

Deborah Dutta, Sanjay Chandrasekharan (2015) *Developing a curricular framework for ecological sensibilities: Exploring the activity of urban gardening as a relevant and critical intervention*, Conference Proceedings in epiSTEME 6

## **Developing a curricular framework for ecological sensibilities: Exploring the activity of urban gardening as a relevant and critical intervention**

*Current environment education curricula focus on presenting facts about the environmental crisis, and providing awareness. This awareness model does not lead to environment-oriented behaviour because of lack of possible interactions between information, critical pedagogy and pro-ecological behaviour. Community gardening presents an interesting alternative approach to developing environment-oriented behaviour focusing on embodied, situated and dynamic interactions with elements of nature. The article chalks out urban gardening as an activity that creates an embodied understanding of nature that is distinct from that created through conventional environmental education alone.*

### **Introduction**

“The volume of education has increased and continues to increase, yet so do pollution, exhaustion of resources, and the dangers of ecological catastrophe. If still more education is to save us, it would have to be education of a different kind: an education that takes into the depth of things.” —E F Schumacher

The above words bluntly describe the gap between our collective knowledge of ecological degradation and our actual behaviour towards the environment. This gap can be understood as arising from a set of cognitive problems.

1. Lack of direct cause and effect relations: Most ecological problems are not immediately perceived; for example, repercussions of using excessive pesticides and fertilisers in farming are not seen or felt immediately. Often groups of people who feel the brunt of ecological degradation are not the same group that caused it. For example, people apprised of pollution, ozone hole, climate change etc still can lead a consumerist life style, and go about their everyday activities without feeling the brunt of these problems. On the other hand, people (and other living beings) suffering the consequences of the consumerist lifestyle are more often than not removed from sphere of influence or action.

2. Cognitive load: Engaging in pro-environmental behaviours decidedly means going against the current of established practices, and thus exerts a cognitive load on the individual, who has to disengage from ‘default’ and instead deliberate over choices. Pichert D. et al (2007) show that many environmental choices depend over what is the default option available to an individual, because of the difficulty in performing trade-offs and reconcile conflicting objectives (such as save money on cheap fuel or go for greener options). As creatures of habit, sticking with the default seems to allow one to bypass an otherwise stressful decision.

3. Invisibility: The invisibility of the production/consumption process, description of problems that mostly seem out of individual control or wouldn’t be impacted by solitary action. Eg: one person opting for public transport or not throwing garbage indiscriminately when problems are described on global scales of climate change or land pollution. In such cases, the ‘locus of control’ seems far removed from the individual, thus prompting questions like, “what difference would my actions make?” The accompanying feeling of apathy and resignation

forms what may call a negative feedback loop and provides added rationale for sticking to default habits.

These are only a few of the cognitive reasons why, despite having pro-environment intent, translating these attitudes into desirable behaviour is not easy. To address these cognitive issues, the problem-spaces need to be local, relevant and solutions must empower individuals to take further action. These elements have been put into practice through various movements, the most recent and promising being 'The Transitions Initiative' which emphasises on community issues in form of "engaged optimism" by firstly convincing people that their actions will result in an enhanced quality of life. A positive outlook makes a problem much more interesting rather than daunting and can help sustain an action despite the cognitive load involved. The usual avoidance associated with conflicts is mitigated by peer involvement which helps create new norms, practices and goals.

To develop an educational curriculum that will lead to environment-oriented behaviour, students need to develop a relational thinking that views the world as a seamless web of relations and processes that affect one another constantly. This recognition would need introduction of new components in the curriculum that integrates facets of geography, science, politics and history and feeds into community life. The immediate surroundings would become an important starting point for entering various disciplines, and the success of a course would be seen in terms of community participation.

## **Educational Implications**

In India, over the past few years, environment education (EE) has been made a mandatory part of all subjects from class I to XII. This is based on a sound rationale since an environmental approach draws from various interdependent disciplines. However, experts and practitioners have highlighted a number of constraints, the main being lack of opportunities and space for synthesis of learning that should take place between different subjects which tend to become compartmentalised as the grade progresses. Another road block exists in the form of lack of a common course at XI and XII level in order to infuse the core content of EE. Nevertheless, the perspectives on inclusion or exclusive space for environmental education are secondary without an unequivocal stand on recognition of nature's value. This recognition will in turn determine how environmental problems are conceived, what kinds of answers are sought, and more importantly, what will count as an answer.

M G Jackson (2004) describes problematic aspects of conventional textbooks, particularly giving disproportionate attention to the concerns of urban minority in terms of pollution and wildlife conservation. Secondly, the content in the books tend to convey that environmental "problems" can be solved by purely technical measures. There is also a perceptible silence over social, economic and political determinants and consequences of these problems and projected solutions. More pertinently, these problems are usually described on huge scales and thus put beyond the child's reach in terms of nuanced understanding or ability to take action. As a result, education creates a body of superficially informed disempowered individuals because they are unable to see their role in any significant manner.

To address these issues, he argues that environmental phenomena must relate to locale specific problems existing within communities so that students can acquire the capacity to deal with them effectively. This implies a need for creating region specific learning resources that is designed by articulating problems faced by native population residing in the area.

Current textbooks fall short of recognising the multitude of realities in immediate environment, and thus fail to create tangible linkages between students and their surroundings. There are many such instances across different grades that indicate an urban perspective, which is unable to question the cultural model on which the society is functioning.

Further, in an attempt to maintain a “neutral” stance as scientific perspective supposedly has, the content turns out to be confusing, contradictory and even incoherent in certain cases. For example, the grade 5 textbook mentions pesticides to be a serious health hazard, yet states that farmers need to use them in small quantities to kill pests. Apart from being contradictory, the use of ambiguous terms like “small” renders the content useless to gain any critical perspective. Further a fatalistic tone, such as “need to”, “have to” suggests that there are no alternative options when in fact increasing movements to switch to organic farming are under way.

A more serious implication arises in absence of clear definitions or realistic solutions. The onus of solving these issues is shifted to global policies or technological innovations, both of which are beyond the reach of common individuals who bear the direct brunt of ecological imbalance. One is then forced to think how such a perspective could prove to be of any value when it comes to taking responsibility and action in immediate locality; Quoting Aldo Leopold, “In our attempt to make conservation easy, we have made it trivial” (Leopold, 1993, p. 37).

A detailed analysis of class VII science textbook has been done to understand ways in which environmental sensibilities have been infused in the curricular content as stated in the National Focus Group Position Paper on Habitat and Learning (2005). Specifically, the frames of reference for reviewing the textbooks consisted of implied message through usage of specific images and terms, attempts to sanitise the content by silences over controversial topics, and ways in which environment has been perceived in different chapters. I propose an alternative approach by elucidating gaps in those chapters that can be addressed through making gardening a central activity in development of critical ecological sensibilities.

Chapter title	Issues to be addressed	Gardening activity	Learning outcome
Nutrition in plants	No activity connecting to importance of soil, diversity in growth patterns	Planting different varieties of plants in various conditions to observe patterns of growth	Learning about interdependence of soil, plants and insects, and food webs.
Nutrition in animals	No activity to observe modes of nutrition. No space for experiential knowledge. Unconnected with nutrition of food items consumed daily	Observe the insects and animals in garden along with what they eat. Grow different vegetables and learn about how they are cooked.	Learning about waste being a socially constructed concept since everything in nature becomes food for some organism; Nature of food and ideas of wholesome nutrition

Fibre to Fabric	Lack of discussion on effort of converting plant or animal fibre into cloth; also negligible mention of environmental impacts	Growing of few cotton plants and harvesting the cotton bolls to spin a yarn	Understanding about resource dependency and labour involved in making consumable products.
Soil	No practical activity to accompany the theoretical information provided about soil components	Make compost. Compare growth of plants in different soil types. See effects of fertiliser/ pesticide	Appreciating the complexity of soil constituents and how it is necessary for growth. Learn about various natural cycles.
Reproduction in plants	Theoretical discussion limited to reproductive parts of plant	Save seeds of different plants and compare their shape, size, colour etc. Examine the variety of flowers and pollinators	Understanding interdependency of insects and plants through pollination. How use of pesticides and fertilisers affects insects. Diversity in modes of reproduction
Water: A precious resource	Discussion limited to knowledge about water cycle and water scarcity	Using different methods of watering plants. Measuring amount of rainfall and growth of plants in monsoon. Making birdbaths in the garden	Learning about water utilisation and how weather plays a crucial role in water cycle. Discussions can be enriched through local case studies
Forests: our lifeline	Activities mentioned can't be done without access to a garden. Mere discussion is of little value.	Plant variety of tree saplings and observe their growth	Appreciation of the time it takes for a tree to grow and how ecosystems emerge around trees.

### **Urban Gardening: An embodied approach to environmental education**

*The alternative to the existing model of environment education is an imagination of rootedness of human life, within 'here and now', as part of an enriching experience; this can only be realised by practiced values and ethics, embedded in a harmonious relationship with environment. The challenge is to create avenues of 'embeddedness' that allow for development of ecological sensibilities in an enacted fashion. Urban gardening is an intervention that provides the possibility of such an enactive environmental education.*

Specifically, a garden by virtue of what it contains, provides for many functional possibilities, termed as affordances by Gibson (1979), to understand principles and ideas about environment by working in the given space. Theories of situated cognition reaffirm the importance of context in learning through participation within a community (Rogoff 2003).

The idea of community gardens is not new, and has been an important part of Gandhian Basic Education. In fact, Anand Niketan, a Nai Talim school at Wardha has made farming an integral part of school activities. The students are however, already from agricultural communities and don't face the distancing from environment, as seen in urban places. As part of an earlier research, 5 students between ages 11-13 from the school were interviewed to understand their perception about environment and sustainable practices. For a comparative analysis, 5 children from an urban settlement were also interviewed<sup>1</sup>. Those living in urban areas (in Delhi) could at most recollect names of three trees in their locality (Neem, Peepal, Gulmohar). Most had a few plants at home but except one child, none took care of the plants personally. All of them mentioned having plants and trees at school but they were taken care of by the gardener employed for the job. Most felt disinterested in participating in "environment-activities" which is considered an extra-curricular subject by them. Even the ones interested mentioned eco-club activities like debates, drawing competitions and related projects as being related to the environment. All of them had very poor knowledge about their immediate locality in terms of energy usage, water consumption, plant diversity and food source.

In contrast, students from Anand Niketan were well aware of trees and plants found in local areas. Interestingly, none of them felt they were doing anything special *for* the environment by growing vegetables at school or home, taking measures to save water, keeping weather records or learning skills to lead a life with minimal dependence on outside resources. Rather their answers indicated that they saw direct relevance of these activities in their life, in other words, they didn't see a distinction between their own well-being and the ecosystem they are a part of. One could assume that they had internalised concepts of interdependence and resilience through various activities at school. During cooking, they usually use the vegetables grown in the school garden and are well aware of the efforts and time taken in growing them. The teachers also facilitate discussions over aspects of nutrition, and the act of cooking itself is done as a group activity so students come to realise by experience the importance of each sub-activity and the outcome (that is eaten by all of them) is dependent on these tasks being done well. The emphasis, thus very naturally shifts from competition to collaboration and coordination. The school premises are cleaned by both teachers and students without exception unless anyone is seriously injured or ill. The activity has led students to take a certain ownership about the place and ambience. They are intuitively aware of their rights and responsibilities. So, issues pertaining to garbage disposal, waste management, pesticide usage and water availability are not in the sphere of theoretical knowledge but active engagement with tangible outcomes. It remains to be seen whether a similar intervention would change perspective among urban students. The argument is that, community gardening, as an intervention could be introduced in urban settings in order to promote 'whole systems thinking', defined by Sterling (2000) as an "extension of perception, a quality of connection in our conceptual thinking, and integration in our planning and actions towards healthy systems." This change in worldview is necessary for developing

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<sup>1</sup> Field study titled *An exploration of ecological sensibilities in school education— analysing its reflections in the NCERT science textbooks, and understanding some initiatives and practices* carried out as part of MAEE at TISS

ecological sensibilities because as aptly put by Bateson (1980), “The world partly becomes—comes to be—how it is imagined.” The diagram below illustrates various themes that can be dealt with using the pedagogy of “getting our hands dirty”.

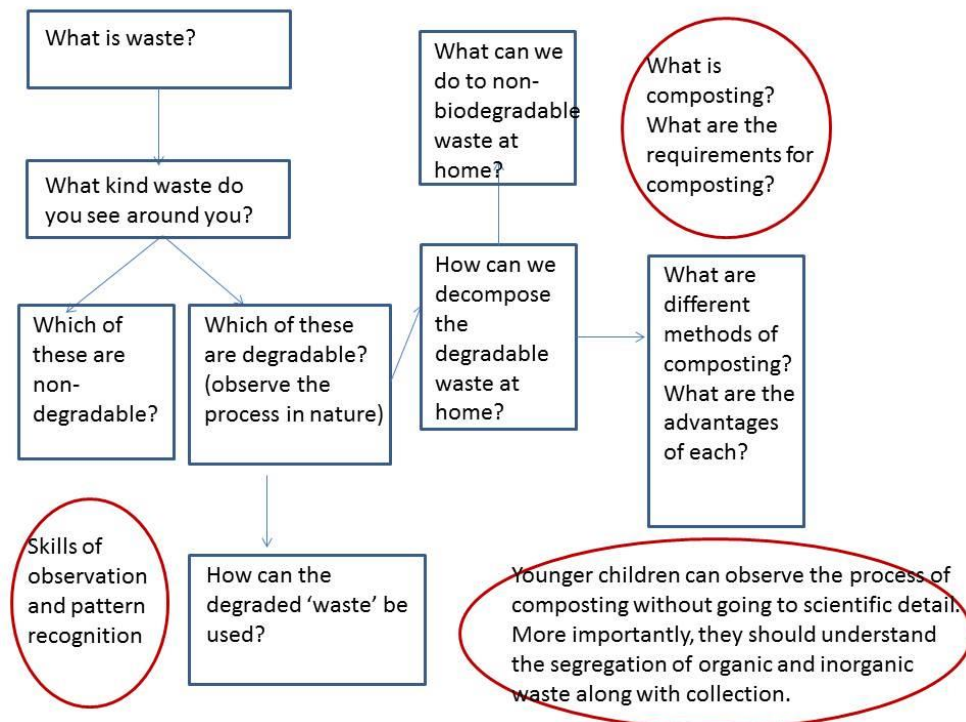


Broadly, a garden provides a rich platform for contextualisation and integration of ecologically relevant concepts along with avenues to experience change brought about by one’s own efforts. The combined approach is essential for development of ecological sensibilities.

### **Urban ecology education in action**

Following is a short description of few activities that can be done to bridge the gap between mere awareness and pro-environmental behaviours mentioned in the previous sections. These activities are also important to help students feel and view natural systems as constituting of mutually interacting entities and connected by complex, non-linear relationships. This view is argued as essential to be able to view the dominant reductionist paradigms in critical light. Implications for cultural perception and behaviour about ecosystems are expected to emerge from the nature of interactions between the environment and individual. Activities under the broad theme of gardening provide ample space for such meaningful interactions and connections that are difficult to make when dealing with fragmented chapters. Depending on the age, the same activity can be explored at different levels of complexity and criticality.

*Making Compost:* Students will be initiated into a discussion of waste; how it is generated; where is it disposed; would waste be around in absence of human population. Next, the concept of compost as a process and principle will be discussed. Students will use waste from school premises to experiment with different kinds of composting techniques. They will also be encouraged to make compost at home. The discussions and activities will help students analyse waste through a constructive lens and about independence of organisms to ensure a healthy ecosystem.



**Diagram depicting some concepts that can be covered under activity of composting**

*Planning for gardening:* Students will be asked to visit some public gardens and nurseries to identify and plan the kind of plants they would like to grow. They will be encouraged to plant vegetables and will thus have to decide the months suitable for growing, learn to grow seedlings, make beds, plan placement of shrubs and vines, and learn about water requirements. The planning involved can be used to initiate discussions around phenology, climate change and food miles.

*Incorporating organic farming principles in garden:* Students will be taken to organic farms and asked to observe what they can. This will be followed by discussions around approaches for growing plants without chemical fertilisers and pesticides. Students will learn to prepare natural remedies to keep plants healthy and analyse how different insects and weeds are part of a garden, and can contribute to growth of their plants. These activities can be linked to problem of monocultures, industrial farming and importance of growing local food.

*Cooking harvested vegetables from garden:* Students will participate in cooking the vegetables they grow in the garden and in the process discuss various aspects of nutrition, energy needed for cooking, alternative sources of fuel and so on. They can be encouraged to learn local cuisines, and gain some understanding of history and geography of the area as a parameter leading to food choices. This brings to fore the question of food miles, environmental impacts, self-reliance, economics of crop production and right to food, especially for those below poverty line. Equally important is the issue of organic food, its relevance, the nature of pollutants in food and what can be done in order to eat healthy food.

### **Assessing impact of urban gardening in ecological education**

While there has been a lot of emphasis on ecological literacy, based on knowledge and awareness about ecological problems, relatively less has been discussed with regard to *environmental competency*, which would look at their ability to take action based on identification and analysis of local environmental issues. They should further be able to

propose, evaluate and justify suitable actions. Their decisions and actions can be reasonably thought to be influenced by the knowledge, experience, sensitivity and disposition accrued by exposure to gardening and related discussions. The idea of embodiment should be reflected in the extent to which students view themselves as part of the environment and respond in light of this understanding. Their responses could be assessed using ethnographic methods in which the researcher would spend extended time observing and analysing their activities and thought through interviews.

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