



Potential negative impacts of vegetable production in polluted ecosystems

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ABSTRACT

Vegetables are important for nutrition, food security and they constitute a major economic activity in rural and urban agricultural systems in developing countries. As land and water resources become scarce within urban areas, and the demand for vegetable products in urban markets increases, there has been increased utilization of marginal areas, e.g. rehabilitated garbage dump sites, road reserves, waste water ways, for vegetable production. Many farmers in urban areas utilize water flowing from sewers or other waste disposal systems to irrigate vegetable gardens. Here a few of the potential hazards that could emanate from these practices are presented.

One of the key dangers of producing vegetables on polluted soils is the potential uptake and accumulation of toxic heavy metals. Depending on variety, some crops are known to take up large quantities of heavy metals and store them within their tissues. Although this trait may be desirable and could be exploited for phytoremediation of polluted environments, consumption of such plants could lead to toxicity when the

metals are transferred from the vegetables into human body tissues.

Depending on the type of waste that is released into the polluted environments, there is also a risk of encountering lethal pathogens, which could cling onto the surfaces of harvested vegetable produce and be subsequently consumed. The risk of pathogen spread is particularly significant when polluted waste waters, e.g. from hospitals or places with large human populations are used to irrigate vegetables. Potential pathogens include especially colliforms, e.g. *Escheria coli*.



Photo 1: Vegetables produced in a small scale garden in urban areas. Although aesthetically appealing, such produce could be loaded with toxic metals or harbor microbial pathogens that can affect consumers.

Although washing of vegetables would reduce or eliminate pathogen loads, increasing water scarcity and costs in urban areas make it even more difficult to clean produce to the required degree.

Furthermore, urban families that keep livestock also use vegetable produce, or remnants, as fodder. Since this fodder is unlikely to be cleaned before feeding to the livestock there is a risk of pathogens passing through livestock products to human body tissues. It is possible that some microorganisms could be transmitted through milk, eggs or meat. In addition, animals fed on plant materials that contain heavy doses of toxic metals, could also accumulate the metals or other pollutants in their tissues, and these can be passed on to humans through consumed animal products.

Besides the danger of product contamination, farmers who work in polluted environments are exposed to increased risk of being directly infected by pathogens that are in such environments. Poor farmers are unlikely to have access to adequately protective working clothes. Thus, even minor wounds could turn into major avenues of infection by a host of microorganisms in water or soil.

Additional adverse impact of growing vegetables in polluted environments would be experienced in markets that have well defined standards for produce. Vegetables from areas associated with presence of polluting substances or practices are unlikely to be accepted and if accepted, it would be at much lower prices.

Considering the importance of vegetables in livelihoods for food and income security, it is necessary to increase awareness of producers, especially in urban areas on the need to observe good production practices. One measure would be to ensure no vegetables are produced in polluted environments or using inputs that could expose consumers to negative health consequences.