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A NEW PARADIGM ON TRADE-OFF BIODIESEL FOOD: THE PERENIAL OLEAGINOUS PALM TREE.

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Introduction

There is a continuously increasing interest concerning the bio-fuel implementation in the world, mainly because of environmental protection and energy supply security reasons. Future shortage in petroleum supply and surging prices for petroleum-based fuels, coupled with the increasing awareness of green house gas emissions increase the shift towards the alternative fuels sector. Therefore, specially related with developing countries it is necessary find opportunities to produce their own domestic transportation, cut their energy costs, create new jobs in their rural economies and ultimately build their export markets. The main question to the papper: is it possible to compete in biofuel market with non-food perennial oleaginous, from developing countries?

To do this task, introduce an alternative fuel discussion: must be technically feasible, economically competitive, environmentally acceptable and readily available. Developing countries have possible alternative to petroleum-based fuels. The use of oils from plant origin like vegetable oils and tree borne oil seeds. This crop oil can be used as renewable resource for fuel helping, mainly inter-tropical population to cut their energy costs.

This alternative fuel, termed as biodiesel, is mainly produced from vegetable oils, which are derived from the seeds or the pulp of oil-bearing crops. There are two types of oil crops. It can be annual (rapeseed, groundnut, soybean, and sunflower) or perennials (oil palms, coconut palms, jatropha).

Oil from the rapeseed was the first type used for biodiesel production and in Europe rapeseed is still the main feedstock for biodiesel production, it presents low oil yield though. Among the sources, palm oil is the cheapest vegetable oil and has the highest oil yields/ha.

As renewable fuel, since the biofuel implementation in the world, take place palm oil as the most important source of edible oil and co products. Perennials oleaginous palm tree has been shown their potential, on

inter-tropical regions where it is adapted producing more than 3 T/ ha oil production, characteristics that is going to build a broad countries export, employee creation, GEE, mainly SO2 low emotions, and green landscape back.

Although the mentioned potential, according to Díaz (2005) the process civilization has led to extensive losses of natural areas for the population's increment, growing urbanization, extension of the mechanization in agriculture, pruning of forests, drying wetlands, erosion of soils for wrong handling and over capacity pasture, contamination of soils and waters and introduction of invasion plants species exotic.

This task divide the issues in topics: first this introduction encompassing the problem, second describe material and methods that achieve. Third are results and discussions. The last is the conclusions.

Material and methods

The methodology to assess is LCA. All environmental impacts associated with a product, process or activity by accounting and evaluating the resource consumption and the emissions, propose by Cunningham *et al.* (2004) made a sustainability matrix has been developed at a Global firm shown the environmental, social, and economic impacts of a product. The approach had shown quicker and more cost-effective than a conventional life-cycle assessment by focusing on specific areas of concern through the product life cycle and then comparing products by scaling their impacts relative to one another. It provides a way of making qualitative and quantitative assessment that gives a depth to the assessment beyond data analysis.

The tool includes subjective judgment, which tends to reflect current thinking in the company. Once the tool has been fully tested on all product types, the indicators that are central to the process will be assessed by external stakeholders. Provides a quick decision-making instrument to help firms to decide which products should be marketed for the business to continue on a sustainable path. The tool also provides a more detailed level of information if a more thorough assessment is necessary.

Summing up its an opportunity to apply this to palm oil like experienced Mattsson, Cederberg and Blix (2000). Other challenge is to establish normalization as multilingual, structured and controlled vocabulary designed to cover the terminology of all subject fields in agriculture, forestry, fisheries, food and related domains. To do it, the Key-words used to research articles about macaúba palm tree:

Results and discussions

To assess environmental impacts associated with the product, process or activity relative macaúba palm tree, start analyzing palm oil (commonly Dendê) as the highest yielding oil crop, producing on average about 4–5

tonnes of oil/ha/year, about 10 times the yield of soybean oil Basiron (2007) (Soybean oil was a distant second at 19%). Palm oil demand was significantly increased by 10.6% to 33.17MnT in year 2006.

LCA methodology regards economic oil palm global chain importance and show that both palm and soybean oils combined, govern almost 48% of global oils and fats consumption in year 2006. It will likely remain the key players in the palm oil sector, accounting for 28.5MnT or 85% of the world's palm oil production.

Despite of Palm oil it self contributes about 33% of the world's vegetable oil demand, in terms of the world market, from Malaysia and Indonesia, whose account 90% export trade, natural areas were lost into these countries, coordinated by British imperialism, to achieve their goal. The growth were obtained against ecosystems, removing natural forests, exposing soils to erosion, changing sweet water cycle, modifying wetlands natural drainage, and some impacts, almost at the resilient limit, has challenged the Nature and contributes to erosion genetics and concentration oligopoly, against biodiversity.

Face at this brief approach, the article aims to organize some information concern with a new paradigm on trade-off biodiesel food: the perennial oleaginous palm tree.

The Malaysia and Indonesia's agro industrial policy, ford's based, have lots to be criticized before adoptable model. To cope many undesired decisions that underlined that develop, other trajectory must be followed, specially agro energy environmental commitment, that requires a balance between social-economic-environmental dimensions. As focused at International Palm Oil Sustainability Conference 2008, a broad practices have been adopted to mitigate some past mistakes, based on the LCA approach used to quantify green house gas emission evaluating:

This industry has brought poverty alleviation, an important aspect for begin equality growth, in spite of tropical plant, the oil palm commodity chain has the peculiarity of possessing a major seed production sector for reasons that are primarily genetic. This seed sector has numerous original aspects. Breeders are also propagators and usually also distribute their seeds (oil palm seeds are semi-recalcitrant: they display pseudo-dormancy). Achieving seed germination is difficult and requires lengthy treatments and special installations. This restriction greatly influences seed distribution and the role of the different stakeholders in the commodity chain. In addition it is difficult to organize seed distribution to smallholders.

Brazilian's Palm oil industry accounts 0,5 % world export trade, among initiatives are supplying electrical power for isolated communities as a way to improve life condition, promote social insertion and exercise citizenship. Therefore, a governmental organization CENBIO, in partnership with a firm called Agropalma, developed a project, which aims to install and test the functioning of a diesel-operated generator adapted to operate with palm oil in low profit community, located in Pará state. Besides its social role, the initiative aims to reduce

carbon emission by replacing the burning of diesel for palm oil, thus contributing for the reduction of the greenhouse effect. The project might also be an alternative for carbon emission credit requirement.

In the same feasibility is bocaiúva or macaúba or mbokayá or coco-palm or an uncountable popular denomination of palm tree Acrocomia aculeata (Jacq.) Lodd. ex Mart, a native tropical forests species, mainly spread in Brazilian's savannas and Paraguayo-Argentinian's Chaco.

Besides the adaptation mentioned above at each biome, genetic erosion, dramatic denomination of the loss of genetic diversity at all the levels (ecological, inter and intra specific), it supposes a complex process that it operates in several fronts in simultaneous form. The modern agriculture also supposed the dependence nutritious of some few species of "high importance", of diffusion universal and of great cultivation and high-performance for surface.

Analyzing other planet's side, there is another dimension of oil palm tree production, macaúba palm tree, a native species of the tropical forests, Lleras e Coradin (1988). Their leaves, fruits, and seeds of this species have been domestically used regionally for several purposes and scientific results were presented by Lorenzi (2006), that illustrate By-product utility.

The current demand increase for oil renewable fuel, the producers need to be prepared to supply it, but have to balance the cost of material inputs because current structure of production suffered degradation for the handling conditions (BOHN, 2006). Both pasture and proper palm tree on the same area have given evidence low yield and provoke likelihood of reduced performance for livestock and agro extractives activities.

Macaúba chain developed beside cotton chain in Paraguay, some research developed aiming to measure consistency of oil showed to be unsuited for conversion to shortening of the all-hydrogenated type. According to Landmann and Feuge (1954) blends with hydrogenated cottonseed oil yielded products having acceptable consistency characteristics.

FAO report is the official registration of volumes of picked fruits but, doesn't precise the amount. So, according Bohn (2006) knowledge, not officially from his contacts with the 7 industries of oil mbokayá, located near Asuncion, allows him to affirm that this county processes 100.000 tons of fruits annually, significant growth, comparatively with 8.000 tons in 1971, published by Cetec (1983). It is an evident effect of stakeholder intervention; the chain is responsive to market.

Probably has been brought impacts of changed usage behavior due to the feasibility to the biodiesel production using Paraguayan national raw material obtained vegetable oils of oleaginous cultivations, as alternative before the situation of imported diesel dependence was accomplished for Bohn, Achar and Cabrera

(2003), whose study discusses the location of industrial plant in two parts: the macro and micro location, and described the economical financial viability and economical and environmental impact of project.

Some Brazilian's savanna, as discussed by Scariot, Lleras and Hay (1995), where take place Indians, *Quilombolas*, small farmers, managing the survived groups of plants, specially in Minas Gerais state, estimate almost 100 mil ha, regarding 7 million plants, according to Roscoe (2008), spaced 10 x 10 m, according to Da Motta et al. (2002).

In Brazil, there is a scarcity of management plans of forestry and non timber resources. Therefore, the broad extensions of degraded pasture livestock hasn't available options to restart high yield, about 60 million ha hitherto in this situation. Here is the scientific opportunity for a Radical Sustainable Development Innovation, discussed by Hall e Vredenburg (2003). With agro forest management readily applicable on more than 10 million ha in degradeted condition, set aside from improve yield cattle 1 to 1,4 head ha^{-1}

So, in the same way proposed by Junqueira e Braga (2005): why don't encompass these potential areas with oil crops and produce in simultaneously meat, milk, feeding the cattle with mill from co-products from palm oil biodiesel production, avoiding likelihood of employee injury?

Constructing answers for these question, some botanical, ecological, social and economic aspects has been jointed by Lorenzi (2003), including environmental and socio-economic characteristics approach at studied area; survey of used, potentialities, and bases for a sustainable agricultural systems of this palm tree; data from population ecology; phenological study; harvesting response and chemical composition.

Presented by Hernández (2007) evaluating the effect of the physical refining on the characteristics in the oil of the corozo's palm kernel fruit (Acrocomia aculeata) could be the new oil research moment, about desacidification, an important problem in agroindustry to the raw and refined oil there decided the profile of oily acids. In the stage of desacidification and deodorized

Some environmental aspects encompassing energy and greenhouse gas balance, is available discuss about the path of biodiesel agribusiness and its development, and the changes in the world's agribusiness oil. According to Armstrong and Bailly (1990), recent literature publications are used to estimate the energy and greenhouse gas balance of the most relevant biofuels in Europe, i.e., ethanol and rapeseed methyl ester (RME). The potential for biofuels to substitute conventional fuels on the basis of available land is discussed. RME represents on average a saving of 37% of the energy contained in the fuel.

Although the inefficiency above described Tilman, Hill and Lehman (2006) argue that biofuels derived from low-input high-diversity mixtures of native grassland perennials can provide more usable energy, greater greenhouse gas reductions, and less agrichemical pollution per hectare than can corn grain ethanol or soybean

biodiesel. High-diversity grasslands had increasingly higher bioenergy yields that were 238% greater than monoculture yields after a decade.

low-input high-diversity biofuels are carbon negative because net ecosystem carbon dioxide sequestration (4.4 megagram hectare^{-1} year^{-1} of carbon dioxide in soil and roots) exceeds fossil carbon dioxide release during biofuel production (0.32 megagram hectare^{-1} year^{-1}). Moreover, low-input high-diversity biofuels can be produced on agriculturally degraded lands and thus need to neither displace food production nor cause loss of biodiversity via habitat destruction.

Furthermore, Read (2005) discussed that the beneficial side effects of using biofuels on a global scale. One of the main benefits includes a powerful approach to cutting the level of green house gases like carbon dioxide. The new approach involves the novel concept of negative emission energy, which combines bioenergy and CCS-the capture, compression and sequestration of CO2 product of combustion deep underground.

Global bioenergy can also provide sustainable development to many African countries that can produce biofuels cheaply. Read (1997) made a simulation model and employed it to study the potential for greenhouse gas mitigation of biomass carbon storage in both long rotation forestry 'sequestration' and indirectly, through biofuel production. The model simulates competition in the allocation of a global fixed supply of non-forest, non-barren land to wilderness, yielding biodiversity benefits and to use in conventional farming, in medium-term sequestration forestry (as a carbon buffer stock) and in biofuel production.

Conclusion

To conclude, based on Sumathi, Chai and Mohamed (2007) Malaysia will be one of the major contributors of world vegetable oil in near future with palm oil comparatively to other types of oil, as the most important source of edible oil and co products. Perennials oleaginous palm tree has been shown their potential, as high net balance. Based on Van Leeuwen, Lleras and Clement (2005) Brazilian's Savannas and Paraguayo-Argentinian's Chaco could follow Malaysia growth, both sowing palm oil tree and macaúba palm tree, because has adequate biome for each one. Especially for Savannas and Chaco a native species rustic, profitable, and highly resilient is macaúba. Although this palm is broadly naturally spread, it is necessary R&D investment prospecting next 50 years, improving genetic material, harvest process, agro industry oil extraction, allowing profitability and sustainability. Based on presented data, it is feasible to join developing countries efforts with their comparative advantage, the all year sun, over palms, producing renewable fuel. To alleviate poverty, it is necessary jobs, and perennial crops should provide it.

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