CHAPTER 8

GENERAL CONCLUSIONS

Bioenergy in general, and biofuels in particular, have come up to the renewable energy stage with some peculiar strength, overall in terms of alternatives for transportation. Some of the drivers behind this option are shared on a global scale, such as the reduction of GHG's emissions, and enhancement of energy security conditions. Some others have a more local nature, like a diversification of markets for agricultural commodities, dynamization of rural areas, improvement of micro and macro-economic indicators (for instance, income of the rural poor and national balance of payment), among others.

However, production, commercialization, and use of biomass based energy have a really complex set of relationships regarding economic, social and environmental effects. Therefore, even though biofuels are associated with several positive consequences; they are also linked to convoluted issues that require the attention of scholars and policy makers, in order to avoid catastrophic outputs from a poor implementation of a bioenergy agenda. Among those negative results are:

- a potential net energy loss (assessed in non-renewable sources),
- a constant threat to food security given that some feedstocks (in fact, the most used ones) can be employed for food and/or energy purposes at the same time,
- a potential increase of carbon emission through LUC and iLUC effects,
- an eventual worsening of the current social or economic situation for vulnerable population,
- and the imperilment of natural ecosystems.

This reality is the one that Colombia has confronted, since 2005, when it started to walk the path of liquid biofuels for transportation. Given agricultural circumstances for this South American country, sugarcane and palm oil were the main chosen feedstock to start this journey. Of course, it does not imply that other alternatives cannot be explored in the immediate or mid-term, but most bioenergy initiatives in Colombia, nowadays are focused on these two options.

A comprehensive analysis of Colombian biofuels chains and their actual and potential effects, regarding their social, economic and environmental behavior was required in order to establish to what extent liquid biomass-based fuels are sustainable. Actually, that is the reason and core of this thesis document.

The results can be summarized as follows:

Among renewable energies, bioenergy and in particular biofuels, represent a transitory and immediate alternative to solve the stress caused by fossil alternatives. Handled properly, biofuels can become in an appealing alternative to both industrialized and developing countries. The latter can take advantage of latecomer position, improve the socio-economic situation of the population, and may alleviate environmental issues caused by traditional energy sources.

Biofuels can be classified by their state of nature and by the degree of technology advance. Within this document current and potential impacts of production and use of those liquid biofuels are studied (alcohols and oils) that are produced within the Colombian territory.

Biofuel production is well justified in this case, given that existent energy sources (hydro, coal, gas and oil) properly cover energy needs, except for transportation. **Colombia is not a net importer of oil, yet, but new reserves have not been found and export rates lead one to think of a shortage scenario in the midterm**.

Despite that, **Colombia produce commercially 1GBf (sugarcane–based ethanol and palm oil–based biodiesel)** and those are highly criticized because of the food vs. fuel dilemma, a study needs to be carried out to understand to what extent these alternatives represent a threat, and if they do not, how much and where can they expend. Per se, 1GBf is not bad, but local analysis is required to see the full implications of their implementation. Therefore, biofuels production cannot be ruled out, and on the contrary must be encouraged. The problem here is establishing conditions to guarantee their sustainability without jeopardizing surrounding ecosystems, food provision, and the socio-economic conditions of the population. Actually, Colombia has managed some initiatives (at exploratory level) that aims to better biofuel under better technologies as it can be seen in the final appendix. **This document argues that, in fact, Colombian biofuels, under current circumstances, are sustainable based on the following rational:**

First, Colombia has set firm foundations in terms of biofuel policies (with a set of mandates, tax exemptions and other tributary and financial aids), following the example given by industry leaders such as Brazil. Drivers are properly adjusted and incentives in term of mature commodity markets ease development for these initiatives. Unlike most countries in the region, along with Brazil and Argentina, Colombia is the only country within the LAC region capable to cover domestic supply and eventually think of export possibilities. Regulations still require some fine-tuning and they need to target sustainable

certificates that boost a proper entrance to a global green oil market. A constant threat to bioenergy is oil price fluctuations, but R&D efforts can overcome this issue in the long term.

Secondly, Colombia must take into account the environmental context to implement a wide bioenergy project, due to the strong connection that this alternative possesses with global warming problems and agricultural management.

In this regard it is fundamental to stress the importance of biodiversity protection, land degradation, and land management issues that emerge with monocultural practices. If the latter are carried out it becomes crucial to include policies in the local planning schemes for implementation of crop intensification in order to avoid LUC and iLUC effects and expansion of the agricultural frontier.

Most of the problems related with air pollution, and climate change is closely linked with mobile sources of contamination, i.e. the transport sector. For that reason, biofuels production and use are able to mitigate such effects, if it is taken into account that photosynthesis captures carbon emissions during the agricultural stage of biofuel creation. When biofuels are blended with regular gasoline the burning process is cleaner, resulting in a lower level of contamination.

Nevertheless, it is also important to recognize the role played by ergoculture as GHG's emitted by account of agricultural practices. Use of fertilizers and pesticides, along with forest clearance might unleash a high pressure on the atmosphere. Therefore, expansion of energy crops must be implemented carefully, as is explained in the last chapter, which overtakes this kind of hindrances.

Environmental pressure can also be reduced by supporting an active biofuel industry, if more opportunities for development are brought to rural areas, avoiding migration processes.

Thirdly, in economic terms, competitiveness of Colombian biofuels, in international markets, can be imperiled by high cost of labor, despite high yields of agricultural commodities. Some other biofuel producing countries pay less than half the wage established in Colombian territory.

Biodiesel costs throughout Colombia are quite standardized. They are mostly explained by feedstock costs that have been calculated between US$482 and US$618 per ton. Benefits should be shared between farmers and plant owners, and are linked to the amount

of oil obtained from each ton of fruit.

Conditions for the final price are discussed informally in this industry, if there is no formal contract that establishes otherwise. As reference, the PSF is used which is usually presented in advance, so levels of uncertainty are reduced.

In the case of sugarcane ethanol, it is required to improve competitiveness in terms of final prices, regarding direct international competitors. Most of the cost, just like in the biodiesel industry is explained by feedstock acquisition cost. A way to solve this issue is via capital investment, but intensive machinery would imply several job losses (8 million shifts if a total conversion is carried out).

In a general sense, the sugar industry (and by-products) is much more organized than the biodiesel industry. Thus, calculation of payments are fully described and distributed between farmers and plant owners. A compensation fund FEPA intervenes in price formation, and act as a kind of insurance for farmers and manufactures.

Recognition of final price in terms of ethanol elaboration, despite having formalization, has created controversy between farmers and sugar processors. On the one hand, a processor wants to give only one third of the final price to a farmer (according with those rules describe in chapter 4), whereas the latter try to get at least 50% of the final price. These discrepancies have brought tension to the ethanol industry. Regulation in this regard, along with some other fine-tuning in terms of compensation of divergences between sugar and ethanol must be introduced and reviewed in further policy analysis.

Fourthly, in this manuscript Policy for Biofuels in Colombia (PNBs) has been studied and it has been concluded that it requires between 6.4 and 9.2 million hectares in order to achieve government plans. According to government target, this land would be taken from fallow and livestock farming land. In chapter 7 it is proven that those levels can be reached, only under severe restrictions (overall in terms of current road infrastructure).

The palm oil industry (and by-products) has grown recently by account of a set of factors (elevated vegetable oil prices and the possibilities of new markets), and domestic conditions (supporting policies for biofuel industry). Yield per hectare has reached near to 4 tons of oil on average, but according to Fedepalma it would be possible to obtain 5.5 tons by 2020, overtaking some countries in South East Asia. It is highlighted that the possibility to concentrate the industry in clusters in order to increase efficiency in the industrial stage and therefore gain competitiveness.

Participation of small farmers is significant but there is a high level of land concentration in this sector. There are just few plantation units that exceed 1000 hectares, but they have almost 40% of the planted area.

There are three types of contractual arrangements for palm oil extraction. Every one of them implies different rights and responsibilities as is explained in chapter 5. The importance of this is the flexibility offered to farmers of any scale. Colombia needs to improve extraction methods, given its low productivity. Colombian plants can process on average 25 tons/ha, whereas Malaysia and Indonesia exceed 30 tons/ha. Evidence has shown an underuse of the installed capacity.

Strategic alliances are a possibility of distributing both risks and benefits of the industry, and they have proven to provide more stability and access to financial resources in an easier way. By training farmers and extractors they get better results and security in feedstock quality and quantity.

Vegetable oil provision has not been jeopardized so far with bioenergy project implementation; therefore, there is no evidence to point out biodiesel as trigger for food scarcity.

In the case of sugarcane, the industry related to ethanol production in based in Cauca valley, despite other regions that have sugar plantations (like Santander, Antioquia, Nariño, among others). Technical assessments have led to this conclusion by demonstrating that this variety of sugarcane (caña panelera) is not suitable for competitive ethanol production.

Crop performance has improved in terms of sugar content (reaching 13 tons per hectare since 2002), despite yield of sugarcane per hectare has been relatively stable (close to 120 tons/ha). This is proof of enhancement of soil performance and therefore less pressure on surrounding lands for expansion purposes.

There is also land concentration in this industry, but not as strong as in the palm sector. One fourth of land belongs to the ingenios and the remaining land to other owners. Proprietorship and management can be combined, thus 51% land is managed by independent owners. The remaining 49% is managed by different kinds of formal contracts presented in chapter 5.

Based on the existing surplus of sugar since 1987, the ethanol initiative was supported. In this way, food security was not put at risk. Neither the use of juices and molasses

from sugarcane, nor the reduction in sugar production and exports since 2005, created any perverse effect on the sugar availability for the domestic market.

Current capacity of potential ethanol processing (1.07 million liters/day) is far from the one established originally by the government (2.7 million liters/day) in order to reach a level of E20 in the entire Colombian territory; however, expansion is still possible under some assumptions exposed in chapters 6 and 7.

Chapter 6 present a LCA for Colombian biofuels: Average environmental impact of the evaluated biofuels was compared with international standards of sustainability, which provide a first approach on a key factor in regards to the export potential for Colombian biofuels. iLUC effects were evaluated in this assessment, by establishing that those crops which satisfy sugar demands in international markets can be set somewhere else.

When the iLUC effect was left out, it was concluded that ethanol made out of sugarcane was generating close to 26% of GHG's emissions in comparison to pure fossil gasoline. However, when it was included 156% of GHG's was created if and only if crops were to be grown in tropical forest.

RED standards use as reference 40% of GHG's savings in order to consider a bioenergy alternative as sustainable. In this case Colombian ethanol saves up to 74% in the best scenario; therefore the requirement is fulfilled.

In terms of biodiesel, approximately 40% of GHG emissions per vehicle can be saved by using current technology and average cultivation practices, in comparison to fossil diesel alternatives (if LUC and iLUC effect are not considered). These results can be improved if methane is captured using residual waters.

Palm oil tree cultivations are able to store relatively great amounts of carbon in comparison to other use of lands, thus carbon balance has a propensity to be enhanced even more, up to 83% (using average technology) and up 107% (if advance or optimized technology is employed), due to the fact that most palm tree plantations took place in areas that formerly were destined for grazing purposes or agricultural production. This result strengthens the positions of some scholars (Mathews and Tan), and invite one to review results obtained by others like (Searchinger et. Al.). Based on the aforementioned, it can be asserted that Colombian biodiesel made out of palm oil offers a good performance in comparison with some other biofuels produced

internationally, and it accomplishes 40% of GHG's emission savings defined by several international standards.

The non-renewable energy demand for biofuels based on highly productive crops (as the palm oil crop) is considerably less in comparison to other biofuels, especially when lingo-cellulosic biomass is used to provide energy in processing facilities. It is important to note that if the lingo-cellulosic is used for second generation technologies a more efficient result might be reached as well, in terms of fuel generation but co-generation potential and compost elaboration will be affected negatively.

In general, if all existing biofuel producing plants work at their maximum capacity, it is possible to save 1.8 million tons of CO2 eq per year. That is equivalent to 3% of total emissions of CO2 in Colombia in 2008 or 8% of those emissions caused by the Colombian transport sector (UN, 2012).

Compared with some other international biofuels, Colombian biofuel exhibits a good performance and it reaches 40% of minimum GHG's emission savings suggested by several bioenergy fuel standards.

Biofuels exported from Colombia can be favored by various mechanisms for subsidies in "sustainable" international markets for biofuels. However, sustainability assessments should be applied for each producing firm and plantation in an isolated way, given that the present study provides only an insight for the average Colombian case, and it evaluates its range of impacts.

The relatively low demand of fossil fuels of sugarcane–based ethanol and palm oil–based biodiesel is explained by the fact that most of lingo–cellulosic material is employed for co–generation.

Finally, the last chapter was shown as exercise to map the potential expansion of palm oil and sugarcane crops for increasing biofuels production. After a biophysical analysis was carried out, several sustainability filters were applied to Colombian territory through GIS tools:

- In those lands produced biofuels must save at least 40% of GHG's emissions in comparison to fossil reference (GHG's net savings).
- Territories of black communities and indigenous reservations are considered as not suitable for commercial biofuel initiatives exploitation.

- Natural reserves, such as forests, were left out because of biodiversity preservation, and resource maintenance.
- Land with current agricultural purposes was left out to guarantee food provision.
- Land without proper road infrastructure was not included to provide a more accurate expansion scenario in the short and midterm.

For palm oil crops, sustainable expansion area is reduced to the northern section of the Llanos (in the eastern side of Colombia), central areas in the Andean Valleys, non-forest land in the eastern zone and small spots in the south-western area of Colombia.

In total 1000000 hectares where identified as highly suitable for palm oil cultivation and near to 2,900,000 hectares as moderately suitable. The larger area for the highly suitable zones is located in the base of the Eastern branch of the Colombian Andean mountain chain, in the departments of Caquetá and Meta. Potential area for expansion goes from 4 million hectares to more than 9 (being flexible with the results). However, it needs to be stressed that this high potential is only possible if it is accompanied by proper investment in roads and some other infrastructure.

In the case of sugarcane, the area for a sustainable expansion is reduced to northern plains and some areas in the Andean Valleys and the non-forest area in the eastern region. This study concludes that there is a high potential of expansion up to 1,518,000 hectares of high suitability and 3,400,000 hectares with moderate suitability.

The largest areas with moderately suitable lands are located in the eastern base of the Andean mountain chain in Meta and partially in Caquetá.

Suitable areas for sugarcane cultivation suggested by the Ministry of Agriculture are approximately 3,892,000 hectares (Fernández Acosta, 2009) (Fernández Acosta, 2009) (Fernández Acosta, 2009) whereas in this study found 10,973,000 hectares as suitable land (Fernández Acosta, 2009). Albeit, if those lands that are highly suitable and moderately suitable were considered, which should be the ideal case, given that crops held in suitable lands with severe restrictions are not economically attractive, results dropped, hence drawing a similar result to the Ministry report (4,919,000 ha).

In low biomass areas of Vichada and Meta, areas of potential expansion were presented. Nevertheless, these areas, at the present time have difficulties regarding road network infrastructure, hence, they are considered as non-suitable. However, through investment

in transport infrastructure these areas might be suitable for sugarcane cultivation.

In summary, in the case of the feedstock for biodiesel production there is a predilection for the departments of Caquetá and Meta; and contrarily sugarcane exhibits a bias for the conditions found in Magdalena, Cesar and Córdoba. Likewise, the region of the department of Vichada showed to be moderately suitable for biofuels feedstock production in general, but first access to the region must be improved significantly, i.e. investment in the road infrastructure network.

It is absolutely required to complete a land use planning and put into practice some specific agricultural routines that might alleviate land pressure (such as intensive cropping or grazing), or simply avoiding the use of already active (high productivity) land to dodge iLUC effects.

REFERENCES

"Plantas de etanol…". (2010). Ethanol plants started to sink [Original in Spanish: Plantas de etanol 'hacen agua'.] Retrieved from: http://www.dinero.com/edicion-impresa /investigacion/articulo/plantas-etanol-hacen-agua/104313 Accessed 28/03/11. Dinero.

ACCEFYN. (2003). Emission factors of Colombian Fuels (Original in Spanish: Factores de emisión de los combustibles colombianos) Bogota, Colombia: UPME.

ACR. (2011). Biodiesel in Guatemala. [Original in Spanish: Biodiesel en Guatemala] Retrieved from: ww.acrguatemala.com/biodiesel.shtml#biodieseG Accessed 11/12/12.

Acuña, N. (2010). Colbiocel presented a project of a cellulosic ethanol plant. [Original in Spanish: Colbiocel presentó proyecto de planta de etanol celulósico]. Retrieved from: http://www.vanguardia.com/historico/63193-colbiocel-presento-proyecto-de-planta-de-
-etanol-celulosico#sthash.D4GxvJzV.dpuf, Vanguardia Liberal.

Achten, W. M., Mathijs, E., Verchot, L., Singh, V. P., Aerts, R., & Muys, B. (2007). Jatropha biodiesel fueling sustainability? Biofuels, Bioproducts and Biorefining, 1(4), 283-291.

Agrammon. (2009). Technical process description AGRAMMON - Draft.

Ajila, V. H., & Chiliquinga, B. (2007). Biofuel legislation analysis in Latin America. [Original in Spanish: Análisis de legislación sobre biocombustibles en América Latina.] Retireved from:
http://revistavirtual.redesma.org/vol4/pdf/legislacion/Analisis%20de%20la%20 legislacion%20de%20Biocombustibles.pdf Accessed 25/06/11. Revista Olade.

Álvarez, M. (2001). Could peace be worse than war for Colombia's forests? The Environmentalist, 21, 305-315.

Anderson–Teixeira, K. J., Davis, S. C., Masters, M. D., & Delucia, E. H. (2009). Changes in soil organic carbon under biofuel crops. Gcb Bioenergy, 1(1), 75-96.

Anderson, J., Fergusson, M., & Valsecchi, C. (2008). An overview Of Global Greenhouse Gas Emissions and emissions reduction scenarios for the future Retrieved from: www.ieep.eu/ assets/428/overview_gge.pdf Accessed at: 13/12/12. Brussels: IEEP.

Andrade, G. (2004). Forest wothout law. Conflict, drugs and globalization of deforestatoin in colombia. [Original in spanish: Selvas sin ley. Conflicto, drogas y globalización de la deforestación de Colombia]. Retrieved from: http://library.fes.de/pdf-files/bueros/ kolumbien/01993/05.pdf. Bogotá. Foro Nacional Ambiental-CIFOR.

Aquino, M. (2006). State of Biofuels in Paraguay. [Original in spanish: Situación de los biocombustibles en Paraguay] Retrieved from: http://www.mag.gov.py/dgp/SITUACION
%20DE%20BIOCOMBUSTIBLES%20EN%20PARAGUAY%202006.pdf
Accessed:
02/06/10. Asunción.

Argentinian Congress. (2006). Regulation and promotion scheme for production and sustainable use of biofuels. [Original in Spanish: Régimen de Regulación y Promoción para la Producción y Uso Sustentables de Biocombustibles.] Retrieved from: www.bccba.com.ar/bcc/images/ 00001197_BIOCOMBUSTIBLES.pdf. Buenos Aires.

Arriaza, J. M. (2011). Biofuels: Analysis on their contribution to the Chilean energy matrix. [Original in Spanish: Biocombustibles: Análisis sobre su aporte a la matriz energética de Chile.] Retrieved from: http://www.tesis.uchile.cl/tesis/uchile/2011/cf-arriaza_jh/ pdfAmont/cf-arriaz a_jh.pdf accessed 15/06/12. Universidad de Chile, Santiago de Chile.

Asamblea constituyente de Ecuador. (2007). Organic Law for Natioanl oil resources recovery and distribution of the debt processes. [Original in Spanish Ley orgánica para la recuperación del uso de los recursos petroleros del estado y racionalización administrativa de los procesos de endeudamiento] Retrieved: http://constituyente.asambleanacional.gob.ec/documentos/ ley_petroleros_2_% 2 0informe_final.pdfAccessed 15/03/10. Quito.

Asamblea nacional. (2011). Guidelines for National policy on biofuels and electricity generation from biomass within national territory. [Original in Spanish: Lineamientos para la política nacional sobre biocombustibles y energía eléctrica a partir de biomasa en el territorio nacional.] Retrieved from: http://www.energiarenovablepanama.com/wp-content/uploads/2011/09 /Ley-42_Bioco m bustibles.pdf Accessed: 18/03/12. Panama.

Asman, W. (1992). Ammonia emission in Europe: updated emission and emission variations. Roskilde, Denmark: National Institute of Public Health and Environmental Protection.

Asocaña. (2009). History of the sugar sector [Historia del sector azucarero (in Spanish)] Retrieved 30/07/10, 2010, from http://www.asocana.org/publico/info.aspx?Cid=8

Asocaña. (2010). Annual report 2009-2010 (Original in Spanish: Informe anual 2009-2010). Cali: Asocaña.

Asocaña. (2011). Annual report 2010-2011 (Original in Spanish: Informe anual 2010-2011). Cali: Asocaña.

Asocaña. (2012). Balance del sector Azucarero Colombiano 2000-2012 (In Spanish) Balance of the sugar industry in Colombia 2000-2002. http://www.asocana.org/modules/documentos /5528.aspx Accessed 05/11/12. Cali, Colombia: Asocaña.

Asocaña. (2013). Balance azucarero colombiano Asocaña 2000 - 2013 (en tmvc). [In Spanish: Sugar sector balance Asocaña 2000-2013] Retrieved from: www.asocana.org/modules/ documentos/3/194.aspx Accessed at: 13/12/13.

Asocaña. (2014). Sugar sector balance Asocaña 2000-2014 [In Spanish: Balance azucarero colombiano Asocaña 2000–2014 (en toneladas).] Retrieved from: www.asocana.org /modules/documentos/5528.aspx Accessed at: 25/08/14.

Assessment, M. E. (2005). Ecosystems and human well-being (Vol. 5): Island Press Washington, DC.

Ausubel, J. H. (2000). The great reversal: nature's chance to restore land and sea. Technology in Society, 22(3), 289-301.

Azizi, B., Zulkifli, H., & Kasim, M. (1995). Indoor air pollution and asthma in hospitalized children in a tropical environment. Journal of Asthma, 32(6), 413-418.

Badgley, C., Moghtader, J., Quintero, E., Zakem, E., Chappell, M. J., Aviles-Vazquez, K., Perfecto, I. (2007). Organic agriculture and the global food supply. Renewable agriculture and food systems, 22(2), 86-108.

Balasundram, S. K., Robert, P. C., Mulla, D. J., & Allan, D. L. (2006). Relationship between Oil Palm Yield and Soil Fertility as Affected by Topography in an Indonesian Plantation. Communications in Soil Science and Plant Analysis, 37(9-10), 1321-1337. doi: 10.1080/00103620600626817

Barros, S. (2012). Brazil biofuel anual report http://gain.fas.usda.gov/Recent%20GAIN%20 Publications/Biofuels%20Annual_Sao%20Paulo%20ATO_Brazil_8-21-2012.pdf In USDA (Ed.).

Basiron, Y. (2007). Palm oil production through sustainable plantations. European Journal of Lipid Science and Technology, 109(4), 289-295.

Batidzirai, B., Smeets, E., & Faaij, A. (2012). Harmonising bioenergy resource potentials – Methodological lessons from review of state of the art bioenergy potential assessments. Renewable and Sustainable Energy Reviews, 16(9), 6598-6630.

Batjes, N. (2010). IPCC default soil classes derived from the Harmonized World Soil Data Base. Retrieved 12/06/11, 2011

Bergkamp, G., Orlando, B., & Burton, I. (2003). Adaptation of water management to climate change.: Gland & Cambridge: International Unioin for Conservation of Nature (IUNC).

Berndes, G. (2008a). Future biomass energy supply: The consumptive water use perspective. Water Resources Development, 24(2), 235-245.

Berndes, G. (2008b). Water demand for global bioenergy production: trends, risks and opportunities. Journal of Cleaner Production, 15(18), 1778-1786.

Besosa, R. (2005). Organic Matter in the Soils of Cauva Valley region [Original in Spanish:Materia Orgánica de los suelos del Valle del Cauca]. Presentation: Ingenio Providencia. Procaña Seminar .

BioPact. (2007). A quick look at 'fourth generation' biofuels. Website: www.google.com.co/search?sourceid=navclient&ie=UTF-8&rlz=1T4WZPA_enCO207CO208&q=Heverlee Accesed: 05/04/2010.

Bittencourt, G., & Reig, N. (2009). Biofuel industry in Uruguay: Current situation and perspectives [Original in Spanish: La industria de biocombustibles en Uruguay: situación actual y perspectivas] Retrieved from: http://www.fcs.edu.uy/archivos/1109.pdf Accessed: 12/05/11 Departamento de economía, : Universidad de la República,.

BMI. (2008). Colombia Power Report Q4 2008: Business Monitor International.

Bolivian National Congress. (2005). Law 3152. [Original in Spanish: Law 3152] Retrieved from: http://revistavirtual.redesma.org/vol4/pdf/legislacion/Bolivia–Biocombustibles%20(Ley%203152).pdf Accessed 02/12/12. La Paz. Bolivia.

Bongiovanni, R., & Lowenberg-DeBoer, J. (2004). Precision agriculture and sustainability. Precision Agriculture, 5(4), 359-387.

Briceño, C. (2006). Disposition of vinasses produced in sugar processing distilleries in Colombia. (Original in spanish: Disposición de las vinazas producidas en las destilerías del sector azucarero colombiano.). Paper presented at the Taller combustibles, energía y el medio ambiente a partir de la caña de azúcar y otras biomasas., Santa Lucía, Guatemala.

Brooks, T., De silva, N., Foster, N., Hoffmann, M., & Knox, D. (2008). Biodiversity hotspots. Retrieved from: www.biodiversityhotspots.org Accessed 10/02/09: Conservation international.

Brugman, A. (2004). Design of an economic instruments Porogram for managing and Controlling Urban atmospheric pollution in Colombia. Consultant report. Bogota, Colombia: MAVDT.

Buchanan, E. (1975). The introduction of a relative cane payment system in the South African Sugar Industry. South African Sugar Year Book, 45, 11-14.

Buitrago, A. C., Correa Roldán, D., & Palacios Botero, F. A. (2007). Agri-industrial potential in Antioquia, colombia (Original in Spanish: Potencial Agroindustrial Antioqueño). Medellin, Colombia.

Calixto, D., & Díaz, A. (1995). Economic Valuation of the enviromental impact of air quality on population undet 5 years old. [Original in Spanish: Valoración económica del impacto ambiental del aire sobre la salud de los habitantes menores de 5 años en Bogotá.]. Unievridad Javeriana, Bogota. Colombia.

Cámara de Diputados. (2008). Law of Promotion of Bioenergy products. [Original in Spanish: Ley de promoción y desarrollo de los bioenergéticos] Retrieved from:

http://www.diputados.gob.mx/LeyesBiblio/pdf/LPDB.pdf Accessed from: 18/03/11. Ciudad de México.

Cámara de Senadores. (2005). [Original in Spanish: Ley n° 2.748.- de fomento de los biocombustibles.] Retrieved from: www.bvsde.paho.org/bvsacd/cd38/Paraguay/L2748-05.pdf Accessed: 15/06/11. Asunción.

Camastra, N. D. (2008). National Security and Development: How Blocking the U.S.-Colombia Free Trade Agreement will Protect Colombians and the U.S. Retrieved 03/08/2009, from http://www.foodfirst.org/en/node/2110

Campuzano, L. F. (2011). Platform Jatropha Colombia: Myth or True [Original in Spanish: Plataforma Jatropha Colombia: Mito o Realidad] Retrieved from: www.minagricultura.gov.co/archivos/plataforma_jatropha_colombia.pdf Accessed 12/05/
12. Bogotá, Colombia: Corpoica.

CARB. (2009). Californian Low Carbon Fuel Standard. Resolution 09-31. Sacramento, California.

Cardona Alzate, C. A. (2009). Perspectives of Biofuels Production in Colombia: Latinamerican and World Contexts [Original in Spanish: Perspectivas de la producción de biocombustibles en Colombia: contextos latinoamericano y mundial] Retrieved from: https://revistaing.uniandes.edu.co/pdf/A12%2029.pdf. Revista de Ingeniería(29), 109-120.

Cardona, C. A., C.E., O., Sanchez, C. A., & Rincón, L. E. (2007). Rapeseed biodiesel: an Alternative of rural development. [Original in spanish: Biodiesel de higuerilla: una alternativa de desarrollo rural] Retrieved from: http://corpomail.corpoica.org.co/BACFILES/BACDIGITAL/55173/19.pdf Accessed at: 25/04/14. Manizales: Universidad Nacional de Colombia.

Carnoval, M. (2009). Free Markets? - A Look Into the US Colombia FTA

Carpenter, S. R., Mooney, H. A., Agard, J., Capistrano, D., DeFries, R. S., Diaz, S., Pereira, H. M. (2009). Science for managing ecosystem services: Beyond the Millennium Ecosystem Assessment. Proceedings of the National Academy of Sciences, 106(5), 1305-1312.

Cassalett, C., Torres, J. S., & Isaacs, C. (1995). Sugarcane cultivation in the sugar production zone of colombia. (Original in Spanish: El cultivo de la caña en la zona azucarera de Colombia) Retrieved from: http://www.cenicana.org/publicaciones/libro_cana/libro_cana.php Accessed 15/07/11. Cali.

Cassman, K. G., Dobermann, A., Walters, D. T., & Yang, H. (2003). Meeting cereal demand while protecting natural resources and improving environmental quality. Annual Review of Environment and Resources, 28(1), 315-358.

Castiblanco, C., & Hortúa, S. (2012). Colombiano Biofuels' energetic paradigm and its implications [Original in Spanish: El paradigma energético de los biocombustibles y sus implicaciones: panorama mundial y el caso] Gestion y Ambiente, 15(3), 5-26.

Castillo, E. F. (2009). Cogeneration in the Colombian sugar sector. (Original in spanish: Cogeneración en el sector azucarero colombiano) Retrieved from http://www.acolgen.org.co/jornadas2gen/CenicanaCogeneracion.pdf 12/05/10. Bogota: Alcogen.

Cazal, g., & Cáceres, O. (2006). Biofuels in Paraguay. [Original in Spanish: Biocombustibles en Paraguay] Retrieved from: http://www.olade.org/biocombustibles/Documents/PDF-22-8%20Paraguay.pdf Accessed: 02/06/12. Paper presented at the Seminario Internacional "BIOCOMBUSTIBLES", Brasilia, Brazil.

CEET. (2009, 31/03/2009). 'Upaquizaron el precio del etanol' advierte ex codirector del Emisor, Salomón Kalmanovitz (Manipulation on ethanol prices warns Central Bank ex-bydirector, Salomon Kamanovitz) http://www.portafolio.com.co/economia/economiahoy/2009-04-01/ARTICULO-WEB-NOTA_INTERIOR_PORTA-4929267.html, Portafolio.

CEN. (2009). CEN/TC 383 Sustainably produced biomass for energy applications Retrieved from http://www.cen.eu/cen/Sectors/Sectors/UtilitiesAndEnergy/Fuels/Pages/Sustainability.aspx Accessed at 15/06/10.

Cenicaña. (2010). Water savings and applied volumes with the use of irrigation technologies (Original in Spanish: Ahorros de agua y volúmenes aplicados con el uso de tecnologias de riego). Florida, Colombia: Cenicaña.

CENICAÑA. (2011). Historic dates of the sugar agroindustry in Colombia http://www.cenicana.org/quienes_somos/agroindustria/historia_eng.php.

Cenicaña. (2012). Anual report 2012. [Original in Spanish: Informe anual 2012] Retrieved from http://www.cenicana.org/pdf/informe_anual/ia_2012/ia_2012.pdf. Accessed at 25/08/14. Cali, Colombia: Cenicaña.

Cenipalma. (2000). Palm oil plagues in Colombia [Original in Spanish: Plagas de la palma de aceite en Colombia]: Fedepalma-Cenipalma Santafe de Bogota.

Cepeda, V. (2007). Incentives laws to Renewable energies and their special schemes of aplication: law 57-07. Components and potentials. [Original in Spanish: Ley de Incentivos a las Energías Renovables y sus Regímenes Especiales. Ley 57- 07: Componentes y Potencialidades] Retrieved from: www.olade.org/biocombustibles2008/Documents/ponencias/d%C3%ADa3/Sesi%C3%B3n12-Dia%203/VirgilioCepeda.pdf Accessed: 05 /06/11. El Salvador.

Cerrato, M. (2011). Biofuels in El Salvador. [Original in Spanish: Biocombustibles en El Salvador] Retrieved from: www.cepal.org/drni/noticias/noticias/8/45098/ManuelCerrato.pdf Accessed 15/06/12. San Salvador.

CNE. (2007). Curcular Number 30. [Original in Spanish: Circular N°30 Del 16 De Mayo Del 2007] Retrieved from: http://www.sii.cl/documentos/circulares/2007/circu30.htm accessed 12/12/11. Santiago.

Coelho, S. (2005). Brazilian sugarcane ethanol: lesson learned. Paper presented at the Workshop & Business Forum on Sustainable Biomass Production for the World Market, São Paulo.

Comisión nacional asesora (2007). Decree 109/2007 Biofuels. [Original in spanish: Decreto 109/2007] retrieved from http://www.ambiente.gov.ar/archivos/web/DNorAmb /File/Decreto_109%202007.pdf Accessed 15/09/12. Buenos Aires.

Law 2 About forest economy of the Nation and preservation of renewable natural resources. (Original in Spanish: Ley 2 Sobre economía forestal de la Nación y conservación de recursos naturales renovables.) http://www.minambiente.gov.co/documentos/ley_0002_161259.pdf, (1959).

Congreso de Ecuador. (2006). Law 2006-57. Organicg Law of creation of the ecuadorian investment fund in Energy and hydrocarbon sectors. [Original in Spanish: Ley No. 2006-57. Ley orgánica de creación del fondo ecuatoriano de inversión en los sectores Energético e hidro-carburífero -FEISEH] Retrieved from: http://revistavirtual.redesma.org/vol4/pdf/legislacion/Ecuador-Biocombustibles%20(Ley%202006-57).pdf Accessed 31/01/11. Quito.

Congreso de la República. (2003). [Original in Spanish: Ley De Promoción Del Mercado De Biocombustibles] Retrieved from: http://intranet2.minem.gob.pe/web/archivos/dgh/legislacion/l28054.pdf Accessed: 06/03/12. Lima, Peru.

Congreso Nacional de Bolivia. (2005). Law N. 3279 of December 9th of 2005. Ley N° 3279 del 9 de Diciembre de 2005. Retrieved from: http://revistavirtual.redesma.org/vol4/pdf/legislacion/Bolivia-Biocombustibles%20(Ley%203279).pdf Accessed 12/02/11. La paz.

Congreso Nacional de la República Dominicana. (2007). Law 57-07: Incentives law to Renewable energies and their special schemes of aplication [Original in Spanish: Ley No. 5707 sobre Incentivo al Desarrollo de Fuentes Renovables de Energía y de sus Regímenes Especiales.] Retrieved from: http://www.phlaw.com/pubs/rejec/sp/Ley_Energia_Renovable.pdf Accessed: 22/05/11. Santo Domingo.

Consejo de Ministros. (2007). [Original in Spanish: Reglamento para la comercialización de biocombustibles] Retrieved from: http://www2.osinerg.gob.pe/MarcoLegal/docrev/DS-021-2007-EM-CONCORDADO.pdf Accessed: 03/010. Lima, Peru.

Contexto Ganadero. (2014). Colombia, it is stuck in the Biofuels National program [Origianl in Spanish: Colombia, estancada en Programa Nacional de Biocombustibles] Retrieved from: http://www.contextoganadero.com/agricultura/colombia-estancada-en-programa-nacional-de-biocombustibles accessed 12/05/2014 Contexto Ganadero.

Contreras, C., & Rodríguez, M. (2006). Fundations and current use of ethanol anhydro as oxygenant of regular fuels in Costa Rica. [Original in Spanish: Fundamentos y situación actual del uso de etanol anhidro como oxigenante de gasolinas en Costa Rica] Retrieved from: http://www.mopt.go.cr/planificacion/centrotransferencia/RTM_06/Etanol.pdf Accessed 23/02/11. San José.

Corley, R. H. V., & Tinker, P. (2007). Care and Maintenance of Oil Palms The Oil Palm (pp. 287-325): Blackwell Science Ltd.

Corley, R. H. V., & Tinker, P. (2007). The Origin and Development of the Oil Palm Industry The Oil Palm (pp. 1-26): Blackwell Science Ltd.

Corley, R. H. V., & Tinker, P. (2008). The oil palm: Wiley-Blackwell.

Corpoica. (2011). Castor oil: productive enrgy and agroindustria alternative for Colombia. [Original in Spanish: Higuerilla, Aternativa productiva, Energetica, y agroindustrial para Colombia] Retreieved from: http://www.minagricultura.gov.co/archivos/presentacion_higuerrilla_navas.pdf Accessed: 12/05/12. Bogota, Colombia: Corpoica, MADR.

Corzo, G., Londoño-Murcia, M. C., Fonseca, C., Ramírez, W., Salamanca, B., Alcázar, C., Lasso, C. A. (2008). Identification of priority areas for preseravation in situ of biodiversity. (Original in Spanish: Identificación de áreas prioritarias para la conservación in situ de la biodiversidad.). In Corzo German et al. (Ed.), Environmental planning for the preservations of biodiversity in the operative areas of Ecopetrol located in Magdalena Medio and the Llanos orientales of Colombia (Originial in spanish: Planeación ambiental para la conservación de la biodiversidaden las áreas operativas de Ecopetrol localizadas en el Magdalena Medio y los Llanos Orientales de Colombia). Bogotá, Colombia: Instituto Alexander von Humboldt and Ecopetrol S.A.

□u□ek, L., Klemeš, J. J., & Kravanja, Z. (2012). A Review of Footprint analysis tools for monitoring impacts on sustainability. Journal of Cleaner Production, 34(0), 9-20. doi: http://dx.doi.org/10.1016/j.jclepro.2012.02.036

Chacón , J., & Gutiérrez , R. (2008, 20/12/2008). Controversia por precio de etanol (Controversy for ethanol price) http://www.elespectador.com/impreso/negocios/articuloimpreso100690-controversia-precio-de-etanol, El espectador.

Chartres, C. (1981). Land resources assessment for sugar-cane cultivation in Papua New Guinea. Applied Geography, 1(4), 259-271.

Cherubini, F., Bird, N. D., Cowie, A., Jungmeier, G., Schlamadinger, B., & Woess-Gallasch, S. (2009). Energy-and greenhouse gas-based LCA of biofuel and bioenergy systems: Key issues, ranges and recommendations. Resources, Conservation and Recycling, 53(8), 434-447.

Cherubini, F., & Strømman, A. H. (2011). Life cycle assessment of bioenergy systems: State of the art and future challenges. Bioresource Technology, 102(2), 437-451. doi: http://dx.doi.org/10.1016/j.biortech.2010.08.010

Christodoulidis, N. (2011). International Governance Options for the Sustainable Production of Biofuels. THE UNIVERSITY OF NEW SOUTH WALES - INSTITUTE OF ENVIRONMENTAL STUDIES, Sydney.

Chum, H., Faaij, A., Moreira, J., Berndes, G., Dhamija, P., Dong, H., & Others. (2011). Bioenergy IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation ed O Edenhofer et al: Cambridge: Cambridge University Press.

Dale, B. E., Allen, M. S., Laser, M., & Lynd, L. R. (2009). Protein feeds coproduction in biomass conversion to fuels and chemicals. Biofuels, Bioproducts and Biorefining, 3(2), 219-230.

DAMA. (2004). Atmospheric emissions of Bogotá Savannah. [Original in Spanish: Emisiones atmosfericas de la sabana de Bogotá]. . Bogota, Colombia: Departamento Administrativo del Medio Ambiente (DAMA).

DANE. (2005). National census 2005 [Original in Spanish: Censo nacional 2005]. Bogota, Colombia: Departamento Nacional de Estadistica (DANE).

DANE. (2009). Principales indicadores del mercado laboral: Febrero 2009 (Main Indicators of Labor Market: February 2009). Bogota: DANE, Departamento Administrativo Nacional de Estadística. (National Administrative Department of Statistics).

Dangond, I. (2013). Biofuels, without rules of the game . [Original in Spanish: Biocombustibles sin reglas de juego] Retrieved from: http://contextoganadero.com/columna/biocombustibles-sin-reglas-de-juego accessed at 13/12/13, Contexto Ganadero.

de Fraiture, C., & Berndes, G. (2009). Biofuels and water Biofuels: Environmental consequences and interactions with changin land use.

De Klein, C., Novoa, R. S., Ogle, S., Smith, K., Rochette, P., Wirth, T., Walsh, M. (2006). N2O emissions from managed soils, and CO2 emissions from lime and urea application. IPCC Guidelines for National Greenhouse Gas Inventories, Prepared by the National Greenhouse Gas Inventories Programme, 4.

Demirbas, A. (2007). Importance of biodiesel as transportation fuel. Energy Policy, 35(9), 4661-4670.

Demirbas, M. F. (2011). Biofuels from algae for sustainable development. Applied Energy, 88(10), 3473-3480.

DENC-SEIC. (2009). Biofuel in dominican Republic [Original in Spanish: Los biocombustibles en República Dominicana] Retrieved from: http://www.seic.gov.do/media/135701/marco%20legal%20de%20los%20biocombustibles.pdf Accessed: 12/06/12.

Department of Conservation. (2010). Annual Reports of the State Oil & Gas Supervisor, 2009-2000. . California, USA: Department of conservation.

Dickey, E. C., Shelton, D. P., Jasa, P. J., & Peterson, T. R. (1985). Soil erosion from tillage systems used in soybean and corn residues. TRANS. AM. SOC. AGRIC. ENG., 28(4), 1124-1129.

Dilek, F. B., Yetis, U., & Gökçay, C. F. (2003). Water savings and sludge minimization in a beet-sugar factory through re-design of the wastewater treatment facility. Journal of Cleaner Production, 11(3), 327-331. doi: 10.1016/S0959-6526(02)00029-X

Dincer, I., & Rosen, M. A. (1999). Energy, environment and sustainable development. Applied Energy, 64(1), 427-440.

Division of Oil & Gas. (2012). Lessee's Acreage Summary. Retrieved from http://dog.dnr.alaska.gov/Leasing/Documents/LeaseReports/Acreage_by_Owner_Summary.pdf. Alaska, USA: Department of Natural Resources.

DLD. (1992). Land Evaluation for Economic Crops Manual. Bangkok, Thailand: Department of Land Development.

DNP. (2005). CONPES 3343 Lineamientos y estategias de desarrollo sostenible para los sectores de agua, ambiente y desarrollo territorial (in Spanish) [Policy guidelines and sustainable development stratewgies for water, environment and terrtorial development]. (Conpes Document 3510). Bogotá: MAVDT, DNP, MHCP.

DNP. (2007). Vision Colombia 2019: Creating an enviromental management framework to promote sustainable development. Proposal for discussion [Original in Spanish: Vision Colombia 2019: Consolidar una gestion ambiental que promueva el desarrollo sostenible - Propuesta para discusion]. Bogota: Departamento Nacional de Planeacion.

DNP Departamento Nacional de Planeación [National Economic Planning Bureau]. (2008). Lineamientos de política para promover la producción sostenible de Biocombustibles en Colombia (in Spanish) [Policy guidelines to Promote Sustainable Biofuels Production in Colombia]. (Conpes Document 3510). Bogotá.

DNV. (2010). Biofuels 2020. A policy driven logistics and business challenge Retrieved from: http://www.dnv.com/binaries/biofuels%202020%20position%20paper_tcm4-434417.pdf Accesses at 19/12/13. Høvik, Norway.

Doherty, S., & Rydberg, T. (2002). Ecosystem properties and principles of living systems as foundation for sustainable agriculture – Critical reviews of environmental assessment tools, key findings and questions from a course process. Ekologist lantbruk, 32.

Dufey, A. (2006). Biofuels production, trade and sustainable development: emerging issues: Iied.

EC. (2003a). CAP reform. [Original in Spanish: Reforma de la PAC] Retrieved from: http://www.viaganadera.com/aseava/reformaPAC/articulos/29.pdf accessed 18/06/10. Madrid, Spain.

EC. (2003b). Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity. Retrieved from: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:283:0051:0070:EN:PDF accessed 12/05/11. Luxembourg.

EC. (2003c). Directive 2003/17/EC of the European Parliament and of the Council of 3 March 2003 amending Directive 98/70/EC relating to the quality of petrol and diesel fuels Retrieved from: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32003L0017:en:NOT Accessed 15/03/10. Brussels.

EC. (2003d). Directive 2003/30/ec of the European Parliament and of the Council of 8 may 2003 on the promotion of the use of biofuels or other renewable fuels for transport. Retrieved from: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:123:0042:0042:EN:PDF accessed 13/05/11. Brussels.

EC. (2008). Directive of the European parliament and of the council on the promotion of the use of energy from renewable sources Brussels, Belgium: Official Journal of the European Union.

EC. (2009). Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC. Strasbourg,: European Comission.

Ecopetrol. (2009). Refining and Petrochemistry Annual Report 2009 Retrieved from http://ecopetrol.com.co/english/especiales/Corporate%20Management%20and%20Finances%202009/finan-down.htm (05/08/10). Bogotá: Ecopetrol.

Ecopetrol. (2011). Evaluation of a Life cycle assessment of the Ecopetrol's fossil fuels (Original in Spanish: Evaluación del Análsis del Ciclo de Vida de los combustibles fósiles de Ecopetrol). Bogota: Ecopetrol.

EIA. (2009a). Colombia Energy Data, Statistics and Analysis - Oil, Gas, Electricity, Coal: EIA (Energy Information Administration).

EIA. (2009b). Petroleum statistics - Colombia. Retrieved from http://www.eia.gov/countries/country-data.cfm?fips=CO. Accesed (05/10/10).

EIA. (2012). Annual Energy Review 2011 Retrieved from: http://www.eia.gov/totalenergy/data/annual/pdf/aer.pdf Accessed 10/12/13. . Washington DC: EIA.

El Pais Newspaper. (2009). El valle producirá bioetanol con yuca (The valley will produce cassava-based ethanol), El Pais.

Ellis, R., & Merry, R. (2007). Chapter five: Sugarcane agriculture Sugarcane, Second Edition (pp. 101-142).

Eneas, G. (2006). Cassava, A biofuel, Tha Bahama Journal.

EPA. (1996). Bagasse combustion in sugar mills. Retrieved from http://www.epa.gov/ttn/chief/ap42/ch01/bgdocs/b01s08.pdf Accesed at: 15/06/11. In EPA (Ed.), Clearinghouse for Inventories & Emissions Factors: EPA.

EPA. (2010). Renewable Fuel Standard (RFS) Retrieved from: http://www.epa.gov/otaq/fuels/renewablefuels/index.htm Accessed 10/01/2010.

EPFL. (2008). Roundtable on Sustainable Biofuels Global: Principles and criteria for sustainable biofuels production. Version Zero. Lausanne, Switzerland: EPFL - Energy center.

Etter, A. (1993). General ecological characterization and human action in the amazon jungle. [Original in Spanish: Caracterización ecológica general y de la intervencion humana en la amazonía colombiana] Amazonia colombiana, diversidad y conflicto [Original in spanish: Colombian amazon, diversidad y conflicto]. Bogota: Colciencias.

EU-Comission. (2010). Communication from the Commission on the practical implementation of the EU biofuels and bioliquids sustainability scheme and on counting rules for biofuels. Retrieved from http://www.efoa.eu/en/document/2010-16002-communication-from-the-commission-on-the-practical-implementation-of-the-eu-biofuels-and-bioliquids-sustainability-scheme-and-on-counting-rules-for-biofuels.aspx Accessed at 23/10/11. Official Journal of the European Union.

Evans, G. (2007). Liquid Transport Biofuels - Technology Status Report. York: The National Non-Food Crops Centre, NNFCC.

Faaij, A. (2007). Biomass and Biofuels. Background Report for the Energy Council of the Netherlands. See also: http://www. energieraad. nl/Include/ElectosFileStreaming. asp.

Faaij, A. P. C., & Domac, J. (2006). Emerging international bio-energy markets and opportunities for socio-economic development. Energy for Sustainable Development, 10(1), 7-19.

Fadul, M. (N.D.). Report: Alliances for peace: The case of Indupalma. (Original in Spanish: Informe alianzas por la paz: el modelo Indupalma) Retrieved from: www.indupalma.com/
sites/default/files/gallery/Informe_Alianzas_por_la_Paz_fadul-esp.pdf Indupalma (Ed.)
Retrieved from http://www.indupalma.com/sites/default/files/gallery/Informe
_Alianzas_por_la_Paz_fadul-esp.pdf

Fahrig, L. (2003). Effects of habitats fragmentation on Biodiversity. Annual Review of Ecology, evolution and systematics. ProQuest Ecology Journals, 487.

Faist Emmenegger, M., Reinhard, J., & Zah, R. (2009). SQCB - Sustainability Quick Check for Biofuels: Background Report. Retreieved from http://rsb.epfl.ch/files/content
/sites/rsb2/files/Biofuels/Working%20Groups/GHG%20EG/SQCB_Background
_report_en.pdf Accessed at 21/11/11. Dübendorf, Switzerland: EMPA.

FAO. (1981). A framework for land evaluation (Retrieved 12/05/09) (Vol. 32). http://www.fao.org/docrep/X5310E/x5310e00.htm: FAO.

FAO. (2008). The State of Food and Agriculture. Biofuels: Prospects, risk and opportunities. Rome, Italy: FAO.

FAO and IIASA. (2007). Mapping biophysical factors that influence agricultural production and rural vulnerability. Rome: FAO.

FAOSTAT. (2009). Land availability and use. Retrieved from: http://faostat.fao.org/site/377/default.aspx#ancor Accessed: 05/07/09.

FAOSTAT. (2010). FAO Online Database: Crops production by country http://faostat.fao.org. Retrieved 12/01/2010, from FAO Statistic Division

FAOSTAT. (2011). Food and Agricultural commodities production (Sugarcane, Palm and other commodities) Retrieved from: http://faostat.fao.org/site/339/default.aspx Accessed at 02/09/11.

FAOSTAT. (2014). Fertilizers and pesticides Retrieved form http://faostat.fao.org/site/575/default.aspx#ancor Accessed 05/01/14.

Fargione, J., Hill, J., Tilman, D., Polasky, S., & Hawthorne, P. (2008). Land clearing and the biofuel carbon debt. Science, 319(5867), 1235-1238.

Fedebiocombustibles. (2010a). Biofuels today Bulletin of the Biofuel Colombian Federation [Original in Spanish: Biocombustibles hoy]Retrieved from http://www.fedebiocombustibles.com/files/boletin19.pdf Accessed: 12/11/11. In Fedebiocombustibles (Ed.), (Vol. 19). Bogota, Colombia.

FEDEBIOCOMBUSTIBLES. (2010b). Ongoing ethanol processing plants [Plantas productoras de Etanol en funcionamiento (in Spanish)]. Retrieved 30/06/10, 2010, from www.fedebiocombustibles.com

Fedepalma. (2000). Vision and strategy of the palm business in Cololmbia. [Original in Spanish: Visión y estrategias de la palmicultura colombiana: 2000-2020.]. Bogota, Colombia.

Fedepalma. (2004). Le apostamos al ALCA pero con reglas de juego claras (We bet on FTAA but with clear game rules). Palmas, 24(1), Editorial.

Fedepalma. (2006a). Fedepalma sectoral CDM Umbrella Project For methane capture, fossil fuel displacement and cogeneration of renewable energy–Project design document form (CDM PDD). Retreieved from www.dnv.com/focus/climate_change/Upload/FEDEPALMA%20 CDM%20PDD%20V2_13_03%2007%20(2).pdf Accessed at 12/04/10: CDM Executive Board.

Fedepalma. (2006b). The Oil Palm Agroindustry in Colombia. Bogota: FEDEPALMA.

Fedepalma. (2009). Statistical Annual report 2009 - The palm oil agri-business in Colombia and the world (Original in Spanish: - Anuario estadistico 2009 - la agroindustria de la palma de aceite en Colombia y el mundo). Bogota: Fedepalma.

Fedepalma, & MAVDT. (2011). Environmental guide for the Palm agribusiness industry in Colombia [Original in Spanish: Guía ambiental de la agroindustria de la palma de aceite en Colombia] Retrieved from http://portal.fedepalma.org/documen/2011/Guia_Ambiental.pdf Accessed 14/03/12.

Fehér, A., & Lýdia, K. (2005). An Analisys of Indicator for Sustainable Land use based on Research in Agricultural Landscape. In W. Leal Filho (Ed.), Handbook of Sustainability Research (Vol. 20, pp. 49-67): Peter Lang. Europäischer Verlag der Wissenchaften.

Fernández Acosta, A. D. (Producer). (2009, 12/05/12). Biofuels National Policy (Original in Spanish: Política Nacional de Biocombustibles). Retrieved from www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&ved =0CCwQFjAA&url=http%3A%2F%2Fwww.minagricultura.gov.co%2Farchivos%2 Fbiocombustibles_asamblea_bid_30_de_marzo_2009.ppt&ei=GmnHUOnLHoms9A SFl4H4DA&usg=AFQjCNF_jlz2Pm-zeO6TS45utp2tWhVccw Accessed: 12-05-12.

Finkbeiner, M. (2014). Indirect land use change–Help beyond the hype? Biomass and Bioenergy, 62, 218-221.

Fischer, G., Shah, M., van Velthuizen, H., & Nachtergaele, F. O. (2001). Global agro-ecological assessment for agriculture in the 21st century.

Forero, O. (2009). Sugarcane bagasse: Green oil of this century. [Original in Spanish: El bagazo de caña de azúcar, petróleo verde del siglo] Retrieved from: http://www.dinero.com/Imprimir/82610 Accessed 15/05/14, Dinero.

FPP. (2007). Promised land: Palm oil and land acquisition in Indonesia: Implications for local communities and indigenous peoples: Forest Peoples Programme (FPP).

Franklin, M., Zeka, A., & Schwartz, J. (2006). Association between PM2. 5 and all-cause and specific-cause mortality in 27 US communities. Journal of Exposure Science and Environmental Epidemiology, 17(3), 279-287.

Freitas Vian, C. E. (2005-2007). Sugarcane Pre-production. Features, Cilmate. (Original in portuguese: Cana-de-açúcar, Pré-produção, Características, Clima.) Retrieved from: http://www.agencia.cnptia.embrapa.br/gestor/cana-de-acucar/arvore/CONTAG01_11_711200516716.html accesed at 15/01/12. Brasilia DF, Brasil: Embrapa.

Frischknecht, R., Jungbluth, N., H, A., Doka, G., Heck, T., Hellweg, S., Wernet, G. (2007). Overview and Methodology - Data v2.0 Retrieved from: www.ecoinvent.org/fileadmin/documents/en/01_OverviewAndMethodology.pdf Accessed at 12/04/10 ecoinvent report No. 1. Dübendorf, Switzertland: Swiss Centre for Life Cycle Inventories.

Garcez, C. A. G., & Vianna, J. N. d. S. (2009). Brazilian Biodiesel Policy: Social and environmental considerations of sustainability. Energy, In Press, Corrected Proof.

García, M. L. (2008). Fondos de Estabilización de Precios, desde las normas de la competencia [Original in Spanish: Prices Stabilization Funds, from competition regulation perspective] Retrieved from: http://www.portafolio.co/archivo/documento/CMS-4103218 Accessed 04/04/12, Portafolio.

Garrido, A. (2007). Biofuel production in Peru. [Original in Spanish: La producción de Biodiesel en el Perú] Retrieved from: www.olade.org/biocombustibles2008/Documents/ponencias/d%C3%ADa3/Sesion%2010%20-%20Dia%203/AngieGarrido.pdf Accessed: 12/03 /11. Paper presented at the II Seminario Latinoamericano y del Caribe de Biocombustibles, Lima, Peru.

GBEP. (2009). The Global Bioenergy Partnership Common Methodological Framework for GHG Lifecycle Analysis of Bioenergy. Retrieved from www.globalbioenergy.org/fileadmin/user_upload/gbep/docs/2009_events/7th_SC_NY/GBEP_GHG_report_2306.pdf Accessed at 29/05/12. Rome, Italy: FAO.

Gerbens-Leenes, P., & Nonhebel, S. (2002). Consumption patterns and their effects on land required for food. Ecological Economics, 42(1), 185-199.

Germer, J., & Sauerborn, J. (2008). Estimation of the impact of oil palm plantation establishment on greenhouse gas balance. Environment, Development and Sustainability, 10(6), 697-716. doi: 10.1007/s10668-006-9080-1

Gibson, L. (2010). RFS2 reduces 2010 cellulosic ethanol requirement Retrieved from: http://www.biomassmagazine.com/articles/3474/rfs2-reduces-2010-cellulosic-ethanol
-requirement/. Biomass Magazine.

Gilbert, C. L. (2008). Value chain analysis and market power in commodity processing with application to the cocoa and coffee sectors. Commodity market review, 5-34.

Godfray, H. C. J., Beddington, J. R., Crute, I. R., Haddad, L., Lawrence, D., Muir, J. F., . . . Toulmin, C. (2010). Food security: the challenge of feeding 9 billion people. Science, 327(5967), 812-818.

Goedkoop, M., & Spriensma, R. (2007). The Eco-indicator 99: a damage oriented method for life cycle impact assessment. Methodology Report. Amersfoort, Netherlands, 2000.

Goh, K. J. (2000). Proceedings of the Seminar on Managing Oil Palm for High Yields : Agronomic Principles. Paper presented at the Seminar on Managing Oil Palm for High Yields, Malaysia.

Goldemberg, J. (2007). Ethanol for a Sustainable Energy Future. Science, 315(5813), 808-810. doi: 10.1126/science.1137013

Goldemberg, J., Coelho, S. T., & Guardabassi, P. (2008). The sustainability of ethanol production from sugarcane. Energy Policy, 36(6), 2086-2097.

Goldemberg, J., Coelho, S. T., Nastari, P. M., & Lucon, O. (2004). Ethanol learning curve–the Brazilian experience. Biomass and Bioenergy, 26(3), 301-304. doi: 10.1016/s0961-9534(03)00125-9

Gómez, E. A., Ríos, L. A., & Peña, J. D. (2012). Wood, Potencial Lignocellulosic Material for the Production of Biofuels in Colombia [Original in Spanish: Madera, un Potencial Material Lignocelulósico para la Producción de Biocombustibles en Colombia] retrieved from: http://www.scielo.cl/pdf/infotec/v23n6/art09.pdf Accessed 23/05/14. Información tecnológica, 23(6), 73-86.

Gomez, F. (2010). Current state and perspectives of biofuels in Dominican Republic [Original in Spanish: Estado actual y perspectivas de los biocombustibles en Republica Dominicana] Retrieved from: www.olade.org/biocombustibles/Documents/Ponencias%20Chile/Sesion %207_F%20Gomez_CNE_%20Rep%20Dominicana.pdf Accessed: 12/05/11. Santo Domingo.

Gonsalves, J. B. (2006). An assessment of the biofuels industry in India: UN.

González, A. F., Jiménez, I. C., Susa, M. R., Restrepo, S., & Gómez, J. M. (2008). Second generation biofuels and biodiesel: A brief review of the Universidad de los Andes contribution [Original in Spanish: Biocombustibles de segunda generación y Biodiesel: Una mirada a la contribución de la Universidad de los Andes]. Retrieved from: https://revistaing.uniandes.edu.co/pdf/a8%2028.pdf Accessed 25/04/2014. Revista de Ingeniería Universidad de los Andes(28), 70-82.

González, M. (2006). Biofuel formulation program. [Original in Spanish: Programa de formulación de biocombustibles.] Retrieved from: http://www.olade.org/eficiencia/Documents/PDF-22.pdf Accessed 15/03/12. Quito: Ministerio de Energía y minas,.

Gressel, J. (2008). Transgenics are imperative for biofuel crops. Plant Science, 174, 246–263.

Guinée, J. (2001). Handbook on life cycle assessment–operational guide to the ISO standards. The international journal of life cycle assessment, 6(5), 255-255.

Guinee, J. B., Heijungs, R., Huppes, G., Zamagni, A., Masoni, P., Buonamici, R., . . . Rydberg, T. (2010). Life Cycle Assessment: Past, Present, and Future†. Environmental Science & Technology, 45(1), 90-96.

Gunkel, G., Kosmol, J., Sobral, M., Rohn, H., Montenegro, S., & Aureliano, J. (2007). Sugar cane industry as a source of water pollution–Case study on the situation in Ipojuca River, Pernambuco, Brazil. Water, Air, & Soil Pollution, 180(1), 261-269.

Gurjar, B., Butler, T., Lawrence, M., & Lelieveld, J. (2008). Evaluation of emissions and air quality in megacities. Atmospheric Environment, 42(7), 1593-1606.

Guzman, J. L. (2009). En Colombia no modificarán el precio del etanol. "Ethanol price won't be modified in Colombia" http://www.biodiesel.com.ar/?p=1300. Retrieved 17/07/2009, from http://www.biodiesel.com.ar/?p=1300

Haas, M. J., McAloon, A. J., Yee, W. C., & Foglia, T. A. (2006). A process model to estimate biodiesel production costs. Bioresource Technology, 97(4), 671-678.

Habitat, U. (2008). State of the world's cities 2008/2009: Harmonious cities. Earthscan, London. 264pp.

Hamelinck, C. N., & Faaij, A. P. C. (2006). Outlook for advanced biofuels. Energy Policy, 34(17), 3268-3283.

Hampannavar, U., & Shivayogimath, C. (2010). Anaerobic treatment of sugar industry wastewater by Upflow anaerobic sludge blanket reactor at ambient temperature. International Journal of Environmental Sciences, 1(4), 631-639.

Hartley, C. W. S. (1988). Oil palm (Elaeis guineensis Jacq.) (Third edition ed.). New York: Wiley.

Hauschild, M., Jeswiet, J., & Alting, L. (2005). From Life Cycle Assessment to Sustainable Production: Status and Perspectives. CIRP Annals - Manufacturing Technology, 54(2), 1-21. doi: http://dx.doi.org/10.1016/S0007-8506(07)60017-1

Hebebrand, C., & Laney, K. (2007). An Examination of US and EU Government Support to Biofuels: Early Lessons. International Food & Agriculture Trade Policy Council.

Heriansyah. (2008). Optimizing the use of oil palm by-product (EFB) as fertilizer Supplement for oil palm. PT. BW Plantation tbk. Jakarta, Indonesia.

Hernandez, E. (2008). Comparative study of Biofuel legislation in Latin America. [Original in Spanish: Estudio Comparativo de La Legislación Latinoamericana sobre Biocombustibles] Retrieved from: http://www.snvla.org/mm/file/Estudio_Comparativo.pdf Accessed: 15/03/11. Tegucigalpa: SNV.

Hill, J. (2007). Environmental costs and benefits of transportation biofuel production from food-and lignocellulose-based energy crops. A review. Agronomy for Sustainable Development, 27(1), 1-12.

Hischier, R., Weidema, B., Althaus, H., Bauer, C., Doka, G., Dones, R., . . . Nemecek, T. (2010). Implementation of Life Cycle Impact Assessment Methods Retrieved from http://www.ecoinvent.org/fileadmin/documents/en/03_LCIA-Implementation-v2.2.pdf Accessed at 12/04/12 Ecoinvent report No. 3.

Hoffmann, M. (2006). Advances of Panama in the use of Biofuels. [Original in Spanish: Avances de Panamá en el uso de biocombustibles] Retrieved from: http://www.olade.org/eficiencia/Documents/PDF-22-7%20Panama.pdf Accessed: 02/06/11. Panamá: Ministerio de Comercio e Industrias.

Honty, G., & Gudynas, E. (2007). Agrocombustibles y Desarrollo Sostenible en América Latina y el caribe (Agrofuels and sustainable Development in Latin America and Caribbean) (pp. 34). Montevideo: Observatorio de Desarrollo.

Hopkins, S. (2008). Colombian FTA misses Biofuels., from http://www.greenchipstocks.com/articles/colombia-biofuels-investing/227

House of Representatives. (2002). Public Law 107-171. Farm Security And Rural Investment Act Of 2002 Retrieved from http://www.gpo.gov/fdsys/pkg/PLAW-107publ171/pdf/PLAW-107publ171.pdf Accessed 04/11/11.

Huertas Greco, K., & Sánchez Medina, I. A. (2012). Obtención y caracterización de biodiesel a partir de aceite de semillas de Ricinus communis.(Higuerilla) modificadas géneticamente y cultivadas en el Eje Cafetero [Original in Spanish: Production and Characterization of biodiesel from oil from Ricinnus Communis (repeseed) seeds, genetically modified and grown within the Coffee region] Retrieved from:

http://repositorio.utp.edu.co/dspace/bitstream/11059/3048/1/6626S211.pdf Accessed at: 23/05/14. UNIVERSIDAD TECNOLÓGICA DE PEREIRA, Pereira.

Hurtado, M., & Hernández-Salazar, G. A. (2010). Local Profile and Palm Tree Agro-Industry: Exploring the case of San Albert o and San Martin (Cesar). Cuad. Desarro. Rural, 125-145.

IDB, MME, MADR, MAVDT, & DNP. (2012). Strategies for Sustainable energy and biofuels in Colombia. [Original in Spanish: Estrategias de energía sostenible y biocombustibles para Colombia]. Medellin, Colombia.

IDEAM. (2001a). Colombia: First communication before United Nations Framework Convention on Climate Change. [Original in Spanish: Colombia: Primera Comunicación Nacional ante la Convención Marco de las Naciones Unidas sobre el Cambio Climático] Retrieved from http://unfccc.int/resource/docs/natc/colnc1.pdf accesed 12/05/10. Bogota, Colombia: IDEAM.

IDEAM. (2001b). The natural evironment in Colombia [Original in Spanish: El medio ambiente en Colombia]. Bogotá, Colombia: IDEAM.

IDEAM. (2004). Annual report on the environment and renewable resources in Colombia. [Original in Spanish: Informe anual sobre el estado del medio ambiente y los recursos naturales renovables en Colombia.]: IDEAM.ç

IDEAM (Cartographer). (2005a). Climate Atlas of Colombia . (Original in spanish: Atlas climatológico de Colombia).

IDEAM. (2005b). Solar Radiation Atlas of Colombia. Atlas de Radiación Solar de Colombia.

IDEAM (Cartographer). (2006). Wind and wind power Atlas of Colombia. (Original in spanish: Atlas de Vientos y Energía Eólica de Colombia).

IDEAM. (2007). Forest Ecosystem in zone of forest reserves, based on database of IGAC. (Original in Spanish: Ecosistemas de bosque en las Zonas reserva Forestal de Ley 2 de 1959 con base de da-tos de IGAC) Bogota: Ideam.

IDEAM. (2009a). Final document of the ecologic component within the framework of cosntruction of the suitability map of recommended areas for Palm oil cultivation. (Original in Spanish: Documento final del Componente ecologico en el marco de la construcción del mapa de aptitud de areas aptas para cultivo de palma de aceite en Colombia.) Bogota: Ideam.

IDEAM. (2009b). Introduction of enviromental criteria in the identification and characterization of suitable zones for palm oil cultivation. (Original in spanish: Incorporación de criterios ambientales en la identificación y caracterización de zonas aptas para el cultivo de palma de aceite programa de apoyo al SINA II). Bogota: Ideam.

IDEAM. (2009c). Socioeconomic and cultural component within the framework of the construction of a suitability map of the areas for palm oil cultivation. (Original in spanish: Componente Socioeconomico y Cultural en el marco de la construccion del mapa de aptitud de areas para el cultivo de palma de aceite en Colombia). Bogota: Ideam.

IDEAM. (2010). Water National Study (Original in Spanish: Estudio Nacional de l Agua) www.siac.gov.co/documentos/DOC_Portal/DOC_Agua/3_Estado/20120928_Estado_agua_ENA2010PrCap1y2.pdf Retrieved 12/03/11 Ideam (Ed.)

IDEAM, & MAVDT. (2007). Annual report on the environment and renewable resources in Colombia: air quality. [Original in Spanish: Informe anual sobre el estado del medio ambiente y los recursos naturales renovables en Colombia: Calidad del aire.]. Bogota: IDEAM

IDEAM, & MAVDT. (2011). Analysis of the impact of "La Niña" 2010-2011 within the hydroclimatology of Colombia. [Original in Spanish: Análisis del Impacto del Fenómeno "La Niña" 2010-2011 en la Hidroclimatología del País] Retrieved from: file:///C:/Users/Carlos/Downloads/Analisis%20impacto%20La%20Ni%C3%B1a.pdf Accessed at 24/08/2014. Bogota, Colombia.

IEA. (2010). World Energy Outlook (pp. 736pp). Paris, France: OECD/IEA.

IEA. (2011). Oil in Colombia in 2009 (Retrieved from: http://iea.org/stats/oildata.asp?COUNTRY_CODE=CO. accessed 21/11/12).

IGAC. (2003). General study of soils 1:500.000 (Original in Spanish: Estudio General de suelos 1:500.000). Bogota: IGAC.

IGAC (Cartographer). (2005). Road Infrastructure Map (Original in Spanish: Vias terrestres).

IGAC (Cartographer). (2010). Indigenous reserves and collective titles for black communities. (Original in Spanish: Resguardos indigenas y titulos colectivos de comunidades negras).

IGAC and CORPOICA. (2002). Cover and current use of land in Colombia (Original in spanish: Cobertura y uso actual de las tierras de Colombia).

Infante, A. (2008). National biofuels program. An answer to the energy challenge. [Original in Spanish: El Programa Nacional De Biocombustibles. Una Respuesta al desafío Energético] retrieved from http://www.colombiaaprende.edu.co/html/directivos/1598/article-157195.html Accessed at 6/05/14. Paper presented at the Seminario Internacional Sobre Políticas De Ciencia, Tecnología E Innovación, Bogotá.

Infante, A., & Tobón, S. (2010). BIOENERGÍA PARA EL DESARROLLO SOSTENIBLE: Políticas Públicas sobre Biocombustibles y su relación con la seguridad alimentaria en Colombia [Original in Spanish: Bioenergy for Sustainable Development: Public policies on biofuels and their impact on food security in Colombia]: FAO.

IPCC. (2006). Guidelines for National Greenhouse Gas Inventories - Volume 4 Agriculture, Forestry and Other Land Use. Retreived from: http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.html. 21/04/11 IPCC.

ISO. (2006). ISO 14040:2006 Environmental management –Life cycle assessment– Principles and framework. Geneva, Switzerland.

ISRIC-WSI. (2005). Development of a soil and terrain database for Latin America and the Caribbean (SOTERLAC) Retireved from http://www.isric.org/projects/soter-latin-america-and-caribbean-soterlac Accessed at 15/05/10.

James, G. L. (2007). An Introduction to Sugarcane Sugarcane (pp. 1-19): Blackwell Publishing Ltd.

Jatzke, H. (1994). Possibilities and limits of tax concessions for bio-fuels. Zeitschrift für Zölle und Verbrauchsteuern, 70(4), 104-108.

Johnson, F. X. (2011). Regional-global Linkages in the Energy-Climate-Development Policy Nexus: The Case of Biofuels in the EU Renewable Energy Directive. Renewable Energy L. & Pol'y Rev., 91.

Johnson, F. X., & Roman, M. (2008). Biofuels sustainability criteria: relevant issues to the proposed Directive on the promotion of the use of energy from renewable sources (COM (2008) 30 final).

Johnson, F. X., & Rosillo-Calle, F. (2007). Biomass, livelihoods and international trade. Stockholm Environment Institute Climate and Energy Report, 1.

Jonker, J., & Faaij, A. (2013). Techno-economic assessment of micro-algae as feedstock for renewable bio-energy production. Applied Energy, 102, 461-475.

Jungbluth, N., Chudacoff, M., Dauriat, A., Dinkel, F., Doka, G., Faist Emmenegger, M., Sutter, J. (2007). Life Cycle Inventories of Bioenergy. Final report. Uster, Switzerland: Swiss Centre for Life Cycle Inventories.

Kaplinsky, R., & Morris, M. (2001). A handbook for value chain research (Vol. 113): IDRC.

Keerthipala, A., & Thomson, K. (1999). A cane payment formula for sugarcane small-holders in Sri Lanka. Sugar Tech, 1(1), 1-9.

Khan, S. R., Khan, S. A., & Yusuf, M. (2007). Biofuels trade and sustainable development: The case of Pakistan. The Sustainable Development Policy Institute (SDPI), Working document.

Khatiwada, D., Pacini, H., & Lönnqvist, T. (2010). Tailor-made solutions: Small-scale biofuels and trade. Bridges Trade BioRes Review, 4(4), 10-11.

Khatiwada, D., Seabra, J., Silveira, S., & Walter, A. (2012). Accounting greenhouse gas emissions in the lifecycle of Brazilian sugarcane bioethanol: Methodological references in European and American regulations. Energy Policy, 47, 384-397.

Kuppatawuttinan, P. (1998). A model of Land Suitability Evaluation for Economic Crops in Song Kram Watershed: An Application using Satellite Data and Geographic Information System. Master of Science Thesis in Soil Science, Graduate School, Khon Kaen University.[ISBN 974-676-039-4].

La Rotta, S. (2009, 22 julio 2009). La bacteria verde (The green bacteria), El espectador.

Lamers, P., Hamelinck, C., Junginger, M., & Faaij, A. (2011). International bioenergy trade–A review of past developments in the liquid biofuel market. Renewable and Sustainable Energy Reviews, 15(6), 2655-2676.

Lamers, P., Junginger, M., Hamelinck, C., & Faaij, A. (2012). Developments in international solid biofuel trade–An analysis of volumes, policies, and market factors. Renewable and Sustainable Energy Reviews, 16(5), 3176-3199.

Larsen, B. (2004). Cost of Environmental Damage: A Socio- Economic and Environmental Health Risk Assessment (Prepared for MAVDT). Bogota, Colombia: MAVDT.

León, T., Valbuena, S., & Borrero, M. (2006). Palm oil, biodiversity and policy trends: the Colombian Orinoco case. [Original in Spanish: Palma de aceite, biodiversidad y tendencias de política: el caso de la Orinoquia colombiana]. In W. W. Fund (Ed.). Bogotá: Instituto de Investigaciones de Recursos Biológicos Alexander Von Humboldt.

Londoño, L. (2012). General facts of the Colombian Sugar Business Industry 2011-2012. [Original in Spanish: Aspectos Generales del Sector Azucarero Colombiano 2011 – 2012] Retrieved from: http://www.asocana.org/documentos/3152012-3e90e415-00ff00,000a000,878787,c3c3c3,0f0f0f,b4b4b4,ff00ff,2d2d2d,b9b9b9.pdf. Accessed 15/09/12. Cali, Colombia.

López, N. A. (2000). La palma de aceite: un caso exitoso de desarrollo empresarial en Colombia (In Spanish) [Palm oil: a successful case of entrepreneurship in Colombia] Retrieved from: http://portal.fedepalma.org/responsabilidad_social/palma_aceite_caso_exitoso.pdf Accessed at 17/10/11. Palmas, 21(2), 132-141.

Lorenzo de Juárez, A. (2011). Current situation of Biofuels in Guatemala. [Original in Spanish: Situación Actual de los Biocombustibles en Guatemala] Retrieved from: www.corpoica.org.co/sitioweb/Documento/JatrophaContrataciones/GUATEMALA.pdf accessed 15/03/12. Guatemala.

Lovera, L. (2010). Biofuel in Paraguay: Current State and perspectives. [Orinigal in Spanish: Biocombustibles en el Paraguay Situación actual y perspectivas] Retrieved from: www.olade.org/biocombustibles/Documents/Ponencias%20Chile/Sesion%207_L%20Lovera_VMME_Paraguay.pdf Paper presented at the V Seminario Latinoamericano y del Caribe de Biocombustibles, Santiago, Chile.

Lozano, N. (2003). Air pollution in Bogotá (Colombia): A concentration Response approach. Master Thesis., University of Maryland, Maryland.

Lozano, N. (2004). Air Pollution in Bogotá, Colombia: A Concentration-Response Approach. Desarrollo y Sociedad. (Development and Society) Universidad de los Andes CEDE, 133-177.

Lu, J., Sheahan, C., & Fu, P. (2011). Metabolic engineering of algae for fourth generation biofuels production. Energy & Environmental Science, 4(7), 2451-2466. doi: 10.1039/C0EE00593B

Lubis, A., & Adiwiganda, R. (1996). Agronomic management practices of oil palm plantation in Indonesia based on land conditions. Paper presented at the Seminar on Agronomic Update in Oil Palm Management, Pekanbaru, Indonesia.

Lyutse, S. (2011). Out with the old, in with the new; bidding farewell to the corn ethanol tax credit.

Macedo, I. C. (2010). Sustainable Biofuels: recent studies on land use and climate change. Sugarcane expansion and sustainability: land use, GHG emissions and technology. Tokyo, Nov 19 2010: NIPE/UNICAMP.

Macedo, I. C., Seabra, J. E. A., & Silva, J. E. A. R. (2008). Green house gases emissions in the production and use of ethanol from sugarcane in Brazil: The 2005/2006 averages and a prediction for 2020. Biomass and Bioenergy, 32(7), 582-595.

MADR. (2005). Vegetable oil chain in Colombia. Overview of its structure and dynamics 1991-2005. [Original in Spanish: La cadena de las oleaginosas en Colombia. Una mirada global de su estructura y dinámica 1991-2005] Retrieved from: www.agronet.gov.co/www/docs_agronet/2005112162648_caracterizacion _oleaginosas.pdf Accessed 20/02/10. Bogota: Ministerio de Agricultura y Desarrollo Rural,.

MAG-MINAE. (2008). Biofuels National Program. [Original in Spanish: Programa Nacional de Biocombustibles.] Retrieved from www.dse.go.cr/es/03Publicaciones/01PoliticaEnerg/ Programa%20Nacional%20de%20Biocombustibles.pdf Accessed: 09/03/11. San José de Costa Rica.

Mannan, R. (2009). Intellectual property landscape and patenting opportunity in biofuels. Journal of Commercial Biotechnology, 16(1), 33-46.

Manson, A. (2003). Colombia's Democratic Security Agenda: Public Order in the Security Tripod. Security Dialogue, 34, 391-409.

MANUELITA WEBSITE. (2010). www.manuelita.com. Retrieved 18/01/2010, 2010

Martines-Filho, J., Burnquist, H. L., & Vian, C. E. F. (2006). Bioenergy and the rise of sugarcane-based ethanol in Brazil. Choices, 21(2), 91-96.

Martinez, H. (2009). Biofuels program in Colombia (public speech). [Original in Spanish: El programa de Biocombustibles en Colombia] Retrieved from: www.olade.org/biocombustibles2009/Documents/ponencias/ponencias%20pdf/2009-04-28-Discurso%20Ministro%20Colombia.pdf. Paper presented at the IV Seminario Latinoamericano Del Caribe De Biocombustibles, Cali.

Martinez, H., Espinal, G., & Ortiz, L. (2005). The agribusiness Chain of Panela in Colombia, an overview on its structure and dynamics. [Original in Spanish: La cadena agroindustrial de la panela en Colombia, una mirada global de su estructura y dinámica, 1991 – 2005]. Retrieved from: http://ebookbrowse.com/20051121163343-caracterizacion-panela-pdf-d55602836 Accessed 16/10/10 (Vol. 57). Bogota, Colombia: Ministerio de Ambiente y Desarrollo Rural.

Masera, O., Rodríguez, N., Lazcano, I., & Horta, L. (2006). Potential and feasability of Ethanol and Biodiesel use for transportation in Mexico. [Original in Spanish: Potenciales y Viabilidad del Uso de Bioetanol y Biodiesel para el Transporte en México] Retrieved from: http://www.sener.gob.mx/res/169/Biocombustibles_en_Mexico_Resumen_Ejecutivo.pdf Accessed: 15/03/12. Mexico D.F.: GTZ.

Mathews, J. (2007a). Biofuels: What a Biopact between Nort and South could achieve. Energy Policy, 35, 3550-3570.

Mathews, J. (2007b). Biofuels: What a Biopact between North and South could achieve. Energy Policy, 35(7), 3550-3570.

Mathews, J. (2007c). Biofuels: What a Biopact between North and South could achieve. Energy Policy, 35, 3550-3570.

Mathews, J. (2008a). Carbon-Negative Biofuels. Energy Policy, 36, 940-945.

Mathews, J. (2008b). How carbon credits could drive the emergence of renewable energies. Energy Policy.

Mathews, J. (2009). From the petroeconomy to bioeconomy: integrating bioenergy production with agricultural demands. Biofuels, bioprod. bioref, 3, 613-632.

Mathews, J., & Goldsztein, H. (2008). Carpturing latecomer advantages in the adoption of Biofuels: The case of Argentina. Energy Policy. doi: 10.1016/jpenpol.2008.07.022

Mathews, J., & Tan, H. (2009a). Biofuels and indirect land change effects: the debate continues. Society of Chemical Industry John Wiley & Sons Ltd. Biofuels, Bioprod, Bioref. doi: 10.1002/bbb.147

Mathews, J., & Tan, H. (2009b). Biofuels and indirect land use change effects: the debate continues. Biofuels, Bioproducts and Biorefining, 3(3), 305-317.

Mathews, J. A. (2008). Biofuels, climate change and industrial development: can the tropical South build 2000 refineries in the next decade? Biofuels, Bioproducts and Biorefining, 2, 103-125. doi: 10.1002/bbb.63

McBratney, A., Whelan, B., Ancev, T., & Bouma, J. (2005). Future directions of precision agriculture. Precision Agriculture, 6(1), 7-23.

ME-BID. (2008). Pre-feasability studies of Ethanol production by use of sugar cane. [Original in spanish: Estudios de pre-factibilidad de la producción de etanol utilizando caña de azúcar.] Retrieved from : http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=35237968. accessed 04/09/12. San Salvador.

Mejía, D., & Posada, C. E. (2008). Cocaine Production and Trafficking: What Do We Know? World Bank Policy Research Working Paper 4618.

MEN. (2008). Support to research in Biofuels [Original in Spanish: Apoyo a la investigación en biocombustibles] Retreived from: http://www.mineducacion.gov.co/cvn/1665/article-152017.html Accessed at: 05/01/14. Boletin digital.

Meneses, K., & Valenciano, J. (2007). Fuel alternative sources in Costa Rica: General overview of the molasses-based ethanol and palm oil-based biosieles chains. [Original in Spanish: Fuentes alternativas de combustibles en Costa Rica: Una visión general de las cadenas de etanol a base de melaza, y de biodiésel a base de aceite de palma.] Retrieved from: http://biblioteca.icap.ac.cr/rcap/52_53/karla_meneses.pdf. Accessed 13/07/12. Revista Centroamericana de Administración Pública, 52-53, 97-140.

Mesa-Dishington, J. (2007). Palm oil biodiesel, a fact in Colombia [Original in Spanish: Biodiésel de Palma, una Realidad en Colombia] Retrieved from: http://portal.fedepalma.org//documen/2007/Presentacion_Fedepalma.pdf. Paper presented at the Biofuels Americas Conference & Expo III, Cartagena, Colombia.

Mesa Dishington, J. (2010). Reality and perspectives of the palm oil agroindustry. [Original in Spanish: Realidad y perspectivas de la agroindustria de la palma de aceite.] Retrieved from: http://www.indepaz.org.co/blogs/palma/wp-content/uploads/2012/09/municipios_palmeros.pdf. Accessed at 04/05/14. Paper presented at the PRIMER ENCUENTRO DE MUNICIPIOS PALMEROS, Bogota.

Metzger, M., Rounsevell, M., Acosta-Michlik, L., Leemans, R., & Schröter, D. (2006). The vulnerability of ecosystem services to land use change. Agriculture, ecosystems & environment, 114(1), 69-85.

MIDAS. (2010). De Las Alianzas Productivas a los Negocios Inclusivos: Guía de Mejores Prácticas para la implementación de Negocios Inclusivos en palma de aceite [Original in Spanish: From productive alliances to inclusive business: Guide for Better practices for Inclusive Business implmentation in the palm oil sector] Retreived from: http://www.mapeo-rse.info/sites/default/files/De_las_alianzas_productivas_a_los.pdf Accessed at 05/07/10 Fedepalma (Ed.)

Mielke, I. (2008). Oil World Annual 2008. Hamburg: ISTA Mielke GmbH.

Miller, A. S., Mintzer, I. M., & Hoagland, S. H. (1986). Growing power: Bioenergy for Development and Industry: World Resources Institute.

Ministerio de Agricultura. (2007). Oportunidades para la Equidad Rural: Alianzas productivas. [Original in Spanish: Opportunities to reach rural equity: Productive Alliances] Retreived from: http://www.minagricultura.gov.co/02componentes/08rur_04alianzas.aspx Accessed at 05/07/10.

Ministerio de Agricultura. (2011). Proyecto Apoyo alianzas productivas: Firma protocolaria de Alianzas Productivas en zonas emblemáticas del país [Original in Spanish: Support to Productive Alliances: Protocolary signature of Productive Alliances in emblamatic regions across the nation] Retreived from:http://www.minagricultura.gov.co/archivos/presentacion _alianzas_productivas.pdf Accessed at 05/02/12. Bogota.

Ministerio de Energía de Chile. (2012). Biofuel National Directory [Original in Spanish: Directorio Nacional de Biocombustibles] Retrieved from: http://biocombustible.minenergia.cl/dhtml/cne/paginas/index.php. Retrieved 12/01/13, 2013

Ministerio de Energía y Minas. (2007). Current situation and perspectives of biofuels industry in Peru. [Original in Spanish: Situación Actual y Perspectivas de los Biocombustibles en el Perú] Retrieved from: http://www.comunidadandina.org/desarrollo/biocombustibles_peru.pdf Accessed: 02/11/11.

Ministerio de Minas. (2005). Regulation on the law of promotion of biofuels market. [Original in Spanish: Reglamento de la ley de promoción del mercado de biocombustibles] Retrieved from: www.minem.gob.pe/minem/archivos/file/Hidrocarburos/normas_legales/ ds013-2005.pdf Accessed: 02/03/10. Lima. Peru.

Resolution 181232 of 2008 [Original in Spanish: RESOLUCION 181232 DE 2008] Retrieved from: faolex.fao.org/docs/texts/col83372.doc Accessed at 15/12/13 (2008).

Ministry of Housing, & environment, S. p. a. t. (2000). Eco-indicator 99 - Manual for designers. A damage orieted method for Life Cycle Impact Assessment. Retrieved from http://www.pre-sustainability.com/download/manuals/EI99_Manual.pdf accessed at 14/03/11. The Netherlands.

Mirón, d. (2010). Ethanol biofuel in Guatemana. [Original in Spanish: El biocombustible etanol en Guatemala] Retrieved from: www.oas.org/dsd/Energy/Documents/SimposioG/1%20 Panel%20I%20Etanol.pdf Accessed 15/03/12.

Mondragón, H. (2007). The sugarcane industry in Colombia. Retrieved from http://base.d-p-h.info/en/fiches/dph/fiche-dph-7797.html Acessed at 09/07/10.

Monsalve Gil, J. F., Medina de Pérez, V. I., & Ruiz Colorado, Á. A. (2006). Ethano production of Banana shell and cassava starch. [Origianl in spanish: Producción de etanol a partir de la cáscara de banano y de almidón de yuca] Retrieved from: http://www.bdigital.unal.edu.co/10960/1/johnfredymonsalvegil.2006.pdf accessed 23/05%14. Dyna, 73(150), 21-27.

Moor, G., & Wynne, A. (2001). Economic maximisation of grower and miller sugar cane profits: optimising the length of milling season at South African sugar factories. Paper presented at the International Society of Sugar Cane Technologists. Proceedings of the XXIV Congress, Brisbane, Australia, 17-21 September 2001. Volume 1.

Morton, O. (2008). Eating the sun. How plants power the planet: Harper.

Mosquera Montoya, M., Bernal Hernández, P., & Silva Carreño, Á. (2009). Agenda Prospectiva de Investigación y desarrollo Tecnológico de la Oleína Roja [Original in Spanish: "Research and Technological Foresight Agenda for red palm oil"] Retreived from:
http://www.agronet.gov.co/www/docs_agronet/2009424103533_OLEINA.pdf
accessed at 20/06/2011. Bogotá, D.C.: MADR, Universidad Nacional de Colombia, Cenipalma, Fedepalma.

Mutert, E. (1999). Suitability of Soils for Oil Palm in Southeast Asia. Better Crops International, 13(1), 30-38.

Netafim. (2011a). Crop Growth Phases http://www.sugarcanecrops.com/crop_growth_phases/.

Netafim. (2011b). Favourable climate conditions for sugarcane production (Original in portuguese: Clima favorável à produção de cana-de-açúcar) Retrieved from http://www.sugarcanecrops.com/p/climate/ Accesseed 12/04/12. Retrieved 05/06/10, 2011

Neumann, K., Verburg, P. H., Stehfest, E., & Müller, C. (2010). The yield gap of global grain production: A spatial analysis. Agricultural Systems, 103(5), 316-326.

Nicolella, A. C., & Belluzzo, W. (2011). Impact of reducing the pre harvest burning of sugar-cane area on respiratory health in Brazil. Paper presented at the Anais do XXXVIII Encontro Nacional de Economia [Proceedings of the 38th Brazilian Economics Meeting].

Norman, R., Cairncross, E., Witi, J., Bradshaw, D., & Collaboration, S. A. C. R. A. (2007). Estimating the burden of disease attributable to urban outdoor air pollution in South Africa in 2000. South African Medical Journal, 97(8), 782-790.

Northoff, E. (2005). Cattle ranching is encroaching on forests in Latin America. Retrieved from: http://www.fao.org/newsroom/en/news/2005/102924/index.html Accessed at: 19/12/13. FAONewsroom.

O'Brien, P. J. (1997). Global Processes and the Politics of Sustainable Development in Colombia and Costa Rica. In R. Auty & K. Brown (Eds.), Approaches to Sustainable Development: Pinter.

Ogunkunle, A. O. (1993). Soil in land suitability evaluation: an example with oil palm in Nigeria. Soil Use and Management, 9(1), 35-39. doi: 10.1111/j.1475-2743.1993.tb00925.x

Ojima, D., Galvin, K., & Turner, B. (1994). The global impact of land-use change. BioScience, 300-304.

Omer, A. M. (2008). Energy, environment and sustainable development. Renewable and Sustainable Energy Reviews, 12(9), 2265-2300.

Ortega, G., Cárdenas, C., Recalde, P., & Cazco, P. (2007). Biofuels. [Original in Spanish: Biocombustibles] Retrieved from: www.comunidadandina.org/desarrollo/biocombustibles _ecuador.pdf Accessed 12/03/11. Quito.

Ospina, M. (Producer). (2008). Fluvial transport in colombia (Original in Spanish: La navegacion fluvial en Colombia) Retrieved from: www.google.com/url?sa=t&rct=j&q= &esrc=s&source=web&cd=9&ved=0CFMQFjAI&url=http%3A%2F%2 Fwww.oas.org%2Fcip%2Fdocs%2Fareas_tecnicas%2F11_des_puert_fluv_y_lacustres %2F10_la_nav_fluv_colombia.ppt&ei=0QLBUImyFoHO9QTctYGoAQ&usg=AFQ jCNFmLJD0tvovQNXWPP9NIvMx17HfIg&cad=rja Accessed 02/06/2011.

Oxford Analytica. (2007, 02/02/2007). Bush Outlines '20 In 10' Energy Plan. Forbes.com.

Paiboonsak, S., Chanket, U., Yommaraka, B., & Mongkolsawat, C. (2004). Land Suitability Evaluation For Sugarcane: GIS Application Centre of Geo-informatics, Northeast Thailand. Khon Kaen Province.

Parques Nacionales Naturales de Colombia. (2011). What is the national system of protected areas? (Original in Spanish: ¿Qué es el Sistema Nacional de Áreas Protegidas?) Retrieved from www.parquesnacionales.gov.co/PNN/portel/libreria/php/decide.php?patron=01.11 Accesed at 24/09/11. Bogota: MinAmbiente.

Patiño, C. (2010). Microalgae, another option to produce biofuels [Original in Spanish: Microalgas, otra opción para producir biocombustible] Retrieved from www.unperiodico.unal.edu.co/dper/article/microalgas-otra-opcion-para-producir -biocombustible.html Accessed: 23/02/11, UN Periodico.

Perez, M. (2007). International trade and environment in Colombia: review from Ecology economics [Original in Spanish: Comercio internacional y medio ambiente en Colombia: mirada desde la economia ecológica]. Cali, Colombia: Universidad del Valle.

Perez, M., Rojas, J., & Ordoñez, C. (2010). Sustainble development, principles, aplications and policy guidelines for Colombia. [Original in Spanish: Desarrollo Sostenible, principios, aplicaciones y lineamientos de política para Colombia]. Cali, Colombia.: Universidad del Valle.

Pérez, M., Rojas, J., & Ordoñez, C. (2010). Sustainable development: Principles, aplications and policy guidelines for Colombia [In Spanish: Desarrollo sostenible: principios, aplicaciones y lineamientos de política para Colombia] (1st ed.). Cali, Colombia: Universidad del Valle.

Pfister, S., Koehler, A., & Hellweg, S. (2009). Assessing the environmental impacts of freshwater consumption in LCA. Environmental Science & Technology, 43(11), 4098-4104.

Pimentel, D. (2003). Ethanol Fuels: Energy Balance, Economics, and Environmental Impacts Are Negative. Natural Resources Research, 12(2), 127-134. doi: 10.1023/a:1024214812527

Pinzon, L. (2009). Colombian Sugar Market Outlook. Retrieved from www.thebioenergysite.com /articles/contents/colombia.pdf Accessed at 23/10/11 GAIN Report Number: CO9012: USDA.

Piñeros, Y., Rincón, L., Bourdon, A., & Velásquez, M. (2009). Assessing ethanol production from palm wastes pretreated with NaOCl, using hydrolysis and fermentation simultanouesly. [Original in Spanish: Evaluación de la producción de etanol a partir de residuos de palma pretratados con NaOCl, mediante hidrólisis y fermentación simultáneas] Retrieved from: www.smbb.com.mx/congresos%20smbb/acapulco09/TRABAJOS/AREA_IX/CIX-14.pdf Accessed: 25/04/2014. Paper presented at the XIII Congreso Nacional de Biotecnología y Bioingeniería. VII Simposio Internacional de Producción de Alcoholes y Levaduras.

Prada Owen, T. (2004). Welfare Analysis of the implementation of the Sugar Price Stabilization Fund in Colombia. [Original in Spanish: Análisis del efecto en el bienestar de la incorporación del fondo de estabilización de precios del azúcar en Colombia.] Retrieved from: http://fen.uahurtado.cl/wp-content/uploads/2010/07/inv158.pdf Accessed : 16/12/13. Santiago, Chile.

Prada, T. (2004). Analysis in the welfare effect through the incorporation of the Sugar Price Stabilization Fund in Colombia [Original in Spanish: Análisis del efecto en el bienestar de la incorporación del fondo de estabilización de precios del azúcar en Colombia] Retrieved from: http://fen.uahurtado.cl/wp-content/uploads/2010/07/inv158.pdf Accessed 13/08/09. Georgetown University, Georgetown.

PRé Consultant. (2010). SimaPro 7.2.3 LCA software. Amersfoort, Netherlands.

PROEXPORT. (2012). Biofuels sector in colombia. [Original in Spanish: Sector de biocombustibles en Colombia] Retrieved from: http://www.inviertaencolombia.com.co/images/Perfil_Biocombustibles_2012.pdf. accessed at 15/12/13. Bogota.

PROEXPORT. (2013). Investment in the Biofuel sector in Colombia [Original in Spanish: Inversión en el sector de Biocombustibles en Colombia] Retrieved from: http://www.inviertaencolombia.com.co/sectores/agroindustria/biocombustibles.html Accessed at 03/01/14.

Publicaciones Semana. (2010). Ethanol plants sink [Original in Spanish: Plantas de etanol 'hacen agua'] Retrieved from: http://www.dinero.com/edicion-impresa/investigacion/articulo/plantas-etanol-hacen-agua/104313 Accessed at: 15/05/14, Dinero.

Ramirez-Villegas, J., Salazar, M., Jarvis, A., & Navarro-Racines, C. E. (2012). A way forward on adaptation to climate change in Colombian agriculture: perspectives towards 2050. Climatic Change, 115(3-4), 611-628.

Ramírez Triana, C. A. (2010). Biocombustibles: seguridad energética y sostenibilidad. Conceptualización académica e implementación en Colombia [Biofuels: energy security and sustainability: Academic discussion and its implementation in Colombia]. Punto de Vista, 2, 43-79.

Ramírez Triana, C. A. (2011). Energetics of Brazilian ethanol: Comparison between assessment approaches. Energy Policy, 39(8), 4605-4613.

Ravindranath, N., Balachandra, P., Dasappa, S., & Usha Rao, K. (2006). Bioenergy technologies for carbon abatement. Biomass and Bioenergy, 30(10), 826-837.

REDAIRE. (2003). Atmospheric emissions for Bucaramanga [Original in Spanish: Emisiones atmosfericas para Bucaramanga]. Retrieved from www.cdmb.gov.co/monitoreo.redaire.php.

Rojas R, J. C. (2008). Colombian Plan for Research, development and innovation of Biofuel sector. [Original in Spanish: Plan Colombiano de Investigación,Desarrollo e Innovación en Biocombustibles] Retrieved from www.corpoica.org.co/sitioweb/Documento/Jatropha Contrataciones/JCARLOSROJAS.pdf Accessed at 05/01/14. Paper presented at the Biocombustibles Colombia 2008, Bogota.

Romero, M., Cabrera, E., & Ortiz, N. (2008). Report on the Biodiversity status in Colombia 2006-2007. [Original in Spanish: Informe sobre el estado de la Biodiversidad en Colombia 2006-2007.] Retrieved from www.humboldt.org.co/download/Informe_Nacional _biodiversidad_I.pdf. Bogota.: IIAvH.

Romijn, H. A. (2011). Land clearing and greenhouse gas emissions from Jatropha biofuels on African Miombo Woodlands. Energy Policy, 39(10), 5751-5762.

Rost, S., Gerten, D., Hoff, H., Lucht, W., Falkenmark, M., & Rockström, J. (2009). Global potential to increase crop production through water management in rainfed agriculture. Environmental Research Letters, 4(4), 044002.

Rothkopf, G. (2007). A Blueprint for Green Energy in the Americas. Strategic Analysis of Opportunities for Brazil and the Hemisphere: IDB.

Rutz, D., Janssen, R., Anton, H., Helm, P., Rogat, J., Hodes, K., & et al. (2008). Biofuels assesment on technical opportunities and research needs for Latin America: BioTop. Biofuels RTD-cooperation Latin America-Europe.

Rutz, D., Thebaud, A., Janssen, R., Segura, S., Riegelhaupt, E., Ballesteros, M., Coelho, S. (2009). Biofuel Policies and Legislation in Latin America, BioTop Project. Seventh Framework Programme, European Commission.

Ryan, D. (2006). Cuban Oil And Ethanol Could Prosper In Havana's Hunt For Energy Supplies. Retrieved from http://www.coha.org/cuban-oil-and-ethanol-could-prosper-in-havana%E2%80%99s-hunt-for-energy-supplies/ Accessed 2010/12/15.

SAGARPA. (2008). Law of Promotion and development of Bioenergy products. [Originao in Spanish: Ley de Promoción y Desarrollo de los Bioenergéticos.] Retrieved from http://www.bioenergeticos.gob.mx/index.php/programas/marco-legal.html accessed: 15/06/2011. Ciudad de México.

Saikkonen, L., Lankoski, J., & Ollikainen, M. (2012). Biofuels from alternative feedstocks under fiscal fuel taxation and actual EU biofuel policy or optimal emission taxes: The case of palm and rapeseed based renewable diesels from Finland's perspective when global greenhouse gas emissions are accounted for.

Sánchez, L., & Cochrane, T. (1985). General description of the ecosystem, landscape soils and climate of the Eastern flatlands in Colombia [Original in Spanish: Descripción general del ecosistema, paisajes, suelos y clima de los Llanos Orientales de Colombia]. Bogota: CIAT (International Center for Tropical Agriculture).

Schuck, S. (2006). Biomass as an energy source. International journal of environmental studies, 63(6), 823-835.

Schuck, S. (2007). What Now and What Next for Global Biofuel Technologies? BIOFUELS, ENERGY AND AGRICULTURE, 14.

Searchinger, T., Heimlich, R., Houghton, R. A., Dong, F., Elobeid, A., Fabiosa, J., Yu, T.-H. (2008). Use of U.S. Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land-Use Change. Science, 319(5867), 1238-1240. doi: 10.1126/science.1151861

Secretaría de Energía. (2009). Guidelines for the Law of promotion and development of Bioenergy products. [Original in Spanish: Reglamento de la ley de promoción y desarrollo de los bioenergéticos] Retrieved from: http://www.bioenergeticos.gob.mx/descargas/Reglamento-de-la-Ley-de-Bioenergeticos.pdf Accessed 13/06/12. Ciudad de México.

Secretaría de Nacional de Energía. (2012). Law of Biofuels. [Original in Spanish: Ley de biocombustibles] Retrieved from: http://www.energia.gob.pa/Biocombustibles.html Accessed: 15/06/12. Panama.

Senado de Chile. (2007). Bulletin 4873. [Original in Spanish: Boletín N° 4.873-08] Retrieved from: http://www.bcn.cl/actualidad_legislativa/temas_portada.2007-01-29.7882319251/boletin_4873_actualidad.pdf. Accessed 23/06/11. Santiago.

Senado de Uruguay. (2002). Law 17.567 alternative, renewable and substitute fuels of oil origin made out of national feedstock of animal or vegetal origin. [Original in Spanish: Ley 17.567 Combustibles alternativos, renovables y sustitutivos de los derivados del petróleo elaborados con materia prima nacional de origen animal o vegetal] Retrieved from: www.ursea.gub.uy/web/mnormativo2.nsf/98FFB2517A61DBA0832579090068A320/$file/Ley%20N%C2%BA%2017567.pdf?OpenElement Accessed: 15/16/12. Asunción.

Senado de Uruguay. (2007). Law 18.195 Agrofuels. Promotion and standarization of production, comercialization and use. [Original in Spanish: Agrocombustibles:Fomento y regularizacion de su producción, comercilización y utilización] Retrieved from: http://www0.parlamento.gub.uy/leyes/AccesoTextoLey.asp?Ley=18195&Anchor= Accessed: 15/16/12. Asunción.

Sheridan, M. (2006). California crude oil production and imports. California, USA: Fossil Fuels Office - Fuels and Transportation Division - California Energy Commission.

SHL. (2010). Technical Parameter Model Agrammon (Original in german: Technische Parameter Modell Agrammon) Retrieved from: agrammon.ch/assets/Downloads/Technische_Parameter_Modell_Agrammon_20100309.pdf Accessed 12/04/11. Bern, Switzerland: Swiss College of Agriculture (SHL).

Singh, M. (2006). Economics of biofuels for the transport sector in South Africa. Energy for Sustainable Development, 10(2), 40-47. doi: http://dx.doi.org/10.1016/S0973-0826(08)60530-X

Slaughter, J. C., Kim, E., Sheppard, L., Sullivan, J. H., Larson, T. V., & Claiborn, C. (2004). Association between particulate matter and emergency room visits, hospital admissions and mortality in Spokane, Washington. Journal of Exposure Science and Environmental Epidemiology, 15(2), 153-159.

Smeets, E. (2008). Possibilities and limitations for sustainable bioenergy production systems. (PhD Thesis), Utrecht University.

Smeets, E., Junginger, M., Faaij, A., Walter, A., & Dolzan, P. (2006). Sustainability of Brazilian bio-ethanol (Vol. NWS-E-2006-110). Utrecht, The Netherlands: Copernicus Institute– Department of Science, Technology and Society.

Smil, V. (2002). Worldwide transformation of diets, burdens of meat production and opportunities for novel food proteins. Enzyme and Microbial Technology, 30(3), 305-311.

Smith, J. P., Lawn, R. J., & Nable, R. O. (1999). Investigations into the root:shoot relationship of sugarcane, and some implications for crop productivity in the presence of sub-optimal soil conditions. Paper presented at the Australian Society of Sugar Cane Technologists.

Smith, K. R., Uma, R., Kishore, V., Zhang, J., Joshi, V., & Khalil, M. (2000). Greenhouse implications of household stoves: an analysis for India. Annual Review of Energy and the Environment, 25(1), 741-763.

Solomon, S., Qin, M., Manning, Z., Chen, M., Marquis, K. B., & Averyt, M. (2007). Climate Change 2007: The Physical Science Basis. Retrieved from: www.ipcc.ch/publications_and _data/publications_ipcc_fourth_assessment_report_wg1_report_the_physical_science _basis.htm Accesed 30/06/11. United Kingdom and New York, NY, USA: IPCC.

Stehfest, E., Bouwman, L., van Vuuren, D. P., den Elzen, M. G., Eickhout, B., & Kabat, P. (2009). Climate benefits of changing diet. Climatic Change, 95(1-2), 83-102.

Stern, N. H., Peters, S., Bakhshi, V., Bowen, A., Cameron, C., Catovsky, S., Dietz, S. (2007). Stern Review: The economics of climate change. Retrieved from: http://webarchive.nationalarchives.gov.uk/+/http:/www.hm-treasury.gov.uk/sternreview_index.htm Accessed: 03/07/11 (Vol. 30): HM treasury London.

Subía Loayza , E. C., & Cueva Moya, J. J. (2005). Carbon fixation in two agricultural systems of the humid tropical region of Costa Rica (original in Spanish: Fijación de carbono en dos sistemas agrícolas del trópico húmedo de Costa Rica). (Agronomical Engineering), Universidad Earth, Guacimo, Costa Rica.

sugarcane.org. (2014). Brazilian experience http://sugarcane.org/sugarcane-products/ethanol.

Sumathi, S., Chai, S., & Mohamed, A. (2008). Utilization of oil palm as a source of renewable energy in Malaysia. Renewable and Sustainable Energy Reviews, 12(9), 2404-2421.

Tilman, D., Cassman, K. G., Matson, P. A., Naylor, R., & Polasky, S. (2002). Agricultural sustainability and intensive production practices. Nature, 418(6898), 671-677.

Toasa, J. (2009). Colombia: A New Ethanol Producer on the Rise? In WRS-0901 (Ed.): Economic Research Service USDA.

Tokgoz, S., & Elobeid, A. (2006). Policy and competitiveness of US and Brazilian ethanol. Iowa Ag Review, 12(2), 6-7.

Trenberth, K. E. (2012). Framing the way to relate climate extremes to climate change. Climatic Change, 115(2), 283-290.

Trindade, S. (2005). Global Biofuels Trade. Paper presented at the XV International Symposium on Alcohol Fuels - ISAF "Alcohol Fuels' role in sustainable transportation", San Diego, California, USA.

Trindade, S. C. (2010). Nanotech Biofuels and Fuel Additives http://cdn.intechweb.org/pdfs/17478.pdf Accessed 27/08/2013.

Trindade, S. C., Cocchi, M., Onibon, A., & Grassi, G. (2012). BIOFUELS TECHNOLOGY CHANGE MANAGEMENT AND IMPLEMENTATION STRATEGIES. Bioenergy for Sustainable Development and International Competitiveness: The Role of Sugar Cane in Africa, 369.

Tyner, W. E. (2008). The global impacts of US and EU biofuels policies. Sugarcane ethanol, 181.

U.S. Congress. (2006). Biomass reseach and Development Act of 2000. Retrieved from http://www.usbiomassboard.gov/pdfs/biomass_rd_act_2000.pdf Accessed 25/05/10: U.S. Congress.

U.S. Congress. (2005). Public Law 109-58. Energy policy act. Retrieved from http://www.gpo.gov/fdsys/pkg/PLAW-109publ58/pdf/PLAW-109publ58.pdf Accessed 26/02/12. Whashington. D.C.

UN-Energy. (2007). Sustainable Bioenergy: A Framework for Decision Makers: UN.

UN. (2012). Millennium Development Goals indicators: Carbon dioxide emissions (CO2), thousand metric tons of CO2 (CDIAC). Retrieved from http://mdgs.un.org/unsd/mdg/SeriesDetail.aspx?srid=749 Accessed 19/03/11

UNEP. Biofuels Working Group, & Management, U. N. E. P. I. P. f. S. R. (2009). Towards sustainable production and use of resources: assessing biofuels: UNEP.

UNFCCC. (2013). Greenhouse Gas Inventory Data. Retrieved from: http://unfccc.int/ghg_data/items/3800.php Accessed at: 13/12/13.

UNODC. (2007). Illicit crops report Colombia. [Original in Spanish: Informe de cultivos ilicitos Colombia]. Bogota DC: Programa SIMCI de la UNODC.

UNPD. (2014). Sustainable Enegy (Retrieved from www.undp.org/content/undp/en/home /ourwork/environmentandenergy/focus_areas/sustainable-energy/) Accessed 01/04 /2014.

UPME. (2008). Energy demand forecast for the transportation sector. [Original in Spanish: Proyección de demanda de energía para el sector transporte]. Bogota, Colombia.

UPME. (2009). Reference expansion plan Generation-Transmision 2010-2024. (Original in spanish: Plan de Expansión de Referencia Generación – Transmisión 2010-2024) Retrieved from http://www.upme.gov.co/Docs/Plan_Expansion/2010/Plan_Expansion_2010-2024_Preliminar_DEF3.pdf Accessed at 23/05/10. Bogotá, Colombia.

USCO. (2012). Biofuel production does not pose a threat to food security, according to Fedebiocombustibles [Origianl in Spanish: La producción de biocombustibles aún no afecta la seguridad alimentaria en Colombia, según Fedebiocombustibles] Retreieved from http://ingenieria.usco.edu.co/formacion/component/content/article/286-la-produccin-de-biocombustibles-an-no-afecta-la-seguridad-alimentaria-en-colombia-segn-fedebiocombustibles–wadfrfj Accessed at: 05/01/14. Faculty of engineering. Universidad Surcolombiana.

USGS. (2012). GTOPO30 30 Arc Second elevation data (1976 Version). Retrieved from http://eros.usgs.gov/#/Find_Data/Products_and_Data_Available/gtopo30_info Accessed 12/02/12.

van Dam, J., Junginger, M., & Faaij, A. P. (2010). From the global efforts on certification of bioenergy towards an integrated approach based on sustainable land use planning. Renewable and Sustainable Energy Reviews, 14(9), 2445-2472.

Van Den Wall Bake, J., Junginger, M., Faaij, A., Poot, T., & Walter, A. (2009). Explaining the experience curve: Cost reductions of Brazilian ethanol from sugarcane. Biomass and Bioenergy, 33(4), 644-658.

Vargas, R. (2010). Alternative development in Colombia and Social engagement: Proposals towards a change of strategy. [Original in Spanish: Desarrollo Alternativo en Colombia y Participación Social: propuestas hacia un cambio de estrategia.]. Bogota, Colombia: Diálogo Inter-Agencial en Colombia.

Verdonk, M., Dieperink, C., & Faaij, A. (2007). Governance of the emerging bio-energy markets. Energy Policy, 35(7), 3909-3924.

Vergara, W. (2010). Extensive ranching and the agricultural problem. Challenge for a sustainable rural development for Colombia. [Original in spanish: La ganadería extensiva y el problema agrario. El reto de un modelo de desarrollo rural sustentable para Colombia] Retrieved from: http://revistas.lasalle.edu.co/index.php/ca/article/view/350 Accessed 19/12/13. Ciencia Animal, 3, 45-53.

Vlek, P. L. G., Denich , M., Martius, C., Rodgers, C., & Giesen, N. v. d. (2005). The potential of oil palm and forest plantations for carbon sequestration on degraded land in Indonesia. Ecology and Development Series, 28.

Von Braun, J., & Pachauri, R. (2006). The promises and challenges of biofuels for the poor in developing countries: Intl Food Policy Res Inst.

WB. (2007). Environmental Priorities and Poverty Reduction: A Country Environmental Analysis for Colombia (Directions in Development). Washington: World Bank.

WCED. (1987). Our Common Future: A report to the World Commision on Environmental and Development of the United Nations Oxford University Press.

Wicke, B., Sikkema, R., Dornburg, V., & Faaij, A. (2011). Exploring land use changes and the role of palm oil production in Indonesia and Malaysia. Land Use Policy, 28(1), 193-206.

Wicke, B., Verweij, P., van Meijl, H., van Vuuren, D. P., & Faaij, A. P. (2012). Indirect land use change: review of existing models and strategies for mitigation. Biofuels, 3(1), 87-100.

Wilhelm, W. W., Johnson, J. M., Karlen, D. L., & Lightle, D. T. (2007). Corn stover to sustain soil organic carbon further constrains biomass supply. Agronomy journal, 99(6), 1665-1667.

Wirsenius, S. (2003). Efficiencies and biomass appropriation of food commodities on global and regional levels. Agricultural Systems, 77(3), 219-255.

Wood, B. J., & Corley, R. H. V. (1991). The energy Balances of oil palm cultivation. . Paper presented at the PORIN International palm oil Conference, Kuala Lumpur, Malaysia.

Worldwatch Institute. (2006). Biofuels for transportation: Global potential and implications for sustainable agriculture and energy in the 21st century (Extended summary) Washington D.C.: Worldwatch Institute.

XM expertos (Ed.). (2010). Neon Database. Colombia. Retrieved from: http://sv04.xm.com.co/neonweb/ accessed 12/12/11.

Yáñez Angarita, E. E., Silva Lora, E. E., da Costa, R. E., & Torres, E. A. (2009). The energy balance in the palm oil-derived methyl ester (PME) life cycle for the cases in Brazil and Colombia. Renewable Energy, 34(12), 2905-2913.

Yáñez, E. Y., Castillo, E. F., & Silva, E. (2011). Cogeneration in palm processing plants: An alternative for increasing competitiveness and reducing environmental impact. (Original in Spanish: Cogeneración en plantas de beneficio: Una alternativa para el incremento en la competitividad y reducción del impacto ambiental) Retrieved from: http://galeon.com/separacionfrutos/cogeneracion.pdf accesed 15/09/12: Cenipalma. UIS UIS-CEIAM. UNIFEI-NEST.

Zah, R., Böni, H., Gauch, M., Hischier, R., Lehmann, M., & Wäger, P. (2007). Life Cycle Assessment of Energy Products: Environmental Assessment of Biofuels. Bern, Switzerland: Federal Office for Energy (BFE), the Federal Office for the Environment (BFE) and the Federal Office for Agriculture (BLW).

Zúñiga, O., Osorio, J., & Cuero, R. (2009). Alternatives in the sustainable managing of soils: a analitical anb synthetic aproach. [Original in Spanish: Alternativas en el manejo sostanible de los suelos un enfoque analítico y sintético]. Cali, Colombia: Universidad del Valle.