Transition from Conventional Agriculture to High Tech Urban Food Production System. A High Tech Response to Urban Food Production Strategies

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Résumé / Summary

By 2050, 70% of the world's population will live in urban areas. Urban migration and mounting population will increase the need for stable, accessible, and nutritious food sources. The world population growth entailed to a massive growth of urban agglomerations, not just in terms of density but also in land consumption. Over the past few decades, efforts to improve the global issue of food tended to focus on producing sufficient quantities of food by increasing productive efficiency and capacity. Since 1950s countries in developed and developing countries have employed the industrial food production methods to produce vast amounts of cheap price food. The Industrial food production system has been successful in increasing the quantity of food production at a very low price for both consumers and producers. But these food production systems have developed with the high cost to vulnerable ecosystems and human health. Using vast amount of lands and fresh water to sustain productive capacity exacerbate the problems of the conventional or industrial farming practices.

High Tech Urban Food Production System (HTUFPS) right now is niche that has become a major player in the niche market of locally grown, high margin, perishable greens. HTUFPS refers to the vertical farming, plant factories, rooftop gardening and soilless agro food production methods like hydroponic and aquaponics technics and those urban agriculture practices that use modern technologies for cultivation inside, on top or façade of built up spaces. This study focuses on production of non-staple foods like herbs and vegetables within urban boundaries and in periurban areas.
This research aims to link HTUFPS to the idea of Sustainable and Resilient Food System (SRFS). SRFS is a global movement that aims to transform existing agro food systems into a driving force of sustainability transitions. This study identifies the obstacles to the development and expansion of HTUFPS and reviewed different policy proposals, literatures and planning approaches. In this paper a selected set of existing literature on research and experiences with high tech agro food production system assessment, urban food public policies, strategy development and planning approaches in alternative urban food system have been analyzed. The collected data were used to compare conventional agriculture and HTUFPS in four different areas: 1. Environmental and social sustainability; 2. Resource and energy efficiency; 3. Economic dimensions; 4. Product quality and health benefits.
The review of literature has shown that HTUFPS is a promising solution for future of agro food production. The research has unveiled that high energy consumption and technological complexity are the most important obstacle to development and adoption of HTUFPS in cities. High consumption is making environmentalist skeptical about the sustainability of HTUFPS. But the advocates of HTUFPS believe replacing the current sources of energy with renewable energies i.e. wind turbines and solar panels can resolve this problem. In addition the study has shown that the improvement of technologies used in HTUFPS in last 10 years have significantly increased the efficiency of these food production systems. The social and economic privileges of HTUFPS in addition to its land and water resources efficiencies are the main justification for adoption of HTUFPS as a food production strategy in both developing and developed countries.

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