

If Technology is like word, Institutions are like Grammar:

Institutional context of technological innovations and knowledge systems at grassroots¹

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When silk was exchanged with salt 2000 years ago through the silk route in Himalayan region connecting India with China, the impact of markets on influencing knowledge systems of a local region, otherwise disconnected with the rest of the world became evident. Subsequently, barring some regions in Amazon, Andamans, and some tribal regions of Africa or Pacific, there is hardly any region where local communities either through language or resource have not interfaced with the world beyond their physical boundaries. The knowledge systems at local level have interacted with the knowledge that other communities, institutions or societies have produced and thus a healthy and sometimes not so healthy interaction has taken place. In such a context, I have always argued, that to consider knowledge as truly indigenous is difficult. It does not mean that endemic resources do not provide a context for indigenous knowledge to evolve. It only means that when such knowledge evolves, several influences are at work. To the extent that knowledge evolved by a community based on resources which are endemic is indigenous, the institutions governing the evolution, development, validation, diffusion or rejection of such knowledge within and outside the community play an important role in influencing the direction, scope and extent of exchange with other knowledge systems. Technology, I have submitted, is like words. The institutions are like grammar (Gupta, 1992). The culture could be considered as a thesaurus (Gupta, 2004).

I am using the term “indigenous knowledge” interchangeably with the term “local knowledge”. The reason I am avoiding the word, “indigenous” is because when a crop like muskmelon goes out of India, or neem is introduced in Africa, or chillies are brought into India, the knowledge systems at local level very quickly adapt and evolve around such species. Since species when introduced from one region to another (including the plants that may become weeds like *lantana camara* or *Prosopis juliflora*) do not necessarily carry the knowledge heritage of the society where they originated from. Local names for such plants is the first step when a community or network of communities starts to accept its existence as a part of their world view. Once naming is

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done, the enterprise of classifying, characterizing, and dealing with it begins. When a farmer AUTA GRAVETAS noticed in Uganda that the sweet potato plants in a part of field having *lantana camara* on the border did not have pests incidence, he evolved a hypothesis. Can *lantana* leaves help extend the shelf life of sweet potato slices? Since a large number of people in that region survived on sweet potato slices as a staple food when they could not afford maize or paddy, the shelf-life of these slices was directly linked to the food self provisioning. He had an idea. He put *lantana camara* leaves in between the layers of dried slices stored for future use. He could extend the shelf-life and food self provisioning by almost a month and a half more. The weed became a resource. In an international competition organized by IFAD, Rome with the help of Society for Research and Initiatives for Sustainable Technologies and Institutions (SRISTI) for scouting innovations from seventy countries, this innovation was considered worthy of first prize, given at Global Knowledge Conference – 2 organized in Malaysia, 2002. Neither *lantana camara* was indigenous, nor the knowledge had been transferred by one generation to another over centuries. Still the way of knowing was traditional, i.e., observing an odd phenomena, discriminating, abstracting, hypothesizing, testing and developing a robust rule or technology. National Innovation Foundation (NIF) with the help of Honey Bee Network has scouted scores of other uses of this plant which was introduced as an ornamental by British colonial rulers in India and Africa more than 100 years ago. Use of *lantana camara* as a pesticide for controlling pests resistant to chemical pesticides in cotton can be a very powerful solution across the world. The constraint can become an opportunity. This weed has damaged large number of forest regions around the world. The knowledge developed by an individual and/or a community over a long period of time or in recent past at grassroots level is something that we need to learn from.

The institutional context of such a knowledge becomes evident when a farmer like AUTA is able to experiment and a District Agriculture Officer recognizes the merit, submits his entry for the international competition and SRISTI is able to identify its potential and thus contributes to its recognition by IFAD. When further work is not done on this technology by the Ugandan National Council of Science and Technology (which does not even take note of it officially despite the author having helped them in writing their indigenous knowledge policy), another dimension of knowledge systems and their institutional context becomes evident. When World Bank which funded the exercise of writing this policy takes a nonchalant view of the potential that this innovation has, still another dimension of institutional context becomes apparent.

I do not intend to dwell more on this example because there are more 46000 examples of traditional knowledge and contemporary grassroots innovations scouted by NIF in India from about $\frac{3}{4}$ of the country (more than 360 districts) with the help of Honey Bee Network and directly over last four years. An evidence of this kind demonstrates the potential local knowledge has in solving local problems (in some cases, global problems) even if sub-optimally or inadequately. Rather than getting into a debate on semantics of whether a knowledge system is local or indigenous and to what extent does it draw upon or inform the institutional science and technology, I would prefer to discuss the directions for future.

The institutions of conformity, compliance and compromise have helped in carrying forward lot of traditional knowledge over centuries. At the same time, allowances for deviation, innovation and sometimes insurgency at the level of knowledge and surrounding institutions, have helped in helping some communities conserve resources and grow economically. There are a large number of other communities which could not do either.

The challenge is to identify policy and procedural innovations that will help not only recognize, respect but also reward the sustainable aspects of local knowledge systems. The institutions that generate healthy and self-critical scrutiny of these knowledge systems are necessary. The blending between excellence in formal and informal science is an inevitable if these knowledge systems have to become building block of designing institutions that spur the creative urges at local level for sustainable outcomes. There is obviously no point in sustaining such institutions which prevent unfolding of the creative potential of particularly disadvantaged social groups. Even if in some cases, for a given period of time, such discrimination may have helped in conserving resources through coercion. While I agree that “optimal coercion is not zero” (Paquet, 1983), I do believe that societies must evolve democratic means of self-governance that can combine creativity, conservation, compassion and community spirit.

What are the ways in which national governments can deal with this challenge?

- a. Identifying local champions who have a passion for building upon people’s creativity and innovative potential as well as traditional knowledge without in any way taking an obscurantist view of formal institutional science and technology.
- b. Empowering such individuals through endowments similar to the one created by Government of India in the case of NIF set up by Department of Science and Technology (with a corpus of 5 million dollars).
- c. Trusting the Governing Board of such a Foundation to maintain national register of grassroots innovations and traditional knowledge, and build a value chain around such innovations.
- d. Creating a policy environment for protection of people’s knowledge and also providing risk capital for adding value for developing products and commercializing technologies at varying terms for mass consumption.
- e. Developing a fund for supporting diffusion of open source public domain technologies governed by the Prior Informed Consent of the knowledge holders, communities as well as individuals.
- f. Incorporating lessons from the unaided innovations as well as traditional knowledge in the curriculum at school level to reinforce the spirit of conservation of biodiversity and associated knowledge systems with simultaneous inducements of healthy skepticisms and positive experimental ethic.

There may be many more steps that one can take (see sristi.org, sristi.org/eu, nifindia.org, gian.org, indiainnovates.com) to build a knowledge based approach for poverty alleviation and overcoming unemployment without impairing the ecological balance, precarious as it is.

The ethical basis of excellence, equity, empathy, education, environment and efficiency have been articulated by the Honey Bee philosophy. The voluntary spirit of building upon knowledge systems without impoverishing the knowledge holders and at the same time connecting communities around the world through local language interfaces, protecting their IPRs and ensuring equitable sharing of benefits is possible. The challenge is to realize that public policy cannot create voluntarism. But it can respect the spirit that already exists and help in institutionalizing the obligatory arrangements for catering to other human propensities towards conservation and creativity.