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Global Social and Economic Impact on The use of Biofuels and Recomendations for Sustainability

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Keywords : *Biofuels, biomass, renewable energy, fossil fuels.*

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Global Social and Economic Impact on The use of Biofuels and Recomendations for Sustainability

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Abstract - **Biofuels currently represent a potential source of renewable energy. As well as that could lead to major new markets for farmers. However, only some of the current biofuel programs are feasible, and most involve high social costs and environmental ironically. The economic, environmental and social impacts of biofuels are widely debated and needs to be carefully assessed before extending public support to programs of biofuels on a large scale.The country strategy on biofuels should be based on a thorough assessment of these opportunities and costs in the medium and long term. One factor to consider is that oil reserves will run out, experts say, in fifty years. This article presents the social and economic impact of biofuel production in industrialized countries and developing countries that are or could become, efficient producers in export markets and profitable new.**

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I. Introduction

Biofuel is the term which is called to any type of fuel derived from biomass, refers to any organic matter of recent origin that has been derived from animals and plants as a result of photosynthetic conversion process, the biomass energy derived from plant and animal material such as wood from forests, residues from agricultural and forestry processes, industrial waste, human or animal (Hernández and Hernández, 2008).

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Biofuels currently represent a potential source of renewable energy that could also generate major new markets for agricultural producers (Hernández and Hernández, 2008, p.15). However, only some of the current biofuel programs are feasible, and most involve high social costs and environmental ironically. The economic, environmental and social impacts of biofuels are widely debated and needs to be carefully assessed before extending public support to programs of biofuels on a large scale.

The fuels of biological origin can replace part of the traditional fossil fuel consumption, such as oil or coal. Applying agricultural techniques and strategies appropriate processing, biofuels can provide emissions savings of at least 50% compared to fossil fuels such as diesel or gasoline (Hernández and Hernández, 2008, p.17). In addition, biofuels are produced from agricultural crops, which are renewable sources of energy.

A disadvantage in the production of these fuels has been rising for example, food prices, increased competition for land and water, and deforestation. When using agricultural land for direct cultivation of biofuels, rather than use only the remains of other crops, has begun to produce an effect of competition between food production and biofuels, resulting in an increase in the price of the first (Hernández and Hernández, 2008).

A key step in maximizing opportunities and regional comparative advantages, is to follow the procedures for environmental impact assessment, which are key instruments for decision making. The main impacts are related to increases in demand for inputs, resources and energy, with the potential risks to water quality and habitat conservation (Stachett, Rodrígues, Aparecida, Buschinelli, and Ligo, 2007).

One advantage is related to environmental preservation, any effective path leading to a reduced consumption of nonrenewable energy collides with the same difficulty: the decrease of the gain or extraordinary profits, which would negate the essence of a free market. The free market "can" help innovate something to sell (eg biofuels) that will help "keep", however the actual act of environmental preservation kills profits (Recompensa, Días, Zabala, and Ramos, 2008).

The purpose of this paper is to show the advantages and disadvantages in the use of biofuels,

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based on research of different authors and the social and economic impact of biofuel production in industrialized countries and developing, which could reach to be efficient producers in new export markets and profitable. This article is distributed as follows: Section 2 considers the current situation in the social and economic impact of biofuel production in industrialized countries and developing countries; section 3 presents the methodology , Section 4 the results, with advantages and disadvantages of using biofuels in developed and developing, and finally in Section 5 the conclusion, which presents the potential benefits to using biofuels.

II. State of the Art

a) *Current status of biofuels*

The world is facing a massive global campaign, which aims to include in the fastest possible way different raw materials such as sugar cane, soybeans, corn, rapeseed, sugar beet, etc., The production of biofuels as perfect substitutes petroleum derivatives. The main justifications found for this phenomenon are based on global warming and environmental pollution. The 1st generation biofuel specific crops used as raw materials, the most widely publicized are biodiesel and bioethanol. The latter represents more than 90% of all biofuels used today in the world. In Brazil, Sweden and the United States there are 6 million vehicles on the road that can accept mixed ethanol / gasoline up to 85%. The processing steps are different depending on the source of carbon and the technologies used in 1st generation processes are simpler than those of the 2nd processes and their production and investment costs are lower (Chauvet and González, 2008).

Figure 1 shows schematically the main stages to produce ethanol from sucrose (cane, beet, etc.), Starch (corn, wheat, tubers, etc.) And lignocellulosic residues (straw, agricultural residues and industrial, bagasse, etc.). The characteristics of lignocellulose offers major technical challenges, which increases the cost of production and investment technologies for the production of biofuels 2nd generation are under development in the world, and is expected to dip sensitive in both items in the medium and long term.

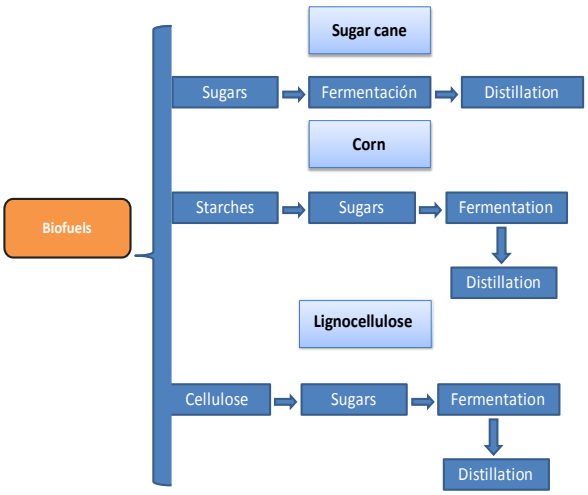

Figure 1 : Main stages to produce bioethanol

Table 1 shows the variation in the cost of bioethanol production 1st generation according to the carbon source and feedstock used (Chauvet and González, 2008).

Source of carbon	Crops	Efficiency (l/ton of crops)	Efficiency (l/ha)	Production cost (USD/l	Country
Sucrose	Beet (juice)	100	7000	0.48	European Union
	Cane (juice)	70 - 85	6000	0.21	Brazil
		10	590	0.32	India
	Cane (molasses)	10	730	0.23-0.37	Mexico
	Sorghum	56 - 90	2500 - 4000		Sweden
Starch	Corn	400	3000	0.29-0.37	United States
	Wheat	340	2700	0.62	European Union
	Corn/Wheat	285		0.59	United States
Cellulose	Bagasse (cane)	55	3850	0.8	Chile

Table 1 : Main raw materials for ethanol

The differences between the energy that wants to get today's agriculture and energy contained in fossil fuels (oil, natural gas and coal) which represents 80% of the energy consumed in the world, the first is obtained as a result of photosynthesis : sun, water and nutrients that are purchased each year to crops, but fossil energy has the same origin but with the difference that the result of saving of photosynthesis produced over millions of years. Intention now is to replace all fossil fuel consumption (oil, natural gas and coal) using biofuels, which has a set of specific such as: a) high fossil energy consumption, b) the need to use large farms and concentration land c) intensive use of technologies and machines, d) large-scale environmental damage, e) high concentration of capital (Recompensa, Días, Zabala and Ramos, 2008).

The key to the economics of biodiesel production is in the raw materials used. In Colombia there have been several investigations at laboratory and pilot plant in order to obtain biodiesel from different raw materials such as palm oil, castor oil, frying oils and byproducts of the poultry industry. Castor oil belongs to the raw materials considered strategic for the production of biodiesel in the country. With regard to diesel engines, biodiesel, given the technical advantages, strategic and environmental features, is the best alternative to replace partially or totally to petroleum diesel fuel (Benavides, Benjumea and Pashova, 2007).

Biodiesel has achieved great interest as an alternative source of energy, as it has many attractive features: non-toxic, biodegradable, nonflammable, technically viable and economically competitive. In Medellin, Colombia was modeled and simulated a membrane bioreactor using an enzyme catalyst Candida Antarctica lipase for the production of biodiesel from palm oil and ethanol. The result was that the

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membrane reactor with immobilized enzymes is the best option for the production of biodiesel. Not only because it achieves high conversions, but also because it minimizes the residence time, it also shows the simultaneous separation of reactants and reaction products (Solano, Moncada, Cardona and Simón, 2008).

United States of America imports oil from different countries, so that its influence is global, both in the real economy and financial markets. From the supply side, oil-producing countries are in conflict zones and unstable, so it records a negative impact on international financial markets. The difficulty of projecting the price of oil, uncertainty in the estimation of future prices is one of the main points of the Agenda (international energy) despite the perception of high price insensitivity to bringing the complaint. On the other hand, specifically the United States seeks an increase in research investment in clean energy technologies and alternative fuel production (De Paula and Cristian, 2009).

It should be stressed that within this strategy, biofuels are meant to be part of the diversification of energy demand, such as with wind and solar. Given these energy programs, both U.S.A and European Union have increased their production volumes of biofuels each year. At the regional level Brazil is inserted internationally as a producer of biofuels, with a clear objective: to capture markets that require a demand for this type of energy above its level of production. Brazil is the world's largest producer of ethanol, from the use of sugar cane as feedstock, sharing leadership with the United States, which is produced from corn. Brazil, in addition to producing ethanol, biodiesel produces (De Paula and Cristian, 2009).

In Brazil, the Federal Government established that from 2008, the biodiesel should be added to diesel at 2% and from 2013 the percentage increased to 5%. For its part the European Union states that by 2010 all diesel fuel dispensed in Europe will contain 10% biodiesel (Aimaretti, Intilángo, Clementz and Yori, 2008). In the case of Argentina, are developing some points of the agricultural sector, from which it extracts the raw material for biodiesel: soybeans. To make feasible the alternative fuel business, it was necessary for soybean crops are grown in abundance in the country. In addition to this increase in yield for soybeans, another feature of the Argentine agricultural sector is that it has a highly competitive oil industry worldwide. In Argentina there are sustainable and unsustainable practices in agriculture. But the truth is that the challenges exist, and it should be noted that what is at stake is the strategic natural resource: the "soil" (De Paula and Cristian, 2009).

The bounded oil reserves and the need to reduce environmental pollution intensified the development of renewable fuels like biodiesel. In Argentina, the use of glycerol obtained as a byproduct of biodiesel production, is the key advantage as it provides added value to a low-cost feedstock, reducing the final cost of biodiesel produced, achieving an economic benefit (Aimaretti, Intilángo, Clementz and Yori, 2008).

In the case of Mexico, in 2006 began the construction of two ethanol plants in the state of Sinaloa. The argument for this policy is to dispose of corn production in the region to the niche market covering the states of California and Arizona in the United States, the two projects involve an investment of 85 million dollars and treated some 335 thousand tons of corn and sorghum. The benefits provided by the Sub-Objective direct income support to the account for the states of Sinaloa, Sonora, Tamaulipas, Chihuahua and Baja California, in 2004, with 62% of the tonnes supported, and in 2005 with 72%. Sinaloa has been the most benefited by concentrating 40% of subsidized tons nationwide in 2004, and 35.5% in 2005. The product has received more support is corn (Chauvet and González, 2008).

The politics of ethanol can have a significant impact on corn prices, causing costs to soar and may also increase the inefficiency of agricultural subsidies and vice versa. Production costs of ethanol from corn in the U.S. are very high. The gap between the intersection of the supply curve of ethanol and oil prices create large costs that can harm all the external benefits (Gorter and Just, 2010).

III. Methodology

Choose the topic to develop this article was based on the current problem: **the preservation of the environment**. Several points are factors in our research, given that biofuels currently represent a potential source of renewable energy, considering the volatility of international oil prices (energy resource of excellence) and that oil producing countries are in conflict zones and unstable , representing a negative impact on international financial markets (De Paula and Cristian, 2009).

The methodology used to develop research on the advantages and disadvantages in the use of biofuel, the social and economic impact in industrialized countries and developing, was performed based on descriptive research (Medina, 2007) and (Hernandez, Fernandez and Baptista, 2010, p.80), making an initial search process (data collection), collection (sampling), analysis of information (variables) and results in order to present an overview of the topic research.

The methodology undertaken for this research can be summarized in the following points:

1. Data capture
   a. We performed an initial search procedure in scientific databases:
      Springer, Emerald, Wiley, Oxford Journals, World Scientific, Redalyc.
   b. The search criteria were based on key words: biofuels, biomass, renewable energy, fossil fuels, etanol and diesel.

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2. Sampling

a. In approximately 30 articles read were selected that had the most relevant and appropriate to the subject develops, and we choosing a total of 16 articles, which can be found in the references.

3. Information analysys

a. The information collected, carefully analyzed, following four main variables:

- Variable 1: Developing Countries.
- Variable 2: Industrialized countries.
- Variable 3: Benefits of the use of biofuels (point of view social and economic)
- Variable 4: Disadvantages of the use of biofuels (point of view social and economic)

4. Results

a. Based on the descriptive research and the variables used to analyze the information (research articles), provides the results of research that are the basis for the conclusions.

In Figure 2, you can see the applied methodology.

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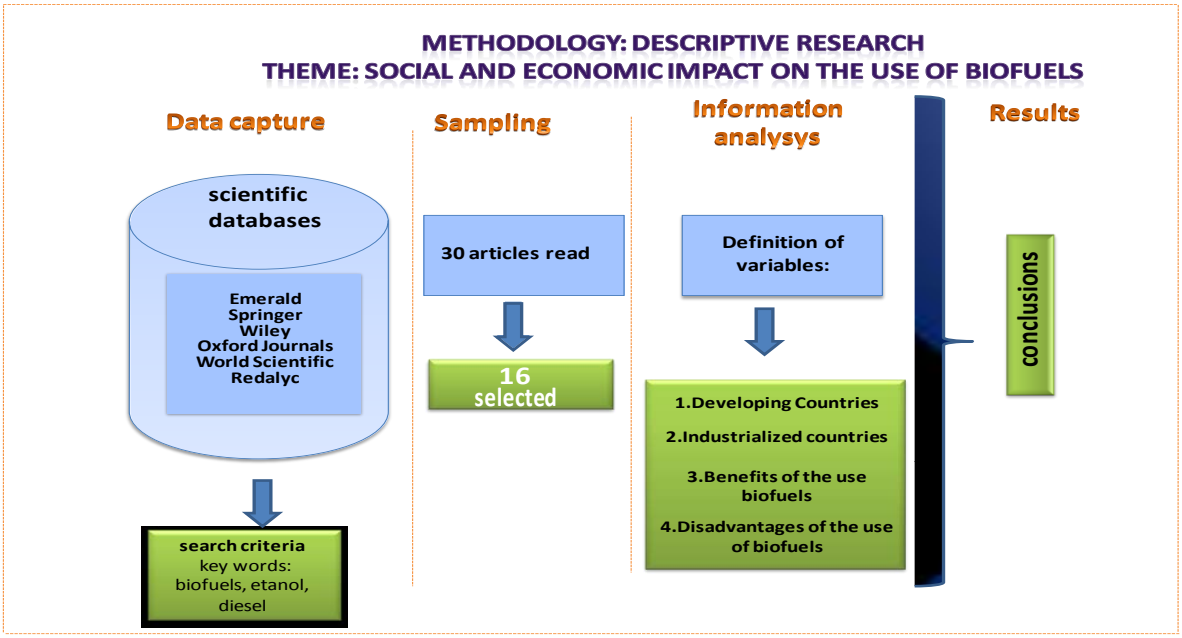

Figure 2 : Methodology

IV. Results

The results obtained in research on the advantages and disadvantages in the use of biofuel, the social and economic impact in industrialized countries and developing countries, are described in Table 2.

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Variable 1: Developing countries	*Variable 2: Industrialized countries*	*Variable 3: Benefits of the use of biofuels (point of view social and economic)*	*Variable 4: Disadvantages of the use of biofuels (point of view social and economic).*
✓	✓	✓ The development of alternative energy, the progress in the investigation of second-generation biofuels and to promote greater use of biofuels, are just only a few points to follow in developed countries (De Paula and Cristian, 2009).	✓ Focus on production: the location of the sites are in countries that in recent years have demonstrated high legal uncertainty and unpredictability policy and regulatory (De Paula and Cristian, 2009).
Mexico		✓ In 2006, began the construction of two ethanol plants in the state of Sinaloa. The argument for this policy is to dispose of corn production in the region to the niche market that includes the states of California and Arizona, United States (Chauvet and González, 2008).	✓ The transportation costs of corn produced in Sinaloa to consumption centers in the south are high, no less incongruous than the volumes of corn destined for ethanol production when the country is importing, but more disturbing and scandalous is to subsidize the business of a few producers, such as **the social group is supporting an activity which is not profitable and also is exported** (Chauvet and González, 2008). ✓ Mexico as producer and exporter of oil, the renewable energy research is not their priorities (Chauvet and González, 2008).
Developed countries and particularly emerging economies China and India		✓ *Concentration and demand growth in developed countries and emerging economies* (De Paula and Cristian, 2009).	✓ *Financial speculation and uncertainty*; *The main reason for high prices is the growing perception in the markets, in the future the offer maybe will not be sufficient to satisfy demand*. (De Paula and Cristian, 2009).
	United States of America	✓ *Rationalize energy consumption in homes, buildings, businesses, cars and public transport so reduction contamination* (De Paula and Cristian, 2009).	✓ *Agricultural subsidies in the United States of America, the policy statement that ethanol reduces the tax costs, can still not be confirmed. But the inefficiency of production subsidies for corn and ethanol are still worrying, however ethanol production (and consumption) is constant, as determined by the government* (Gorter and Just, 2010). ✓ The increase in ethanol prices increases also the corn price , because it competes for the land with other crops (Gorter y Just, 2010).
	European Union	✓ *Direct their efforts to establish an energy diversification of oil supply.* ✓ Establish privileged partnerships with producer countries (Russia), transit (Algeria) and develop alternative energy (De Paula and Cristian, 2009).	
✓	✓	✓ Generation of second-generation biofuels obtained by biomass that can be obtained not necessaryly by inputs for food or compete with them (Chauvet and González, 2008).	✓The reason that has stopped its application are the technical difficulties that they present , the estimated levels of investment and high production costs for obtain biofuels (Chauvet and González, 2008).
Brazil		✓ Capture of markets that require a demand for this type of energy above its level of production (De Paula and Cristian, 2009). ✓ The integration of technological development and pro-activity of all team members is crucial for the development of flexible fuel (De Souza, Sin, Nigro and Lima 2009). ✓ Production of biofuels in the world is profitable because of subsidies and incentives for renewable energy. In Brazil, the prices to be sustainable levels of profitability of ethanol production from sugar cane is profitable when a barrel of oil	✓ The high cost of castor oil and the relatively low level of technology, is still present in the production areas of Brazil and are the main obstacles to actually make feasible the production of biodiesel (Stachett, Rodrígues, Aparecida, Buschinelli, and Ligo, 2007).

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		ranges from 45 to 50 USD (Chauvet and González, 2008). ✓ The local arrangements for the production offer the best options for promoting sustainable development and avoiding environmental degradation risks (Stachett, Rodrígues, Aparecida, Buschinelli, and Ligo, 2007). ✓ The socio-environmental impact and the intensification of production is reflected favorably on the expectations of farmer training, income generation, improved land value, and improving opportunities, training, and job quality indicators (Chauvet and González, 2008).	
✓	✓	✓ Participation of governments, some governments have provided incentives and financing to develop for new technologies with the aim of achieving a sustainable economy (Hazy, Torras and Ashley, 2008). ✓ *Tariff*, Biofuel production in industrialized countries has been developed under the protection of high tariffs, while subsidies granted to producers (Hernández and Hernández, 2008).	✓ Biofuel production has influenced the increase in food prices (corn, wheat and sugar cane), that probably to keep growing over the next decade. These increases not only include food used for fuel production but will also have expanded to meat and vegetables. (Sanhueza, 2009).
	Japan	✓ Being a buyer of Brazilian products but wants to ensure that the supply of the product will not be interrupted (Recompensa, Días, Zabala and Ramos, 2008).	✓ The free market prefer the renewable energy sources because they are easily controlled (Recompensa, Días, Zabala and Ramos, 2008). ✓ In countries where the rights over mineral resources are privately owned (such as in the United States of America and Canada), these resources can be controlled via property rights and that situation is a disadvantage for Japan, because for biofuels can be apply the same situation (Recompensa, Días, Zabala and Ramos, 2008). ✓ In the rest of the world, the minerals can be easily controlled through exclusive contracts with governments (Recompensa, Días, Zabala and Ramos, 2008).
Colombia		✓ The simulation of the production of biodiesel from palm oil using an immobilized lipase as biocatalyst (Candida Antarctica) in a membrane bioreactor, is the best option for biodiesel production (Solano, Moncada, Cardona and Simón, 2008).	
Argentina		✓ *The use of glycerol obtained as a byproduct of biodiesel production, is the key advantage as it provides added value to a low-cost in raw material, reducing so the final cost of biodiesel produced, achieving an economic benefit* (Aimaretti, Intilángo, Clementz and Yori, 2008). ✓ Improving fuel quality through the use of additives, significantly reduces the environmental pollution produced, helping to meet stringent environmental regulations that apply today (Aimaretti, Intilángo, Clementz and Yori, 2008).	

Table 2 : Results of the advantages and disadvantages of using biofuels.

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IV. Conclusions

In the production of biofuels, if we take the example of ethanol and other biofuels in Brazil, this attempted solution to our energy problems are being controlled through ownership or lease of land to produce raw materials and /or the Intellectual property (proprietary processes of distillation, proprietary microbes that turn sugar substances, etc.), the point is that governments create more problems, no matter that biofuels provide a low energy return on investment, the depletion of fertile soils , pollution and energy, **what matters is that governments can do a lot of money** (Recompensa, Días, Zabala and Ramos, 2008).

In relation to environmental preservation any effective path leading to a reduced consumption of nonrenewable energy collides with the same difficulty: the decrease of the gain or extraordinary profits, which would negate the essence of free market (Recompensa, Días, Zabala and Ramos, 2008).

First generation biofuels *such as ethanol production is one of the more traditional industrial applications in all respects, the requirements of scale, costs and improving efficiency in fuel use almost inevitably point towards the use of transgenic crops, which further complicate the national debate.* ***The second-generation biofuels*** *are the benefits that can be obtained from biomass that is not appropriated for food supplies or compete with them, such as agricultural harvests, industrial and urban waste, so there is also rivals for the use of natural resources. Cost-effective production of ethanol obtained from lignocellulose via enzymatic hydrolysis would increase the variety and availability of basic material and, therefore, expand the production of biofuels without compromising food security and sovereignty* (Chauvet and González, 2008).

The trend is towards second generation biofuels, since the use of crops for biofuel does not replace the energy needs of low-cost oil achieved today and its derivatives. Hence the importance for a country like Mexico, at this time, to allocate resources for Research & Development for 2nd generation biofuels. For the July 24, 2007, the administration reported that "the federal government will not support projects and ethanol plants carrying corn as raw material, since it has the priority of this cereal are not distracted from their destinations in human food or animal nutrition " (Chauvet and González, 2008).

The management of strategic natural resource "soil" presents a challenge because there is no quantification of damages in the case of unsustainable practices (De Paula and Cristian, 2009).

Is important to link the sustainability standards for biofuels policies, the most logical approach would be to punish or compensate the use of ethanol. Concerns about land use for biofuels can be contracted with the overall theme of global climate change in general. Agriculture has considerable potential for the mitigation of greenhouse gases, especially in developing countries. The impact of biofuel policies in the development and adoption of new technology should be examined. Biofuel policies may be needed to ensure the market in order to exploit the benefits of learning "doing and using" dynamic benefits and innovation of new technologies (Gorter and Just, 2010).

The production of biofuels is part of a competitive strategy in the global market, mainly for developed countries like the United States. The problem created by the rising international food prices exacerbated a structural agricultural situation in Mexico, where he has abandoned the priority to have an auto policy in food supply and insufficient support investment in the field (Merino and Castañeda, 2008). Bioenergy generation is not the panacea for poverty in the Mexican countryside, nor would solve the problems of the country's economy in general. You can create a problem socioeconómicoambiental, not planned in a multidisciplinary production, use and exploitation (González, 2009).

a) Recommendations

For the use of biofuels actually be an advantage in the economic, social and environmental care, should take care of the following (Serna, F., Barrera, L.):

1. **Biofuels policy :** The success of biofuels depends on their use mandatory, tax facilities, subsidies provided by the State, pricing to consumers, the recognition of the rights of workers and the thousand and one ways develop from the rural communities and effective use of their land.
2. **Grants :** The production of biofuels in the world is profitable because of subsidies and incentives for renewable energy, but must ensure that these subsidies are allocated to the most vulnerable.
3. **Soil use :** The problem of land use represents the medium and long term environmental liabilities is hardly balanced with assets derived from the production of biofuels.
4. **Second generation biofuels :** They should turn the attention to second generation biofuels, the advantages is that they can be obtained from biomass that is not appropriated for food supplies or compete with them and protect this soil use.
5. **Research & Development :** Both developed and developing nations must pay attention to the benefits associated with research and development, adopt new technologies, resulting in improved environmental heritage and obtaining economic benefits in the development of biofuels.
6. **Profit vs. environmental benefits :** The ambition for the profits do not should exceed the benefits of environmental preservation. In relation to environmental preservation any effective path leading to a reduced consumption of nonrenewable energy collides with the same difficulty: the decrease of the gain or extraordinary profits.

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References Références Referencias

1. Aimaretti, N., Intilángo, L., Clementz, A., Yori, C. (2008). Aprovechamiento de la glicerina obtenida durante la producción de biodiesel. *Revista Invenio*, *Redalyc,* 11(020), 137-144.
2. Benavides, A., Benjumea, P., Pashova, V. (2007). El biodiesel de aceite de higuerilla como combustible alternativo para motores diesel. *Revista Dyna, Redalyc,* 74(153), 141-150.
3. De Paula, G., Cristian, L. (2009). Inseguridad energética y gestión de recursos naturales estratégicos: análisis de la política de biocombustibles en Argentina en el contexto global. *Revista UNISCI Discussion*, *Redaly,* 1(20), 60-77.
4. De Souza, P., Sin, A., Nigro, F. and Lima, C. (2009). Exogenous Factors in the Development of Flexible Fuel Cars as a Local Dominant Technology. *Journal of Technology management* & *innovation,* 4(4), 110-119.
5. González, A. (2009). Producción de bioenergía en el norte de México: tan lejos y tan cerca... *Revista Frontera Norte, Redalyc,* 21(41), 177-183.
6. Gorter, G. and Just, D. (2010). The Social Costs and Benefits of Biofuels: The Intersection of Environmental, Energy and Agricultural Policy. *Applied Economic Perspectives and Polic,* 32(1), 4–32.
7. Hazy, J., Torras, M. and Ashley, A. (2008). Reconceptualizing value creation with limited resources. *Journal of Technology management* & *innovation*, 3(3), 45-54.
8. Hernández, M., y Hernández, J. (2008). Verdades y mitos de los biocombustibles. *Elementos 71* , 15-18.
9. Hernández, R., Fernández, C., y Baptista, L. (2010). Metodología de la investigación. México: Editorial McGraHill.
10. Chauvet, M. y González, R. (2008). Biocombustibles y cultivos biofarmacéuticos: ¿oportunidades o amenazas? *Revista El Cotidiano*, *Redalyc,* 23(147), 51-61.
11. Medina, C. (2007). Como plantear un problema de investigación y seleccionar un diseño de estudio apropiado. *Revista Archivos en medicina familiar, Redalyc,* 9(3), 127-132.
12. Merino, G. y Castañeda, Z. (2008). Biocombustibles, biotecnología y alimentos. Impactos sociales para México. *Revista Argumentos, Redalyc,* 21(57), 55-83.
13. Recompensa, L., Días, D., Zabala, A., y Ramos, P. (2008). Biocombustibles: ¿Una estrategia de desarrollo o de mercado lucrativo sostenible? *Polis, Universidad Bolivariana*, 021, 1-17.
14. Sanhueza, E. (2009). Agroetanol ¿un combustible ambientalmente amigable? *Revista Interciencia,* 34(2), 106-112.
15. Solano, P., Moncada, J., Cardona, C., Simón, O. (2008). Modelamiento y simulación de un biorreactor de membrana para obtención de biodiesel. *Revista Interciencia*, *Redalyc,* 44(151), 84.92.
16. Stachett, G., Rodrígues, I., Aparecida, I., Buschinelli, C., y Ligo, M. (2007). Socio-environmental al impact of biodiesel productionin Brazil. *Journal of Technology management* & *innovation* , 2(2), 46-66.

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