodology and tools for OT

# Annex 1

LEVEL OF GOVERNMENT	ACTOR	APPLICABLE LAWS	YEAR	IMPORTANT ARTICLES
NATIONAL	GENERAL	Decreto Supremo N° 014-2011-MI-NAM – <i>Plan Nacional de Acción Ambiental 2011-2021</i>	2011	Action 7.11 • By 2021, 50% of national territory with approved OT plans and 25% with implemented OT plans.
	GENERAL	Resolución Ministerial N° 189-2012-PCM – <i>Comisión Multisectorial: ejes estratégicos de la gestión ambiental</i>	2012	To drive OT as a multi-sectorial approach
	MINAM	Resolución Ministerial N° 135-2013-MINAM – <i>Guía Metodológica para la elaboración de Instrumentos Técnicos Sustentatorios para el Ordenamiento Territorial</i>	2013	Finalize OT methodology Article 2.2 • Adds new requirement of seven specialized studies (EE) Article 2.3 • Adds new requirement of DIT
	MINISTERIO DE ECONOMÍA Y FINANZAS	Resolución Directoral N° 007-2013-EF7/63.01 – <i>Lineamientos para la Formulación de Proyectos de Inversión Pública de desarrollo de capacidades para Ordenamiento Territorial</i>	2013	Provides guidelines for applying for funding of the OT process through <i>Inversión Pública</i>
	GENERAL	Ley N°30230 – <i>Ley que establece medidas tributarias, simplificación de procedimientos y permisos para la promoción y dinamización de la inversión en el país</i>	2014	Article 22 • OT is not exclusive, it is not mandatory
	MINAM	Resolución Ministerial N° 056-2015-MINAM – <i>Contenido Mínimo de las disposiciones internas que regulan las Comisiones Técnicas de Zonificación Ecológica y Económica (ZEE) en el ámbito regional o local</i>	2015	Specifies composition of the ZEE technical committee
	MINAM	Resolución Ministerial N° 098-2016-MINAM – <i>Lineamientos Estratégicos y Disposiciones Complementarias para la Conducción del Proceso de Ordenamiento Territorial</i>	2016	Provides guidelines for the implementation of OT
	PCM	Decreto Supremo N° 022-2017-PCM – <i>Decreto supremo que aprueba el reglamento de organización y funciones de la Presidencia del Consejo de Ministerios</i>	2017	Creates the Vice-ministry of Territorial Governance. The separation of functions between MINAM and this office still need to be clarified.

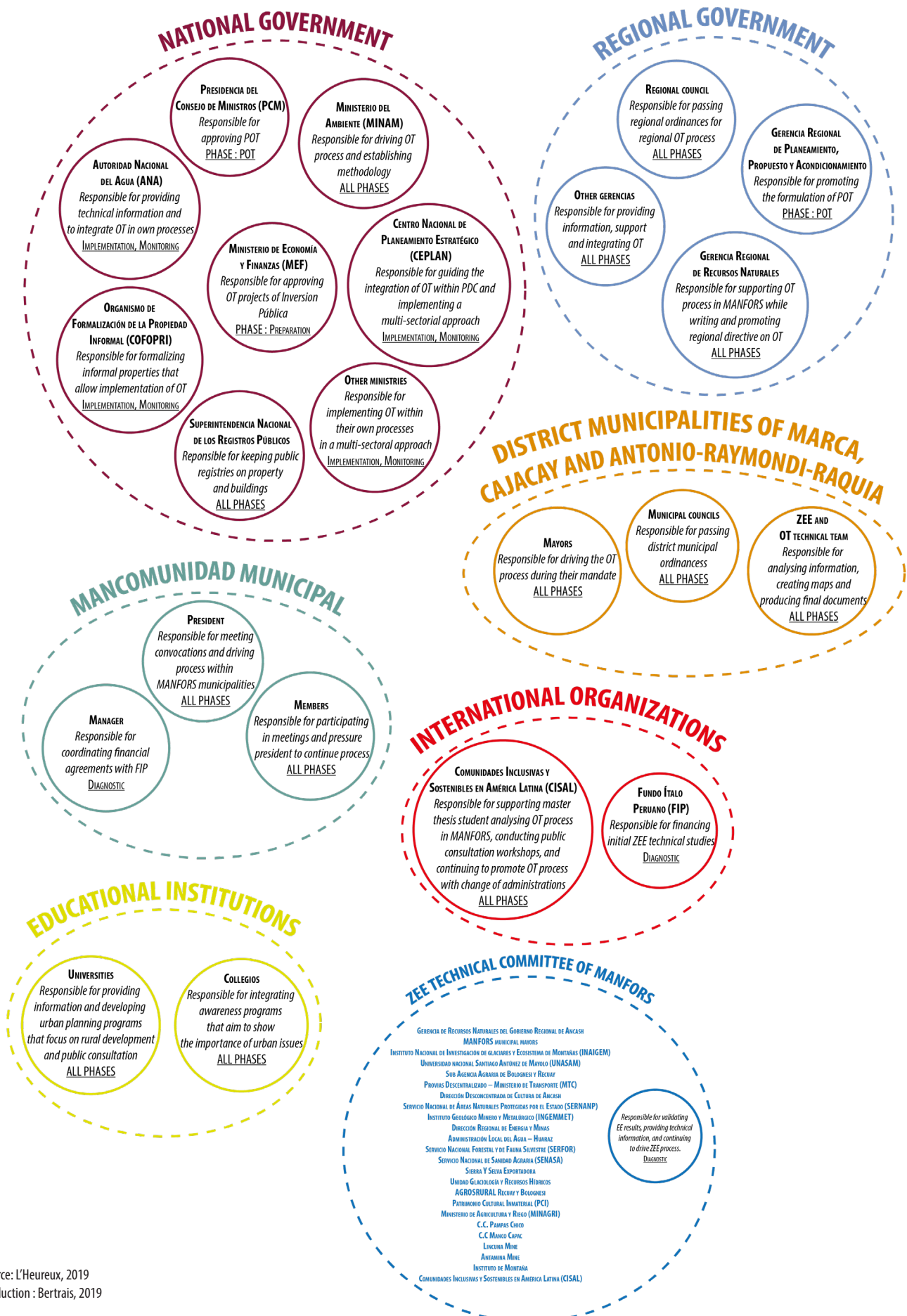
# Annex 1

LEVEL OF GOVERNMENT	ACTOR	APPLICABLE LAWS	YEAR	IMPORTANT ARTICLES
REGIONAL GOVERNMENT	GENERAL	Ley N° 28611 – <i>Ley General del Ambiente</i>	2002	Article 22° • Concerning environmental management, decentralization prioritises the integration of OT in regions
	DEPARTAMENTO ANCASH	Ley N° 27867 - <i>Ley Orgánica de los Gobiernos Regionales</i>	2002	Defines function of regional government Article 53° • Region is responsible for formulating and administrating regional POT, in accordance to local plans
	GERENCIA REGIONAL DE PLANEAMIENTO, PROPUESTO Y ACONDICIONAMIENTO TERRITORIAL	Ordenanza Regional N° 008-2017-GRA/CR – <i>Reglamento de Organización y Funciones</i> – ROF del Gobierno Regional de Ancash	2017	Article 45° - literal j • Gerencia responsible for promoting the formulation of POT
	GERENCIA REGIONAL DE RECURSOS NATURALES	Ordenanza Regional N° 008-2017-GRA/CR – <i>Reglamento de Organización y Funciones</i>	2017	Article 93° - literal a • Responsible for formulating, approving, executing, evaluating, directing, controlling and administrating politics, plans and programs of <i>Ordenamiento Ambiental</i>
LOCAL GOVERNMENT	PROVINCIAL AND DISTRICT MUNICIPALITIES OF MANFORS	Ley N° 27972 - <i>Ley Orgánica de Municipalidades</i>	2003	Article VIII • Municipal competencies and functions are harmonious with national and regional policies of development Article 73 literal a) • Provincial municipalities are responsible for OT
MANCOMUNIDAD	GENERAL	Ley N° 29341 – <i>Ley de la Mancomunidad Municipal</i>	2007	Article 5 literal b) • Allows financial transfers between municipalities
	GENERAL	Resolución de secretaría de descentralización N° 046-2010-PCM – <i>Reglamento de la Ley de la Mancomunidad Municipal</i>	2010	Article 26 • Refines how to apply for <i>Inversión Pública</i>
	MANFORS	Resolución de secretaría de descentralización N° 524-2011-PCM/SD – <i>Inscriben en el Registro de Mancomunidades Municipales a la 'Mancomunidad Municipal del Valle Fortaleza y del Santa'</i>	2011	Creation of MANFORS
	MANFORS	<i>Acta de conformación técnica de ZEE</i>	2016	Creation of technical committee. Still needs regional approval



# Annex 2

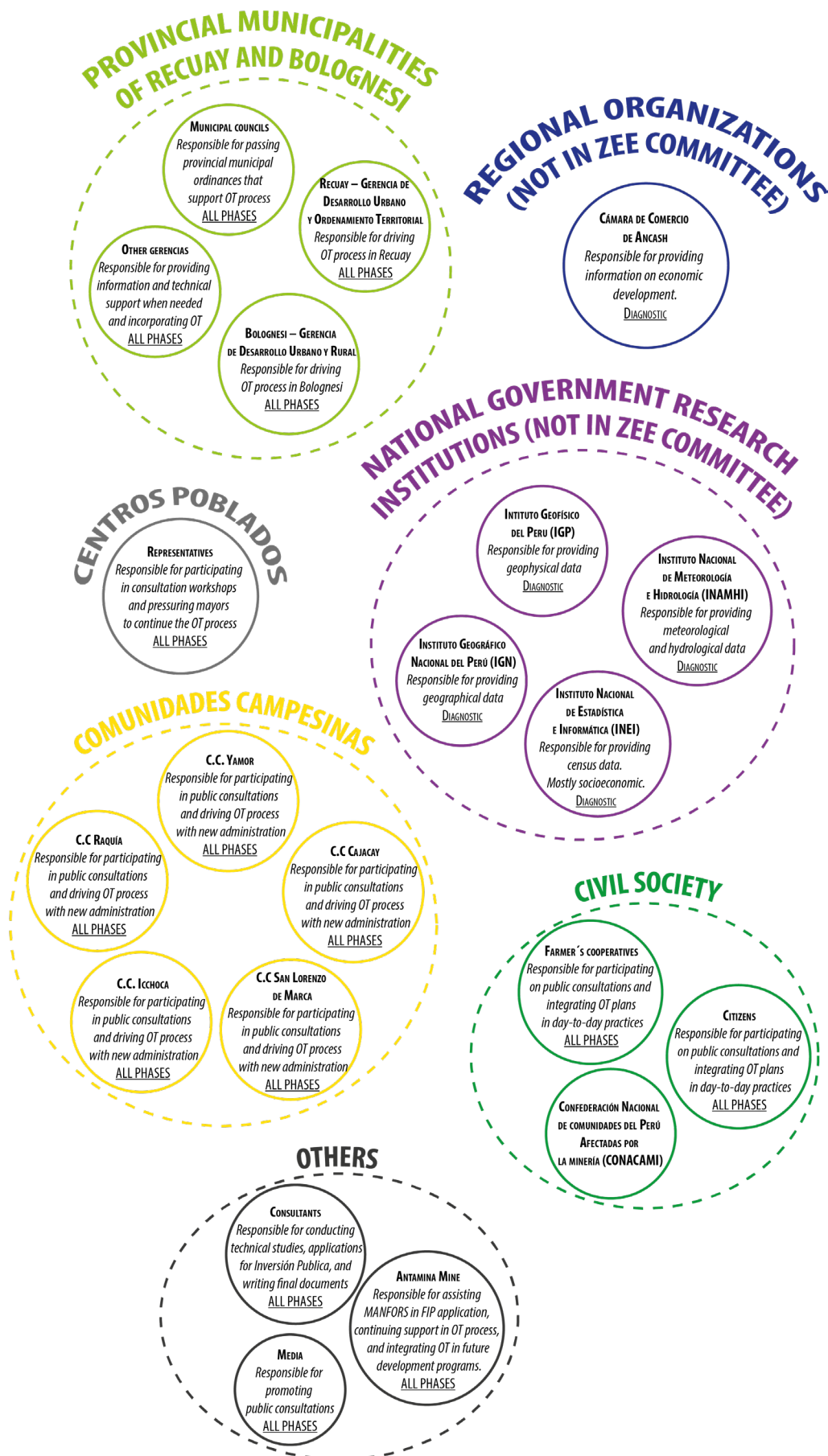
## ➤ Key OT actors in Marca, Cajacay and Antonio-Raymondi-Raquia



Source: L'Heureux, 2019  
Production : Bertrai, 2019



# Annex 2



## Annex 3

### > List of Peru's territorial planning tools

LEVEL	TOOL	ACTOR RESPONSIBLE	UTILITY
NATIONAL	<i>Plan Bicentario 2021</i>	CEPLAN	Set national and transversal objectives and actions for development Does not have binding powers
	<i>Planes Sectoriales</i>	Each ministry	Each ministry has their own plan with their own objectives and actions
	<i>Plan National de Decentralización</i>	PCM	Sets objectives on public participation, administrative and fiscal autonomy, and how to strengthen institutions
	Rural Land registry	MINAGRI	Titulation of informal properties
	<i>Sistema de Diagnóstico y Zonificación de Información Cadastral Predial</i>	PCM	
	Territorial demarcation	PCM	Establishes the process to demarcate administrative territories
	Mining concessions	MEM	Mining concessions give the rights to explore and exploit
REGIONAL	<i>Plan de Desarrollo Regional</i>	CEPLAN	Establishes objectives and actions for development. Has binding power
	<i>Macro and meso Zonificación Ecológica y Económica (ZEE)</i>	Department of Natural Resources	Diagnostic of territory Approach based on environmental protection. Arguments of sustainability
	<i>Plan de Ordenamiento Territorial (POT)</i>	Department of Natural Resources	Establishes objectives and actions for territorial development

Source: L'Heureux, 2019

## Annex 3

LEVEL	TOOL	ACTOR RESPONSIBLE	UTILITY
LOCAL	<i>Plan de Desarrollo Concertado (PDC)</i>	CEPLAN	Establishes objectives and actions for development. Has binding power
	Micro ZEE	MINAM	Diagnostic of territory Approach based on environmental protection. Arguments of sustainability
	<i>Plan de Ordenamiento Territorial (POT)</i>	MINAM	Establishes objectives and actions for territorial development
	<i>Plan de Acondicionamiento Territorial (PAT)</i>	Ministerio de Vivienda, Construcción y Saneamiento	Market based approach, prioritizes urban development for national growth. Zoning policies are used to integrate cities and markets in surrounding economic system. <sup>38</sup> Use arguments of economic development.
	<i>Plan de Desarrollo Urbano (PDU)</i>	Ministerio de Vivienda, Construcción y Saneamiento	Zonification of uses in urban areas.
	<i>Estudio de Diagnóstico y Zonificación (ZEE)</i>	PCM	Necessary for territorial demarcation
	<i>Plan de Gestion del Riesgo</i>	PCM	Identifies dangers and risks Establishes strategies and actions for risk management

# Annex 4

## ➤ Interview questions : three examples

### 1 - Local mayors

1. What are the impacts of mining in your municipality?
2. In your opinion, what is the objective of *Ordenamiento Territorial* (OT)? Of *Zonificación Ecológica y Económica* (ZEE)?
3. How can these tools help you make better decisions?
4. What are the main barriers to the implementation of OT and ZEE in your municipality?
5. What data do you use to develop your local plans?
6. What are your priorities for development? Your future projects?
7. What is your relationship with the provincial municipality? The regional government? The national government?
8. What are the main issues facing your municipalities?
9. Do you believe that decentralization, transparency, and public participation are important principles?
10. Are these principles possible to achieve in Peru?

### 2 - Regional department of Natural Resources (Ancash)

1. In your opinion, what is the objective of *Ordenamiento Territorial* (OT)? Of *Zonificación Ecológica y Económica* (ZEE)?
2. What is the history of OT in Ancash?
3. What are your objectives and expectations of a regional OT policy?
4. How can OT be used to make better decisions at the regional level?
5. What are the main barriers to the implementation of OT?
6. What are the development priorities for Ancash? What are the future projects?
7. Describe the relationship between the regional government and the municipalities. Between the regional and national government.
8. What are the main issues facing Ancash? How can OT be used to tackle these issues?

### 3 - *Ministerio del Ambiente* (MINAM, Ministry of Environment)

1. In your opinion, what is the objective of *Ordenamiento Territorial* (OT)? Of *Zonificación Ecológica y Económica* (ZEE)? What are the differences?
2. In matters of OT, what are the competencies of each level of government?
3. In your opinion, which is the level of government best suited to implement OT?
4. In matters of OT, what are the responsibilities of the various ministries?
5. What is the dynamic between these ministries?
6. What are the most important OT steps for a local government?
7. What are the main barriers to the implementation of OT by local governments in the mining area of influence?
8. What are the conditions that allow ZEE and OT to be implemented in small agricultural municipalities?
9. Are there good examples of ZEE implementation in Peru?
10. How can MINAM support building collaboration between key actors?
11. Are there any legal mechanisms that manage the superpositioning of land-uses?
12. How can municipalities use ZEE and OT to avoid social conflicts in mining areas of influence?
13. Does MINAM have any plans to improve capacity at the local level?
14. In your opinion, how can MINAM reinforce capacities at the local level for the implementation of OT?
15. William de Postigo criticizes the OT methodology saying that the process is too bureaucratic. What is your reaction? Why are the additional *Estudios Específicos* (EE, Specialized Studies) mandatory?
16. How can we simplify OT methodology to facilitate its implementation in small municipalities?

# Bibliography

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- Antamina. (2016). *Raporte de sostenibilidad 2016*. Avanza Sostenible. 112p.
- Autoridad Nacional del Agua. (2015). *Plan de Gestión de los Recursos Hídricos de la cuenca Chancay-Huaral*. Lima, Peru: ANA. 264p.
- Bebbington, A. J. and Bury, J. T. (2009). *Institutional challenges for mining and sustainability in Peru*. PNAS. 106, (41). Pp. 17296 – 17301.
- Bersch, A-K. (2015). *The transformation of public action – A new spatial planning paradigm in Peru?*. Espacio y Desarrollo. 27. Pp. 103-118.
- Bollin, C. (2010). *Incorporar la gestión del riesgo en la planificación territorial: Orientaciones para el nivel municipal*. Lima, Peru: GTZ. 68p.
- Burreo, M. and Chaparro, A. (2010). *Poder, comunidades campesinas e industria minera: el gobierno communal y el acceso a los recursos en el caso de Michiquillay*. Anthropologia/Año XXVIII. 28. Pp. 85-110.
- Capoen, E. and Gomero, L. (2013). Escalamiento de innovaciones campesinas de tecnologías agroecológicas para el fomento de la agricultura sostenible: el caso del programa “Tierra Sana y Soberana” en Ancash, Perú. In Álvaro Paz, María Paz Montoya y Raúl Asensio (Dir.). *Escalando innovaciones rurales*. (Estudios de la Sociedad, 43, pp.149-166). Lima, Perú: IEP, IDRC-CRDI, FIDA.
- Centro Nacional de Planeamiento Estratégico. (2012). *Guía para la formulación de planes de desarrollo concertado regional y local*. Lima, Peru: CEPLAN, GIZ. 177p.
- Chamochumbi, W. (2010). *El ordenamiento territorial en la gestión de cuencas hidrográficas: criterios de base y nuevos elementos de discusión*. Lima, Peru: ISAT. 37p.
- Chamochumbi, W. (2017). *Transiciones de la agricultura familiar a la agroecología y la gestión territorial en ecosistemas alto-andinos : Reflexiones y prospectiva desde la experiencia en Ancash-Perú*. Lima, Peru: Proyecto Tierra Sana y Soberana Fase II. 59p.
- Chapilliquén, R. R. (2017). *El proceso de Ordenamiento Territorial en Piura*. Lima, Peru: Grupo Propuesta Ciudadana. 19p.
- Chirinos, A. and al. (2013). *Mirada sobre el ordenamiento territorial desde lo local hacia lo nacional : Lecciones y recomendaciones desde las experiencias de ordenamiento del territorio en Cajamarca, Pitumarca y El Carmen de la Frontera*. Lima, Peru : ADG, BD, CBC, DIACONIA, IDP, RAAA, CooperAcción. 160p.
- Chirinos-Almanza, A. (1975). *La Reforma Agraria peruana*. Nueva Sociedad. 21. Pp. 47-64.
- Chquisengo, O. (2007). *Gestión de riesgos en Ancash: Experiencias y propuestas*. Lima, Peru: Soluciones Prácticas-ITDG. 99p.
- CISAL. (2016). *Perfil económico Ancash sur*. Peru: FCM. 65p.

# Bibliography

---

- Consejo Nacional de la Descentralización (CND), Ministerio de Economía y Finanzas (MEF) y Programa Pro Descentralización (PRODES). (2006). *Guía específica: Presupuesto Participativo*. Lima, Peru . PRODES. 43p.
- Damonte, G. (2016). Minería, estado y comunidades: Cambios institucionales en el último ciclo de expansión extractiva en el Perú. Un balance de investigación. In GRADE (Dir.), *Investigación para el desarrollo en el Perú: Onze balances*. (pp.403-444). Lima, Peru: GRADE.
- Damonte, G. and Glave, M. (2016). *Industrias extractivas y desarrollo rural territorial en los Andes peruanos: Los dilemas de la representación política y la capacidad de gestión para la descentralización*. Lima, Peru : GRADE. 112p.
- Delning, K. and al. (2011). Applying the Land Governance Assessment Framework in Practice: Evidence from five Pilot Cases. In *The Land Governance Assessment Framework: Identifying and Monitoring Good Practice in the Land Sector*. (pp.52-131). World Bank.
- Ferreiros, M. and Pantoja, E. (2017). *Local Government Fragmentation in Peru: The Challenges for Land Governance and Territorial Planning*. Paper prepared for presentation at the 2017 World Bank Conference on Land and Poverty. Washington DC. 21p.
- Fondo Ítalo Peruano. (2017). *Hidrología a escala 1/50,000 en los 11 distritos, MANFORS, Ancash*. Elaborated by Corporación B&O SAC. Peru. 145p.
- Gobierno Regional de Ancash. (2016). *Estrategía Regional de Cambio Climático de Ancash. Resumen*. Huaraz, Peru: Gerencia Regional de Recursos Naturales y Gestión del Medio Ambiente. 84p.
- Grupo Propuesta Ciudadana. (2014). *El Ordenamiento territorial en el Perú: Avances y retos para las regiones y el país*. Lima, Peru: Grupo Propuesta Ciudadana. 32p.
- Huber, L. (2009). Antamina: licencia social y conflicto de baja intensidad. In CBC, CIPCA, CIES, IEP (Dir.), *Minería y conflicto social*. (p.99-124). Lima, Peru: CBC, CIPCA, CIES, IEP.
- Instituto de Montañas. (2017). *Informe de recolección de información primaria y secundaria referida al inventario de recursos hídricos en las cabeceras de cuencas del Santa y Fortaleza*. Huaraz, Peru: CISAL. 63p.
- Jeronimo, R. P. and Gutierrez, C. A. (2016). *Gobernanza del agua en zonas mineras del Perú*. Lima, Peru: CooperAcción. 220p.
- KPMG International. (2016). Peru country mining guide. 32p.
- Lynch, B. D. (2012). *Vulnerabilities, competition and rights in a context of climate change toward equitable water governance in Peru's Rio Santa Valley*. *Global Environmental Change*. 22. Pp.364-373.
- Mendoza, A. and De Echave, J. (2016). *¿Pagaron lo justo? Política fiscal peruana en tiempos del boom minero*. Lima, Peru: CooperAcción and OXFAM. 142p.
- Ministerio del Ambiente. (2015a). *Guía metodológica para la elaboración de los instrumentos técnicos sustentatorios para el Ordenamiento Territorial*. Lima, Peru: MINAM. 23p.
- Ministerio del Ambiente. (2015b). *Lineamientos de Política para el Ordenamiento Territorial*. Lima, Peru: MINAM. 45p.



# Bibliography

---

- Ministerio del Ambiente. (2015c). *Orientaciones básicas sobre el Ordenamiento Territorial en el Perú*. Lima, Peru: MINAM. 60p.
- Mongeau, P. (2009). *Réaliser son mémoire ou sa thèse : Côté Jeans et Côté Tenue de soirée*. Québec, Canada : Presses de l'Université du Québec. 145p.
- Postigo De la Motta, W. (2017). *Ordenamiento Territorial: Entre la confusión y el estancamiento*. Lima, Peru: Grupo Propuesta Ciudadana. 16p.
- Presidencia del Consejo de Ministros. (2017). *Registro de Mancomunidades municipales*. Lima, Peru: Secretaría de Descentralización. 39p.
- Presidencia del Consejo de Ministros. (2014). *Plan Nacional de Gestión del Riesgo de Desastres: PLANAGERD 2014-2021*. Lima, Peru: Secretaría de Gestión del Riesgo de Desastres. 63p.
- Rojas, R. A. (2013). *Ordenamiento Territorial y Cambio Climático: Metodología para incorporar Cambio Climático y Gestión del Riesgo de Desastres en procesos de OT*. Lima, Peru: GIZ. 184p.
- Servicio Nacional Forestal y de Fauna Silvestre. (2017). *Guía metodológica para la zonificación forestal*. Lima, Peru : Ministerio de Agricultura y Riego. 67p.
- Tupayachi, E. (2016). *Estudio sobre marco normativo minero en Perú*. Lima, Peru: Grupo Propuesta Ciudadana. 38p.
- Valenza, C. (2018). *Capacidades para la gobernabilidad y mecanismos de gobernanza en materia de ordenamiento territorial: Informe final*. Lima, Peru : MINAM. 123p.
- Vallejo Castillo, J. L. (2015). *La gestión territorial para el desarrollo integral. Apuntes sobre los gobiernos subnacionales y locales en el Perú*. 12p.
- World Bank. (2010). *Mining Foundations, Trusts and Funds: A Sourcebook*. 178p.
- Yancari, J. (2009). *Crisis y pobreza rural en América Latina: el caso de Perú*. Dinámicas Territoriales Rurale. 41. Santiago, Chile: IEP. 41p.

## Websites

- Antamina. (2018). *Projects and development initiatives*. Data collected at [http://www.antamina.com/en/gestion-social/desarrollo\\_sostenible-proyectos-iniciativas/](http://www.antamina.com/en/gestion-social/desarrollo_sostenible-proyectos-iniciativas/)
- Canadian Institute of Planners. (2019). About Planning. Data collected at <http://cip-icu.ca/Careers-in-Planning/About-Planning>
- Darlington, S. and al. (Feb. 9, 2019) *A Tidal Wave of Mud*. Data collected at <https://www.nytimes.com/interactive/2019/02/09/world/americas/brazil-dam-collapse.html>
- MCCOPA. (Oct. 2, 2017). *Antamina: la mina de cobre más grande de Perú*. Data collected at <http://www.mineria-pa.com/reportajes/antamina-la-mina-de-cobre-mas-grande-de-peru/>
- UNESCO. (2019). UNESCO Global Geoparks. Data collected at <http://www.unesco.org/new/en/natural-sciences/environment/earth-sciences/unesco-global-geoparks/>