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Promotion of urban and peri-urban agriculture may play a catalytic role in improving food security and enhancing livelihoods for rural poor. But there is a need for widespread recognition in policy and practice of peri urban agriculture.

Key points

- Peri-urban farmers are excluded from agricultural extension as well as municipal services, enhancing their vulnerability.
- Increasing urbanisation and the accompanying changes in land-use patterns are leading rapid conversion of agricultural lands to housing estates and shopping malls, will jeopardises the futures of the newly created urban spaces
- Urban growth based on migration and the absorption of rural areas into the urban has led to immense problems ranging from impoverishment, ill-health, malnutrition and food insecurity to over-concentration of slums and squatter settlements.

Dulari rues the day she agreed five years ago to allow her husband Ravi to sell their half acre land to Matadin, the insistent middleman. Dulari and Ravi used to eke out a living commercially cultivating vegetables and some paddy for domestic consumption in Moharipur village northwest of Uttar Pradesh's Gorakhpur City. Thirteen km from the city centre, Moharipur is just outside the municipal limits. Their land, in the heart of the Rohin Basin, was extremely fertile. Matadin promised them Rs 100000 but gave only Rs 75000 on the pretext that he had to pay various people as the papers were not in order. Dulari and Ravi were too illiterate to understand paperwork. They knew they were cheated but could not protest as Matadin was a powerful man. The money soon disappeared with Ravi's taking to alcohol and gambling and the remaining going for Sushma's (their daughter) dowry. Shorn of an identity and a livelihood, Dulari and Ravi were forced to lock their hut and move to Gorakhpur to work as pavement dwelling casual labourers. Ravi cannot work much now as he has tuberculosis. They have no other children (GEAG nd).

Dulari's story is apocryphal in many parts. But such incidents are common in almost every peri-urban site in India. As the country urbanises, every year the identities of thousands of Dularis and Ravis are decimated. The figures don't matter simply because they don't exist but growing urban sprawls steamroll small and marginal farmers into a state of non-being, reducing happy homes to marginalised pavement or slum dwellers. Land values go up but unscrupulous middlemen dupe the small and marginal farmers of their dues. To be

urban is to be modern. But such thinking ignores the fact that the elimination of small and marginal farmers and converting their agricultural lands into housing estates and shopping malls jeopardises the futures of the newly created urban spaces. Indeed, increasing urbanisation and the accompanying changes in land-use patterns are leading to a silent crisis through the destruction of ecosystems and the services they provide to support the poor, as well as affecting the resilience of urban areas.

Globally, urban growth based on migration and the absorption of rural areas into the urban has led to immense problems ranging from impoverishment, ill-health, malnutrition and food insecurity as well as over-concentration in slums and squatter settlements that also often get flooded or are prone to other disasters. Most of these urban poor work in the informal sector, in menial jobs ranging from waste picking to domestic help. They service the city but their work does not get the due acclaim or remuneration. Children's education is not given sufficient attention with the proliferation of unrecognised schools and private tutors. Health care is left mostly in the hands of unqualified medical practitioners (Mitra and Singh, 2011).

Addressing the deterioration of ecosystem services is directly linked to the MDG goals of eliminating hunger, disease and poverty, and providing universal primary education (MEA, 2005). Both health and education are critical for building resilience to climate change, enhancing the scope of redundancy and safe failures: sick people cannot work efficiently and lack of education leads to failure to acquire the necessary skills to maintain the ecosystem in contemporary times. Socioeconomic challenges exacerbate these issues in the peri-urban areas.

The Way Out : Peri-Urban Agriculture

Densely populated intensive smallholder agriculture is the dominant norm in peri-urban areas. Marginal local farmers and poor inner-city as well as rural migrants live side by side and may all be engaged in agriculture in peri-urban areas. With the urban poor spending the majority of their income on food and with limited transport infrastructure, peri-urban production plays a crucial role in supplying fresh and affordable food for growing urban populations which have relatively easily accessible markets (Marshall *et al.,* 2003).

For poor peri-urban communities, agriculture forms a key part of often-diverse livelihood strategies meeting basic food requirements, as a source of income from selling produce, or as employment e.g. as farm labourers. However, the obstacles to producing safe and affordable food that preserves environmental integrity are immense.

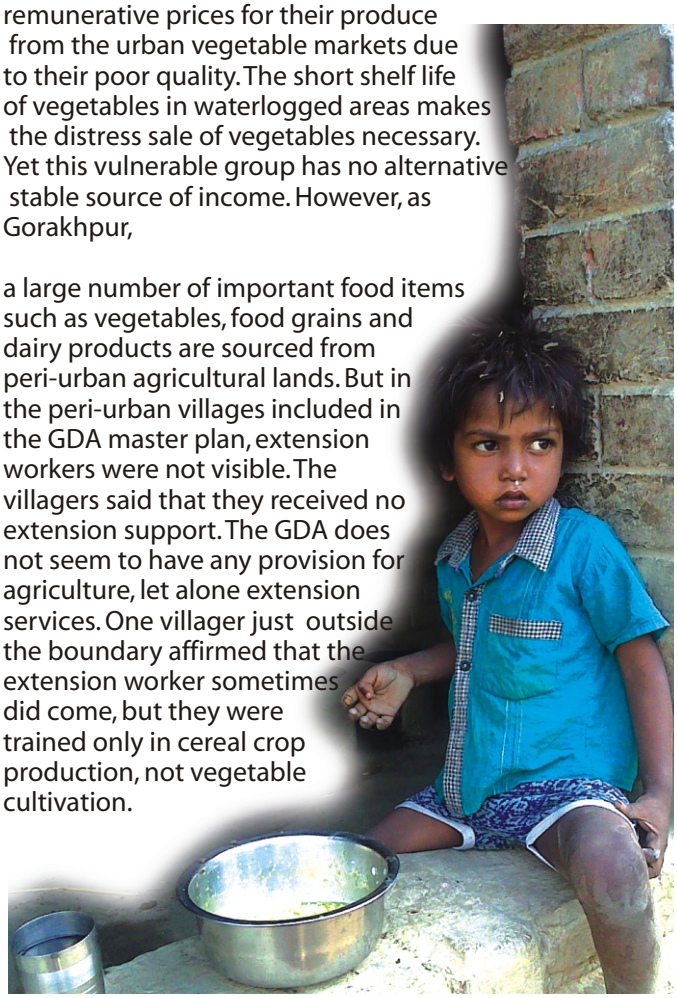
The role of urban and peri-urban agriculture in improving food security and enhancing livelihoods is increasingly recognised (Bakker *et al.,* 2000). But there remains a lack of widespread recognition in policy and practice, and despite the increasing demand for affordable fresh produce for urban populations, the peri-urban interface is often perceived as a temporary 'belt' on the city fringes, and the decline of agriculture is often seen as inevitable to make way for urban development (Marshall *et al.,* 2009).

Peri-urban agriculture generally occurs outside the jurisdictional boundaries of municipal authorities but close to the urban core and are excluded from rural agricultural development programmes, as seen in the peri-urban villages of Gorakhpur (Mitra et al, 2015).

This means peri-urban farmers are excluded from government extension services as well as municipal service provision and their vulnerability is enhanced by this exclusion. The role of peri-urban agriculture in both the urban and rural hinterlands point to potential pathways towards peri-urban sustainability, 'building on better conceptualisation of the multiple and diverse ways in which agriculture intersects with social, economic, environmental and health issues and the diverse perspectives involved.'

However, farmers in these areas do not receive remunerative prices for their produce from the urban vegetable markets due to their poor quality. The short shelf life of vegetables in waterlogged areas makes the distress sale of vegetables necessary. Yet this vulnerable group has no alternative stable source of income. However, as Gorakhpur,

a large number of important food items such as vegetables, food grains and dairy products are sourced from peri-urban agricultural lands. But in the peri-urban villages included in the GDA master plan, extension workers were not visible. The villagers said that they received no extension support. The GDA does not seem to have any provision for agriculture, let alone extension services. One villager just outside the boundary affirmed that the extension worker sometimes did come, but they were trained only in cereal crop production, not vegetable cultivation.



GEAG's EXPERIENCES

Rapid urbanisation in Gorakhpur has created strong pressures to convert agricultural land. Land is wanted for industrial, residential and commercial use, as well as for infrastructure development. Since last three years GEAG has been promoting resilient agriculture in the peri-urban areas. This is central to building resilience to climate change for the entire urban area. The initiative started with 30 small and marginal farmers which has now increased to 619 model farmers who are following the footsteps of these 30 model farmers.

The initiative representing a practical mechanism for diversifying urban livelihoods for poor and marginalised communities, ensuring local food supplies, particularly vegetables and fruits, and conserving open areas that serve as flood buffers. The process has helped the farming communities to become more robust and flood-resilient by minimising the chances of losses. The farmers have also adopted recycling processes in farm sub systems, reducing the need for external inputs. Farmers use a range of practices including reducing external bio-inputs, growing appropriate crop varieties, employing space and time management, seed banking, land shaping and potable nursery systems.

Thus, if villagers are helped to improve farming, horticulture and animal husbandry in eco-friendly ways, the possibility increases that they will not sell out their valuable lands to builders, and protect open spaces and water bodies in their area. The Gorakhpur case has been a successful attempt to reduce migration by desperate farmers as it has generated hope in farming. The practices of climate resilient agricultural have helped in reducing input costs, boosting the net gains. It has also contributed to the enhanced livelihood security of vulnerable groups and ensured food security for the urban poor.

cultivation. These deficiencies in extension services are a serious problem for cities seeking to promote sustainable peri-urban agriculture and need immediate attention (Mitra et al, 2015).

Another major deficit is the provisioning of institutional credit. The government of India provides small-scale and marginal farmers (individually or as groups) with cheap credit through public sector banks by issuing Kisan credit cards. However, farmers in peri-urban or urban areas are not extended such facilities (Mitra et al, 2015). While many continue to hold job cards under MNREGA, there are few takers as the work in the urban informal labour market pays more. These villagers and farmers are neither 'rural' nor 'urban'. Combined with rapidly changing ecosystems and declining ecosystem services, they receive little or no support from either the state or development programmes. This is partly because governments, policy makers and academics often do not recognise that even in peri-urban contexts agriculture is a part of an ecosystem, thanks to the farmers' ingenuity and inherent adaptive capacities. However, such ecosystems are eroding rapidly due to short-sighted policies and poor implementation of existing policies, underlining the importance of regulatory services such as natural hazard mitigation, erosion control and water management.

Though there are some evidences that the city administrations recognize the role of urban and peri-urban agriculture in improving urban food security and enhancing nutritional and livelihoods

security, but still there remains a lack of widespread recognition in policy and practice, and despite the increasing demand for affordable fresh produce for urban populations, the peri-urban interface is often perceived as a temporary 'belt' on the city fringes, and the decline of agriculture is often seen as inevitable to make way for urban development (Marshall et al., 2009).

Thus, a fundamental change in mindsets is needed, to prevent further land-use changes and unregulated construction activities. The international agencies like FAO and CGIAR has already insisted for supporting policies and practices for peri-urban agriculture (Marshall et al., 2009; FAO 2007), they do not seem to consider agriculture as part of an integrated system within ecological settings which contributes to the overall resilience of the city. Multidisciplinary and integrated administrative land-use planning that recognizes the agricultural ecosystem as a core component of the urban and peri-urban natural resources system is essential for this initiative (Marshall et al., 2009; Pothukuchi and Kaufman, 1999).

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