



SHIV NADAR UNIVERSITY

# International Conference on

# India's Soils: Science - Policy - Practice Interfaces for Sustainable Futures

February 26 - 28, 2017

Indian Institute of Technology, Delhi

Widespread and continuing **degradation of India's natural resource base** has been established by many scientific studies. Degradation of land in general and **the soil systems** in particular has been highlighted time and again (RCA, 1928; NCA, 1976; Bhumbla and Khare, 1984; NRSA, 1985, NBSS-LUP, 2005). Though soil erosion by wind and water, acidity, alkalinity/salinity and other complex problems are the principal causes for land degradation, historically, loss of 'life in soils' is fast becoming a major challenge to address.

A more recent estimate puts the extent of degraded land in India at 120 million ha, which is about 38 per cent of our total geographical area (NAAS, 2010). In many states in India, **anywhere between 40 to 80 percent of the land area is classified as degraded** in some form or the other. As incremental yield per unit of applied plant nutrients tends to be lower with increasing fertilizer dosage per hectare, there is mounting evidence that soil organic matter depletion is a prime cause for declining soil health and soil productivity (Sharda *et al*, 2010).

Since agriculture uses 141 million ha out of 328.7 million hectares of the country, faulty land and water management practices in agriculture could significantly contribute to land degradation. Intensive irrigation and application of agro-chemicals (fertilizers, pesticides, soil amendments etc.) adds to degradation (Planning Commission, 2012). Further, resource degrading subsidies such as provision of free electricity, subsidized fuel, and free irrigation water, worsen the situation (Reddy, 2003; Sehgal and Abrol, 1994; Raina and Sangar, 2002). The amount of chemical fertilizer subsidy has grown exponentially in India during the last three decades from Rs. 60 crore in 1976-77 to an astronomical Rs. 70,000 crore in 2016-17. In response to increasing micro-nutrient deficiencies, subsidies are now being extended to micro-nutrients, too, under schemes like "Bhu-Bharati" in Karnataka.

Yet, **this chemical nutrient-based subsidy approach has sidestepped the fundamental crisis facing India's soils: the loss of 'life'**. The bio-dynamic and living nature of soils has often been invisible to policy makers and agricultural scientists. The crisis in agriculture is a reflection of the crisis in soils, resulting from diminishing organic matter. Soils with good organic matter are reservoirs of water, being able to harvest and retain rainfall in their profile. This hydrological dimension of soils has been much less appreciated, especially in mitigating crop failures in rain-fed areas.

The research objectives of formal scientific research on soils came from the policies under the green revolution emphasizing fertilizer responsive plants and input subsidies. The resulting research initially focused on NPK

(nitrogen-phosphorus-potassium) trials, and now, on micro-nutrients. The policy frame of nutrient subsidies, together with monocultures, ensured that the land-husbandry practices began to die out. Farmers found it uneconomical to take care of soils through this process and practices shifted to replacing organic matter with chemicals. Increasing apathy of farmers towards 'soil-husbandry' (practising monocultures, inadequate addition of organic matter, and poor crop rotation, among others) is now a nation wide phenomenon threatening the productivity of soils. India's soils are battling a silent and losing war.

Unfortunately, neither researchers nor policy makers have taken up the mandate of evaluating the results of these actions. This process requires recognition of farmers' knowledge and location-specific understanding of soils, as well as an acknowledgement of valuable knowledge and innovations that have arisen from practice (knowledge in practice). The **problem of soil degradation has not been seen as a key objective for research and policy** due to the absence of this feedback loop. Unfortunately, the biggest impact of this is, increasingly, going to be felt by our farming communities, pastoralists, and our food security and healthcare systems.

In order to arrest and reverse the current degradation of India's soils, **it is imperative to come up with a coherent and shared understanding** of the public policy problem and its relationship to the scientific research questions, and the practices of using, tending, and conserving soils. We no longer have the luxury of time. In order to address this pressing issue, the DST Centre for Policy Research at IIT Delhi, Revitalising Rainfed Agriculture (RRA) Network and Shiv Nadar University, together, are planning an **International Conference on Soils** designed as a "trialogue" between scientists, policy makers and practitioners to be held at IIT Delhi from February 26-28, 2017.

The conference brings together **three powerful actors in soil health management** in India: scientists with knowledge within the formal domain of the sciences; policy makers with experience of designing policies, programmes, and choosing between policy instruments; and practitioners with their deep understanding of location-specific, yet highly diverse practices, that may or may not be codified, but are knowledge intensive. This conference is meant to enable a conversation between these groups to arrive at a **technologically, economically, and politically robust, and ecologically informed** understanding of soils and soil problems, and ways to address them.

The triad of knowledge-policy-practice has shaped the way soils have been understood in India, thus far. Policies have set formal research objectives for scientific

enquiry; the results of science have influenced practice and also shaped public investments in addressing soil health (through chemical-based subsidies, for instance) and incentive structures for farmers and others; these, in turn, have determined practices—such as using fertilisers as the primary means of enhancing soil productivity. However, this has resulted in a **lock-in for farmers, practitioners, scientists, and policy makers, and produced disastrous consequences** for soils in the medium and long-term. The technological and institutional momentum of this lock-in has prevented independent scrutiny of the problem by science, and insulated the system from external

#### The conference has three objectives:

- **To put together available knowledge on India's soils, their status, distribution and key problem areas, as understood by policy makers, the sciences, and other local knowledge systems.**
- **To enable a knowledge-policy-practice synthesis that can ensure that some of the high priority soil problems are clearly defined and understood.**
- **To facilitate integrated efforts between the three sets of actors to enable appropriate actions and investments for healthy, sustainable soil systems.**

feedback from practitioners. The current crisis in soils in India, is a cumulative result of such processes that are not taking due cognisance of the massive ecological degradation of our soils.

The overall purpose is to develop scientifically valid, politically plausible and practically feasible solutions, placing special emphasis on marginal, small and medium farmers, and make these available to diverse actors and stakeholders such as the Union government of India, state governments, farmers' and women's movements, industry, and health and nutrition coalitions.

## THEMATIC SESSIONS

*The conference will consist of the following thematic sessions*

1

Soil Structure, Erosion and Conservation

2

Soil Health Management and Soil Husbandry

3

Soil Moisture Management and its Role in Managing Droughts

4

Soil - Plant - Livestock Complex

5

Gender Relationships and Soil Health Management

6

Land Use, Agro-ecosystems and Conservation of Biodiversity

7

Pollution and Problem Soils

In each session, policy makers, practitioners, and researchers will be invited to discuss the **relationship between the way policy decisions are made (and programmes designed), and the knowledge inputs that go into the policy-making process**. Knowledge inputs, or policy intelligence, includes evidence from the formal sciences, both natural sciences and social sciences, as well as informal knowledge from the world of practice. Participants will also be asked to reflect upon the relationship between formal and non-formal sources of knowledge production. Papers will be expected to discuss either the knowledge-policy interface or the knowledge-practice interface, or both, as applied to the theme.

**THE KNOWLEDGE - POLICY INTERFACE:** These papers would reflect on the current processes of knowledge generation and dissemination related to soils (forms of policy intelligence), and the policy responses emanating from this. They would ask how these policy responses shape the production of further knowledge, influence the choice of technologies / other inputs, public and private investments and incentive structures for other actors? In what ways does this lead to technological or institutional lock-in? The critical question is, **what forms of knowledge inputs are brought into the policy-making process, and thus, receive legitimacy?** Is non-formal knowledge, which is outside the domain of the formal natural and social sciences, included as policy intelligence and used in policy formulation? Examples include indigenous practices and location specific understanding of farming communities / pastoralists, women's understanding of the nurture and vitality of soils, farmer's knowledge of soil organic matter and its role in soil moisture retention, to name a few. **What mechanisms can enable non-formal knowledge to be acknowledged and legitimately used in policy design?** Moreover, to what extent are processes of knowledge generation and policy making rooted in local realities and evaluated on the basis of restorative ecological impacts?

**THE KNOWLEDGE - PRACTICE INTERFACE:** These papers would highlight diverse, location-specific practices that use and sustain healthy soils, present examples of scalable successes and experiences from practice, and reflect on the ways in which the learning from these is used for policy-making and further research. Papers can highlight the bio-physical, social and political contexts in which these practices exist and are nurtured. They may analyse experiences within and beyond the formal domain of science, highlighting areas where scientific evidence through research needs to be generated, and may be absent or inadequate, currently. How can knowledge generation, both within formal scientific research and in policies/programmes, engage with knowledge coming from the world of practice? In what ways can the **formal sciences acknowledge the importance of, learn from, respond to and support practices that are working to enhance the health of soils?**

## References

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## CALL FOR PAPERS

The organizers hereby invite policy makers, scientists, and practitioners to submit an abstract that outlines your contribution in any of the conference themes. Specific mention must be made about the focus on the knowledge-policy issues or knowledge-practice issues within the theme that the paper addresses.

Abstracts must be submitted through email ([soilsconference2017@gmail.com](mailto:soilsconference2017@gmail.com)) on or before 5 PM Indian Standard Time on **January 25, 2017**. The abstracts will be reviewed and successful submissions will be notified on or before **February 5, 2017**.