LEARNING ABOUT SOIL: STUDENT'S VOICES

SANTOSH KUMAR

What do students know about soil? What experiences shape their understanding of it? What would they like to learn about soil? This article attempts to answer these questions by recording the voices of some urban and rural students in informal discussions about soil. It also provides pointers to help teachers make the classroom teaching of soil more informative, creative and interactive.

For most of us, one of the earliest memories of soil is a sensory one. Playing with mud as a child involved touch, smell and even taste (yes, definitely). With increasing urbanisation, many children spend their childhood in high-rise apartments, largely alienated from nature on the whole, and more specifically from 'this experience of soil'.

Soil, which, in itself, teems with diverse micro-organisms, and supports myriad life forms including humans, is often introduced to children as a dry collection of theoretical concepts in their Geography, Social science, or Biology curricula. As educators, however, we have a number of opportunities to bring this subject to life. Including activities that provide children a more hands-on, physical experience of soil, for example, would enable children to an understanding of soil that is more lively and interactive.

In designing activities to support classroom teaching, we often reach for the resources and experiences of other teachers etc. This time around, however, I thought it might be interesting to ask students what they would want to learn about soil and how. Looking at their responses closely and sensitively could hold lessons for us, as educators, in designing more enriching learning experiences around this subject.

A dialogue with students

Rather than a formal interview, I decided to have an informal dialogue with two groups of students from classes 7 and 8. One group included students from a predominantly urban background, but studying in a residential school located in a rural area. The second group of students belonged to a community of small farmers, pastoralists, potters, blacksmiths and landless labourers, and were day scholars in a local private school.

The students' responses were thought-provoking and, in some cases, quite unexpectedly lyrical.

For most of us, one of the earliest memories of soil is a sensory one. Playing with mud as a child involved touch, smell and even taste (yes, definitely). With increasing urbanisation, many children spend their childhood in high-rise apartments, largely alienated from nature on the whole, and more specifically from 'this experience of soil'.

Fig. 1. Classroom teaching about soil should focus on learning by doing.

Credits: Santosh Kumar. License: CC-BY-NC (used with permission).

This article presents the dialogue under various themes and also discusses some learning's for us as educators.

Matti ante manasulo yemi gurthiki osthundi – what is your first impression of soil?

Urban students responded to the word soil by sharing visions of crops, fertility, earthworms, agricultural fields, minerals, water table, soil pollution etc. One of the students was reminded of a Kabir composition: *"Maati kahe kumhar ko"*. Another student thought of a Hindi film song: *"Mere desh ki dharti sona ugle..."*

For students from the rural community, the word soil conjured up the idea of diversity – the different kinds of soil in their area, which they described using the local Telugu dialect – *nalla regada matti* (black cotton soil), *yerra matti* (red soil), and so on. Soil to them also meant microorganisms, earth worms, insects, farm yard manure, dry leaves, cow dung, sheep droppings etc. Many of them were reminded of the 'sweet smell' of the soil that accompanies the first spell of rains during or after the summer (known as *tulakari* in Telugu). For most of them, a wide variety of issues around fertility seemed to dominate their mental associations with soil.

What do you know about soil? What experiences shape this knowledge?

Students from the rural community seemed to have a very natural relationship with soil. Their understanding and knowledge about soil came mainly from observing and being part of agriculture-related activities at home. They knew, for example, the types of soil that support specific crops: groundnut, tomato, red gram, field bean – all of which are grown locally. These children had other opportunities to learn about soil as well. For example, they were able to discuss differences in the soils near water holes or on hills where they took their cattle to graze. They could identify the kinds of soil that could be used in pottery (two of the children are from a village with a lot of potters), to build houses, or make bricks. Some of them also talked about how they learnt about soil through conversations with their parents, grandparents, and other family members. At school, they mentioned learning about soil mainly through experiments with it, and a little bit of gardening that they were involved in – which included growing vegetables using waste-water from the school kitchen. However, it was clear that a significant part of their learning came from personal and practical experiences at home. In fact, this understanding of soil seemed to make their classroom learning quite simple.

In contrast, children from urban communities learnt most of what they knew about soil in school. Only two of the students (one whose grandparents live in an Agricultural University campus; and the other from Uttaranchal) mentioned having some exposure to soil at home as well. Geography and biology classes provided these students with several opportunities to learn about soil both in theory and from the outdoors. These included activities, such as gardening, field work including planting trees, creating bunds to store water, and conversations with farmers during visits organised by the school. Many of these students were familiar with the concept of soil ecosystems, and differences in soil types – from alluvial and black, to loamy and sandy soils. Some of them were capable of strongly articulating the importance of soil – referring to its capacity to support diverse flora and fauna; or correlating soil health with human health. Hearing these students discuss the impact of human activities on soil quality or how the agro-climate of an area could support only certain kinds of agriculture sustainably, was an interesting experience. In the context of sustainable agriculture, some of the students were even able to discuss the adverse impacts of mono-cropping on soil quality. Clearly, their theoretical understanding of soil was quite sound. However it was difficult to assess the extent to which these students were able to connect this understanding to their lifestyles, what they ate and their own health.

Students from the rural community seemed to have a very natural relationship with soil. Their understanding and knowledge about soil came mainly from observing and being part of agriculture-related activities at home.

What do you want to learn about soil?

The discussion on what they knew about soil spilled over into one where they expressed a desire to learn a lot more about it. Both groups of students had a number of suggestions about what should be discussed in school and how learning should happen.

In terms of what they would like to learn about soil there were a lot of similarities between both groups of students. For example, all of them wanted to learn about soil cultivation methods and their implications for human society; specifically – what remedial measures could be taken to arrest soil erosion/ degradation, and what were the different sustainable approaches that could be used to grow food? A lot of interest was expressed in learning to create a 'soil atlas' that would illustrate the various kinds of soils found across the country, what soils are suitable for what crops etc. The use of chemical fertilizers and pesticides and their impacts on soil ecology,
ground water aquifers and human health was another area of deep interest.

Some of the urban students were interested in the history of agriculture, traditional cropping practices, and impacts of the green revolution. They were also keen to learn more about celebrations around the cycle of

agriculture — festivals, songs and dances associated with sowing, cultivation, harvesting etc.

In contrast, students from the rural community were eager to learn more about micro-irrigation systems, and crops that could be used both by humans and animals. This probably stems from the fact that this community is located in a drought-prone, semi-arid landscape which is constantly battling water scarcity. Construction techniques and pottery using different types of mud was another special area of interest among these students. Although many of these students celebrated local harvest festivals themselves, they were as keen as the urban students to know more about them, especially since many of these practises are rapidly disappearing from their own communities.

What emerged from this discussion was a deep desire to understand social practices around soil and to learn mainly by doing. Both groups of students also expressed an eagerness to learn about the various dimensions of soil. They seemed to view soil as a versatile, vibrant and multi-functional life-form, rather than being something to be connected only to agriculture: a view often seen in textbooks.

What feelings do you associate with soil?

Towards the end of our discussion, all the students were asked to share feelings that they most often associate with soil. Here are some of their sensory experiences in their own words:

"Playing with soil brings a lot of joy...";

"Observing a crop grow is an enjoyable experience...";

"It is fun to make idols of gods and other toys with clay and mud and to play with them..."; and

"Farming and working with soil is soothing, satisfying and fulfilling...".

Learnings for Educators

That sensory experiences can trigger some of the most powerful learning experiences was brought out in these discussions with middle school students in multiple ways. Some key learnings from this discussion could be used to develop ideas to introduce soil in classrooms:

1. Make hands-on activities with soil the central point through which learning should happen: depending on circumstances and constraints, pottery, gardening, composting, and roof-top vegetable cultivation are activities that can powerfully engage the senses. These activities can also be used to connect classroom learning about soil from biology, geography and general science. Growing food, in particular, helps inculcate a sense of respect for hands-on work and for farming as a way of life.
2. Organise visits to a neighbouring farm/roof-top garden and provide opportunities to interact with the farmer/ roof-top gardener.
3. Take children to a soil-testing lab and get them to interact with the technicians or scientists there. This will help them understand how scientific techniques can support experiential knowledge.
4. Work with children to trace the journey of their food from seed, soil, manure, compost, field and farm to their table in an attempt to answer the question: Where does your food come from?
5. Have students identify poems and songs about soil, mud, and earth in various languages. They could take the help of elders in their family and or their community. These could be shared in class.

Personal Learning

This interaction with students turned out to be an enriching learning opportunity for me. I was touched by the enthusiasm with which they tried to put across a point. These discussions broadened my own perspective on soil. They also made me think more seriously, and with renewed vigour, about various issues related to soil, and proved to me yet again that the teacher is a learner too!

Acknowledgements

I would like to convey my thanks to Radha Gopalan, friend & ex-colleague, but for whose guidance & support, this article would not have been possible.

Santosh Kumar works at the Rishi Valley School. He is involved in organic agriculture, livestock and agricultural biodiversity conservation and afforestation. He can be contacted at gowdasantosh@gmail.com