

ITT PROJECT

OPTION 1:

CONSERVING CRUDE OIL IN THE SUBSOIL

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CONSERVING CRUDE OIL IN THE SUBSOIL

PROPOSAL

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Summary of the proposal

The aim of the proposal is to provide a creative solution for the threat posed by the extraction of crude oil in the Ishpingo-Tiputini-Tambococha (ITT) oil fields, which are located in the highly vulnerable area of Yasuní National Park. The proposal would contribute to preserving biodiversity, reducing carbon dioxide emissions, and respecting the rights of indigenous peoples and their way of life.

Ecuadorian President Rafael Correa has stated that the country's first option is to maintain the crude oil in the subsoil. The national and international communities would be called on to help the Ecuadorian government implement this costly decision for the country. The government hopes to recover 50% of the revenues it would obtain by extracting the oil.

The procedure involves the issuing of government bonds for the crude oil that will remain "in situ", with the double commitment of never extracting this oil and of protecting Yasuní National Park.

It is important to keep in mind that if Ecuador succeeds in receiving the hoped for amount – estimated at 350 million dollars annually – it would only be for a period of ten years beginning after the sixth year, since production and thus potential revenues would progressively decline at the end of that period.

A more promising alternative would be a strategy to provide the government with the 50% of resources in such a way as to provide a consistent income for an indefinite period of time. This resources would be channelled towards activities that help to free the country from its dependency on exports and imports and to consolidate food sovereignty.

Arguments in support of the proposal

The proposal is framed within the national and international contexts based on the following considerations:

1. Climate change: Climate change has come to occupy a place on both the national and international agendas, and even in people's daily lives. It has moved beyond the realm of speculation or potential threat to become a reality that demands concrete and immediate action. The two main causes of global warming are the burning of fossil fuels and deforestation.

When it comes to this global problem, the world's countries have shared yet different responsibilities. The industrialized nations bear a greater share of responsibility for this problem, yet have failed to contemplate real solutions.

Climate change inflicts a double punishment on countries like Ecuador. On the one hand, the biophysical, social and economic impacts are exacerbated by increased interference in natural ecosystems, and these effects are felt even more acutely because of the lack of the conditions and resources needed to adapt to them. On the other hand, many of the so-called "solutions" based on the buying and selling of environmental services cause problems at the local level because they involve the ceding of rights over forests and territories.

2. Destruction of biodiversity: According to a report prepared by a group of experts in 2004, Yasuní National Park has levels of diversity of many taxonomic groups that are locally and globally outstanding. The Napo Moist Forest encompassed by the park has been declared by the World Wildlife Fund as one of the world's 200 most important regions to protect. Yasuní also conserves a large tract of the Amazonian rainforest, which is considered one of the world's 24 wilderness priority areas. In a single hectare of Yasuní's forests there are almost as many tree and shrub species as in all of the United States and Canada combined.¹

The extraction of crude oil would inevitably wreak destruction on this biodiversity. The most serious direct impact of oil activity would probably be the spilling of toxic "produced waters" that accompany crude oil when it is brought to the surface, along with other contaminating waste products.

Experience has shown that this is an undeniable reality in Ecuador. According to data from Petroecuador, there is an 80/20 water-to-crude oil ratio in its oil fields (80 barrels of produced water for every 20 barrels of oil). The usual "solution" is to re-inject this water into the subsoil, but it is now known that the geological strata are not able to absorb such large amounts of water. As a result, all or a large part of this water ends up in the area's rivers.

¹ Scientists Concerned for Yasuní National Park, 2004. Technical Advisory Report: The biodiversity of Yasuní National Park, its conservation significance, the impacts of roads therein, and our position statement.

The problem in the Amazon region, the world's primary freshwater reserve, is that most freshwater organisms cannot withstand the high levels of salinity found in produced waters. These toxic waters constitute a threat to the region's biodiversity and freshwater reserves.

In addition, the substances contained in oil industry wastes are bioaccumulative and have been directly linked to numerous diseases.

3. Measures to protect the Huaorani people: Both the ITT oil fields and exploration block 31 are the territory of the Huaorani indigenous people, as well as the hunting grounds of other indigenous groups that live in voluntary isolation.

When contracts were negotiated for oil activity in exploration block 16, forceful warnings were voiced about the threats this posed to the Huaorani people. Calls were made for strong measures to prevent negative impacts on this indigenous community, but the effects of oil industry activity have been dramatic: disease, growing poverty, violent conflicts...

The danger is even greater given that the area in question now is part of the territory used by three indigenous ethnic groups –the Tagaeri, Taromenani and Oñamenane peoples – who have voluntarily chosen to avoid all contact with the outside world and reject any attempts at interaction or occupation of their territory. These are the last free beings in Ecuador, who live in what are described as “societies of abundance” because they produce just enough to satisfy their needs.

On 10 May 2006 the Inter-American Commission on Human Rights ordered protective measures on the behalf of the Taromenani and Tagaeri, implying the implementation of measures to ensure the rights and safeguard the lives of these ethnic groups.

On 18 April 2007, President Correa announced the adoption of a governmental policy to safeguard the lives of these peoples, assuming responsibility for protecting their basic rights and pledging to make efforts aimed at confronting the threat of extermination and guaranteeing the defence of the collective and individual human rights of peoples who live in voluntary isolation.

4. The economic transformation of the country: Oil has constituted the cornerstone of Ecuador's economy for the last quarter of a century, and it continues to play a central role. However, it is also the economic sector in which the government has been forced to confront the greatest conflicts, due to the irregularities that have frequently emerged, contractual terms that undermine the state's interests, and serious environmental conflicts.

The national and international public should be informed of the use that will be

given to the funds raised through the proposed mechanism, and the citizen oversight of this spending.

The funds should be allocated towards strategies that would contribute to freeing the country from its current state of dependence and to finding effective solutions to fight poverty. One possibility is the creation of a bond support family-based subsistence farming, considering that the foundation of energy sovereignty is in fact food sovereignty.

1. BACKGROUND

Options for the ITT Block

Energy Minister Alberto Acosta has referred on numerous occasions to a civil society proposal not to extract crude oil in Yasuní National Park. On 30 March 2007 President Correa analyzed the alternatives for developing what has been referred to up until now as the ITT project.

A Ministry of Energy and Mines press release issued on 1 April 2007 puts forward the following proposals regarding the ITT oil fields:

"1. It was agreed that the first option would be to conserve the crude oil in the ground, so as not to affect an area of extraordinary biodiversity and not to endanger the existence of numerous peoples in voluntary isolation, nor those peoples who remain uncontacted. This measure will be considered if and when the international community provides at least one half of the resources that would be generated if the decision were made to exploit the oil - these are resources that the Ecuadorian economy needs for its development.

2. As a second possibility, the door was left open for the state oil company to develop the ITT field with its own resources. Petroecuador has a multidisciplinary team of professionals that has systematically worked on this matter since the discovery of the field by the state company itself. This proposal should consider the prior extraction of heavy crude oil, whose sale would serve to finance the project as a whole.

3. The search for strategic alliances is another possibility to be studied. However, it was emphasized that these alliances can only materialize with companies that are considered state companies. At the moment there is a draft Memorandum of Understanding with SINOPEC-ENAP-PETROBRAS, which in no way implies a contractual commitment of any kind. This draft memorandum does not close the door to other strategic partnerships, such as the one that has been discussed with Venezuela through its state company PDVSA, in the framework of the cooperation agreements signed with this country. There are, of course, other state companies from different parts of the world that have expressed their interest. Within this line of action it is possible to rearticulate a group of alliances combining the abovementioned or other additional ones.

With regard to the signing of confidentiality agreements for the purpose of analyzing ITT technical data, it was considered that such agreements could be signed, but that they would not by any means constitute a commitment obliging Petroecuador to sign any future contract for the exploitation of this field.

4. Finally, the possibility was not ruled out for an international call for bids that would be open for participation by state companies with proven technical and economic capacity, in the framework of a public process that would guarantee the best outcomes for the country, as established in article 19 of the Hydrocarbons

Law.

Yasuní National Park

According to scientific studies, Yasuní National Park, located in the Ecuadorian Amazon region in the provinces of Orellana and Pastaza, is the most biologically diverse region in the world.²

On 20 November 1979 Yasuní was declared a National Park,³ in recognition of the fact that it contains great natural wealth that must be preserved.

In 1989 Yasuní National Park was made a World Biosphere Reserve as part of UNESCO's Man and the Biosphere (MAB) Programme of UNESCO.⁴ As a consequence of this declaration, the park's management must comply with the Seville Strategy for Biosphere Reserves, adopted at the International Conference on Biosphere Reserves held in Seville, Spain in March 1995. The strategy stipulates that in order to preserve their natural equilibrium and prevent pollution, the only activities that can be undertaken in a biosphere reserve are *“cooperative activities compatible with sound ecological practices, including environmental education, recreation, ecotourism, and applied and basic research.”*⁵

In 1999, a portion of the park was declared an “untouchable zone”, which was delimited by the government in 2006. These zones are protected areas of exceptional cultural and biological importance in which no form of extractive activity can be undertaken due to their environmental value, not only for the region, but also for the country and the world.⁶

All of these categories of protection were granted to this area with the goal of protecting and preserving countless endangered species of animals and plants. The protected area covers a total of 982,000 hectares.

The aim of creating the national park was the preservation of endangered species and protecting innumerable species animal and plant species, given that *“any alteration or diminishment suffered by natural forests inevitably leads to the extinction or detriment of genetic diversity and thereby to the degradation of biodiversity.”*⁷

Yasuní National Park is also one of the world's Pleistocene refuges, which formed during the drastic climate changes that took place in the Quaternary

² Scientists Concerned for Yasuní National Park, 2004.

³ R.O N. 69, 20 November 1979.

⁴ <http://www2.unesco.org/mab/br/brdir/directory/biores.asp?code=ECU+02&mode=all>

⁵ UNESCO International Conference on Biosphere Reserves, Seville, 1995.

⁶ http://www.ambiente.gov.ec/paginas_espanol/4ecuador/areas.htm

⁷ Ministry of the Environment and Universidad Católica, “Estudio de flora y fauna en el bloque 31, Parque Nacional Yasuní”, Pecon, Ecuador, 2002, p. 15.

period. During this period, there was an alternation between dry and wet climates, in which the Amazon forests grew or shrunk. In the dry periods, islands of vegetation were formed that served as refuges for species of flora and fauna and centres for the formation of new species. One of these islands was located in the Ecuadorian Amazon, in what has been declared Yasuní National Park.⁸

Yasuní shelters a wide stretch of what is considered the most biologically diverse tree community in the world, which stretches from western Ecuador and northeastern Peru to Brazil. A total of 1,762 species of trees and shrubs have been identified in Yasuní, and some 366 of them have not yet been classified by Western science (due to taxonomical changes, new registries for Ecuador and new species for the scientific community). The “untouchable zone” has not been studied in depth, but another 116 species of trees have been gathered in neighbouring areas. In fact, it has been estimated that there are as many as 2,274 different tree and shrub species in Yasuní National Park.⁹

In just one hectare of Yasuní a total of 644 species of trees and shrubs have been found. To put this figure into perspective, there are almost as many tree and shrub species in one hectare of Yasuní as the total number of native tree and shrub species in all of Canada and the United States combined, estimated at 680 species. Researchers have also recorded over 450 species of vines and 313 species of epiphytic vascular plants.¹⁰

Yasuní holds the world record for lowland forests in terms of the number of epiphytes per parcel of land studied. The density and abundance of epiphytes in Yasuní surpasses the figures recorded in the Andean mountain forests, which were believed to have the greatest abundance of such plants. At least 10% of the epiphyte species in Yasuní are endemic to the Upper Napo region – a small portion of the Western Amazon.¹¹

Yasuní is one of the world’s sites with the greatest diversity of birds, which 567 species recorded. It also shelters close to 40% of all of the mammal species found in the Amazon basin forests as a whole. This is a remarkably high percentage considering that the park’s 9,820 square kilometres are just a tiny portion of the 6,683,926 square kilometres spanned by the Amazon basin forests.¹²

In addition, Yasuní National Park is believed to be the area with the highest herpetofauna diversity in all of South America, with 105 amphibian species and 83 reptile species documented. It is also home to a high diversity of freshwater fish, with 382 species recorded so far, as well as over 100,000 species of insects

⁸ Scientists Concerned for Yasuní National Park, 2004.

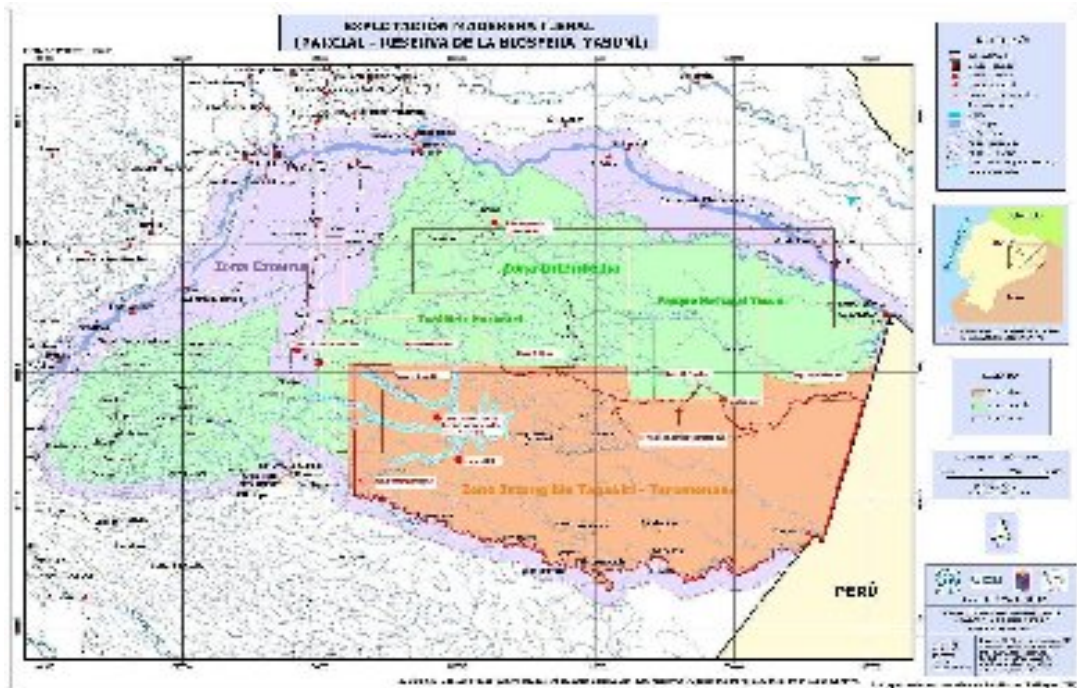
⁹ Scientists Concerned for Yasuní National Park, 2004.

¹⁰ Epiphytes are plants that grow independently upon or attached to other plants, without direct roots in the soil. Many orchids are epiphytes.

¹¹ Scientists Concerned for Yasuní National Park, 2004.

¹² Scientists Concerned for Yasuní National Park, 2004.

per hectare.¹³



Huaorani Territory

The territory of the Huaorani people traditionally covered an area of approximately two million hectares, between the right bank of the Napo River and the left bank of the Curaray River. They maintained their independence and defended their territory through acts of warfare. Ongoing contact with the outside world did not begin until 1958, with the establishment of the Summer Institute of Linguistics (SIL) by US missionaries.¹⁴

The Huaorani are hunter-gatherers who require a considerable area of land to maintain their traditional modes of production and consumption. As a hunting and gathering society, they must be able to move across large stretches of territory. As a result of the pressures exerted by various factors over subsequent decades – the concession of land to oil companies, the sale of forested areas to logging companies, settlers taking possession of tracts of land declared by the government as areas for colonization – the territory in which they were able to

¹³ Scientists Concerned for Yasuni National Park, 2004.

¹⁴ <http://www.codenpe.gov.ec/waorani.htm>

move was reduced to the stretch between the Tivacuno and Curaray Rivers.¹⁵

The work of the US-based evangelical Christian missionaries of the SIL, paved the way to clearing the area for the entry of US oil companies. The SIL proposed the creation of a Huaorani reservation which was finally established in 1983, encompassing 612,000 hectares.

In 1990, the Ecuadorian government officially recognized the Huaorani people's rights over an area of 612,560 hectares of land.

The oil companies influenced the creation of an organization to represent the Huaorani in its dealings with companies and the government, the Organization of the Huaorani Nation of the Ecuadorian Amazon (ONHAE), which basically serves as a liaison with the oil industry. The 20-year "Agreement of Friendship, Respect and Mutual Support" signed between US oil company Maxus and ONHAE established that the Huaorani *"do not oppose the exploitation of hydrocarbons in their territory, and therefore will no longer request a moratorium on exploration and drilling and will collaborate closely with the oil company."*

Moreover, the Ecuadorian government declaration that granted the Huaorani "ownership" of the land set aside as a reserve specifically stipulated that this ownership did not extend to the subsoil, which would still be administered by the government, and therefore the Huaorani are prohibited from *"impeding or obstructing mining or hydrocarbon exploration and/or exploitation activities undertaken by the national government and/or legally authorized individuals or companies."*

Today, many members of the Huaorani community have lost their hunter-gatherer traditions. Their former fierce independence has given way to dependency on the oil companies. This dependency on the food and medicines provided by the oil companies has led to profound changes in their dietary habits. The entry of oil workers into Huaorani territory has also led to serious diseases like hepatitis B, malnutrition and severe cultural impacts. Population settlements have been formed within the park which are inhabited by Huaorani but where the lifestyle and relationship with the environment is very different from the traditional way of life.

Three other indigenous groups living in the area – the Tagaeri, Taromenane and Oñamenane peoples – have voluntarily chosen to live in isolation from the outside world, and have managed to maintain their traditional way of life until now because of the limited entry of outsiders into their territories.

In 1996 the Confederation of Indigenous Nationalities of the Ecuadorian Amazon (CONFENIAE) and ONHAE presented a case before the OAS Inter-American Commission on Human Rights accusing the Government of Ecuador and the oil

¹⁵ Edmundo Guerra, *Pueblos indígenas y petróleo: El caso Ecuatoriano*, Quito, Ecuador, 2004.

companies of threatening the rights of indigenous populations. The accusation led to a visit by a Commission delegation and the subsequent publication of a report with recommendations.

The examination of the human rights situation in the Oriente or Amazonian region of Ecuador was prompted by the filing of a petition on behalf of the Huaorani people, which alleged them to be under the imminent threat of profound human rights violations due to planned oil exploitation activities within their traditional lands. CONFENIAE asserted that these activities would irreparably harm the Huaorani, threatening their physical and cultural survival, in violation of the protections accorded by the American Convention on Human Rights and the American Declaration of the Rights and Duties of Man. The Commission recommended the adoption of measures to prevent these impacts.¹⁶

On 10 May 2006 the Inter-American Commission on Human Rights granted precautionary measures in favour of the Tagaeri and Taramenami indigenous peoples. These precautionary measures imply taking action to protect the rights and safeguard the lives of these indigenous groups. The Commission *“requested that the Ecuadorian State adopt the measures necessary to protect the territory inhabited by the beneficiaries from third parties.”*¹⁷

On 18 April 2007, President Rafael Correa announced the adoption of a governmental policy to safeguard the lives of these peoples, assuming responsibility for protecting their basic rights and pledging to make efforts aimed at confronting the threat of extermination and guaranteeing the defence of the collective and individual human rights of peoples who live in voluntary isolation.

¹⁶ <http://www.cidh.oas.org/countryrep/ecuador-eng/chaper-9.htm>

¹⁷ <http://www.cidh.oas.org/annualrep/2006eng/Chap.3b.htm#C>.

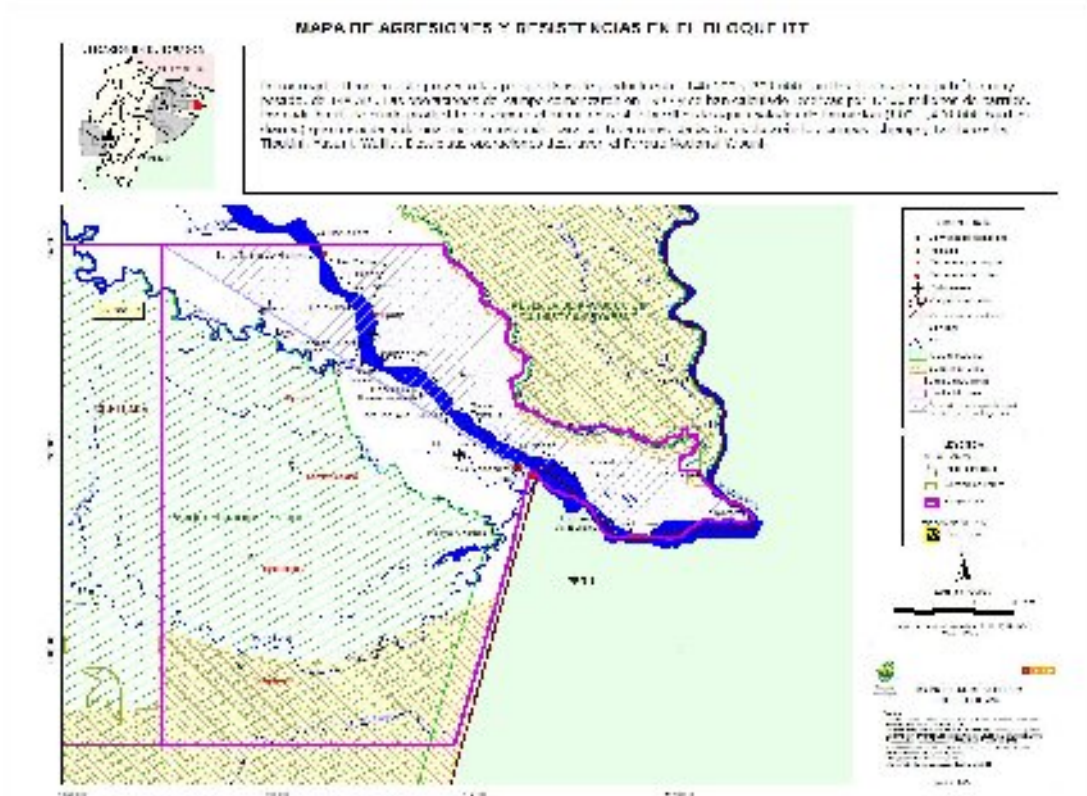
2. THE ITT (BLOCK 43) PROJECT AND BLOCK 31

While there are already oil operations that affect Yasuní National Park, the ITT field and Block 31 are in the very heart of the park. An environmental hearing on the status of the park is underway, and will result in proposals for the integral recovery of this important natural reserve.

The ITT project is tied to Block 31, as they share numerous characteristics in terms of operations. Both blocks are located within Yasuní National Park and form the park's undestroyed frontier.

In both cases, the oil reserves comprise highly viscous heavy crude oil with an API gravity of between 14 and 15 degrees. It is expected that in both blocks, the water-oil ratio will be similar to that found in Block 16, where every 10 barrels of oil are accompanied by 90 barrels of produced water, on average. This would mean a huge amount of waste that would be spilled into the surrounding environment.

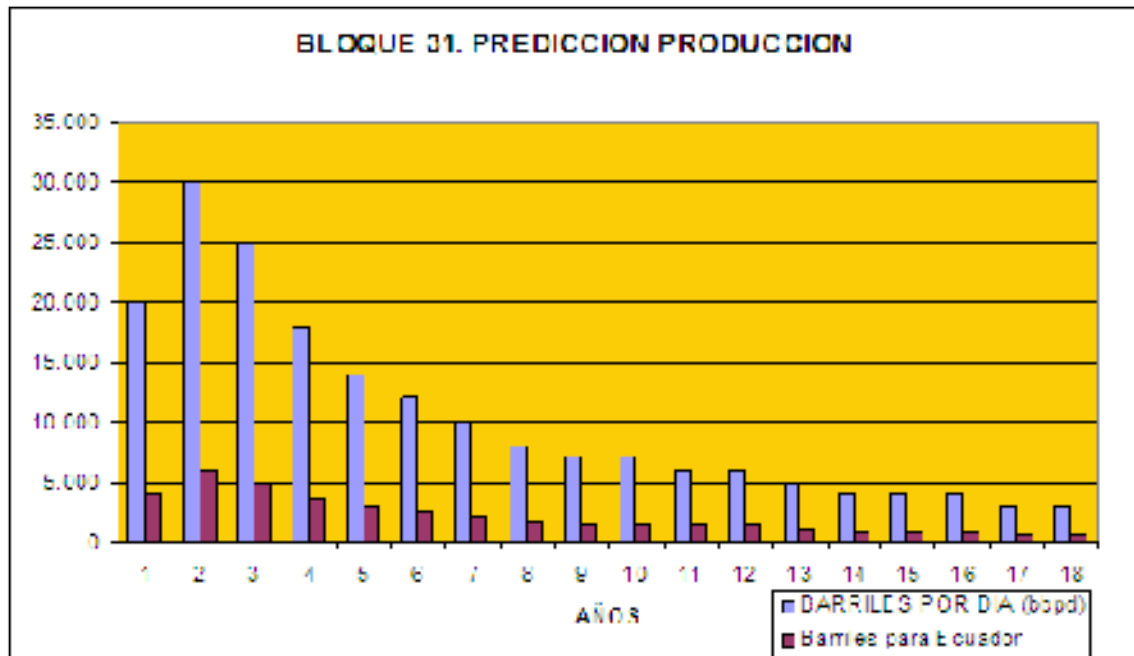
Map of aggression and resistance in the ITT block



Although the press has insistently reported figures of reserves of 960 million barrels, according to Petroecuador data the actual proven reserves (1P) -meaning the amount of oil “in situ” that can almost certainly be commercially produced - total 412 million barrels. When the proven and probable (2P) reserves are combined, the figure rises to 920 million barrels, while the proven and probable and possible reserves (3P) total 1,531 billion barrels. The actual amount could obviously only be confirmed through a prior exploration period.

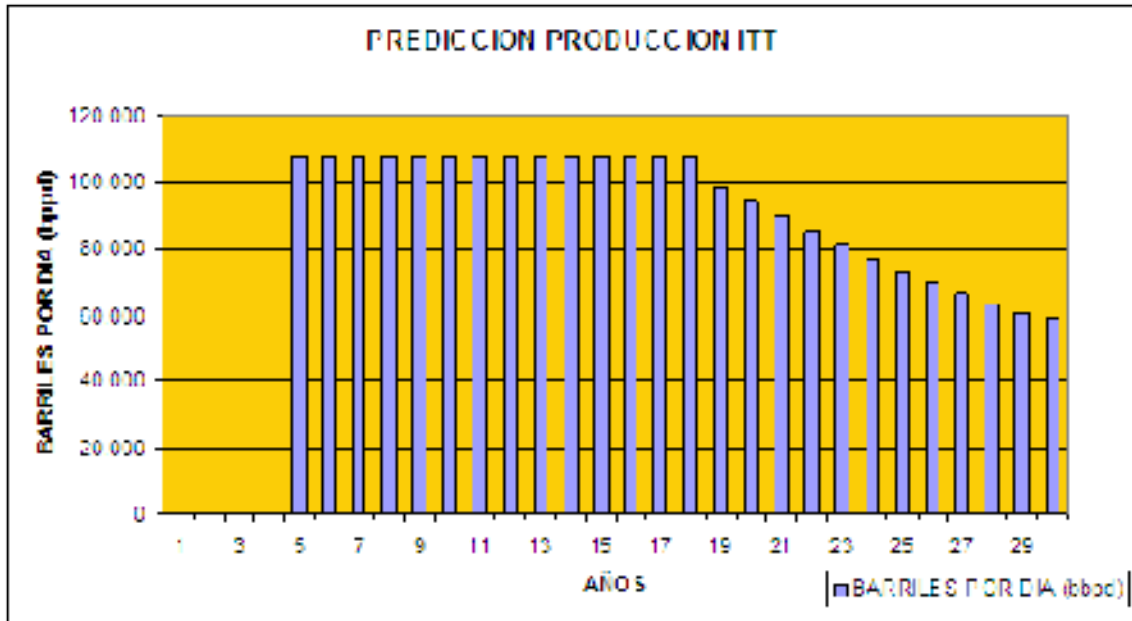
Field	1P	2P	3P
Ishpingo South/North Tambococha – Tiputini Oil in situ	2,614 1,913 4,527	3,235 2,351 5,586	3,729 2,679 6,408
Reserves	412	920	1,531

According to an environmental impact study presented by Petrobras for Block 31, crude oil production would peak at 30,000 barrels a day, but in 18 years it would rapidly decline to 3,000 barrels a day, as illustrated in the following graph.

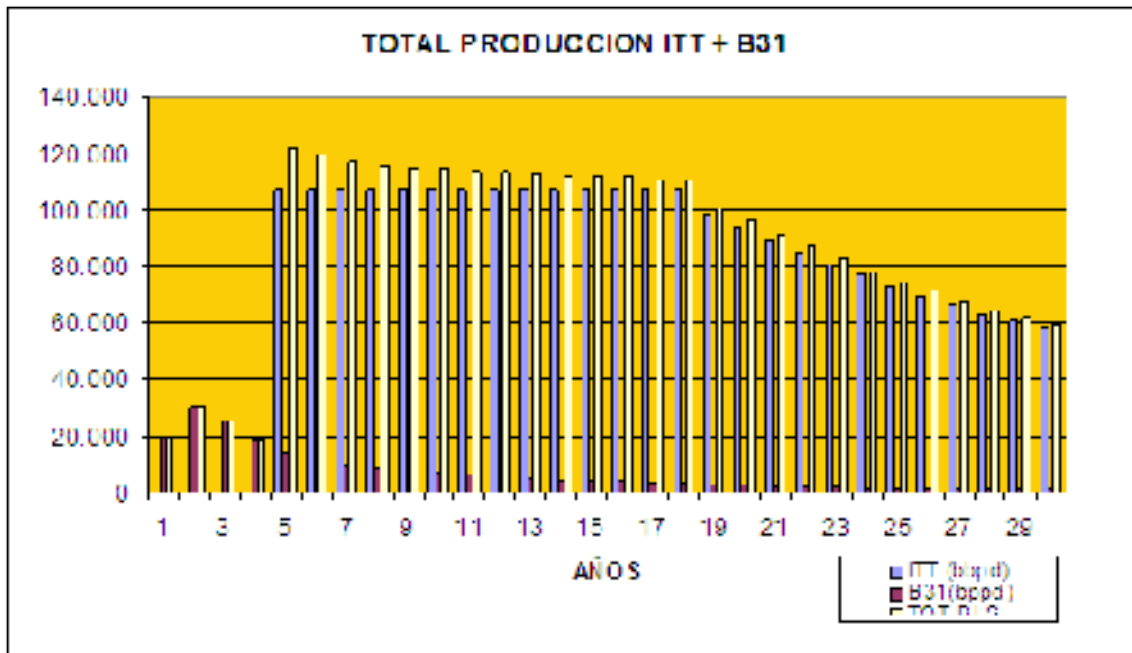


With regard to the ITT Project, according to Petroecuador, oil production would stabilize at 108,000 barrels a day during the first 17 years and eventually drop to

58,000 barrels at the end of 29 years.



For the two projects combined, total production would begin with 20,000 barrels daily, reach a peak of 122,000 barrels daily in the fifth year, and decline to 59,000 barrels after 29 years, as illustrated in the following consolidated graph.



Petroecuador and Sinopec proposals for the ITT project

A comparison of the two proposals sheds light on a number of significant points:

1. The Sinopec proposal is similar to the Petrobras proposal in that it involves joint operations.
2. Both companies propose additional seismic testing to confirm the total volume of reserves. Sinopec, which states that it is working with Petroecuador data, plans to undertake a 450 km² high-intensity 3D seismic survey of the field.
3. Crude oil production is estimated at 160,000 barrels a day as of the fifth year in the case of Sinopec, and at 100,000 barrels in the case of Petroecuador, during a period of 13 years, after which production would decline.
4. Sinopec proposes the drilling of 214 wells, while Petroecuador proposes 130.
5. In terms of investment, Sinopec has stated that if it receives authorization, it would invest a maximum of five billion dollars, but the actual amount has not been established. It also refers to advanced extraction in the third year.
6. Sinopec has also spoken of early production. This does not imply that state revenues will arrive sooner than expected, but rather that this mechanism will be used to finance Sinopec's own investment,¹⁸ which means its actual investment in the country will be smaller.

The proposals that Petroecuador has presented have numerous aspects in common, but they all suggest environmental problems in particular, in terms of the management and disposal of waste products, the excessive optimism regarding the volume of reserves, and incomplete knowledge of the environmental impacts and technology to be used. Judging by the estimates of extraction costs, the technologies utilized will be similar to those that have given rise to the environmental crisis in the areas of Ecuador where the oil industry is already active.

The information provided by Petroecuador refers to an estimated investment of 2.09 dollars per barrel and an extraction cost of 3.41 dollars per barrel, even when the current average extraction cost is over 10 dollars a barrel for heavy crude operations.

Petroecuador has analyzed the following three scenarios for the ITT project:

¹⁸ The Chilean national oil company ENAP signed a contract with former Ecuadorian President Lucio Gutiérrez. The company took a year to carry out studies in the field, and during this time, it charged Petroecuador for the field's operation. This was the money that ENAP invested in the field's production.

CONDITION: EQUAL SHARES AND IRR	Joint venture	Other contract modalities	Petroecuador operation
Internal rate of return	23.6%	23.6%	52.9%
State share	NA	50%	
Petroecuador share	50%	NA	100%
RESULTS:	USD billion	USD billion	USD billion
Labour share	4.210	1.733	NA
Law 10	413	413	
Income tax	5.963	2.455	
State share	NA	16.509	
Petroecuador profit	3.910	NA	28.476
% of net profit	10.070	0	
STATE REVENUES	20.356	19.377	28.476

The revenue figures are not credible, given the numerous and serious doubts over the technology to be implemented, the real investments to be made, the volume of crude oil that will be obtained, and also the real figures related to costs, expenditure, amortization and income tax.

The proposal presented by Sinopec, for example, refers to the generation of 320 MW of electricity with the residue extracted from the oil, the improvement of the crude oil quality to 26 degrees API gravity and its transportation through the Trans-Ecuador Pipeline System (SOTE).

At the same time, however, it refers to the Jaramijó petrochemical complex that would process the heavy crude, which makes it difficult to understand the purpose of a plant for improving the crude, nor would it make sense to generate electricity with the objective of improving the quality of the crude.

3. FORESEEABLE IMPACTS OF OIL INDUSTRY ACTIVITY IN YASUNI

The opening of the oil frontier, if the ITT project is developed, would entail the creation of a new oil industry zone, where the same impacts would be seen as those that have been well documented in already operational zones.

Those impacts can be summarized as follows:

Environmental damage	Pollution, deforestation, alteration of ecological relations in ecosystems.
Economic impacts	Loss of productivity of self-sustenance economies. High costs of security, maintenance, mediation and compensation.
Social impacts	General deterioration in the zone. Alcoholism, violence, prostitution, disease. Destruction of the social fabric.
Political impacts	Increase in conflicts in the region, state abandonment of the zones, cross-border violence.
Cultural impacts	Impacts on the lives of local peoples, cultural extinction.

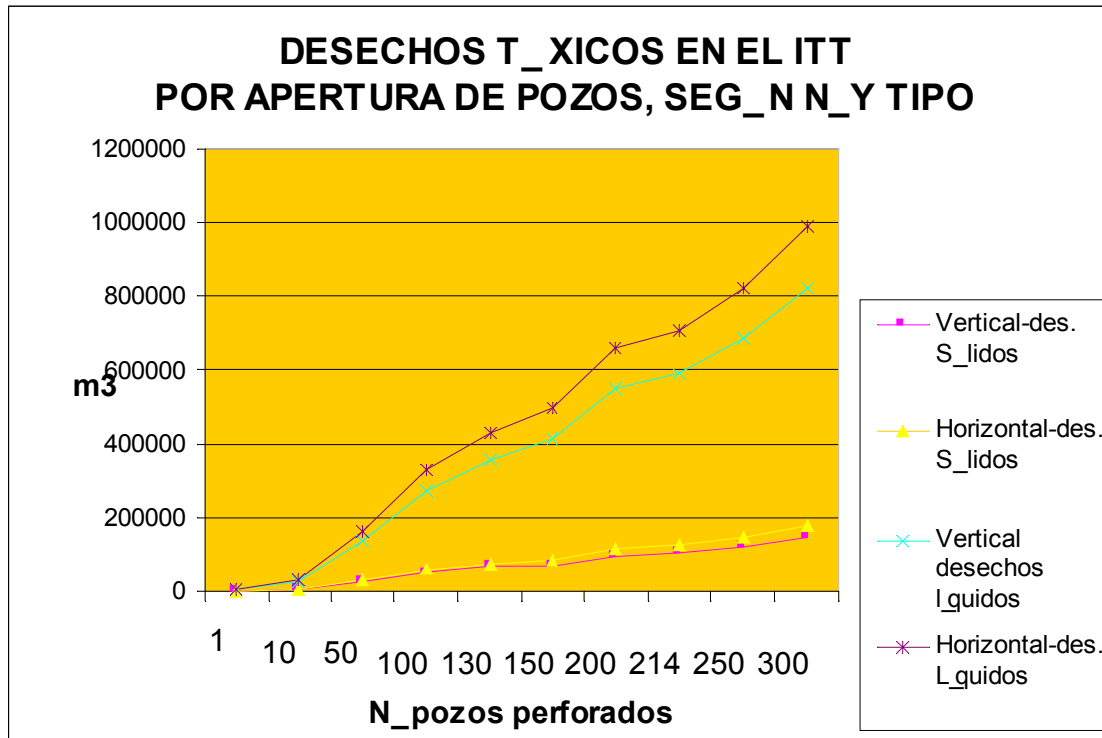
In addition to these impacts, it is also necessary to consider the other impacts triggered by oil industry activity, such as the link between the building of roads and illegal logging -- as is the case in the logging activity in Yasuní National Park and even in the so-called “untouchable” zone – as well as colonization, tourism, bioprospecting and other threats.

Impacts of drilling wells

The oil industry recognizes that for every vertical well that is drilled, 500 cubic metres of solid waste and between 2,500 and 3,000 cubic metres of liquid waste are produced, while directional drilling leads to 20% to 30% more solid and liquid waste per well.

If the plans to drill 130 wells in the ITT fields are carried out, this would create 65,000 cubic metres of solid waste (equivalent to 13,000 dump truck loads of five cubic metres each) and between 325,000 and 390,000 cubic metres of liquid waste (equivalent to more than 65,000 dump truck loads). The companies say this waste will be left beneath the drilling platform, a mechanism through which toxic elements are spread by the first rains. If the drilling is horizontal, the figures could rise to 78,000 cubic metres of solid waste (equivalent to 15,600 dump trucks) and between 420,000 and 504,000 cubic metres of liquid waste (84,000 to 100,000 dump trucks). If the number of wells drilled is doubled, as per the

Sinopec proposal, then the volume of waste would be doubled as well.



It should also be taken into account that in terms of the lifetime of wells, those that are used to extract heavy crude tend to collapse rapidly, and in order to continue extracting the crude, new wells need to be drilled.

Deforestation

Forests, water and climate are closely linked. Mature forests capture water and maintain the balance of the ecosystem and local temperatures. Tropical forests absorb a large amount of solar radiation, and as a result, massive forest clearing increases the reflectivity of the earth's surface. The albedo effect is the increase in solar energy reflected towards outer space, and is fundamental in the control of global warming.

Texaco deforested up to five hectares of land to build a drilling platform. However, according to Executive Decree 1215 (Environmental Regulations for Ecuadorian Hydrocarbon Operations), the maximum allowable in a protected area today is 1.5 hectares for the installation of a platform, camps and heliport.

If the platform contains several wells, the regulations allow for up to 0.2 hectares for each additional well. Then there is the deforestation associated with the building of access roads, which can be up to five metres wide, as well as rights of

way for pipelines and transmission lines, camps, and other infrastructure.

The most significant deforestation is the indirect deforestation associated with the building of roads for infrastructure maintenance and the colonization generated by the project itself.

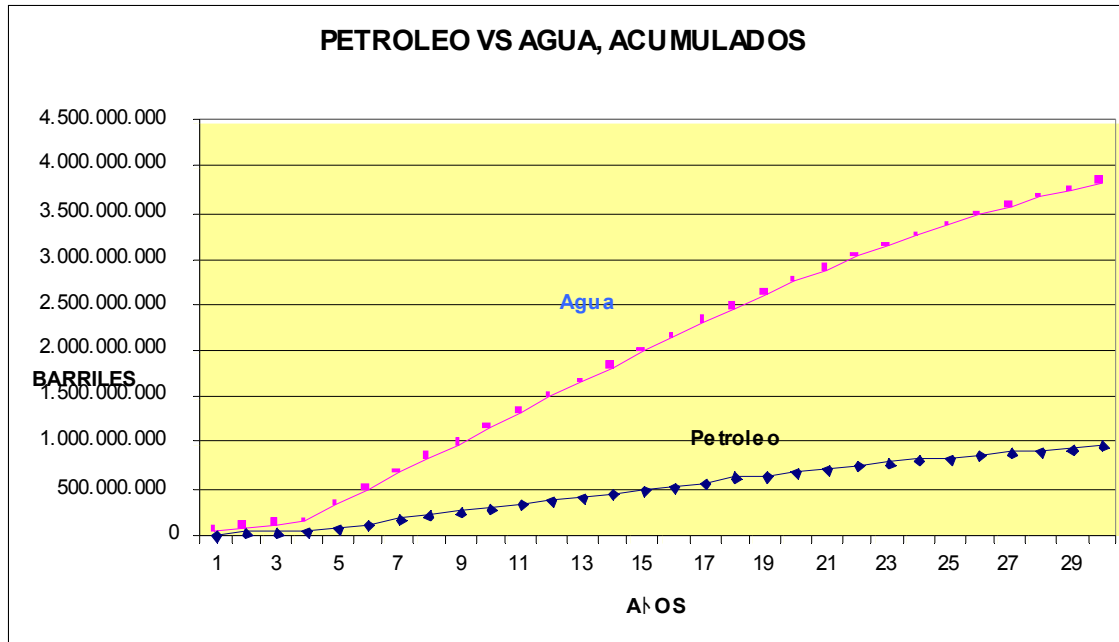
Impacts of produced water

Produced or formation water is a type of sedimentary water that results from 150 million years of natural processing and contains very high levels of chlorides and heavy metals. It can contain concentrations of sodium chloride and other solids as high as 100,000 ppm (parts per million). By contrast, seawater can have concentrations of up to 35,000 ppm.

This high salt content is significant because it increases the solubility of other elements, including the radioactive element radium. In addition, this water reaches temperatures of 80°C.¹⁹ It also contains particles of soluble hydrocarbons and the chemicals that are used to separate the water from the oil and to protect the drilling installations, such as demulsifiers, paraffin inhibitors, biocides and others.

The average water-to-crude ratio in the Amazon region is 80 barrels of water for every 20 barrels of crude oil extracted. This means that after 29 years of operations, the accumulated production of crude oil would total 960 million barrels, while the water produced with it would total 3.84 billion barrels, or four times more.

¹⁹ The temperature of this water tends to be close to the average thermal gradient of the earth and rises between 25 and 30°C for every three to six kilometres of depth (Elder, 1981), which are the depths reached in oil extraction.



Produced water is already a problem for the state company Petroecuador, which was penalized in 2005 after a report from the Comptroller General's Office determined that it failed to comply with its established objectives for reinjecting the water.²⁰

However, the volume of produced water will be much greater in the case of the ITT project and Block 31, and given that the proposals for developing the oil fields involve reinjection, the company that undertakes the operations would be faced with the problem of *where* to reinject the water, for a number of reasons.

1. The reinjection of produced water has been carried out in the permeable strata of the geological formations of Orteguzaza and Tiyuyacu,²¹ Napo, Hollín and others. But these formations do not have an unlimited capacity for storing all of the water produced.

2. The formations where the water is reinjected contain faults and are not impermeable throughout; many reach the surface and are connected to underground and surface aquifers.²²

Moreover, if the water production patterns are similar to those seen in Block 16 (which is more structurally similar to ITT and Block 31), the water-to-oil ratio

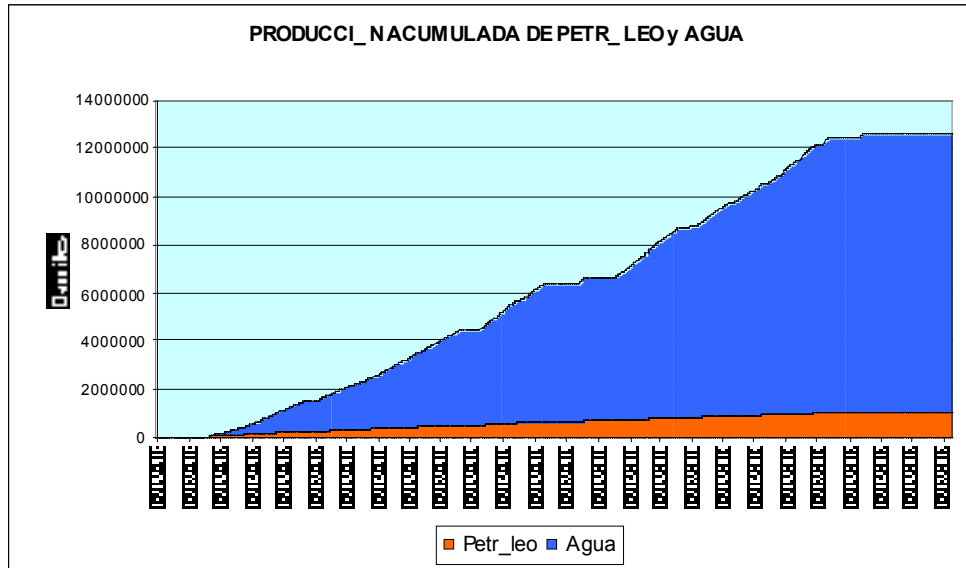
²⁰ Special report by the Comptroller General's Office, 12 April 2005. Auditoria ambiental a la gestión de petroproducción en los procesos de explotación y producción de crudo, relacionados con fluidos y lodos de perforación y aguas de formación en las provincias de Orellana y Sucumbíos.

²¹ The Tiyuyacu formation is known as one of the world's most important freshwater reserves.

²² *ibidem*

would be 90 barrels of produced water for every 10 barrels of crude on average. As a result, the extraction of 960 million barrels of oil would lead us to expect 8.64 billion barrels of water.

If we accept the assumption that the ITT reserves contain 960 million barrels of crude oil, then their exploitation would mean that 8.649 billion barrels of produced water²³ – a whopping **1,375,052,616** cubic metres – would be released into the environment.



The possibility of reinjecting all of this water is unlikely if not impossible, because of the vast size of the formation that would be required. The water would inevitably be discharged in Yasuní itself, or, as has been proposed, in the Shushufindi fields that are already oversaturated from the discharge of produced waters. But in addition, the water that can be reinjected will pollute the underground water sources in this important reserve.

Because of its composition, temperature and the chemicals it contains, produced water that is brought to the surface is extremely toxic for the environment. Most freshwater organisms cannot withstand the high salinity of produced water, and subsequently die off.

It is estimated that there are over 2,000 species of fish in the rivers of the Amazon region, many of which have yet to be identified, in addition to a wealth of other organisms that enable their existence at the top of the food chain. They reproduce in the floodwater areas where food chains develop and the majority of Amazon fish species deposit their eggs. The toxins in the produced water enter

²³ This calculation is based on an average of 75 barrels of water for every 25 barrels of oil, the figures that are used for heavy crude oil and applied to Block 16, the Eden Yuturi field or the crude oil operations of AGIP, which have a geological structure similar to the ITT field.

and pass through the food chain until reaching the final consumer: human beings.

At the same time, other animals living in the Amazon region, especially mammals, whether wild or domesticated, normally face a shortage of salt. As a result, the highly saline produced water spilled in the area will attract peccaries, deer and other animals, and when they drink this water, they will also ingest toxic substances.

Contamination of the soil can also lead to the strangulation of plant roots, thus damaging or in many cases killing off nearby vegetation.

The substances contained in oil industry waste are often bioaccumulative and directly linked to numerous diseases, since they include carcinogenic, teratogenic and mutagenic substances.

Impacts on the Huaorani people

Both the ITT zone and Block 31 are the territory of the Huaorani indigenous people, as well as the hunting grounds of other indigenous groups that live in voluntary isolation. These are traditional hunter-gatherer societies that move throughout a large area inside the park's borders, sometimes reaching the so-called oil blocks.

The danger is even greater given that the area in question is part of the territory used by three indigenous ethnic groups – the Tagaeri, Taromenani and Oñamenane peoples – who have voluntarily chosen to avoid all contact with the outside world and reject any attempts at interaction or occupation of their territory. These are the last free beings in Ecuador, true warriors, who live in what are described as “societies of abundance” because they produce just enough to satisfy their needs.

When contracts were negotiated for oil activity in Block 16, forceful warnings were voiced about the threats this posed to the Huaorani people. Calls were made for strong measures to prevent negative impacts on this indigenous community, but the effects of oil industry activity have been dramatic: disease, growing poverty, violent conflicts...

The reports of killings in these zones, first in May 2003 and then allegedly in May 2006, alerted both society and the government to the dangers of encroaching on the territories of these peoples.

Increased insecurity in the tri-border area (Colombia, Ecuador and Peru)

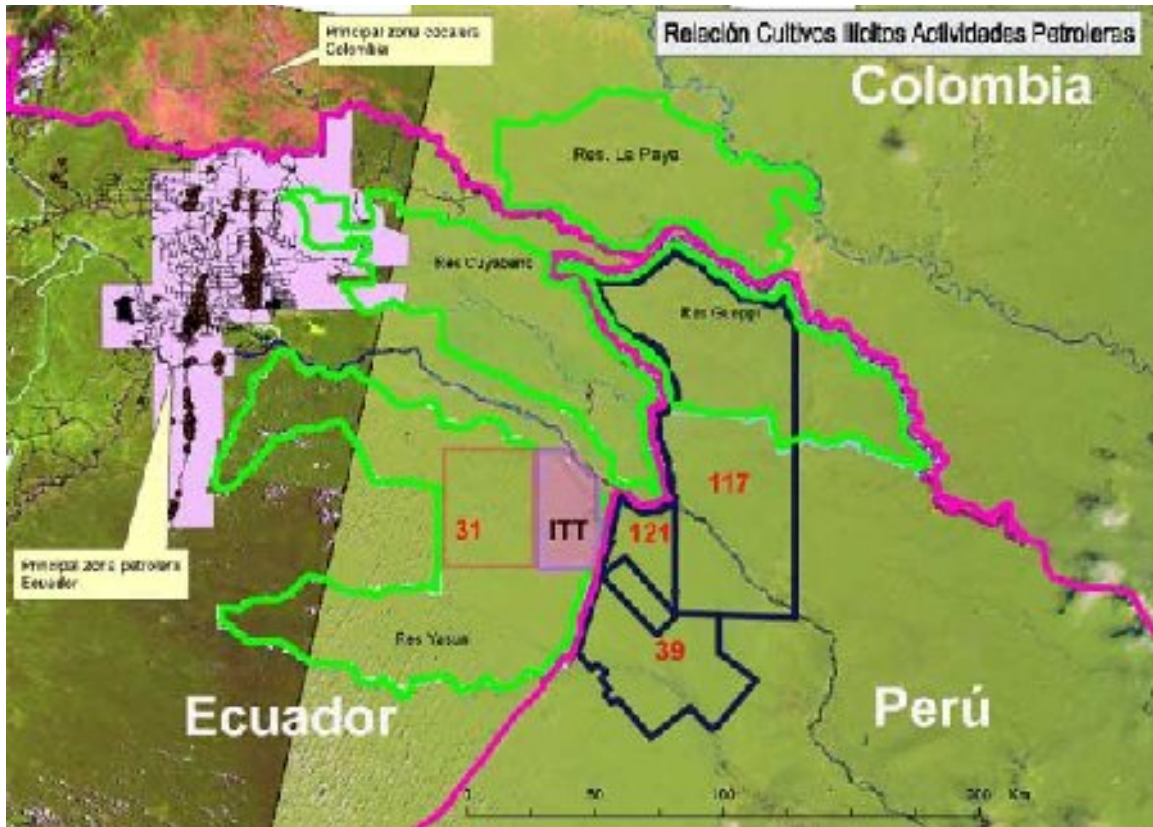
A comparison of the oil-producing and non-oil-producing zones with the distribution of cocaine production zones makes it possible to visualize the relationship between these two activities. It is known that oil exploration activity uses practically all of the “precursors” needed to process coca leaves into coca paste and cocaine.

Numerous substances used by the oil industry can also be used as chemical precursors for illicit drug production, such as white gasoline, sulphuric acid, hydrochloric acid, nitric acid, sodium hydroxide and potassium permanganate.

The development of the ITT fields would be directly linked to the building of roads, colonization and illegal activities such as unauthorized logging, biopiracy and, without a doubt, illicit drug crop production. The tri-border area is already known as a high-risk area.

Consequently, the environmental disaster caused by oil activity would be combined with social pressures and extreme violence, thus creating a national security problem for Ecuador. In addition to national security-related conflicts, internal conflicts will also arise due to the incapacity of the state to deal with the demands of local populations.

A new oil production zone will expand the area of conflict and spark disputes with Peru over the risk of contamination spreading into this neighbouring country, an issue that has already caused problems between the countries.



Removal of waste to Shushufindi

One of the proposals that is consistently put forward in all of the projects under discussion is the removal of waste for disposal in Shushufindi.

The town of Shushufindi is currently the second most populated in the province of Sucumbíos (after Lago Agrio), with 32,184 inhabitants, or 25% of the province's total population. Its population includes both settlers and indigenous inhabitants.

The Shushufindi oil field has five storage stations (Shushufindi Centre, North, South and Southwest and Aguatico), a refinery, a gas processing plant, a gas pipeline, and over 100 waste pits, some covered, others uncovered. In other words, for a place of its size it is overloaded with oil industry infrastructure.

The environmental risk in Shushufindi is 3.8 times greater than the average in other Amazon District settlements. The risk of conflict is 6.5 times greater than the district average. With regard to the frequency of spills, the risk is 3.5 times greater in terms of the presence of waste pits and 2.5 times greater in terms of spilled and unrecovered volumes.²⁴

²⁴ Fontaine, Guillaume. Petróleo, contaminación y microconflictos ambientales en la Amazonía. Comunicación al Tercer Congreso de Prospectiva Petrolera, "Ecopetrol: un año después", Barrancabermeja, Colombia, 30 September 2004.

The report by the Comptroller General's Office notes that according to the National Hydrocarbons Directorate (DNH), a total of 7,937,638 barrels of produced water were released into the environment between 2000 and May 2004, although the figure quoted by the Reinjection Unit is 5,181,827 barrels. In any event, the most important point to consider is that if Shushufindi does not have the capacity to handle its own waste production,²⁵ it is unlikely to have the capacity to receive waste that is produced elsewhere.

Shushufindi is probably the town that is hardest hit by the impacts of oil industry activity. In addition to the environmental pollution, it also suffers a critical health situation (it is the town with the highest rate of tuberculosis in the country) and alarming levels of violence, primarily due to the trafficking of chemicals and white gasoline used for illicit drug production. Reports from the Esquel Foundation and the Centre for Justice and International Law (CEJIL) present figures of between 680 and 715 murders in the province of Sucumbíos, with the highest rate corresponding to Shushufindi.

²⁵ Special report by the Comptroller General's Office, 12 April 2005. Auditoria ambiental a la gestión de petroproducción en los procesos de explotación y producción de crudo, relacionados con fluidos y lodos de perforación y aguas de formación en las provincias de Orellana y Sucumbíos..

4. PROPOSAL FOR COMPENSATION FOR MAINTAINING THE ITT CRUDE OIL “IN SITU”

Article 32 of the Hydrocarbons Law establishes that the exploitation of deposits of heavy crude oil of less than 15 degrees API gravity will be subject to *“integral economic planning directed by the Ministry of the sector.”*

Article 91 of the current Ecuadorian constitution recognizes the Principle of Precaution and states that *“preventive measures will be taken in the event of doubts over the impact or negative environmental consequences of any action or omission, even if there is no scientific evidence of damage. Without prejudice to the rights of those directly affected, any individual or legal entity, or group of people, can undertake the actions foreseen in the law for the protection of the environment.”*

Ecuador has signed international conventions on climate change, the conservation of biodiversity and the protection of protected areas, thereby taking on a commitment to conservation efforts.

Seeking to establish a fund to be disbursed for leaving the crude oil in the ground implies opting for a mechanism that is not the sale of oil reserves, nor the sale of environmental services, but rather payment in the form of compensation for the revenues that Ecuador will forego by implementing this environmental policy of global importance.

In exchange for this payment, the Ecuadorian government will issue a certificate for the crude oil that it commits to leaving in the subsoil.

It is clear that Ecuador has adopted this policy out of its own interests, but it also recognizes the different degree of responsibility for actions to confront global warming, and in this regard the responsibility falls primarily on the countries with high fossil fuel consumption levels.

The estimates of the amounts required are calculated in the medium term and recognize the real costs, that is, real investments minus the losses due to oil operations.

Based on these amounts, a capital fund would be created in order to generate an ongoing, permanent income, and not only a 10 or 20 year income of 50% of the revenues that the country would earn through the development of the block. A capital fund of between 800 million and one billion dollars at current values could provide the equivalent of the revenues expected.

The campaign will be promoted in the initial stage by civil society environmental organizations. The task of exploring for potential interest among other countries should be undertaken by the Ministry of Energy and Mines and the Ministry of

Foreign Relations.

Three types of potential donors have been identified, and are listed in the chronological order by which they will be contacted, not in the order of the importance of their donations:

1. NGOs and cooperation agencies
2. Individuals in Ecuador and the rest of the world
3. Governments

There are a number of options being studied to obtain the funds needed to implement the proposal. These include:

- 25% of personal income tax
- Direct donations over the Internet
- National campaigns to promote participation
- Donations from cooperation agencies
- Government to government agreements for contributions to the proposal or in the form of debt forgiveness
- Funds from philanthropists in the United States to be matched by national contributions in a 10:1 ratio, thus highlighting the different degree of responsibility.

To implement these mechanisms it will be necessary to open an account and keep a strict record of donors in order for them to receive certificates corresponding to their donations.

For an internationally based calculation of the equivalent in barrels of crude oil of the donations given, the following figures can be used as guidelines:

1. The marginal cost of extracting a barrel of oil is between USD 2.00 and 7.00, according to British Petroleum.
2. The cost of removing a ton of carbon from the atmosphere is USD 20.00, according to the World Bank.

Based on these figures, the value of each barrel has been estimated at five dollars.

Use of the funds

Oil has constituted the cornerstone of Ecuador's economy for the last quarter of a century, and it continues to play a central role. However, it is also the economic sector in which the government has been forced to confront the greatest conflicts, due to the irregularities that have frequently emerged, contractual terms that undermine the state's interests, and serious environmental conflicts.

Given that oil has been and continues to be so important for Ecuador, there is an urgent need to promote innovative proposals to solve the contradictions between the current economic model, oil dependency and the wellbeing of the population.

There is a need, of course, for short-term solutions that the country plans to implement through an adequate review of existing contracts and efforts to improve the output of currently operational deposits.

The goal is to seek a way out of the current economic dependence on oil extraction, whose harmful effects on the environment obstruct development and increase global vulnerability.

The proposal is to allocate the funds raised to activities aimed at economic reorientation and consolidating national efforts to achieve food sovereignty. The success of the country's economic and political reorientation will depend, in this case, on the possibility of establishing international agreements.

Projections

This proposal could and should serve as a means of presenting the world with a new strategy for confronting the issue of climate change, one that proposes real solutions for the problem of global warming and allows the non-industrialized countries to benefit from these mechanisms to compensate their decision not to exploit their oil deposits.

Draft certificate

The recipient of this certificate pledges to submit the sum of for barrels in the subsoil, at a price equivalent to, in exchange for which the State of Ecuador will preserve "in situ" the oil in the ITT fields in Yasuní National Park.

The Ecuadorian State will declare this area permanently off limits to oil drilling. In the event that the State's decision is overturned, the Ecuadorian State pledges to reimburse the money invested plus interest.