

Research report for the Eiselen-Foundation Ulm on

**“Produce certification to strengthen consumers’ health interests and poor farmers’
household income from urban vegetable production in Mumbai, India”**

by

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Witzenhausen, 15 March 2011

1. Background

There is an immense contribution of urban and peri-urban agriculture (UPA) towards living strategies, employment and food security of the urban poor especially in developing countries (Hill et al., 2007; Sinha, 2009). UPA offers new potential for waste management and use of limited land in these countries (Ruel et al., 2000). However biological and chemical contamination of UPA products with heavy metals, fecal pathogens and helminths by the use of untreated sewage has been already reported by researchers (Ezedinma and Chukuezi, 1999; Howorth et al., 2001; Asomani-Boateng, 2002; Matagi, 2002; Binns et al., 2003; Bryld, 2003; Cofie et al., 2003; Drechsel et al., 2005). Fast growing economic development, urbanization, population explosion and lack of proper planning make the Indian cities vulnerable to pollution of air, water and land resources (Krishna and Govil, 2004; Roy, 2008) and are affecting the quality of UPA produces (Yasmeen, 2001; Singare et.al., 2010).

2. Introduction

City farming activities in Mumbai were initiated and patented by Padmashree Dr. R.T. Doshi with an economical technology of farming in open terrace and balcony which uses limited resources and inputs. The ideas of city farming and community city farming are gaining increasing popularity with the involvement of governmental organizations and NGO's like Marathi Vidnyan Parishad (MVP), Mumbai Port Trust (MPT) and Urban Leaves (community garden), with committed personnel's like Mrs. Preeti Patil (MPT) and D.N. Herleker (Director, MVP). Kitchen gardens and balcony gardens are getting more important among educated middle class and upper class families (personal communication, Preeti Patil)

The Indian Railways including Central and Western lines are also key players in UPA production in Mumbai Metropolitan Region (MMR). Unutilized land near railway tracks and stations were rented to non railway employees and railway class IV employees (gang man, gate keepers and khalasi¹). These contracts are renewed yearly and railway authorities provide protection and shelter for those who are involved in this field. The scheme "Grow more food" was started by the Indian Railways in 1975 for promoting vegetables, beautification and securing the railway land being encroached by outside

¹ Manual worker

slum people. About 435 acres of land were allotted among 282 railway employees for this scheme in MMR (personal communication, Indian Railways).

Government of Maharashtra spends a reasonable amount of money for the disposal of urban solid wastes (Chaudhari, 1999) and Brihanmumbai Municipal Corporation (BMC) spends 650 to 700 crores of INR (144 to 155 million US Dollars) per annum for waste disposal. It is estimated that around 9300 tones of solid wastes are being generated each day in Greater Mumbai alone and 40% of these wastes are completely biodegradable. This contributes to around 75% of the total solid waste generated in the MMR (MMRDA, 2010; MPCB, 2010).

Due to the rapid population growth and urbanization there have been changes in urban land use pattern with the manifestation of hazard prone areas (Acharya, 2004; Nijman, 2009) and illegal constructions leading to frequent flooding during Monsoon season (Byahut and Parikh, 2006). According to MPCB (2010) there are 16000 industries present through out MMR and out of them 26% were considered under red category generating hazardous wastes.

3. Hypotheses

- 1) The intensive agricultural usage of solid and liquid industrial wastes lead to heavy metal accumulation in UPA vegetables and soils of MMR
- 2) The direct application of untreated sewage water increases the risk of food chain contamination and threatens the quality of UPA products
- 3) The introduction of a proper regulatory system (certification schemes) can enhance produce quality, trust of consumers and higher household income of UPA producers.

7. Conclusions

Despite of the rapid expansion and population growth of MMR, many people are involved in UPA production of dairy products, vegetables, fruits and flowers. The distribution of these production systems are widely dispersed through out the MMR and shows unique identities and different modes of production. The UPA production does generate income not only to farmers but also to local street venders who reap multiple

benefits from this activity since they can procure the products easily and sell them fresh. Terrace and balcony farming are considered as a leisure activity that marginally reduce the garbage and help to recycle bio-wastes generated in kitchens. Commercial vegetable production systems close to the railway tracks raise the question of possible health risks for consumers and producers which must be further studied. Despite of all these problems, the products can easily be sold inside MMR due to a large market demand.

8. Outlook

- Further sub-classification of production systems
- Analysis of socio-economic data for grouping farmers
- Laboratory analysis of soil samples for characterisation and heavy metal contamination (preliminary test)
- Analysis of produce for heavy metal residues (preliminary test)
- Use of crop management and irrigation methods for selecting representative gardens
- Determination of the produce quality and resource use efficiency
- Assessment of consumer health
- Market surveys
- Guidelines and recommendations for quality improvement of UPA vegetables
- Development of Participatory Guarantee System (PGS): for local market