Conoco's "Green" Oil Strategy (A)

Case Review

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The main question that troubles executives of DuPont oil subsidiary, Conoco, is whether to proceed with the development of a new oil exploration site, Block[1] 16, in Ecuador or not. The main challenge that company faces is the opposition of the diversified range of NGOs that have serious environmental concerns and have an ultimate goal of ceasing Conoco's operations in Ecuador, to protect pristine tropical rain forest region. My recommendation to the Conoco's management is to refuse exploration of Block 16 given the justification and discussions below.

Overview

In order to understand the challenges and opportunities facing Ecuador and key stakeholders in the exploration of Block 16 the background and overview of the country's development needs to be presented. The Republic of Ecuador is a representative democratic republic in South America, bordered by Colombia on the north, by Peru on the east and south, and by the Pacific Ocean to the west. It is one of only two countries in South America (with Chile) that does not have a border with Brazil. The country also includes the Galápagos Islands in the Pacific. Ecuador straddles the equator, from which it takes its name, its capital city is Quito and its largest city is Guayaquil[i]. Ecuador has three easily definable and separate regions: the coast, the spine of the Andes bisecting the country and the eastern region known as *El Oriente*, the East. Ecuador's El Oriente occupies the lowlands of the Amazon basin.

Ecuador's economy was mainly based on agriculture and oil production. In 1970, bananas accounted for nearly 47% of total export revenues; coffee and cacao followed.[ii] But dramatic increases in oil production volumes of the early 1970 catapulted petroleum to the top of the country's export charts. Revenues coming from oil allowed Ecuador to invest in new industries & transportation infrastructure. The country's oil reserves and untapped reserves were used to attract loans from banks in developed countries to further develop oil industry. Because oil prices fell from a peak of $45/barrel in the late 1970s to $15/barrel by the mid 1980s, Ecuador's external debt reached $9.6 billion in 1987, split evenly between multilateral development institutions and commercial banks. After the earthquake the situation has changed even worse and by 1990 total outstanding debt was $12.4 billion, which is 120% of GNP.

Project Importance to Conoco and DuPont: Headquartered in Houston, Texas, Conoco is the third-largest integrated energy company in the United States, based on market capitalization, oil and natural gas reserves. The company is the fourth-largest refiner and the seventh-largest reserves holder of nongovernment-controlled companies. Conoco is known worldwide for its technological expertise in reservoir management and exploration, 3-D Seismic technology, high-grade petroleum coke upgrading and sulfur removal. With operations in more than 30 countries, Conoco is committed to contributing to social, economic and environmental improvements in all the communities in which it operates. The company is listed on the New York Stock Exchange. Conoco already has a decade experience of operating in South America; however, Ecuador was represented for the first time. Management of the company considers it as a good opportunity to diversify geographically its portfolio of projects. Conoco has 35% investment in the consortium, which needs to invest $44 million over 4 years to explore Block 16. This project, according to the data available, is the most successful risk projects for Conoco. The drilling and oil find represents more than 80% success, which is three times more the usual success rate of the company. Moreover, it gives Conoco the ability to develop any commercial reserves for twenty years. Conoco found the first heavy duty crude oil reserves in Ecuador. These explored wells represent 6% of Conoco's worldwide reserves and could increase production and total revenues by around 4%.

However, Conoco, British Petroleum, Shell and other major resource based firms need to take several factors into consideration while deciding where to invest in particular project or not. First of all, the company's decision should match its development strategy and the mission. Then, there are factors, such as annual budget limitations and comparative analysis of all possible investments from the point of view of high returns, less administrative and political barriers, less explorations costs (including technological constraints) and the lowest pressure from different stakeholders (such as local population, civil society, competitors, etc) that should influence the final decision. Availability of co-financing and support from the government, where the exploration works should be implemented are the key prerequisites as well. Du Pont, as a headquarter of the company compared all the possible alternatives and after long negotiation processes with NGOs and government, and after getting the final permission, nevertheless decided to sell its rights to explore Block 16 to other company *(see brief overview at the end)*. Afterwards, Conoco acquired the Gulf Canada, which is an indication, that after assessing all of the alternatives and opportunity costs, the company decided to allocate its investment in more profitable and less risky project. That transaction vastly expanded the company's long-term growth opportunities in several prolific basins in North America and Southeast Asia by adding 1.2 billion barrels of probable reserves. At the same time, Conoco increased current production by more than one-third. Diversity, integration value and strength of Conoco's assets allowed the company to sustain profits and have high value of shareholding.

Oil Companies & Environmentally Sensitive Habitats: It is almost impossible or highly difficult for the oil companies like Conoco to play a constructive role in developing commercial properties in environmentally unique and sensitive habitats. However, this cannot substitute the major limiting factor for barring from any oil exploration and development in such areas. Among the factors that could cause actual outcomes and results to differ materially for Conoco maybe changes in crude oil prices; changes in refining and marketing margins; potential failure to achieve, and potential delays in achieving, expected reserve or production levels from existing and future oil as well as gas development projects due to operating hazards, drilling risks, and the inherent uncertainties in interpreting engineering data relating to underground accumulations of oil and gas; unsuccessful exploratory drilling activities; unexpected delays or difficulties in constructing company manufacturing facilities; general domestic and international economic and political conditions; the ability to meet government regulations; potential disruption or interruption of the Company's facilities due to accidents or political events and other matters[iii].

Before the project bidding, careful analysis and evaluation of the possible negative impact on environment, as well as assessment of all the risks should be done. Then the environment management policy should be developed with negotiation of strong NGOs, and other major possible stakeholders. The designed policy should include sustainable strategy with the possibility of on-going monitoring by the committee, which can be comprised of representatives of government, civil society (including media), and other stakeholders. The program may involve reforestation, community development programs and profit allocation mechanisms to benefit the society. At the same time it is almost impossible to avoid the environmental damages and there should be well-designed promotional campaign to emphasize the economic importance for the country and nearby communities versus the possible negative impact from exploration. This case is complicated with the fact that indigenous people are living in the neighborhood. They used to make their living for hunting in the forests and fishing, so it will be difficult in the short-term to design and implement ready-made

[1] *Block- is a concessionary piece of territory where exploration and drilling rights are leased by the Ecuadorian government to an oil company.*

community programs, to educate people and to employ them, as it could happen in more developed countries. Besides, any activity of oil exploring company may result in the increased hostility and adverse reaction from the local population. As will be presented below, Maxus Energy Corporation of Texas that took over the contract with the Ecuadorean government to develop the oil fields in Block 16 later on, has designed and implemented quite efficient environmental management program that tried to address the above stated risks.

Overall, if we compare Conoco opportunity with Block 16 in Ecuador, and South American rainforests generally, with the potential for oil development in the Caspian Basin and other regions, we can say, that there are certain commonalities and differences.

In the case of rainforests generally, the oil production not only destroys the flora and fauna, but significantly influence living patterns, migration, and the structure of economy in the regions, where exploration works are implemented. As the hazard is obvious and it directly concerns people living in the neighborhood, environmental groups seemed to be more active, thus preventing and/or delaying the exploration process. In the case of offshore (sea, ocean etc) drilling, obviously, because of limitations of technology, marine flora and fauna will be destroyed, the water maybe polluted, which can bring to inevitable environmental harm. However, apart from the narrow group of specialists, who knows the potential hazardous impact of oil drilling offshore, general public, usually, does not have such an active involvement in protesting the drilling, thus creating for the politicians and governments more flexibility in decision making. At the same time, it should be mentioned that in the Caspian region specifically, there are many political interests of neighbor countries and international community that will add complication to the bidding and selection process. At the same time, local governments do not have such unequal profit-sharing ratios, which make the region more attractive for foreign investors.

WB Guidelines: World Bank's mission is[iv]: *To fight poverty with passion and professionalism for lasting results; to help people help themselves and environment by providing resources, sharing knowledge, building capacity and forging partnerships in the public and private sectors.* It also has a set of environmental guidelines, based on which the exploration of oil in environmentally sensitive areas contradicts to the WB mission and its main principles. However, it needs to be stressed here, that after the earthquake in Ecuador in 1987, WB provided disaster recovery loans, which highly indebted the country and Ecuador needed to create the revenues in order to repay these loans. As oil constitutes the main part of expected profits for the nearest decades, the government was interested in attracting investors.

World Bank conducted a study of Ecuador Amazon region. Its predictions for the nearest future are: the loss of the regions' renewable and non renewable resources; diminishing returns on economic activities as resource base will be depleted; social conflicts between indigenous and migrant population and; and reverse migration as people abandon the degraded Amazon region, thus contributing to even greater pressures in non-Amazon regions. However, as WB was not directly involved in the project financing all those statements were of declarative nature and cannot be imposed on the government for the pre-condition of loan.

Reputational Risks, Conflicts: Negative public opinion can negatively impact the company's profits. The negative opinion surely pre-existed in Ecuador Block 16 exploration project. There was a high interest of a wide range of environmental NGOs and there was a strong opposition to it. So, any step of Conoco's negotiation with the government was strictly observed by the army of NGOs and all the possible means (like media, Tribunal, appeals to government, UN bodies, etc) were used to prevent the company from exploration activities. Moreover, the interest was not limited to only local national structures, there was an involvement of US-based NGOs with the successful experience of lobbying, which brought the discussion about the future of environmentally preserved areas into global arena. Joint and separate activities of these NGOs could damage the reputation of the Conoco in Ecuador and Du Pont- worldwide. And, as we will see later on, the civil society groups from Germany, Italy and other countries became involved at some stage as well.

Oil exploration and development in Ecuador has come into a conflict with the protection and conservation of the rainforests. Oil development superseded the protection of natural resources in law and in deed. Special laws govern oil production – any minerals below the surface of the land are the property of sovereign state and can be exploited at Petroecuador's will. The Trans-Ecuadorean pipeline has pumped 1.5 billion gallons of oil. Natural Resource Defense Council (NRDC) estimated that 4.3 mln gallons of toxics were dumped every day into waste pits, which overflow into nearly rivers and streams, thus destroying plant and animal's life for hundreds of miles and jeopardizing local populations dependent on the land and its resources for their sustenance. Exploration and development activities required cleaning portions of land to undertake seismic testing and facilitate helicopter transportation. According to Atlantic Richfield Company, in an average block it cleared 355 acres and felled 372,000 trees. And those numbers will increase significantly in the development and production phase. Foundacion Natura, environmental NGO, predicted that the Oriente will go the way of Ecuador's western region, where over 90% of original forests have been lost and only 3.4% have been reforested. As a result of joint Government and NGO activity, eleven major oil companies, Petroecuador and Foundacion Natura signed an Act of Commitment (voluntary agreement) with the ministry of Energy and Mines in August of 1990. The main element of a two-year agreement was a commitment by the companies to ensure the rational management of oil activities and to undertake environmental impact studies. However, this agreement raised many controversial opinions among NGO leaders.

Not only deforestation was the main problem for indigenous people living there. Roads that need to be constructed may be the greatest long-term threat to the landscape and its people. Road building leads to the lands being colonized and used for farmland to grow coffee, cocoa and other cultures.

Relationship with Government; Risk/Service Contracts; Profit Sharing Ratios: In 1972 government formed state-owned company, Petroecuador to manage and oversee oil production. By 1982, after 10 years of unsuccessful exploration by joint vet venture Petroecuador &Texaco, the government decided to attract foreign investors. It changed legislation to allow foreign oil companies to undertake exploration activities under service/risk contracts. The risk of exploration was borne entirely by foreign companies. After earthquake, Government took some emergency loans from World Bank and assistance from Columbia. Ninety nine percent of the country oil output came from Oriente region. Because of increase of domestic consumption and subsequent fall in exports, the experts' prediction was that Ecuador will have no oil exports by the end of century, if new fields are not developed. Government officials were contemplating dropping out by OPEC.

For the government of Ecuador Conoco's Block 16 discovery will mean 20% expansion in Ecuador reserves, which is quite significant. The risk/service contract signed by Conoco-led consortium proposed four years of oil exploration on Block 16 (with investment of $44 million for six exploratory drills)

and have an option for further twenty years of commercial exploration in the case of success. The risk/services contracts, according to the changed legislation, proposed that foreign oil companies put the initial exploration costs, which are recovered, only if the oil is found and then further government permission to develop the site means that 80% of the profits (after quite high taxes-50% paid to the government) will go to Petroecuador (in, fact it goes to the government as well), and only 20% of the remaining profits will be shared among the foreign investors. For Conoco it would mean only 7% of the revenue (20% of 35% share in the consortium), which cannot be very convincing, taking into considerations all the challenges that company had to meet. In addition to that government is entitled to the royalties as well. So, unlike the other cases that we have discussed, government of Ecuador, being seemingly passive in the campaign of protests of different stakeholders', in fact, receives the major stake and has biggest influence. The second strongest influence represent civil society organizations, that have seemingly similar but, in fact, controversial agendas. At the same time, government was using all the possible means to protect itself from the public discontent. In April 1990, the government altered the boundaries of Yasuni National Park[2]. Prior to the changes, Block 16 was entirely within Yasuni. Afterwards Yasuni and Block 16 overlap only in a small area that is not planned for development. In order to clean up past environmental changes, $100,000 environmental tax on each company was imposed after controversial tribunal decision (initially they took the decision that the exploration was illegal and then Tribunal changed the decision and announced that it was legal). Hence, the profit sharing and/or tax revenue scheme in the Conoco case does not seemed to be equitable**.**

Certainly, Government of Ecuador took some obligations as well. First of all, after the earthquake major infrastructures including roads were destroyed, and the Government needed to reconstruct the roads, using WB loans. Because of the heavy nature of the crude oil in the area, twin pipelines need to be constructed so that lighter oil can be mixed with the heavy oil before sending it down. This heavy crude oil is not very cost effective to get out of the ground. Conoco-led consortium has invested only 90 million in the exploration of Block 16 and could not continue exploration. The exploration activities were disrupted by Huaorani tribesmen as well.

The analysis of key stakeholders of the project with their capabilities, interests and levels of influence on project are presented in *Appendix 1.*

Current Situation: The oil concession Blocks 15 and 16 areas are well-known to environmental activists fighting rainforest oil development in the Amazon Basin. Block 15 is currently operated by Occidental Petroleum of Los Angeles and Block 16 by Yacimentos Petroliferos Federodes (YPF), an Argentinean oil company and the largest in South America. In October 1991, after the Conoco Corporation backed out under pressure from environmentalists, their partner Maxus Energy Corporation of Texas took over the contract with the Ecuadorean government to develop the oil fields in Block 16. Awhile back Maxus then sold all its shares in Block 16 to YPF. The Maxus Road was constructed. As did Maxus before it, YPF now tightly controls access to the Maxus Road and Block 16. Transport along the Maxus Road was part of the agreement reached in return for oil drilling on their land, so YPF has provided two trucks just to transport Quichua and Huaorani up and down the road. The assumption was, that in twenty years or so when the oil had all been pumped out of the area, the narrow road would be abandoned and would eventually deteriorate and revert to forest again. However, according to experts, it is the best built road in Ecuador and will never disintegrate and at the very least, the road will have to be dynamited if it is to disappear. The World Bank was at the time funding a study for a new park management plan. This is the same World Bank that has also placed debt-connected demands on Ecuador for continued oil production, so it is a safe bet that the new plan will continue to place a higher value on sustained oil development than on protection of biological diversity[v]. In 1992 several indigenous communities protested after Maxus Oil Company leased exploration rights to oil Block 16. The oil company and the government had not consulted the affected communities. Maxus responded to the pressure by negotiating with local indigenous communities. Throughout 2000, economic conditions worsened. Inflation approached 100 percent, and oil developers continued to ravage the Amazon. The price of cooking fuel doubled and transportation costs went up by 75 percent (while average income of an indigenous person was $2.00 a day).[vi]

Recommendation: Given the financial calculations[3] *(presented in Appendix 2)* and state of the negotiations with Environmental groups, ***I would not recommend Conoco to invest $US 200 million and move forward with the project*****.** There were several assumptions done while doing financial calculations. First of all, the initial investment of $44 mln. was considered as a sunk cost. Then, $60 mln. were added to $200 mln. investment as environmental management cost (assumption is that environmental costs comprise 10% of total project cost). Also as the full production capacity of 45,000 barrels per day (bpd) will not be reached immediately, the assumption was that it will start with 5,000 bpd and will increase yearly by 4,500 bpd, hence the of highest capacity will be reached by 10th year, then because of difficulties of exploration the production will be decreased. The tax rate is taken as 50% and the inflation has not being taken into consideration. The prices are based on 1991[vii] available prices and discount rate is taken as 10%. The financial calculations show that the investment will be occupied in twenty years with quite high IRR, however, usually, as the project case states, the exploration investment could be recovered in five years and all the development costs in 10 years, which does not happen in our case. Also, given the current state of the lobbying activities of local and international NGOs, there is a high risk of their future involvement in the project implementation that will considerably destroy the process of exploration. My general recommendation for any oil extracting company is to acquire the support of only key stakeholders, such as: government and key strong local NGOs that may influence government decision and try to negotiate the acceptable terms of the deal with them only. In case of Conoco, it tried to fit everybody's needs, forming coalitions with different players at different times, which negatively impacted the situation. As NGOs has their own profiles and expertise, they will always try to emphasize the negative impact of the project on their specific field of interest in order to: 1) fundraise and 2) increase their own reputation (of course having promoted their main missions as well). Hence, "all inclusive" scenario did not work that time and local NGOs were opposed to US based ones claiming that they know the situation better then international NGOs. As a result local NGOs were able to attract media which created reputational risk to Conoco, and finally refusal to move forward with the project.

Photos are taken from Internet.[viii]

[2] *Yasuni Park is a national park in the central Oriente inhabited by Huaorani; part of it is protected*

[3] *Please kindly note that financial calculations were done together with* ***Elen Zargaryan***

Appendix 1

#	Stake holder	Description, Capabilities, Interests	Importance of the Project for Shareholder /Ability of the Stakeholder to Influence
1	**Petroecuador/ Government of Ecuador**	Government owned company, member of Texaco/Petroecuador joint venture • Petroleum industry represents 47% of all government revenues and almost 44% of exports (49% including oil derivatives). • The country is highly indebted and is interested in new exploitation as a means to cover debt • Petroecuador will get 80% of the profit on exploitation • Government will get taxes, royalties • It will get $100,000 additional environmental tax • Petroecuador has the power to decide on the new entrant (foreign company) • Responsible for construction twin pipelines • Interest in attraction of tourists- as a source of revenue	• Key decision maker • Influence on all state structures, Tribunal • Flexibility in decision making • Ability to change the legislation when needed • Ability to pose taxes • Ability to give permission and stop projects • Highly interested in project, as it will give 75% of Ecuador's oil production • Has low ability or unwillingness to influence local NGOs • Failure to protect ecological zones from colonists
2	**Ecuadorian NGOs**	CONAIE Confederation of Indigenous Nationalities of the Amazon, Campana Amazonia Por La Vida (Amazon for Life)-(coalition of env. NGOs), CONFENIAE --Confederation of the Nationalities Indigenous to the Amazon of Ecuador, Foundacion Natura- largest env. NGO in Ecuador, Movimiento Por La Paz, Cordavi (Env. Group) • Concerns about oil exploitation impact on local environment and indigenous people • Increased reputation as effective lobbying body • Project is a fundraising opportunity • Environmental and Human Resource NGOs sometimes have conflicting interests • Interest in monitoring activities of oil companies	• Oil has helped to turn Ecuador's indigenous movement into one of the strongest in Latin America. • Protests against The Heavy Crude Pipeline • Coalition of environmental groups has stronger influence • Ability to organize different campaigns, attract media • Ability to protest the laws • Appeals to Tribunal • Ability to influence local population
3	**US-based NGOs**	Rainforest Action network (RAN), Sierra Club Legal Defense Fund (SCLDF) (human resource), Natural Resource Defense Council (NRDC), Nature Conservancy (env. NGO), World Wildlife Fund (WWF-env. NGO), Cultural Survival (cultural NGO) • Aims Conoco to withdraw from rain exploration • Concerns about oil exploitation impact on local environment and indigenous people • Estimation of toxic damage of the project • Ability to lobby internationally • Internal conflicts within the organization • Project is a fundraising opportunity	• May have strong influence on Conoco's reputation • Moderate influence on international bodies (UN, WB, etc) • Commissioned a report to UN accusing oil companies of genocide in relation to Huaorani • Requires to implement $50 mln. environmental clean-up programs to protect colonization of lands and its negative impact • Ability to organize different campaigns, attract international media
4	**Conoco/ Du Pont**	One of the major project implementers, DuPont oil subsidiary • 35% share in the project, hence interest-profits • Contribution of $200 mln. • 6% of Conoco's worldwide oil reserves • Du Pont- headquarter- interested in profitable and less risky investment • Du Pont need to consider opportunity cost of other projects • To match environmental needs within its budget limits	• New geographic zone for Conoco • Major risk taker, as if there is no oil found, the expenses will not be reimbursed • For Du Pont –diversification • Almost no influence on final decision • Ability to develop environmental management plans, within the company budget limits • Limited ability to negotiate with civil society
5	**Indigenous people**	HUARANI, ZAPARA, SIONA, COFAN, AND SECOYA--Pre-Incan indigenous communities of Ecuador. The project mostly impacts Huarani • Indigenous people make up 40% of Ecuador's population • They have been most affected by oil contamination. • Huarani- is one of the few remaining groups to have had minimal contact with outside group (which makes the situation more difficult) • 100,000 native Indians, were affected by project • Controversial interests: some of them interested to establish contacts with Conoco personnel and even traded blow-guns for T-shirt	• Colonists, oil workers and tourist potentially introduced new deceases to which many indigenous people had no natural immunity • Potential threat to oil companies and colonists there were cases of threatening colonists and Conoco workers for invading their lands). • Mostly affected by project and partially protected by NGOs
6	**Local Communities**	Locals in the towns of Lago Agrio and Cascales • Demand greater share in the benefits from the increased flow of oil • Demand compensation for the probable pollution. • Demand implementation of community 'compensatory projects' such as road paving and municipal sewage construction.	• Ability to organize strikes • Influence on local and central government

Appendix 2

Year	Equity investment	Environmental costs	Approximate production (barrel/ per day)	Approx. production (barrel/per year)	Prices per barrel (1991)	Total Revenues	Tax Rate	Total Taxes	Net Income After Taxes	Net Cash Flows
1986	44,000,000	0	0	0	0	0	0	0	0	-44,000,000
1987	0		0	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0	0	0	0
1990	200,000,000	60,000,000	5000	1,825,000	23.19	42,321,750	50%	21,160,875	21,160,875	-238,839,125
1991	0	0	9500	3,467,500	23.19	80,411,325	50%	40,205,663	40,205,663	40,205,663
1992	0	0	14000	5,110,000	23.19	118,500,900	50%	59,250,450	59,250,450	59,250,450
1993	0	0	18500	6,752,500	23.19	156,590,475	50%	78,295,238	78,295,238	78,295,238
1994	0	0	23000	8,395,000	23.19	194,680,050	50%	97,340,025	97,340,025	97,340,025
1995	0	0	27500	10,037,500	23.19	232,769,625	50%	116,384,813	116,384,813	116,384,813
1996	0	0	32000	11,680,000	23.19	270,859,200	50%	135,429,600	135,429,600	135,429,600
1997	0	0	36500	13,322,500	23.19	308,948,775	50%	154,474,388	154,474,388	154,474,388
1998	0	0	41000	14,965,000	23.19	347,038,350	50%	173,519,175	173,519,175	173,519,175
1999	0	0	45000	16,425,000	23.19	380,895,750	50%	190,447,875	190,447,875	190,447,875
2000	0	0	45000	16,425,000	23.19	380,895,750	50%	190,447,875	190,447,875	190,447,875
2001	0	0	45000	16,425,000	23.19	380,895,750	50%	190,447,875	190,447,875	190,447,875
2002	0	0	41000	14,965,000	23.19	347,038,350	50%	173,519,175	173,519,175	173,519,175
2003	0	0	36500	13,322,500	23.19	308,948,775	50%	154,474,388	154,474,388	154,474,388
2004	0	0	32000	11,680,000	23.19	270,859,200	50%	135,429,600	135,429,600	135,429,600
2005	0	0	27500	10,037,500	23.19	232,769,625	50%	116,384,813	116,384,813	116,384,813
2006	0	0	23000	8,395,000	23.19	194,680,050	50%	97,340,025	97,340,025	97,340,025
2007	0	0	18500	6,752,500	23.19	156,590,475	50%	78,295,238	78,295,238	78,295,238
2008	0	0	14000	5,110,000	23.19	118,500,900	50%	59,250,450	59,250,450	59,250,450
2009	0	0	9500	3,467,500	23.19	80,411,325	50%	40,205,663	40,205,663	40,205,663
2010	0	0	5000	1,825,000	23.19	42,321,750	50%	21,160,875	21,160,875	21,160,875
Total reserves≈	-	-	-	200,385,000	23.19	-	-	-	-	-
Discount rate	10%									
IRR	36%									

[i] http://en.wikipedia.org/wiki/Ecuador
[ii] *Environmental Management, Michael V. Russo, p 478-479* http://books.google.com/books
[iii] www.conoco.com
[iv] www.worldbank.org
[v] *A Trip to Ecuador's Oriente and Block 16, Paul Donahue, May 1998;* http://www.pauldonahue.net/
[vi] http://www.advocacynet.org/resource/427
[vii] http://www.ioga.com/Special/crudeoil_Hist.htm
[viii] http://www.fotosearch.com/photos-images/offshore-exploration.html.