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Crop Diversity as a Livelihood Strategy? The Case of Wastewater Irrigated Vegetable Cultivation Along the Musi River in Periurban Hyderabad, India

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Abstract

Along the Musi River in periurban Hyderabad, leafy vegetables are increasingly grown and sold in urban markets. Wide areas are irrigated with river water, highly polluted by sewage and industrial wastewater. Previous studies showed that periurban agriculture in Hyderabad plays an important role for the livelihoods of a diverse group of people, many of whom are women, from different castes, religions and social classes.

During a field study in 2007 (in cooperation with the International Water Management Institute and the University of Freiburg, Germany), a rapid appraisal of vegetables cultivated with wastewater irrigation was carried out. In order to estimate the risk from pathogens for consumers, the percentage of vegetables consumed raw was calculated. A large number of vegetable varieties were found in the vegetable gardens, also in those where wastewater was used for irrigation, contrary to expectations. The leafy vegetables - traditionally in high demand - have a short growing season and fetch high market prices due to their usage in traditional dishes. In 2008, the study was extended to explore the role of agricultural biodiversity for livelihoods and building resilience using the sustainable livelihoods approach as theoretical background.

54 varieties of vegetables from 20 families were identified. Among those, 18 were cultivated for the leaves most of which were usually cooked. There was no significant difference in biodiversity (Shannon-Index and Simpson-Index were calculated) between wastewater and groundwater irrigated fields, but a significant difference in the species composition (almost 95 % leafy vegetables where wastewater was used, around 70 % fruit bearing vegetables where groundwater was used for irrigation) for several reasons such as insecure land tenure, water and soil quality, risk mitigation and market demand. Previous studies show that the use of wastewater for irrigation can have both positive and negative effects on agriculture. Besides possible health risks, fertiliser costs could be saved due to the high nutrient content of the wastewater. Agricultural Biodiversity is thus not necessarily diminished by the use of wastewater and can contribute in many ways to resilience, some of which are analysed and discussed in the study.

Keywords: Adaptation strategies, agricultural biodiversity, agrobiodiversity, crop diversity, ethnobotany, Hyderabad, leafy vegetables, livelihoods, resilience, smallholders, wastewater irrigation

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