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FOOD SECURITY AND SUSTAINABILITY – CHANCES AND LIMITATIONS OF AGRICULTURE

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ABSTRACT
The increasing population of the world may induce various problems. There are two major fields; food security and adequate fresh water supply, which are predominant for all Global economic structures. On the other hand all activities implemented in favour of meeting the demand of the population, increase the ecological footprint and may risk sustainability of both mankind and its environment. The present study deals with an assessment of future trends on the basis of the present state of alimentation.
Agriculture has a basic role in providing food for the human race. All sort of activities of that are in relation with the environment and at the same time they are driven by economic and social aspects. Sustainable agriculture can only be implemented if agricultural production can be run in an environment which is socially bearable, and economically viable. The scheme has to take into consideration that the society has to be equitable economically continuously. Whenever any of these interrelations cannot be manifested, the whole system may turn to be non-sustainable, or inefficient regarding food security.

Keywords: sustainability, food security, water scarcity, social equality

INTRODUCTION

Sustainability is the capacity to endure. In ecology the word describes how biological systems remain diverse and productive over time. Healthy ecological systems on a long term represent sustainability. Regarding the human society, sustainability is the potential for long-term maintenance of wellbeing, which has environmental, economic, and social dimensions (JOLÁNKAI ET AL., 2008).

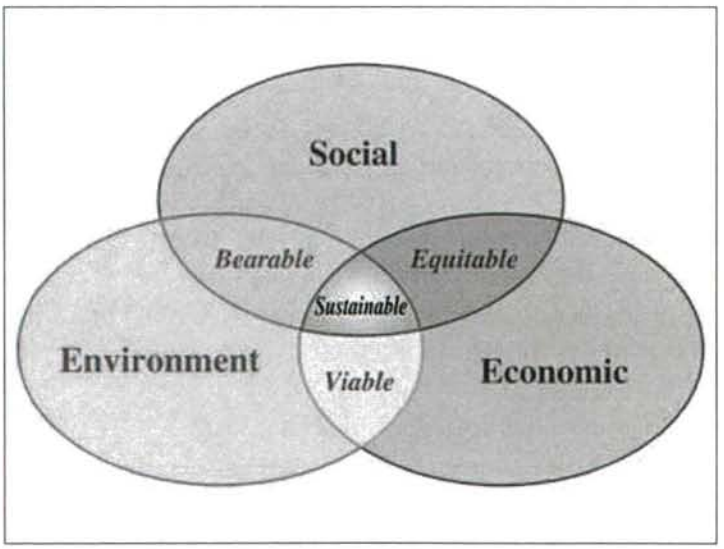

Figure 1. The interactions of sustainability
(Source: FAO 1990)

Sustainability as a term was developed upon the initiation of the United Nations by the Brundtland Committee. After the 1972 Stockholm Conference on the Human Environment

and the 1980 World Conservation Strategy of the International Union for the Conservation of Nature, the leaders of the world realized that there was a need to create an organization whose sole purpose was to raise awareness of the need for sustainable development (UN, 1987a). During this time period, people in developed countries were starting to become more aware about environmental issues stemming from industrialization and growth. Developed countries wanted to reduce the environmental impact of their growth. On the other hand, developing countries were becoming discouraged because they were not at and could not reach the higher levels of economic growth that industrialized countries had. Because of this need for growth, developing countries were desperate to use cheap methods with high environmental impact and unethical labour practices in their push to industrialize. The United Nations saw a growing need for an organization to address these environmental challenges which were intertwined with economic and social conditions as well (UN, 1987b).

The Brundtland Report was a response to the conflict between the nascent order promoting globalized economic growth and the emerging ecological disaster on a global scale. The challenge posed in the 1980s was to harmonize prosperity with ecology.

MATERIAL AND METHOD

The study has been focusing on three aspects of sustainability: economic growth, environmental protection and social equality. In the evaluation assessment public databases and statistics of the United Nations, within that the FAO (FAO, 2013) have been used.

RESULTS

Economic Growth is a crucial point when attempting to attain more sustainable efforts and development. In trying to build their economies, many countries focus their efforts on resource extraction, which leads to unsustainable efforts for environmental protection as well as economic growth sustainability. While the international scientific community was able to help to change the association between economic growth and resource extraction, the total worldwide consumption of resources is projected to increase in the future. So much of the natural world has already been converted into human use that the focus cannot simply remain on economic growth and neglect the continuously increasing problem of environmental sustainability. Agenda 21 of the United Nations reinforces the importance of finding ways to generate economic growth without hurting the environment. Through various trade negotiations such as improving access to markets for exports of developing countries, Agenda 21 looks to increase economic growth sustainability in countries that need it most. The key tasks for sustainable agriculture and rural development are as follows:

- Support for national policies and strategies;
- Promoting farmer-centred research and extension;
- Improving rural infrastructure;
- Strengthening local resource management;
- Providing entitlements for food security;
- Establishing fair and secure land tenure; and
- Reinforcing farmers' organisations and users' groups.

The seven tasks listed above may be divided into two fields; namely the responsibility of the governments and the desirable activities of the local stakeholders.

Environmental Protection has become an important issue regarding politics and businesses over the past decades, leading to great improvements in the number of people willing to invest in green technologies. Healthy ecosystems provide vital goods and services to humans and other organisms. There are two major ways of reducing negative human impact and enhancing ecosystem services. The first of these is environmental management. This direct approach is based largely on information gained from earth and environmental sciences as well as conservation biology. However, this is management at the end of a long series of indirect causal factors that are initiated by human consumption. In accordance with that a second approach is needed through demand management of human resource use.

Management of human consumption of resources is an indirect approach based largely on information gained from economics. There are three broad criteria for ecological sustainability: renewable resources should provide a sustainable yield (the rate of harvest should not exceed the rate of regeneration); for non-renewable resources there should be equivalent development of renewable substitutes; waste generation should not exceed the assimilative capacity of the environment (DALY AND FARLEY, 2004).

The focus on environmental protection has transpired globally as well, including a great deal of investment in renewable energy power capacity. Sustainable development occurring around the world helps to develop and implement water conservation, encourages the use of renewable energy sources, up to date electricity and energy efficient building. The consumption gap remains, consisting of the fact that "roughly 80 per cent of the natural resources used each year are consumed by about 20 per cent of the world's population". This figure is a sort of an evidence of imbalance, and furthermore, the vulnerability of the system. The increasing number of the world's population induces an increment in agricultural activities in favour of providing food security. This may influence two fields of environment; the decrement of natural ecosystems and the water scarcity. Figure 2 shows the dynamics of food production in relation with growth of population.

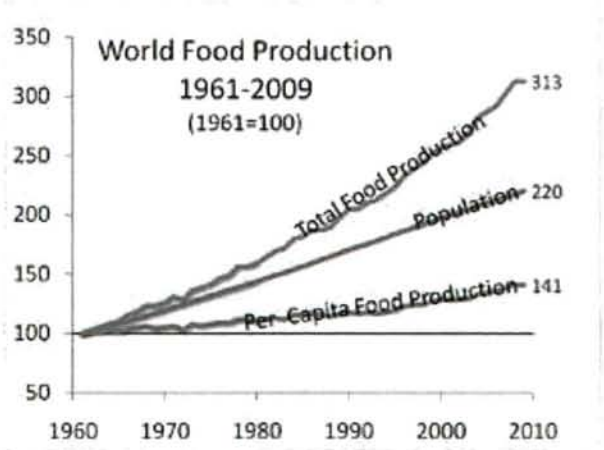

Figure 2. Trends of human population and food production of the world
(Source: FAO, 2013)

Social Equality. A major topic in achieving sustainability is the alleviation of poverty. It has been widely acknowledged that poverty is one source of environmental degradation. The social equality pillar of sustainable development focuses on the social well-being of people. The growing gap between incomes of rich and poor is evident throughout the

world with the incomes of richer households increasing relative to the incomes of middle- or lower-class households. Global inequality has been declining, but the world is still extremely unequal, with the richest 1 per cent of the world's population owning 40 per cent of the world's wealth and the poorest 50 per cent owning around 1 per cent. The Brundtland Commission has made an impact in helping to reduce the number of people living on less than a dollar a day to just half of what it used to be, but this can also be attributed to growth in BRIC countries.

Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life. Figure 3 gives information on food availability. Countries of the world are labelled with colours – green: food surpluses, yellow: balanced state, red: food supply insufficiency.

Figure 3. Alimentation of the world
(Source: FAO, 2013)

In 1996 the World Food Summit (WFS) set the target of "eradicating hunger in all countries, with an immediate view to reducing the number of undernourished people to half their present level no later than 2015". In 2000, the Millennium Declaration (MD) promoted the target to "halve, between 1990 and 2015, the proportion of people who suffer from hunger" (LÁNG, 2003).

FAO received the mandate of monitoring progress towards the objectives set by the WFS and the MDGs. For this reason, the FAO statistics division rigorously and continuously works on the methodology and the parameters needed for estimating the prevalence of undernourishment.

Fresh water supply of the world is closely related to alimentation. In this case the situation is more sophisticated, since water availability if often influenced by physical and economic factors. Figure 4 provides information on water availability. Almost 40 per cent of the world's population is facing physical or economic water scarcity of various extent.

Sustainable agriculture integrates three main goals; environmental health, economic profitability, and social and economic equity. A variety of philosophies, policies and practices have contributed to these goals. People in many different capacities, from farmers to consumers, have shared this vision and contributed to it. Despite the diversity of people and perspectives, the following themes commonly weave through definitions of sustainable agriculture.

Sustainability rests on the principle that we must meet the needs of the present without compromising the ability of future generations to meet their own needs. Therefore, stewardship of both natural and human resources is of prime importance. Stewardship of human resources includes consideration of social responsibilities such as working and living conditions of labourers, the needs of rural communities, and consumer health and safety both in the present and the future. Stewardship of land and natural resources involves maintaining or enhancing this vital resource base for the long term.

A systems perspective is essential to understanding sustainability. The system is envisioned in its broadest sense, from the individual farm, to the local ecosystem, and to communities affected by this farming system both locally and globally. An emphasis on the system allows a larger and more thorough view of the consequences of farming practices on both human communities and the environment. A systems approach gives us the tools to explore the interconnections between farming and other aspects of our environment.

A systems approach also implies interdisciplinary efforts in research and education. This requires not only the input of researchers from various disciplines, but also farmers, farmworkers, consumers, policymakers and others.

For a sustainable agricultural production, apart from theoretical and practical knowledge and the necessary technical support for its implementation, quality of human resources should be considered as an essential basis. Nowadays green movements often do more harm to environment than any other people involved in regular agricultural production.

Politicians speak of agriculture, as if it was some kind of hobby farming. Actually it is an economic necessity in most countries. Green movements often manipulate the public with arguments of no scientific value.

Agriculture and environment are bound together. There are several problems in their inter-relation, however these problems should never be placed in the field of politics.

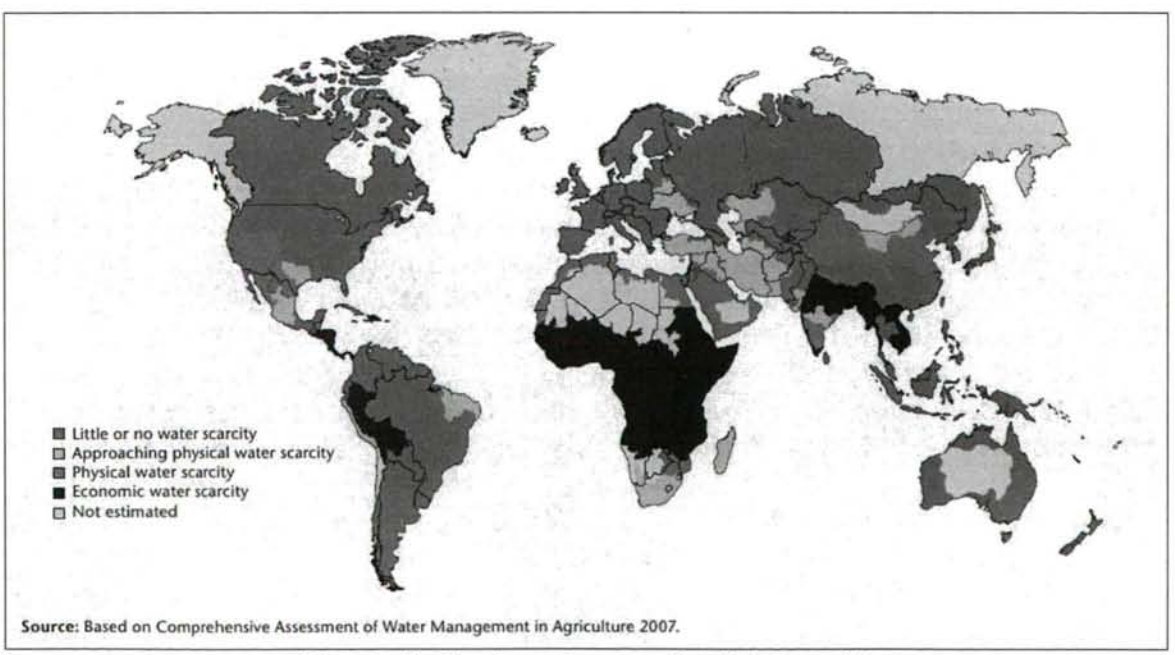

Figure 4. Fresh water supply of the world
(Source: FAO, 2013)

CONCLUSIONS

This brief overview does not give enough bases to draw general conclusions. May be the definition of sustainable agriculture (GOLD, 2009) is giving some suggestions for future tasks, mainly in relation with sustainable rural development. According to that sustainability should be "an integrated system of plant and animal production practices having a site-specific application that will last over the long term:

- Satisfy human food and fibre needs
- Enhance environmental quality and the natural resource base upon which the agricultural economy depends
- Make the most efficient use of non-renewable resources and on-farm resources and integrate, where appropriate, natural biological cycles and controls
- Sustain the economic viability of farm operations
- Enhance the quality of life for farmers and society as a whole."

Professor S. Cserháti a renowned Hungarian scholar has written in 1905 (*cit in* JOLÁNKAI ET AL., 2002): „Crop production is not an empirical craftsmanship anymore, but rather an art based on a wide range of knowledge". Let us be keen on to encourage knowledge-farming versus eco-anarchism.

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