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Social Changes in the Peruvian Amazon Due to Foreign Influence

Zoran Stiperski and Tomica Hruška

Abstract

The prehistoric Amazon had low numbers of hunter-gatherers due to poor soil and harsh landscape conditions, due to which it was not able to support advanced cultures. The arrival of Christian missionaries, oil companies, and farmers changed the lifestyle of a specific portion of the population, although some indigenous groups still avoid contact with the outside world. Missionaries stimulated changes in the indigenous medical-religious-political systems. In the Peruvian Amazon, the local government is too weak to carry out the usual functions of the state, and therefore oil companies have replaced the state in terms of various functions such as employment, building wells for the drinking water, healthcare, donation of electric generators, and aircraft transport of local indigenous authorities to meetings in Iquitos or Lima. The policies of the national government are turning the Peruvian Amazon into a productive area and are exploiting its natural raw materials. In modernising the Amazon region, however, the world is permanently and irreparably losing valuable knowledge regarding the nature of tropical areas.

Keywords: Peruvian Amazon, foreign influence, indigenous people, missionaries, oil industry, plantation agriculture, deforestation, loss of knowledge regarding the tropics

1. Introduction

Migrations of people, especially of the intense variety, bring change to societies and landscapes. The Amazon has historically been sparsely settled, mostly by hunter-gatherers and primitive farmers. Its settlements are small and spread far and wide throughout the vast forests. The largest South American cultures and empires arose in the Andes, along the Pacific Ocean coast, and in the lowlands in the southern part of the continent, while the Amazon was bypassed. Numerous researchers have searched the jungle for signs of highly-developed Amazonian civilisations, but none succeeded in finding anything—their attempts have resulted rather in great stories of adventure and valuable ethnic documentation. Franciscan monks founded a church and monastery in Santa Rosa de Ocopa in the Peruvian Andes 300 years ago to serve as a missionary school and destination for missionary work in the Amazon. During the 20th century, companies and states “discovered” the Amazon as a new area of development. This primarily meant exploitation of natural resources such as oil, natural gas, hydro energy, wood, and agriculture. Today, road networks are spreading along with pipelines, and harbours and airports are being built. Along with the development of business, workers from the Andes and other parts of the world are flocking to the Amazon. Concurrently, indigenous

peoples are losing their territory and strong deforestation processes are underway. The world also regards the Amazon in ecological terms, referring to it as the “lungs of the world”. Numerous politicians of Amazonian states look at the jungle in terms of what it could mean for economic development of their respective states. Many local politicians think that what is happening to the Amazon now is what European settlers did to both Europe and North America over the last several centuries: cut down the forests; developed agricultural land; opened new business opportunities; and spread their civilisation.

In this chapter, our goal is to confirm the reasons for the arrival of settlers in the Amazon, and the significance of individual activities and how they transform nature and society. Special emphasis is placed on logging and the widespread process of deforestation, whereby we are interested in the consequences of cutting down the forest from various aspects: the effectiveness of agricultural activity; maintenance of biological diversity; and the influence of climate change on indigenous communities. Special attention is given to the adoption of the principle of market exchange, i.e. the exchange of money for goods/services, in indigenous communities, as well as key related sociological changes within indigenous societies themselves. Important landscape changes in the Amazon often happen due to deforestation, but in this chapter we explore other types of landscape change that are rarely mentioned in scientific and profession literature: the emergence and spread of networks of modern settlements that are planned in a completely different way than traditional indigenous settlements. In our analysis of modern plans of the Peruvian government, as well as similar projects of Peruvian and foreign companies, we touch on both the strategic and geopolitical dimensions of exploitation of the Amazon. Finally, we also cover the vanishing Amazon forests and indigenous way of life, and with them knowledge regarding the tropics and the Amazon itself—a great loss for the entire world.

2. Study area

The territory of Peru can be divided into three parts: the Pacific coast (11%); the Andes (29%), and the Amazon (60%). The area of the Pacific coast (slope) is home to 65% of the population, while only 5% reside in Amazonian Peru (roughly 1.6 million). The Peruvian Amazon can be divided into three main landscape wholes: (1) humid, weak drainage areas; (2) drainage areas; and (3) high altitude areas.

1. Humid, weak drainage areas stretch from east of the Ucayali River and the eastern slopes of the Andes, upriver of Atalaya and into the northern Peruvian Amazon. Here the tropical rainforest (**Figure 1**) is dense and impenetrable, and the area is home to traditional agriculture-practicing tribes such as the Shipibo.
2. Drainage areas stretch from the eastern slopes of the Andes, at an altitude of 200–400 m a.s.l. to west of the upper and middle courses of the Ucayali River. The soil here is easier for hunters to walk on, and better for agriculture and general health. This area is inhabited by agricultural-practicing tribes such as the Ashaninka.
3. High altitude areas are Amazonian drainage areas of low hills, slopes of the Andes below 2000 m a.s.l. and plateaus such as El Gran Pajonal, which extends at 1000 m a.s.l. westwards from the point where the Tambo River flows into the Ucayali River (**Figure 2**).



Figure 1.
Tropical rainforest in a drainage area in the Peruvian Amazon along the Tambo River. Picture by the author Zoran Stiperski.



Figure 2.
The Ucayali River near Atalaya. Picture by the author Zoran Stiperski.

3. Settlement

Numerous archaeological papers describe how the prehistoric Amazon was sparsely settled by hunter-gatherers because of its poor soil, difficult landscape characteristics, and generally difficult living conditions, which limited population growth and the development of more advanced civilisations [1–5]. Past research of the settlement structure indicated how the permanent population was settled along the main rivers [6, 7] due the abundance of fish, which served as a source of animal protein [8]. An additional reason for the presence of population along the main

rivers was fertile soil [9]. Archaeological data show that the contemporary population of the Amazon is smaller than that of the pre-Colombian era [10–15]. Certain researchers also claim that the population of the Amazon was ten times greater prior to the arrival of Europeans than it is today [16]. The pre-Colombian Amazon was the home of peoples who developed complex forms of social organisations and familial structures [17–40]. Currently, the notion among most archaeologists is that natural limitations preventing the development of agriculture are responsible for the lack of highly-developed civilisations [41], along with insufficient settlement.

The population of the Peruvian Amazon is a complex mix of different peoples and ethnicities: 64 indigenous nations speaking languages from 16 different language families [42], numbering roughly 333,000 according to data from 2007, i.e. roughly 21% of the population of the Peruvian Amazon. The most numerous indigenous tribes in the Peruvian Amazon have up to 90,000 members, while the smallest nations in remote parts of the forest have as few as 100. Even such small groups have the characteristics of a nation, as they speak their own language. Most such smaller tribes live deep in the forest, and are often nomadic. The two most important autochthonous Amazonian ethnic groups are the Ashaninka (88,700 members) (**Figures 3 and 4**), and the Aguaruna (55,400 members), followed by the Shipibo and the Chayahuita (both nations have more than 20,000 members), and the Quechuas and the Cocama (each nation has more than 10,000 members). The Peruvian Amazon is a massive area of new colonisation and numerous newcomers from the Peruvian Andes that have come to make a living. These newcomers are not indigenous Amazonian peoples, rather people from the Andes, Pacific coast, or other parts of the world. An important part of the colonisation is led by Peruvian and foreign companies and their respective enterprises. Highly-educated workers from these companies are newcomers to the area and are, as a rule, temporary residents of the Amazon. A smaller share of Peruvians have been sent by the state to work as teachers, doctors, and the like, and come from the Andes or Pacific coast. Missionaries also make up a share of the newcomers.

The main push factors on the Pacific coast and in the Andes are the lack of agricultural land, high poverty rates, and poor prospects for employment, while



Figure 3. *The indigenous, traditional village Buenos Aires along the Tambo River. Picture by the author Zoran Stiperski.*



Figure 4.
A stilt house in an indigenous settlement along the Tambo River. Picture by the author Zoran Stiperski.

the main pull factors in the Amazon are cheap and available land, ability to gain ownership of land, perception of economic “climbing”, lack of workforce, support from credit programs and tax easements, spread of road infrastructure, and general security [43].

In this vast area, there is a strong process of urbanisation underway (**Figure 5**). In the Loreto Region and its capital Iquitos (380,000 residents), which is also the largest city in the Peruvian Amazon, a higher share of urban population in relation to rural was first documented in the early 1970s; this trend has continued and in 2017 there were 600,000 urban residents and 280,000 rural residents in the region. Iquitos is the largest city in the world that has no road connections to the outside,



Figure 5.
The City of Atalaya. Picture by the author Zoran Stiperski.

transit takes place rather by boat and airplane. Likewise, in the Ucayala Region there are 400,000 urban and 100,000 rural residents (2017). A similar ratio of urban-rural population is also found in the Madre de Dios and San Martin regions [43]. Urbanisation is linked to the development of certain professions and markets, as well as with new settlers arriving in the Amazon.

4. The arrival of Europeans

4.1 Missionaries

The Spanish put the Peruvian Amazon on the back burner while they were spreading their empire. The Pacific coastal desert area and the Andes were home to advanced indigenous civilisations, while the Amazon showed few such signs. There were researchers who believed that remains of highly-developed indigenous civilisations were hidden in the forest, but no archaeological remains have been found to prove their theories. Near Atalaya, at the headwaters of the Ucayali River, there might be evidence of the remnants of the Inca civilisation in the Amazonian jungle (according to some Peruvian experts) in popular hunting area for local indigenous people. The place in question is called Canuja, and it is a natural stone formation where people carved the likeness of some large tiger-like cat at some point in the distant past, long removed from common memory (**Figure 6**).

The first Europeans that came to the Peruvian Amazon were missionaries. Franciscan monks built a church and monastery at the beginning of the 18th century in Santa Rosa de Ocopa, near the city Huancayo. Santa Rosa de Ocopa became the base for missionaries who were active in what would come to be called the Peruvian Amazon (**Figure 7**), but also in parts of Brazil, Bolivia, and Ecuador. Iquitos, the largest city in the Peruvian Amazon, was founded by Jesuit missionaries from Quito in the mid-18th century. Evangelical missionaries arrived in the territory of the Piaroa people during the 1940s [16]. The missionaries set into motion



Figure 6. *Canuja stone monoliths are, according to some Peruvian experts, the remains of the Inca civilization. Picture by the author Zoran Stiperski.*



Figure 7.
The interior of a Roman Catholic church in an indigenous village in the Peruvian Amazon. Picture by the author Zoran Stiperski.

radical changes in the indigenous medicinal-religious-political systems [44]. The contemporary influence of missionaries can be seen in the founding of universities and radio stations for broadcasting agricultural advice and farm reports [45]. There are still, however, indigenous tribes that avoid all contact with the outside world [45]. The missionary centre Puerto Ocopa on the Perene River has a church, a youth home, and a school. Until a few decades ago, local shamans would, from time to time, declare that a devil had entered into some poor child, who must be banished from the village into the jungle. Parents were obligated to accept the word of the tribal shaman, but often couldn't bring themselves to leave their child to the mercy of the jungle. Instead, they left them with the Franciscans of the missionary centre where they got a roof over their heads and education. The first encounter between missionaries and the Huaorani people in eastern Ecuador was during the 1950s [46], and the arrival of missionaries and oil companies started a series of changes in the lifestyle of a significant share of the Huaorani population. Some of them now live in newly-founded cities, while some live along rivers, far from roads [45].

4.2 Oil companies

In 1939, oil extraction in the Peruvian Amazon began [47]. An intense era of oil hunting took place in the 1970s [48]. Demand and high prices of oil spurred a new boom in oil extraction in the Peruvian Amazon. Today, oil and natural gas extraction is allowed throughout the Peruvian Amazon, except for within the boundaries of national parks and reserves that make up roughly 10% of the total area of Amazonian Peru. In neighbouring Brazil, the population grew by 10.9% from 2000 to 2010 (from 170 million to 191 million), while energy demands over the same period grew by 40.7% [50]. Hydro energy is the dominant energy source in Brazil, but recently-discovered oil and natural gas are also important sources of energy [50].

Lack of sufficient involvement on the part of state agencies and other institutions has led to local communities becoming dependent on oil companies [49]. The Achuar community, for example, is heavily dependent on the Pluspetrol oil company. Oil companies have replaced the state in various fields such as employment,

construction of drinking water wells, health care centres, donations of electric generators, autostop, air transport for local indigenous authorities to meetings in Iquitos or Lima, and emergency medicine services [50, 51].

Via investment, the oil industry has sped up the process of migration towards areas with western services and goods, which are often located on the edge of traditional indigenous territory [16]. Illegal gold mining, such as the mine in the Madre de Dios region with its 30,000 workers [52], also attracts newcomers to the Peruvian Amazon. Connections to global networks are made with new roads, rail lines, harbours, and communications technology [53], much of which is built for the needs of the oil industry and agricultural activities (ranches, plantations). Activities such as mining, oil and natural gas extraction, and plantation agriculture in Amazonian states—especially Brazil and Peru—have become areas of interest for investment from Chinese state companies. In order to exploit natural wealth, large infrastructural projects like the construction of a highway that would link Brazil to the Pacific Ocean via Peru have been announced [54].

4.3 Plantation farmers and ranchers

Bosquesino (forest man) is a name for someone who lives off the forest in rural parts of the Amazon. It is interesting that indigenous Amazonians have named all rivers, creeks, and water sources, but rarely have names for mountains or large hills—waterways are clearly more important to them than mountains. A Bosquesino hunts, fishes, gathers fruit, plants, minerals, nuts, honey, insects, various water creatures, crabs, lizards, and amphibians. The difference between a farmer and a Bosquesino is that a farmer practices cultivation and uses less land, while a Bosquesino does not only grow food, they also hunt and gather over a much wider area [55]. Alluvial plains, which make up 7% of the area of the Amazon [55, 56], are desirable for cultivation agriculture (horticulture, monoculture), while flood plains and slopes are not. There are exceptions to this such as peanut, rice, corn, and cassava, which are sown in the sand in flood plains along rivers in the dry season.

Agricultural activities are the strongest factor of landscape and social change in the Amazon. Many workers settled the area to extract latex from caoutchouc trees for the rubber industry, creating a vast amount of wealth. This turned parts of the Amazon into a wasteland, useable to indigenous communities, and led to a general cultural and social transformation. The main centres of the rubber boom in the Amazon were Manaus and Belem in Brazil, and Iquitos in Peru. Numerous settlers arrived in Iquitos between 1880 and 1914 to work in the rubber industry.

Traditional Amazonian communities are small and they depend on hunting, fishing, gathering, and primitive agriculture. In various Amazonian communities, the bulk of households practice agriculture (84–99%), fishing (61–91%), hunting (4–25%), aqua culture (14–41%), and gathering (11–67%) [57]. Cassava is the main crop for many Amazonian communities, regardless of whether they are indigenous or descendants of European colonists [57]. Indigenous people along the Tambo River, downriver from Atalaya, practice hunting and fishing, and cultivate only bananas—they don't practice any sort of gardening. The last 50 years have seen major changes in food production: rice and jute cultures became common at the beginning of the 1960s, spreading throughout the 1970s and 1980s until the beginning of the 1990s. Production fell drastically thereafter as a consequence of the closure of the Banco Agrario (agricultural bank) and the lack of available credit for rice and jute farmers while Alberto Fujimori was president of Peru [55]. Accordingly, indigenous people from the area of Ampiyacu stopped sowing rice and jute. The fall of the Banco Agrario resulted in a drastic reduction in agricultural production in the Amazon, but reasonable prices for rice were maintained in Iquitos'

markets, so production in the area around the city continued. Rice production grew significantly in 2000 when Caritas Internationalis offered short-term loans to small businesses [55]. The example of rice, in this case, is a good example of the vulnerability of local producers vis-à-vis availability of financing.

Traditional shifting agricultural cultivation systems practiced by indigenous peoples are sustainable long-term [58] in contrast to typical farm agriculture [59]. Shifting agriculture and cattle ranches are responsible for 80–85% of deforestation in the Amazon [60] (**Figure 8**). During the process of making new areas for agriculture at the expense of tropical rainforest, we must bear in mind the high value of the Amazon in terms of bio-diversity, which far exceeds regions with temperate climates. In just 100 ha of the study area in the Peruvian Amazon there are more species than in most individual states of the U.S.A. [61]. This means that roughly half of the planet's species are found in tropical forests. Areas along arterial thoroughfares are more exposed to logging than remote areas, and agricultural activity along trans-Amazon highways is shifting toward herding and multi-year crops [38]. The average cattle rancher from a dynamic village along a trans-Amazon highway covers 20 times more area than a family with a smaller operation [62]. Both Indigenous people and settlers cleared sections of the Amazonian forests during the 20th century [63]. Some research has indicated a negative link between exploitation of the forest and wealth, such that richer families depend less on extracting raw material from the forest [64, 65]. There are key differences in the forest clearing techniques of Bosquesinos and plantation farmers. Typically, plantation farmers clear larger areas than Bosquesinos, who only clear enough to allow sunlight to cover the area they want to plant (chakra). Plantation farmers cut trees down and dig up their roots, which makes the soil less fertile, while Bosquesinos leave the roots. Chakras are used for three years and left for nature to reclaim thereafter (**Figure 9**). Chakras are typically used for one banana harvest and two jute harvests, while other fruit can be harvested longer. Accordingly, this is a form of horticulture with quick and easy recovery, while the typical plantation practices horticulture without land renewal because the degradation of the



Figure 8.
An area of forest that has been cut down for the purposes of cattle herding along the Perene River. Picture by the author Zoran Stiperski.



Figure 9.
Tropical rainforest renewal in the area of a fallow chakra. Picture by the author Zoran Stiperski.

forest around the plantation continues. One of the consequences of deforestation is a reduction in precipitation [52]. Climate change has led to increasing average temperatures, larger and more frequent fires during the dry season, more frequent flooding along rivers, and more landslides. In terms of agricultural production amid current climate change trends, there has been a significant reduction in corn and coffee harvests.

4.3.1 Logging/forest clearing

Traditional communities like the Ashaninka depend on the land to survive. The greatest threat to traditional ways of life in the Peruvian Amazon comes from farmers who clear the forest to make arable land [58]. Cleared land is quickly exhausted, and cannot be used for longer than two to three years [66]. Ranching, commercial logging, and agricultural activities are the main reasons behind forest clearing in the tropical Amazon, but an important share of deforestation is linked to infrastructure and roadbuilding investment (**Figure 10**). Deforestation also contributes to uncertain ownership rights, because it encourages the transformation of forests into agricultural and pastoral areas [67]. Poor forest management also encourages logging and export of wood [68, 69].

In total, between 8.9 and 10.5 million ha of Peruvian forests, i.e. 11.3–13.4%, have been cut down [42]. Deforestation in the Peruvian Amazon was below average in relation to other Amazonian states until 2012, but thereafter the rate of deforestation doubled [42]. In the period of 1988 to 2007, an average of 18,000 km² of forest were cut down yearly in the neighbouring Brazilian Amazon [67]. Only 5.6% of the original forest areas in the Bolivian Amazon had been cut down for agricultural use up to 1990, but the rate of deforestation grew afterwards [70]. Lower deforestation rates in the Bolivian Amazon are the result of the fact that settlers gravitate toward cities and areas of coca production, rather than toward the Amazon [70]. A positive and significant link has been established (from 0.35 to 0.47) between household income and forest clearing among poor communities in rural areas of the Amazon. The forests in Bolivia's Tsimane area are also faced with growing pressure



Figure 10.
The road between Puerto Ocopa and Mazamari on the slopes of the Andes in the Peruvian Amazon. Picture by the author Zoran Stiperski.

from indigenous peoples, not just from settlers [63]. Research has shown that the commercialisation of wood and forest products creates good opportunities for local stakeholders and contributes to forest preservation [71].

4.4 Shotguns

Game is an important dietary element for traditional communities [72]. Widespread hunting throughout the Amazon threatens the survival of large primates (mammals) and other vertebrates. Shotguns have caused a much greater reduction in the numbers of hunted animals than traditional hunting tools (bow and arrow) of the indigenous Machiguenga, for example. This provides evidence of why pre-Colombian peoples didn't wipe out all the large animals that they hunted—bows and arrows are much less effective than shotguns. Furthermore, spider monkeys are quickly being driven toward extinction by shotguns, even around smaller settlements [73]. Hunting with shotguns strips areas of wildlife and consequentially hurts the local population because they end up stripping an ever-larger area of its normal fauna [73]. The usefulness of shotguns in hunting is short-term [74]. The Machiguenga have overhunted their lands near the Urubamba River, where the shotgun is the main means of hunting. This provoked a response from the Peruvian government, which has implemented aquaculture on a small scale to preserve local settlements and reduce the need for hunting [73].

4.5 Tourism

The economic effect of strong tourism development is rather small for locals because a large share of the earnings goes to external organisers, who pay indigenous folk meagrely [75]. There are only three areas in the Peruvian Amazon that are seriously involved in tourism: two resorts in the jungle and the City of Iquitos. Manu National Park is touristically attractive and is found on the UNESCO list of Natural Heritage. The Park, however, is faced with rapid population growth as a consequence of settlers from the isolated Machiguenga nation. The consequence of

this overcrowding is the erosion of bio-diversity and emigration of Europeanised Machiguengas [73, 76]. From this example, we can see that it isn't always clear whether people living in national parks are allies or threats to bio-diversity. 'The forest is full of people and empty of fauna' insist conservationists of bio-diversity of tropical areas who argue that overpopulation or high-volume tourism is a threat to national parks. [77, 78].

In many areas, tourism is not yet practiced. After I returned from the Peruvian Amazon, tourist agents from Lima asked me what it was like—for them it was a totally unknown area. Outside of established paths and large cities, indigenous people are wary of foreigners—particularly white people, who they often associate with criminals, terrorists, or dubious characters. It is not rare for indigenous people to shoot at unknown foreigners, as they have had bad experiences with Shining Path revolutionaries and people involved in the cocaine trade. As there is no presence of state police to protect them, indigenous peoples have to protect themselves with their own weapons and warriors. After indigenous people get to know a foreigner (even a white one), however, they become very warm, friendly, and open.

4.6 The Market

A new socio-cultural phenomenon that has been observed over the last 50 years is the specialisation of cooperatives in relation to plurality among people. The activities of the polyvalent *bosquesino* have begun to commercialise. The use of money has entered into indigenous communities. Huaorani from the upper Amazon trade more with money than barter around larger markets [45]. Existential self-sourced economy and sharing food is common among hunter-gatherer communities [75], but market economy is spreading into traditional areas. In some areas both market and sharing systems operate simultaneously: first comes sharing among the community and the surplus is sold on the market. The advantage of the sharing system is food and material security for those who are unable to provide for themselves. Therefore, the poor favour the sharing system in order to minimise the risk that they might go without [79], while the more affluent easily accept the market system of economy because it maximises income [80].

5. Modern vs. traditional settlements

Planimetrics of settlements are a reflection of people's ways of life and the things that they create. Planimetrics of settlements of the Peruvian Amazon show mutual differences between two basic groups of settlements: traditional settlements and modern settlements. Modern settlements have emerged in areas with numerous and varied flows of foreign influence and communication. Traditional settlements are ubiquitous throughout the Amazon, with a noticeable distance from areas of modernity (**Figure 11** and **12**). The persistence of modern settlements is a sign of the spread of new lifestyles brought by settlers, and represents a step away from the traditional lifestyle of indigenous Amazonians, which is characterised by fishing, hunting, gathering, and basic agriculture. Newcomers from outside of the Amazon make up nearly 90% of the total population of the Peruvian Amazon [81]. Settlement density of Amazonian nations is traditionally very low, due to the prevailing hunter-gatherer lifestyle.

Planimetrics of modern settlements is the same as in the rest of the West, i.e. settlements with streets, stores, parks, and squares. Streets are usually laid out in a grid, which is also typical for modern city planning. The planimetric practice



Figure 11.
A traditional indigenous settlement with stilt houses in the lowland area of the Peruvian Amazon along the Ucayali River. Picture by the author Tomica Hruška.



Figure 12.
Gathering in the "village council chamber" in Buenos Aires along the Tambo River. Picture by the author Zoran Stiperski.

of "right angle" planning was brought to Peru by the Spanish. Planimetrics of traditional settlements, however, is reminiscent of an enlarged garden with irregularly-spaced houses. The houses do not have clearly-defined yards or gardens with fences. Modern Amazonian urban settlements name and arrange their central squares according to the standard Peruvian "Plaza de Armas" pattern, which indicates the spread of Peruvian identity in the Amazon (**Figure 13**). This pattern emerged after the arrival of the Spanish in the 16th century. The first thing built in newly-founded modern Amazonian settlements was often the Plaza de Armas (**Figure 14**). Traditional settlements have no squares and have not taken up this part of Peruvian identity [82].



Figure 13.
Business buildings on the main square (Plaza de Armas) in Atalaya. Picture by the author Zoran Stiperski.



Figure 14.
The main square (Plaza de Armas) in the design of the emerging settlement of Maldonado, being built for the needs of local plantation farmers. Picture by the author Zoran Stiperski.

Larger settlements, in terms of population, are modern, while smaller settlements can be either modern or traditional. Hunters, fishermen, gatherers, and traditional farmers live in traditional settlements. This sort of settlement only works in areas with very low population density, as this kind of lifestyle demands large areas of land, forest, and water resources per resident. Traditional settlements are typically populated by indigenous folk, with very few, if any, outsiders. The few outsiders that do live in traditional settlements are usually married to an indigenous resident or are school teachers. Newcomers to the Amazon mostly live in modern settlements, but there are also numerous indigenous people who have

accepted the lifestyle [82]. Modern settlements are found along transit corridors, in this case rivers and roads. Traditional settlements are found in all areas, from rivers to very remote areas. Traditional settlements that lack any functions are often semi-permanent. These are mostly newer settlements that become abandoned over time. Hunting, fishing, and gathering require mobility, and the agricultural lifestyle is sedentary. The mobility of the settlement largely depends on the shifting of large river beds, in addition to other logical factors. Settlements that are threatened by river erosion move further from the banks. Another reason for changing the location of settlements can be death within the family, old houses, and the need to create new chakras. The arrival of the first functions, foremost schools, rendered many traditional settlements permanent. With time, such traditional settlements can become modern settlements [82].

6. Modern plans of the Peruvian government

Numerous development agencies and national governments around the Amazon encourage market economy for production growth, especially of wood, while simultaneously attempting to sustain the “environment” [83–85]. The policies of national governments are often visible in incentivising the transformation of the Peruvian Amazon into productive land for national or foreign investors, to be used for the purpose of extraction of raw materials and energy, forest plantations, and the production of biofuel [49]. The vast majority of deforestation is a direct consequence of state and corporate policies, aimed to colonise and develop agriculture in the Peruvian Amazon. These policies include road building. The majority of deforestation happens within 20 km of an arterial road [42]. State planners rarely consider forest communities when creating plans that serve for the extraction of wealth for corporate use; meaning that such plans often come at the direct (or indirect) expense of forest communities. This sometimes leads to conflict in indigenous areas, and indigenous political organisations are emerging and gaining strength. The majority of deforestation (75%) happens outside of protected indigenous lands. This indicates that the protected status of indigenous lands is also an effective measure against deforestation [42].

Yearly production of oil in the Peruvian Amazon is less than 4 hours of the world’s total oil consumption [49] and, even so, the damage to the Peruvian Amazon is immense: indigenous human rights; climate change; loss of biodiversity; and loss of indigenous knowledge of the Amazon itself [49]. From 1970 to 2009, 84% of the Peruvian Amazon was spoken for via contract or under negotiation, and permits were issued for oil and natural gas extraction on 55% of indigenous land in remote, pristine areas of the Peruvian Amazon [49]. Oil extraction is a threat to the lifestyle of indigenous folk. Apart from the oil industry, the construction of hydro-electric power plants and powerlines is envisioned. According to expert opinion, the projects for building new hydro-electric power plants will have a negative impact on the local population and biodiversity along the Tambo River. There are also plans to mine, improve and widen the rail and road networks, widen and maintain river channels for water transport, intensify agriculture, and increase exploitation of the forest—in this case export of wood [86]. The most damage is caused by ignoring existing laws, which leads to the negative consequences that exceed what the forest can sustain. Growth in social conflicts over human rights violations, especially of unorganised indigenous folk, is predicted [86].

The Peruvian public on the Pacific coast and in the Andes is generally not interested in and poorly informed about government project in the Amazon. Planners do not attempt to reach harmonious, just, useful, and sustainable development for all

stakeholders (including indigenous people). The public sector and regional government bodies develop projects in isolation from one another, without mutual agreement. The majority of projects are consequences of inertia in public administration, which recycles old ideas from days past. Projects are mainly taken advantage of by political opportunists, construction firms, bankers, foreigners, and certain interest groups and companies.

The numerous ambitiously-planned, anticipated projects for development of the Peruvian Amazon for the period of 2009 to 2021 include 52 hydro-electric power plants, 53 oil fields, numerous oil and natural gas pipelines, 24,818 permits for new mines (extracting ore), 4486 re-built roads including 880 km of new roads and 2089 km of asphalt roads, as well as around 2000 km of railway, 4213 km of river channel works, and new plantations for the production of bio-fuel [86]. There have never been so many projects underway at once in Peru's history, but it is likely that some will not come to fruition.

The consequences will be severe and will quickly lead to drastic changes in the Peruvian Amazon. By 2041, it is likely that deforestation and degradation will come to cover at least 56% of the forest—the more pessimistic projections predict up to 91%. Only 10% of the Peruvian Amazon is protected. CO₂ emissions are expected to rise in proportion to deforestation, putting Peru in a tough position in relation to promises made to the international community. The degradation of natural ecosystems in the process of estuarine water circulation, however, is much more dangerous than rising CO₂ levels, as it will cause increasingly expressed droughts and floods, as well as increases in violent erosive phenomena (landslides, torrents, gullies) [86]. The drastic negative influence will be experienced foremost by indigenous peoples living in voluntary isolation, who will likely disappear entirely. Social conflicts over violation of human rights and ownership rights are predicted to rise in the future. Five main generators of conflict are often mentioned: (1) conflicts between indigenous leaders and the national government over protection of indigenous territory; (2) conflicts between illegal miners and the greater population; (3) conflicts between illegal coca producers and narco-traffickers; (4) conflicts between indigenous people and oil companies on indigenous territory; and (5) conflicts between those who would be affected by the construction of reservoirs and supporters of hydro-electric power plant projects.

There are also geopolitical motivations found within the Peruvian government's projects, as some of them are intended to forge better connections between the Pacific and Atlantic oceans, which is especially favourable for Brazil due to easing Brazilian foreign trade, producing electricity on the slopes of the Andes, widening the markets of Brazilian firms, and the possibility of investment from the Brazilian National Bank. This all comes, however, at the expense of nature itself, Peruvians who will pay for projects that give them no direct benefit, residents of the forest, and indigenous people. The resulting climate change, reductions in biodiversity, and loss of knowledge of the Amazon itself threaten the entire world.

7. Conclusion

The main conclusion of this chapter is that foreign influences have deeply changed the landscape and local societies in the Amazon over the last 60 years. The Amazon is traditionally a sparsely-settled area, in which more-advanced urban civilisations were not able to develop due to harsh landscape conditions. Indigenous people traditionally practice hunting, fishing, gathering, and basic agriculture, as well as a communal "sharing" system in place of a modern system of monetary exchange.

Missionaries were the first Europeans to spread Christianity and alter traditional indigenous Amazonian society (from the beginning of the 18th century). Oil companies have also left their mark on the Peruvian Amazon by extracting oil and natural gas, building pipelines, employing numerous settlers from the Andes and Pacific coast, and luring indigenous folk to the foreign lifestyle. The strongest causal factor of deforestation and societal change in Peruvian Amazonian societies is modern agriculture: plantation farmers and ranchers. By 2012, a total of between 11.3% and 13.4% of the total forest area had been cut down, and this process has only strengthened since then. There is also a risk of overpopulation and over-tourism in some of the area's few tourist resorts and highly-visited areas.

Assuming the arrival of numerous immigrants, the entry of the market, and strong change in the activities of the population, we expect the emergence of new modern settlements and the concentration of the population therein. Reduction in size and disappearance of traditional settlements, and their relocation into remote protected areas away from rivers and arterial roads is also expected. Contemporary settlements in the Amazon planimetrically resemble other settlements in the West with streets and stores, in contrast to traditional indigenous settlements which resemble extended gardens with multiple dwellings. The area of foreign influence, and intense landscape and societal transformation, follows flows of communication: primarily roads and rivers used for transport.

Plans of the Peruvian government are very ambitiously laid out and envision the construction of numerous hydro-electric power plants, oil and natural gas fields, mines, roads, railways, plantations, and river channel works. There are predictions of widening deforestation and forest degradation (estimates range from 56% to 91%) of the Peruvian Amazon by 2041. In this context, it is important to stress that only 10% of the Peruvian Amazon currently has protected status.

The loss of traditional knowledge is linked to the inclusion of the indigenous population in modern market economics, along with the simultaneous exodus from existential hunter-gatherer subsistence [53]. The spread of modernity and the Europeanisation of the population of the Amazon will end up costing the world generations of indigenous knowledge regarding tropical areas.

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