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Food Security and Sustainability: efficient production and innovations considering the environment

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This paper aims to present the concepts and the correlation between food security and nutrition and sustainability. The growing concern over the use of natural resources and the environmental consequences of agricultural practices, requires the increased production is coupled to a sustainable development policy. The food and nutrition security is the realization of everyone's right to regular and permanent access to quality food in sufficient quantity without compromising access to other essential needs, based on best practice health promoting food that respect cultural diversity and that are environmentally, economically and socially sustainable cultural. We define sustainable development as a participatory political process that integrates sustainabilities economic, environmental and sociocultural collective and individual, with a view achieving and maintaining quality of life. Currently we highlight several contributions of technological innovations in agro-industrial production.

Keywords: food security, sustainability, food production, technological innovations.

INTRODUCTION

The production, supply, manufacture, marketing and final consumption of foods represent one of the most important spheres for global regulation of capitalist economies in both the North and the South This also carries profound implications for the environment (MARSDEM, 1999). The growing concern over the use of natural resources and the environmental consequences of agricultural practices, requires the

increased production is coupled to a sustainable development policy. World agriculture must incorporate three aspects: population growth and food security, protection of the environment and natural resources and the expected reduction of stocks of fossil fuels (Camargo, 2010). The production of high quality food in sufficient quantity to meet the demand of the domestic and foreign market determines a major concern in Brazil, taking into account its position as a major supplier of food to the world. Even with the increases observed in the reduction of social inequalities in Brazil, there is a huge contingent of people living in food insecure

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(CORREA, 2009). The price and food crisis of recent years resulted in scientific and political discussions of a topic that went relatively overlooked: food security and sustainable. The purpose of this article is to expose the correlation between food security, sustainability and innovation area. For both, will be presented concepts of food security and in a second time to incorporate concepts related to the environment, land use, extensive monoculture production, breeding and other techniques that seek innovative solutions to produce enough to meet current demand.

Food Safety

The concept of food security was introduced into Europe from the First World War. Its origin was deeply attached to the idea of national security and the ability of each country to produce their own food so as not to be vulnerable to possible sieges, embargoes or boycotts of political or military (VALENTE, 2009)

From the end of World War II, the issue of food security of the populations was understood as a limitation of food availability and a threat to countries, especially Europeans who were, unable to produce enough food for its population (CORREA, 2009).

From the crisis of food shortages of 1972-74 and the agreements made at the World Food Conference of 1974 Food Security came to be understood as a storage policy strategy and supply safe and adequate food, and not as a right of every human being to have access to healthy food. The focus was not on humans, but on food.

The end of the 70s there was an increase in production and a drop in global food prices. Under this view concluded that hunger and malnutrition were due more access problems than production.

In 1983, the Food and Agriculture Organization (FAO) of the United Nations presented a new concept of food safety based on three objectives:

- adequate supply of food;
- stability of supply and food markets;
- secure access to the food offered.

The World Bank, in 1986 defined food security as "access by all, at all times, to sufficient food to lead an active and healthy life."

In the late 80s, early 90s, incorporating the notions of safe food (not chemically or biologically contaminated), food quality (nutritional, biological, health and technology); balancing diet, information and of cultural choices (eating habits) of humans.

At this time, stepped in to question the fairness and justice, particularly in relation to ethical relations between the current generation and future generations, the proper use and management of natural resources, the environment and the type of development adopted. Tariff came into the discussion of sustainable livelihoods.

The right to food has to be put in the context of the right to life, to dignity, self-determination and satisfaction of other basic needs (Valente, 2009).

According Maluf (1996) cited by WANDA the first references to food safety as a public policy in Brazil, arise through the Ministry of Agriculture in late 1985, predicting a "National Policy for Food Security", which aims to meet the food needs of population and achieve national self-sufficiency in food production. The use of the concept of food security was limited until then to evaluate the control of the nutritional status of individuals, especially child malnutrition, under the aegis of the Health Surveillance.

Law No. 11,346, dated September 15, 2006 creating the National Food and Nutrition Security - SISISAN aiming to ensure the human right to adequate food and other provisions. Establishes definitions, principles, guidelines, objectives and composition of SISISAN, through which the government, with the participation of civil society organizations, formulate and implement policies, plans, programs and actions aimed at ensuring the right to adequate food. This defines food security as:

According to Hirai (2008), food production is a crucial condition for consolidating the assumptions of the food security policy that "ensures the right to food in sufficient quantity and quality to all people."

Sustainability, technological innovations and Food Security

When referring to the term sustainability, there are different perceptions that can be classified from two aspects: the vision of persons belonging to social groups and approach the question has made in the fields of scientific knowledge. The word sustainability has the same meaning for people as diverse as the farmer, the politician, the planner of public policy, the member of a traditional community or member of any Indian nation, among other social actors. If their needs, their perception of nature and the relationship that men have with her, his moral standards are not the same are not the same because their ideas regarding what should be kept, and how this should be done, would be the same? (Azevedo, 2002).

We define sustainable development as a participatory political process that integrates sustainabilities economic, environmental and sociocultural collective and individual, with a view achieving and maintaining quality of life, whether in times of availability of resources, is when the periods of scarcity has perspective as cooperation and solidarity between peoples and generations (Marangon, 2004). According to the definitions already presented shows that Brazil has not been practicing sustainable development, in that it does not guarantee nor the present nor the future,

satisfaction of human needs and even preserve natural resources, from the practices exploitation of these resources. Taking into consideration its key features, the model of the last thirty years, in which favored export crops or associated with large agribusinesses at the expense of small production. As concurrent causes and effects of this model set itself the predominant monoculture and intensive use of chemical inputs (fertilizers and pesticides) on crops aimed at the domestic and export markets (Caporal, 2002).

With regard to agriculture sustainability, in turn, incorporates concepts related to environmental conservation, non-use of pesticides and extensive production in monocultures. Advocates of sustainability, for example, placed himself firmly against the use of GM foods (Belik, 2003).

The effects on the environment such as soil erosion, fertilizer use, soil pollution, water and food consumed directly affect food security in respect of contamination of raw food production capacity.

The unjust concentration of land and the consequent poor access to food cultivation, coupled encouraging monoculture mostly cereals, aimed at the export market, will hinder the possibilities of reducing the effects of hunger and poverty. The intensive use of inputs result in soil depletion and contamination of water sources, lack of support for family farming, the dependence of genetically produced seeds, insufficient minimum prices for agricultural products which form the food base of impoverished populations are factors prove that the (un) sustainability of the policy of food security and nutrition (Hirai, 2009).

Although insufficient we can already see a change in one part of consumers and producers. As an example, in the 80s, gave a severe legislation on pesticides, although hardly guaranteed by proper supervision. Grew also adopting technological models suitable alternative to family farming (Caporal, 2009).

Cunha (2010) highlights the contribution of new plant cultivars and better crop management practices. The advances are the result of breeding programs for plants scientifically sound, best practices in plant nutrition and protection from chemical and biological crop. The contributions of image analysis technologies, allowing detailed observation of subcellular structures, sequencing the genome of species of economic interest and applications of information technology, enabling the handling of large data sets, will be increasingly relevant. The future of agriculture is the transformation of basic research in technological applications.

According to the same author identifying a gene or set of genes associated with a better performance of a culture can be used in both breeding programs, in creating cultivars according to generate a new crop management strategy . Genetic transformation and

genetic improvement can be attributed to plants many useful features, such as resistance to pests and diseases. Also noninvasive techniques, computed tomography style, mass spectrometry etc.. will, quickly and relatively inexpensively, creating genetic maps of high resolution, allowing the elucidation of technical questions still unanswered by conventional research in agriculture. It is expected substantial progress in the area of biofortification, involving crops that are capable of producing foods rich in iron, zinc and vitamin A, intended for human consumption or grain free or low mycotoxin content of principles capable of causing pollution by phosphates in swine and poultry.

CONCLUSION

Through the paper presented it is concluded that the processes of development of a country bind to the food issue for ethical reasons, political, cultural, social, economic and environmental aspects currently.

Today there are concerns with the development of sustainable policies that accompany agricultural practices, observing the increased production and use of natural resources.

Food security undergoes changes in its concept, depending on the visions and the real needs of the population, as production capacity, shortages, availability, quality and safety, access and currently with the concern to ensure food quality and quantity to all people, especially future generations.

The Brazilian production model of recent decades, faces a monoculture, large agribusinesses, use of chemicals and pesticides that harm soils and watersheds, yet do not take into account sustainable development.

But already see a change in the behavior of some producers seeking alternatives to reconcile social, economic and environmental legal requirements and seeking even a portion of the population concerned with the relationship between the quality of their food and sustainability.

However there is a need for new technologies and new insight into the agroindustrial production toward the future more productive, more efficient and correct trailer exploitation of natural resources.

REFERENCES

- Azevedo RAB. de. A Sustentabilidade da Agricultura e os conceitos de sustentabilidade estrutural e conjuntural. Available at< www.ciencialivre.pro.br/> Accessed on 30 May Of 2012.
- BELIK, W. Perspectiva para segurança alimentar e nutricional no Brasil. Saúde e Sociedade. São Paulo, v. 12 n.1 jan./jun. 2003. Disponível em <http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104129020030

- 00100004&Ing=pt&nrm=iso> Accessed 30 May 2012.
- Camargo RAL. De; Oliveira JTA (2012). de. Agricultura, Sustentabilidade e Segurança Alimentar em 2050. O estudo francês para uma agenda de pesquisa. Available at<<http://www.sober.org.br/palestra/15/1090.pdf>> Accessed 10 jun. of2012.
- Caporal FR, Costabeber JA (2012). Análise multidimensional da Sustentabilidade: Uma proposta metodológica a partir da Agroecologia. Available at< <http://www2.emater.pa.gov.br/EmaterPortal/downloads/redestematicas/analMultSus.pdf>> Accessed 10 jun.2012.
- Correa AMS, Leon LMA (2012). segurança alimentar no Brasil: Proposições e usos de escala brasileira de medida da insegurança alimentar(EBIA) de 2003 a 2009. Available at< http://www.unicamp.br/nepa/san.php?pag= san_vol_16 _2_artigo_1 .php> Accessed 30 May
- Cunha GR (2010) Segurança alimentar e o futuro da inovação tecnológica em agricultura. Plantio Direto, Passo Fundo. ed. 117, mai.Jun.
- Hirai WG (2008). Agricultura Familiar e Segurança Alimentar: a importância da produção para o autoconsumo em três municípios do RS. 2008. 148f. Dissertação de mestrado. Faculdade de Agronomia Eliseu Maciel. UFPEL, Pelotas,
- Segurança alimentar em tempos de (in) sustentabilidade produzidas.Porto Alegre, 2009,161 paginas. Tese (Serviço Social) Faculdade de Serviço Social da Pontifícia Universidade Católica do Rio Grande do Sul.
- Maluf RS, Menezes F, Velente FL (2012) Contribuição ao Tema da Segurança Alimentar no Brasil. Available at< <http://www.pachamama.agr.br/biblioteca/MALUF001.pdf>> Accessed 02 Jun.
- Marangon (2012). Indicadores de sustentabilidade como instrumento par a avaliação de comunidades em crise: Aplicação à comunidade de Serra Negra. Revista Educação & Tecnologia. Curitiba, Editora do CEFET-PR, Available at < http://www.pessoal.utfpr.edu.br/macloviasilva/arquivos/indicad_sustent_serranegra.pdf> Accessed 30 may 8:143 – 161
- MarsdemTK (2012). Globalização e Sustentabilidade: criando espaço para alimentos e natureza. Available at < http://www.ufcg.edu.br/~cedrus/downloads/schneider/marsden_globalizacao_e_sustentabilidade.pdf> Accessed 05 Jun.
- Martins SR (2012) Desenvolvendo a sustentabilidade. Available at < www.danieljs.prof.ufsc.br/...sergio_martins/desenvolvimento_sustent > Accessed 20 Jun
- Menezes F (2012.) Panorama Atual da Segurança Alimentar no Brasil. Available at<<http://amar-bresil.pagesperso-orange.fr/documents/secual/san.html>> Accessed 13 Jun.
- Sistema Nacional de Segurança Alimentar e Nutricional:SISAM (2006). Lei 15 de setembro de. Available at<<http://www.mds.gov.br/acesso-a-informacao/legislacao/segurancaalimentar/leis/2006/Sisan%20-%20Lei%20no%2011.346-%20de%2015%20de%20setembro%20de%202006.pdf>> Accessed13 jun. 2012.
- Valente FLSO (2012). Direito à alimentação. Available at< http://www.gajop.org.br/portugues/alim_p.htm > Accessed 30 may.