

## Urbanization, Food Insecurity and Agriculture – Challenges for Social Sustainable Development

### Urbanizacja oraz zagrożenia bezpieczeństwa żywnościowego – wyzwania dla społecznej płaszczyzny rozwoju zrównoważonego

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#### Abstract

Sustainability essentially involves maintaining level of *per capita* well-being over time. With coming of the concept of sustainability the line of distinction existing between Human and society got vanished and there was a paradigm shift to understanding the various dimension of human society and their inter linkages along with the challenges we face. This paper reviews contemporary thinking and outlines the challenges with regard to the three very important dimensions, namely: urbanization, food insecurity and agriculture. Among the various reasons for growing food insecurity the key one has been Urbanization and its consequential increase in population. Through this paper we are presenting the ideas and practices of agricultural sustainability dealing with the following problems: Agro-environmental Sources, Inputs System, Socio-Economic system and the various Farming Systems. Also in this paper outline for ideas of urban sustainability incorporating the concept of urban social sustainability, understanding the position of urban ecology have been studied. Concept of urban farming is also important, since it helps to reduce problems in urban food supply by ensuring urban food security.

**Key words:** food security, sustainability, education, ecology

#### Streszczenie

Zrównoważony rozwój w istocie polega na stałym utrzymywaniu odpowiedniego poziomu życia ludzi. Wraz z rozwojem koncepcji rozwoju zrównoważonego linia podziału pomiędzy jednostką a społeczeństwem zanika, a jednocześnie następuje zmiana paradygmatu w kierunku poznania różnych wymiarów życia społecznego i ich powiązań z wyzwaniami, przed którymi stoimy. Niniejszy artykuł stanowi refleksję odnoszącą się do wyzwań związanych z trzema ważnymi wymiarami: urbanizacją, zagrożeniami bezpieczeństwa żywnościowego i rolnictwem. Wśród różnych uwarunkowań rosnącego zagrożenia bezpieczeństwa żywnościowego kluczową rolę odgrywa urbanizacja i jej konsekwencje. Przedstawiamy idee i zagadnienia praktyczne związane ze zrównoważonością w rolnictwie zwracając uwagę na: aspekty agro-środowiskowe, system wejść, system społeczno-ekonomiczny i różne systemy uprawiania roli. Próbuje także przybliżyć koncepcję miejskiej zrównoważoności, zawierającej w sobie zagadnienia związane z miejską zrównoważonością społeczną, rolą, którą powinna odegrać ekologia miasta, a także możliwościami rozwoju miejskiego rolnictwa, jako sposobu na zmniejszenie niedostatków dostaw żywności i poprzez to zapewnienie miejskiego bezpieczeństwa żywnościowego.

**Słowa kluczowe:** bezpieczeństwo żywnościowe, zrównoważoność, edukacja, ekologia

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## Introduction

Food is the essential for human well-being and human development. Sustainability is when People, at all times, have access to required food for a normal and healthy life. Food Security is determined by food stability, food availability, utilization, food access and linked to livelihood security. Food security assessments include indicators of food availability, access and nutritional status. Increased food production is the cornerstone for alleviating global food insecurity (Corvalan, Hales and McMichael, 2005). Despite the agricultural production being more adjusted to the demand, still in some areas there is acute malnourishment. The key reasons connected with pressure on food security are: atmospheric conditions change, urbanisation, worldwide integration, population increase, diseases, as well as various other factors responsible for changing patterns of food consumption. In developing countries these factors are concentrated. Together they impede people's access to sufficient, nutritious food; mainly through affecting livelihoods, income and food prices.

## An Asian Perspective on Food Security

The strategic approach for sustainability, adopted by Asian governments, includes:

- Growth element of macroeconomics: The period up to 1997 saw high rates of savings and investment along with sustained level of capital productivity and with high investment in human capital. This was the growth that reached the poor termed pro-poor growth (Agarwala, 1983).
- Stabilization of food prices: this ensured that the economic environmental problems, or the short run fluctuation, does not reduce the access to food to the poor.

The above strategies address the macro dimension of food security (not the micro dimension which works within the household and individual level). These include rural education, nutrition education, etc. Asian perspective on food security can be best understood by presenting economic and political background of differences connected with rice cultivation trends, that may be manifested in three ways:

- First, daily access to rice is essential for survival (Timmer, 2005), substantial part of farming involves rice cultivation.
- Second, knowledge acquired by rice growers, as well as skill of cultivation during favourable market condition.
- Third, stock buffering in Asian markets is needed to immunize the consumers from fluctuating prices. This requires that government actively controls the flow of rice.

Removing the special status of rice cultivation will help to make it more as an economic commodity and reduce the political influence. Greater investment is

being done, with the coordinated international efforts, to open free trade in rice market, so as to stabilize the price. This will ensure more prosperous future for Asia by providing greater food security.

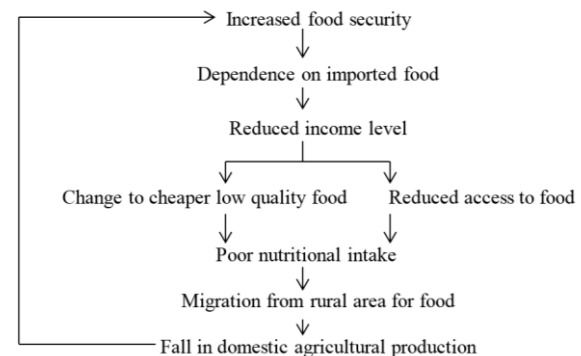


Figure 1. Graphical representation of Food Insecurity cycle

Figure 1 is an incorrect cycle, where each part is strengthening the other. The very first stage, i.e. increased food security, is supplemented by various factors. Key reasons for mounting pressure on food security are: climate change, urbanization, globalization, population boom, diseases, other changes in food consumption pattern, etc. With greater food insecurity subsequently the domestic food supply is already affected; there will be increased dependence on imported food. Since the imports increase consequently, the individual household gets affected because of the same level of income. This would effect in change in livelihood activities. When there will be increased dependence on imported food this would result in reduced income level (effect to livelihood: reduced expenditure on non-essential items what lead to sale of non-productive assets).

Reduced income level will have two effects. Firstly, shift to cheaper/low quality food, because of reduced buying power. Secondly, reduced access to food (effect to livelihood: increased number of poor people) and use of low quality food will consequently result in poor nutrient intake, because the daily nutritional requirement will not be met. All the above will contribute to increased migration from rural areas in search of availability of food (effect to people: there will be increase in rate of school dropouts in the case of children accompanying their migrating parents). Migration from rural areas will lead to fall in agricultural production, this in turn would lead to even greater increase in food insecurity and the cycle would continue.

Figure 2. is a cyclical representation of individual as an element of food security chain. This cycle considers both the growth aspect as well as the developmental aspect of society. At society level both physical and economic factors are contributing assets. The first box is the assets table including physical, social and economic contributing factors (for example: person's physical attributes contribute to the

farmland production). With more food production the purchasing power increases, hence the earning increases, so also does the saving and investment. Certain livelihood strategies (including production, investment, saving etc.) provide basic services and infrastructure. This subsequently leads to food availability in the market, the outcome of which is better food access, better health care practice and better hygienic conditions. As a consequence, the food intake increases and improves the health status of individual, which supplements the body nutrient stores and increases immunity, thereby decreasing mortality.

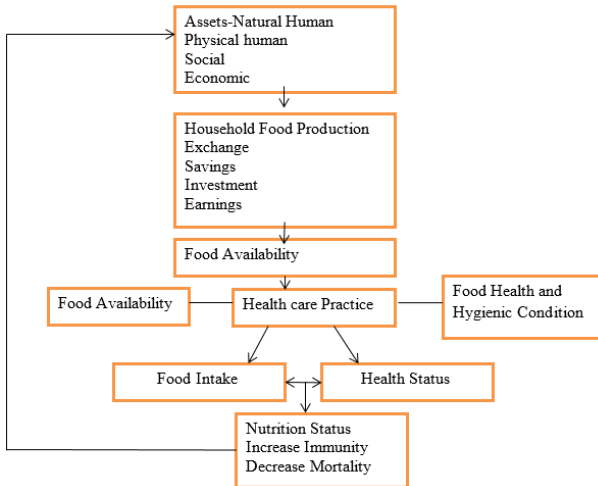


Figure 2. Food Security and Individual's Socio-Economic Status

**Urbanization and Food Security**

As regard to the urban food supply, the rural and international imports represents majority of food supply. One important aspect is that it is highly vulnerable to climate variations and international trade policy. The urban and peri-urban production (high value commodity) also contributes to the urban supply chain and these may include fresh vegetables, fish, meat, dairy, etc. Processing, packaging and transport in urban area is a challenge to food security and is contributing to carbon footprint (hence it becomes a challenge to the sustainability). The consequences are connected with increasing number of infectious diseases and water borne illnesses in urban areas of developing world. Moreover, with imports of high value commodity from rural areas, limited cash incomes makes urban area population more vulnerable to price shocks.

**Agriculture**

Agriculture provides the bulk of various goods, required by the non-agricultural sector, as well as numerous raw materials for industry. The direct and indirect share of agricultural products in exports is quite high. Sustainable food production, protection of ecosystem and climate policy is only achievable through effective agriculture. Poverty is also known

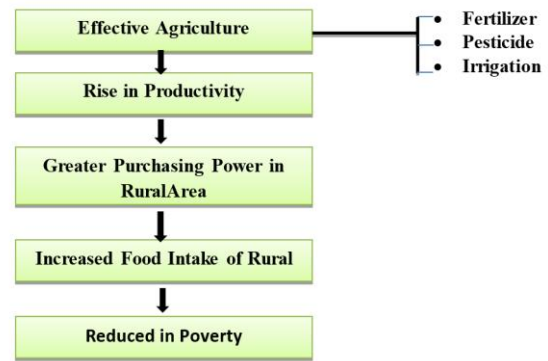


Figure 3. Agricultural Sustainability

to be impacted by agriculture. The forest land, when changed to agriculture land, leads to i.e. soil erosion, which leads to substantial disturbance in coastal ecosystems. This happens because of clearance of forest land for agricultural purposes, which means a consequential elimination of the natural carbon sink. The damage is then mitigated to other components of biosphere including the coastal ecosystem. So there is a need for saving the nature from degradation and to elevate poverty. The Asian 1960's criterion was based on Figure 3. At that time there was a rise in the productivity of rice. The increased productivity of rice led to an increased purchasing power in rural areas. It also improved the food intake of rural households (hence rural economy helps to reduce poverty quickly by inducing higher real wages). All the components which were used in 1960's showed gains in agriculture productivity, but it also raised the concern about sustainability. The excessive use of pesticides, insecticides, herbicides and chemical fertilizers has bad impact on soil fertility. No doubt production was increased manifolds, but it was at the cost of environment.

**Sustainable Agriculture**

The 1990's era saw a growing movement that questioned the role of the agricultural establishment, especially with reference to Green Revolution, in promoting practices that contribute to a variety of socio-economic and other problems. Within the mainstream agriculture this movement has found huge support. Sustainable agriculture addresses environmental and social concerns, and it offers innovative and economically viable opportunities for farmers, consumers, policy makers and many others in the entire food production system. It really is important to identify the basic ideas, practices and policies that constitute the concept of sustainable agriculture, since it will remain evolving in the coming years (FAO, 1989). This will be essential in setting the priorities. In Asian countries sustainable agricultural productivity has to be thought in terms of raising yield levels until population stabilizes and malnutrition is alleviated. Under these circumstances sustained production level, which is not harming the

ecosystem, is considered as sustainable productivity. According to the FAO, agriculture is sustainable when it is ecologically sound, economically viable, socially just, culturally appropriate and is based on a holistic scientific approach. Reijntjes, Haverkort and Water (1992), define Sustainable Agriculture as: *Low External Inputs and Sustainable Agriculture (LEISA) – [so] the agriculture which makes optimal use of locally available natural and human resources such as soil, water, vegetation, local plants and animals, human labour, knowledge and skills and which is economically feasible, ecologically comprehensive, culturally amended and socially fair.* Sustainable agriculture in loose sense defines a range of strategies to address problems like:

- a) Loss of productivity due to soil erosion,
- b) Mismanagement in use of agro-chemicals, particularly pesticides and fertilizers,
- c) Pollution of surface and ground water due to agricultural practices and inputs,
- d) Diminishing supply of non-renewable energy sources, and
- e) Decreased farm income due too low commodity prices and high production costs.

### Urban Sustainability

Urban cities have become the centres of world economy, since substantial part of population live there. It has rightly been said, that humanity has entered the *Urban Age* (more than half of the worldwide population is already urban). Objectives of sustainable development in urban areas involves not only achieving sustainability in development and planning of urban settlements, but also the general guiding principles of sustainability. Urban sustainability provides safe and healthy environment, which means healthy living environment, proper drainage and sanitation, waste disposal, adequate economic base for society and other important social and cultural goals. Due to several associated risks that urbanization has specifically on the human health, it brings several challenges to urban sustainability. A widespread rural relocation to urban areas causes risk to human health, due to certain dietary and social changes. The reason for this is that the societies in rural areas have entirely different social culture and habits compared to those in urban areas. With the migration from rural areas to urban areas it leads to heterogeneous population, which results in emergence of new culture or a new form of human behaviour (Wirth, 1938).

In urban areas the effort to raise living standard resulted in exhaustion of the ecological background. Ecology is the realm of natural sciences, since it is understood as study of relationship between the living and the external world. Whereas urbanization is associated with social sciences, since the centre of urbanization is connected with changes in human society. Ecological factors in urban areas has definitely

been affected by the prosperity of the human society and the consumptive actions of human nature.

The rapid pace at which the growing population is exploiting the locally available resources is a threat to ecological factors. Ecosystem is created through self-building processes and man is its very essential part. Human behaviour in one area can affect the health and well-being of people not only in the same place, but also in other regions (Nan, 2000). For urban sustainability a healthy and protected urban environment is a precondition. Understanding this human spatial relationship with the ecosphere, i.e. the nature, is essential.

### Urban Farming

The main aim of urban farming is to promote and inspire the urban farmers to grow food more sustainably. Irrespective of the size of the farm land, the most important element of urban farming is efficiency. Urban farming contributes to social economic improvement in the urban areas of developing world because firstly, it supplements the income and food production and secondly, because in some communities it acts as sort of recreation and relaxation. Urban farming relieves the rural agricultural production for export oriented purposes by attaining substantial self-sufficiency. Since urban areas are prone to food supply problems, hence farming in urban areas contribute to food availability to urban population.

More importantly, it increases resilience to adverse shocks by maintaining food production. Urban agriculture is in fact a response to increasing urban poor population crisis (Wackernagel, 1994), hence becomes very essential for community building. Sustainability in urban farming is achieved though recognition of environmental degradation of cities. Emphasis is on relocation of resources to better serve the population by various schemes of sustainable agriculture.

### Local Climate Governance

Whether the contemporary political and administrative systems can handle the challenges emerging from climate change is the question.

Local governance is restricted in various fronts on formulating and implementing the action plan. The climate protection strategy, based on the common good, is often objected for the adverse consequences and lack of scientific certainty it holds, hence there is a tendency to delay the action. But most importantly, these findings have implications on urban sustainability (Jagers and Stripple, 2003). Hence the existing governmental systems/institutes are not adapting to the environmental flux and thereby are not going beyond the traditional governance structures. Climate governance essentially means the

modes by which the stakeholders implement policies to mitigate the impact on climate and furthermore adapting to the effect of such climate change. Amongst all the stakeholders much emphasis is on local government as a major stakeholder. For easy understanding of modes of local governance, modes of local climate governance were identified (Bulkeley and Kern 2006):

**Firstly**, mode of self-governance, where the applicability is on the government itself, e.g. going beyond the national building standards and regulating energy use by municipal buildings, purchasing green energy. This also involves self-assessment and certain amount of accountability and transparency.

**Secondly**, through enabling and supporting the other stakeholders. This framework involves an element of decentralization of planning structure and is also effective due to the participation, recognition and inclusion of local stakeholders. Example – access and management of resources for low income groups, advice for energy efficiency, campaigns on green transport, dedicated funding of environment programmes, providing green jobs, etc.

**Thirdly**, the local government act as service provider, i.e. provides basic environmental services like waste collection, safe water supply, public transport and deals with environmental disaster, etc.

**Finally**, governance by authority, e.g. identifying and analyzing environmental issues, selecting program focus, defining institutional structure and planning, incentives and regulations, laying down efficiency and emission standards, providing proper city planning, etc. Effective governance of urban cities is a challenge to the economic productivity and human well-being. Local level of governance does not have full access to the key areas of decision making. Moreover, since there is a need for larger research effort for adaptive framework, hence the local government tend to overlook this aspect. Urban sustainability is the most neglected domain and up to what extent the local governance can address the challenges of sustainability is the most important question. Shaping cities towards a healthy future could help also to achieve goals of sustainability.

There is a need for setting and planning agenda to encourage leadership and gain stakeholders support.

### Conclusion

The concept of sustainable agriculture will remain ever evolving in the years to come. For the society it is really important to identify the basic ideas, practices and policies that constitute the concept of sus-

tainable agriculture. Urbanization has had a big impact on fundamental changes taking place in our contemporary food system. The rapid unsustainable growth of cities is adversely affecting the basic Urban Support Service system, which hampers the basic health of individuals. This, along with migration from rural area, adds to growing number of urban slum dwellers further worsening of food security.

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