Small farms around Bengaluru: Growing money at the cost of food and environment

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Urbanisation, along with becoming a universal trend, has also emerged as a significant driver of agricultural transition in the developing world. More and more people from rural parts of India migrate to urban centers in search of non-farm livelihood options and for better living conditions. Urbanisation is closely coupled with transformation of traditional rural economies into modern industrial economies through irreversible land use change. The land remaining under farming is also influenced by urban demand with mixed outcomes in production and livelihoods. India exhibits this reciprocity of urbanisation and farming prominently.

One major outcome of this reciprocity between cities and farming is that contribution of the primary sector to GDP at current prices declined from 23.3 per cent in 2001 to 17.3 per cent in 2016, though 60 per cent of the total workforce remained dependent on farming as a primary occupation. Another outcome of the above mentioned reciprocity is how peri-urban farming behaves differently from the rest. Varied stressors of urban origin like growing demand for land and exotic commodities, together with constraints in inputs including water and labour, drive peri-urban farming in unanticipated directions. Bengaluru, India's technology hub and home to nearly ten million inhabitants, is a case in point. Commercial, industrial and residential constructions, air and water pollution, and landscape fragmentation in and around this city have greatly transformed farming practices and systems in its surroundings. This paper looks at specific transitions in the production ecology of agrarian peripheries around Bengaluru.

Moving from locally or regionally integrated farming systems and tending towards globally linked value chains, these altered agricultural systems impact multi-functionality [e.g. economic, social and environmental functions (Pretty, 2008)], diversity [e.g. including crops for food, fibre and fuel (King, 2014)] and resilience [e.g. with agro-ecological considerations that ensures sustainability (Altieri, et al 2012)] of family farming. Dietary preferences, gender relations, social connectedness and inclusivity are also reshaped in these new farming practices, through a mosaic of dynamic linkages between the city and its peripheries. In peri-urban areas with new farming systems market network and value chains also get transformed.

Case studies of growing lawn grass, eucalyptus trees and high value flowers around Bengaluru are used to depict agrarian changes in peri-urban Bengaluru.

(a) Lawn grass cultivation: New kinds of urbanism with its roots and shoots in global cities stipulate 'greenery' as integral to its built-up environment. Greenery here means manicured

lawns and exotic plants around. Lawn grass cultivation and nurseries for ornamental plants take up land from staple and other food crops in huge extents of land in peri-urban Bengaluru. Lawn grass cultivation demands generous application of synthetic inputs and water. Sods of lawn grass are harvested every three to four months as green sheets along with half-an-inch of top soil underneath. Thus it demands for soil replenishment using soil purchased either from lake beds or excavations at construction sites or fallows in nearby areas.

The harvested sods are sold to local traders who further sell it to other traders from major cities of South India. Lawn grass, giving nearly three harvests each year and a net income of ₹ 2 to 3 lakhs from an acre with every harvest, could be an ideal candidate if immediate farm income is the only concern of both, the land owner and cultivator, and the government. Soil deterioration and ground water depletion as well as weakening community fabric might indicate differently. Customary sharing of labour, farm animals, manure and even harvest turn to be things of the past. Individualisation and farming exclusively for profit also comes at a cost of nutritional security in the locality.

b) Eucalyptus plantations: Amidst widespread concern over deforestation, fast growing eucalyptus trees were introduced around Bengaluru during 1950s as a greening effort, by the Forest Department on degraded hillsides. Later on it rapidly spread to farm lands as well from 1980s, following a project aided by the World Bank to generate fuel wood and timber for communities.

Other reasons for eucalyptus trees to spread included the fact that a hybrid variety of eucalyptus starts yielding poles within six-seven years. Labour scarcity for regular farm works, water insufficiency for raising crops for the city and assured demand for timber, poles and twigs from the tree as well as the potential to extract and sell essential oils from its leaves also contributed to its spreading. Demand from pulp industries and the construction industry booming in Bengaluru for scaffolding were greatly instrumental in its spread into individual smaller farm lands. The average net income per acre from eucalyptus came to ₹ 1,00,000 annually from the third to fifth year of planting, depending on the harvest of poles or timber.

Still, it was mostly the choice for absentee farmers who wouldn't need staples to be cultivated. Choosing a tree that will demand least inputs and management while yielding some cash income made sense outside an expanding city, where land owners waited for good real estate deals. Some farmers without irrigation converted their entire land into eucalyptus plantation and worked as wage labour in their own village or nearby suburban areas. Locally known as nilgiri, spreading widely in agricultural fallows, eucalyptus implies absentee landlordism and de-peasantisation. Ground water depletion (Srivastava, et al 2003), soil erosion (Thompson, 2016), declining crop diversity, birds (Phifer, et al 2016) and insects (Diniz, et al 2010) are observed in and around eucalyptus groves.

(c) Cut flowers in poly-houses: Bengaluru's image as 'Garden City' with thriving horticultural research and activities makes it a hub for flower trade. The international flower auction centre set up in 2002, gave impetus to intensive export oriented floriculture around the city. Exotic high value flowers for urbanites in and outside Bengaluru are generally grown in poly-houses. Dependence on skilled labour often from Uttar Pradesh and Bihar, use of high-cost agro-chemical inputs, equipment and technology for growing, harvesting, marketing, packing and transporting makes it more of a business that requires good amounts of initial investment and operational costs, than agriculture.

The annual net return comes to ₹ 7-8,00,000 from an acre. Farmers seemed to know that in five-to-six years of this kind of intensive cultivation, soil and water would be depleted. Poly-house floriculture, as in the two cases above, has tradeoffs with food crops, in addition to the externalities in terms of ground water depletion, chemical pollution of soil and water as well as occupational hazards.

Thus the opportunities that cities offer to their agrarian peripheries are harnessed by resourceful entrepreneurs. These opportunities come with considerable trade-offs unless strategised with an 'agriculture first' approach to urbanisation.

References

Pretty, J. (2007). Agricultural sustainability: concepts, principles and evidence. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *363*(1491), 447-465. https://doi.org/10.1098/rstb.2007.2163

Phifer, C. C., Knowlton, J. L., Webster, C. R., Flaspohler, D. J., & Licata, J. A. (2017). Bird community responses to afforested eucalyptus plantations in the Argentine pampas. *Biodiversity and conservation*, *26*(13), 3073-3101. https://doi.org/10.1007/s10531-016-1126-6

Srivastava R. J., Kumar, A., & Prasad, K. (2003). Studies on soil moisture variation under Eucalyptus plantation. Paper presented at the XII World Forestry Congress, Canada. Retrieved from http://www.fao.org/3/XII/0500-B2.htm.

Thompson, A., Davis, J. D., & Oliphant, A. J. (2016). Surface runoff and soil erosion under eucalyptus and oak canopy. *Earth Surface Processes and Landforms*, *41*(8), 1018-1026. https://doi.org/10.1002/esp.3881

Diniz, S., Prado, P. I., & Lewinsohn, T. M. (2010). Species richness in natural and disturbed habitats: Asteraceae and flower-head insects (Tephritidae: Diptera). *Neotropical entomology*, *39*(2), 163-171. http://dx.doi.org/10.1590/S1519-566X2010000200004

King, O. E., Siddick, S. A., Gopi, G., & Kav, N. (2014). Enhancing crop diversity leads to farm resilience. *LEISA India*. Retrieved from https://leisaindia.org/enhancing-crop-diversity-leads-to-farm-resilience/

Altieri, M. A., Funes-Monzote, F. R., & Petersen, P. (2012). Agroecologically efficient agricultural systems for smallholder farmers: contributions to food sovereignty. *Agronomy for Sustainable Development*, *32*(1), 1-13. http://dx.doi.org/10.1007/s13593-011-0065-6