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KNOWLEDGE IN CONTEXT: PRODUCTION AND PRACTICES OF INDIGENOUS MODE OF KNOWLEDGE

Abstract

Science can be defined as knowledge about the natural world which offers humanity the promise of a better life. Policy-makers are now turning away from creating national innovation systems and moving toward establishing knowledge systems that scan for knowledge globally and tie down knowledge locally. The shift is away from a focus on building institutions and toward a focus on the functions that further knowledge and adaptability. This paper is born out of the debates about knowledge claims in different contexts. The key objective of the paper is to offer the possibility of making modest contribution to non-western paradigms of knowledge production – a much needed imperative in the time of cultural globalisation. The question of “scientific” examination and assessment of indigenous medicine has been with us for well over a century. There have been extensive debates and scholarly discussions but for the purpose of this paper, we will just focus on the following: Are there any general criteria based on which we can call a knowledge system as being scientific and if so can indigenous medicine be called scientific based on these criteria? Most of us who are brought up on a diet of modern western scientific theory and ways of thinking notice that there are a numerous factors in indigenous medicine different from what we can expect a scientific system to be? How do we come to terms with this?

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Introduction

Processes of social differentiation are at the same time processes of cognitive differentiation: the division of intellectual labour is part and parcel of the division of labour as a whole. Hence modern, highly differentiated societies increasingly rely upon specialised knowledge and competences, and the equally specialised roles and institutions associated with them. For instance, with the

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development of modern science and technology (S&T) and the onset of worldwide colonialism, all non-Western cultures were dismissed as devoid of any systematic and viable S&T. Yet while modern S&T has limited its blessings to a small minority, the vast majority of people still survive with the material and intellectual sustenance from their own indigenous traditions. What is needed is a thorough re-evaluation of indigenous traditions of S& T as part of the present day search for alternatives. The development debates too brought a rethink on the hitherto dismissed 'pre-modern' systems of survival and well-being in agriculture and medicine. Equally importantly, many new social movements and non-party political processes have already begun deploying these ideas in their political mobilisation. Yet, there was a deep suspicion, intellectual as well as political, of the emancipatory potential of anything 'traditional'¹.

This paper is born out of the debates about knowledge claims in different contexts. The key objective of the paper is to offer the possibility of making humble contribution to non-western paradigms of knowledge production – a much needed imperative in the time of cultural globalisation. The question of "scientific" examination and assessment of indigenous medicine has been with us for well over a century. There have been extensive debates and scholarly discussions but for the purpose of this article, we will just focus on the following: Are there any general criteria based on which we can call a knowledge system as being scientific and if so can indigenous medicine be called scientific based on these criteria? Most of us who are brought up on a diet of modern western scientific theory and ways of thinking notice that there are a numerous factors in indigenous medicine different from what we can expect a scientific system to be? How do we come to terms with this? By focusing on community of researchers on indigenous practices e.g. Ayurveda, this paper endeavours to show that in India a shift in cognitive values from 'knowledge' to "wealth" (i.e. property, patents and profits) is discernible. The paper further suggests sociologically significant questions which may be raised in the changing context.

The paper has drawn from archival sources, policy documents supplemented by observation and interviews with a sizeable number of belonging to diverse stakeholders including scientists, non-governmental organisation (NGO), village resource persons and local healers in three districts viz. Jagatsinghpur, Khurda and Cuttack of Odisha (India) during 2013-14. Further, across the districts three village sites (i.e. Tentulipada, Fakirpada and Kochilanuagaon²) respectively were purposefully visited and brief interactions were held with that many growers of medicinal plants, scientists and local healers. Additionally, library and Internet research on international economic policies, corporate strategy and marketing were consulted.

Interrogating Knowledge: The Sociological Turn

Robert Merton, the only major Western sociologist to have taken a

continued interest in the empirical and analytical investigation of knowledge since the 1930s and the leading contributor to the emergent sociological specialty in the 1960s, with issues including the public agencies supporting scientific knowledge have all become the more deeply concerned with understanding the social dynamics of scientific knowledge and of its place in society. Merton had already extended the insights of Durkheim (1915) and Weber (1917) with respect to the social conditions which seemed essential to the production of scientific knowledge, in such a way that the ground was well prepared for further detailed empirical investigations. The investigations which were carried out during the 1960s and early 1970s were on the whole designed to show, by means of quantitative evidence, that the social structure of scientific knowledge was in fact organised in accordance with what kind of universalistic ethos which Merton had taken to be a prerequisite for the creation of objectively certified knowledge. Merton's functionalist perspective on the sociology of scientific knowledge has been criticised on theoretical and methodological ground and for a-historical characterisation of scientific knowledge (Mulkay 1979; 1980) especially after the availability of Thomas Kuhn's work, which attempted to understand the action of scientists, in historical and sociological terms. As Professor Kuhn has said, in his *The Structure of Scientific Revolutions* (1962), scientists rarely change their views; they merely retire or die away. If there are to be solutions to a grave problem, they will come from the fringe of the profession, from the amateur even, or from those areas of knowledge in which two or more specialisms meet. This is comforting. In the long run, if there is a long run, unless the man³ in the street specially wants to choose the pessimistic restrictionist view on any ecological problem, he/she can wait and see. The scientific establishment has its own structure of stability and change. Our responsibility as layperson and as social scientists is to probe deeper into the sources of our own bias. So, Kuhn argues that the principal characteristic of any field of scientific enquiry, during any particular epoch in its development, is the fundamental paradigm which organises the practice of 'normal science' during that epoch. For example, astronomy, passed from the paradigm of geocentrism to that of helio-centrism and beyond.

Writers in the relativist⁴ genre often talk of the "social construction" of scientific knowledge. Based on social-constructivism⁵, Knorr-Cetina (1981) emphasises that scientific knowledge cannot be understood solely, even primarily, at the level of ideas. We must recognise that scientists are engaged in a series of research practices which occur in, and are linked to, social organisational settings. These practices and organisational contexts have to be taken into consideration if we are to understand how scientific knowledge-claims are produced. Bloor's (1976) work⁶ represents an unambiguous precursor to the relativist approach through two tenets of his "strong program" of scientific knowledge. He argued that the sociologist should analyse knowledge *symmetrically* and *impartially* irrespective of their perceived truth or rationality. These two works exemplify the thesis on mode of knowledge

production and other scholars' contribution to the thesis supports it further. For example, Whitley's work (1970) on "Black Boxism" demanded that scientific knowledge be opened up to examination. He argued that production of scientific knowledge is treated as a "black-box", of which only the inputs and outputs can be studied. This will need the development of some epistemological theory, since different epistemologies shall give rise to different sociologies of knowledge.

Scientific knowledge is supposedly guided by empirical measurements and abstract principles which help order the measured observations to facilitate the testing of hypotheses. However, philosophers of science have abandoned any serious hope for a satisfactory methodology to distinguish scientific knowledge from non-scientific knowledge⁷. For instance, Feyerabend (1975) attacks on the dogmatism and intolerance of science towards insights and methods of inquiry outside established, institutionalised science are sufficiently on target that even his avowed critics accept them. He asserts that the views of scientists and especially their views on basic matters are often as different from each other as are the ideologies of different cultures. Hence knowledge is relative to culture (Pickering 1992: 7) and one can imagine knowledge or knowledge production is *sui generis* to a given a culture or society. For example, Azande beliefs in witchcraft (Evans-Pritchard 1936), the decision-making strategies of the *Raika* shepherds in western India (Agrawal 1993; 1994), between the beliefs among different cultures on intersexuality (Geertz 1983: 80-84) and the marketing activities in traditional peasant communities (Bates 1981; Schwimmer 1979). The uniqueness of such knowledge lies in an organic relationship between the local community and its knowledge. Such knowledge has now become a buzzword in multiples arena, known as *indigenous knowledge* and started colonising the lexicon of anthropologists, sociologists, development-practitioners, even policy-makers.

Indigenous knowledge also finds resonance in the French idea of 'bricolage' (Levi-Strauss 1962 (Translated 1966)), where the bricolage is made up of "elements [that] are collected or retained on the principle that 'they may always come handy'" (p.18) and where none of the elements has just "one definite and determinate use" (p.18). In *The Savage Mind*, Levi-Strauss suggested that the main difference lay in the capacity of the engineer to 'go beyond the constraints imposed by a particular state of civilization while the "bricoleur" by inclination or necessity always remains within them (1966: 19). Using a 'systems of knowledge' framework, Banuri and Appfel-Marglin (1993: 10-18) find the distinguishing features of indigenous knowledge (which they call traditional knowledge) to be located in the fact that: (1) it is embedded in its particular community; (2) it is contextually bound; (3) it does not believe in individualist values; (4) it does not create a subject/object dichotomy; and (5) it requires a commitment to the local context, unlike western knowledge that values mobility and weakens local roots.

The Crisis of (Western) Scientific Knowledge: Surge of Indigenous Knowledge

The instruments for planning and modernisation which modern (Western) science offered to the world in the post-colonial period has dominated social and economic development in the third world over the past four to five decades. However, this modernisation utopianism has not delivered on its promises for most third world societies, particularly the recent onslaught of globalisation. This failure poses a major epistemological crisis for modern science. Modernity has not led to the reduction of human suffering and improvement in the quality of life, but quite the opposite: poverty, ecological destruction and the displacement. The idea of indigenous knowledge was gained prominence in social sciences as a backlash against Modernisation theorists and Marxists, who saw indigenous/traditional knowledge as inefficient, inferior, impediment (3Is) to the march by the Angel of Progress. In other words, the politics of knowledge offered the sterile dichotomy between the 'modern' and the 'indigenous' prompts. Further, in the past five decades, with failures of the grand theories of development, the focus in most of the social sciences has shifted to favour grounded theories or middle-range theories which are size- and time-specific. Goonatilake (1999) argues that the existing apparatus of evolutionary thinking is not sufficient and new approaches from alternative philosophies would be needed. He predicted that knowledge in the next century is not going to be Eurocentric. Therefore when, from another perspective, when we talk of science, civilisational knowledge in the sense of indigenous knowledge systems is hardly taking note of. At the same time, the agency of the subaltern actors, against the manipulative strategies of elites, has regained a significant place (Scott 1985; 1986). Concurrently, the science of development studies appears to be in dismay followed by attempts of various funding agencies (e.g. IDRC, UNICEF, and the World Bank) to incorporate issues pertaining to indigenous knowledge in their activities. In 1993, a publication of *Indigenous Knowledge and Development Monitor* (IKDM)⁸ brought about the international community of people who are interested in indigenous knowledge. When this journal floated then indigenous knowledge tried to gain its stance in social sciences and explained its utility in developmental planning.

Indigenous Medicine and Society: Case of India

It's of recently that every aspect of the sub-system of medicine is open to influence from the wider social system⁹, irrespective of whether it is the organisation of personnel involved in this system, or the environment of the medical settings in which these persons operate, or the system of tools, techniques and ideology which they employ. There are advantages in learning about the indigenous medicinal practices of the community holistically since it provides an insight into their worldview linked to agriculture, politics and interpersonal relations (Lewis 1958; Pederson and Baruffati 1989). Kleinman (1973) equates medical systems with cultural systems as it would be impossible to understand medical systems without understanding the cultural context if

which they are a part. Indigenous knowledge and medicine, i.e. knowledge and medicine produced by native people from and around the world such as Amerindians, Aboriginal Australians, Indian tribals and peasant communities and so on. Indigenous knowledge also refers to the content or substance of knowledge which is the result of intellectual activity and insight in a local context and consists the know-how, skills, innovations, practices and learning that form part of traditional knowledge systems, and knowledge that is embodied in the traditional lifestyle of a community or people, or is contained in codified knowledge systems passed between generations by orally (WIPO 2010) including via songs and stories and is, for the most part, undocumented. For instance, [medicinal] Plants use has always had great significance in culture and medicine of societies in the world. Populations, through their healers and autonomous use, have accumulated experience and broad knowledge of them.

Within the “national” system the analytical fragility of the binaries and typologies of modernity/tradition, nation/community, and medicine/culture has revealed the understandings of indigenous knowledge systems in contemporary India (Mohanty 2018). The Indian sub-continent abounds as it were in a variety and diversity of medical traditions. It has what is perhaps the longest unbroken medical tradition which has not only a stream of practitioners but also a textual and theoretical backing in terms of Ayurvedic and Siddha systems of medicine. They have made their presence felt even outside India, in other parts of Asia such as China, Thailand, Cambodia and Indonesia. The Unani system that came in during the Arab period also enjoys great popularity and it has interacted with the Ayurvedic system and has enriched it as well as got enriched by it. However, what is remarkable about the Indian medical tradition is that it prevails at two different levels, namely, classical system and the folk system. By the classical system, we refer to the codified systems such as Ayurveda, Siddha and Unani traditions. They are characterised by institutionally trained practitioners, a body of texts and highly developed theories to support their practices. As against this, we also have a folk tradition (or what may be termed as the *Lok Parampara*) which is an oral tradition passed on from father to son or mother to daughter (or daughter-in-law) or from *guru* (teacher) to *sishya* (disciple) in tens and thousands of our villages through the ages.

In 1974, World Health Organisation (WHO) recognised the potential and scope of indigenous medicines and made the Alma Ata declaration accepting indigenous medicines as an important tool to achieve health for all by 2000 and requested member-countries to improve the service and availability of indigenous system of medicine. The National Health Policy of 1983 for the first time recognised the problem in India when it said: “The country has a large stock of health manpower comprising private practitioners in various systems – Ayurveda, Unani, Siddha, Homeopathy, Yoga, Naturopathy, etc. and this resource has not so far been adequately utilised. The practitioners of these various systems enjoy high local acceptance and respect and consequently exert considerable influence on health beliefs and practices. It is, therefore, necessary to initiate organised measures to enable each of these various systems of medicine and health care to develop in accordance with its genius”.

Table 1. National Activities Concerning Medicinal Plants

Country	Activities	Remarks
India	Governmental programme launched in 1993 for implementation by an NGO called "Foundation for Revitalisation of Local Health Traditions (FRLHT)"	30 <i>in situ</i> "Medicinal Plant Conservation Areas" (MPCA), 15 <i>ex situ</i> "Medicinal Plant Conservation Parks (MPCP), and one Model Production Unit (MPU) have been established in the programme, for large-scale production in Karnataka, Tamil Nadu and Kerala.
	Traditional Knowledge Digital Library (TKDL) is an Indian digital knowledge repository of the traditional knowledge, especially about medicinal plants and formulations used in Indian systems of medicine started in 2001, as collaboration between the Council of Scientific and Industrial Research (CSIR) and Department of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy (AYUSH), Ministry of Health & Family Welfare, Government of India.	To protect the ancient and traditional knowledge of the country from exploitation through bio-piracy and unethical patents, by documenting it electronically and classifying it as per international patent classification systems.
	Herbal Gene Bank at the Tropical Botanic Garden Research Institute, Thiruvananthapuram	All-India ethnobiological project for the development of drugs from medicinal plants and herbs. Promotion of ethnopharmacological research.
	Central Institute of Medicinal and Aromatic Plants, Lucknow	Institute deals with tissue culture of medicinal plants of commercial significance, monitors All-India Co-ordinated project on Conservation of Endangered Plant species; maintenance of living herbaria or plant gardens which feed traditional systems of medicine such as Ayurveda, Unani and Siddha. Ayurveda recognised by WHO as an alternate systems of medicine.
	Germplasm Bank, Point Calimere Wildlife Sanctuary, Tamil Nadu	More than 40 species of medicinal plants are maintained and projected.

Source: Compiled by the authors.

Indigenous Medicine: Hoax or Science?

There can be three criteria on which we can consider indigenous medicine as scientific. These are namely: (i) Methodological Criteria – It should be based on sufficiently large body of observational data, and have a comprehensive and rigorous theoretical framework and the basis of legitimisation of all theory should be observation. (ii) Epistemological Criteria – This presupposes that the above method is a legitimate method to acquire knowledge about the subject and the knowledge acquired is always limited and subject to modification in the light of new data. (iii) Sociological Criteria – Society must have a professional community with practitioners of knowledge in the above sense. Let us take the example of Ayurveda as an illustration of indigenous medicinal system and examine Ayurveda based on the above criteria.

The Ayurvedic texts mention of a large number of plants, plant products and their formulations. They discuss animal products from different species and a large number of mineral preparations. Quite often we find specific properties given for different parts of plants such as roots, fruits, oils etc. In fact, the Ayurvedic classic *Ashtanga Hridaya* states that – “There is nothing in this universe which is not medicinal...” Ayurveda has developed its own theoretical framework, i.e. materialist theoretical framework in order to understand the structure and properties of all material things of the universe. According to materialist conception of disease, the cause of disease was not the curse of evil spirits but an imbalance between three systems (Tridoshas), namely *Vata*, *Pitta*, *Kapha* (respiratory, circulatory and digestive system in the broadest sense). Texts on Ayurveda give indication that this knowledge system is the product of an active community of physicians that has well established norms to govern itself. There are rules regarding discourses between physicians, admissions of students into the fold, ethics of practitioners and manners of settling disagreements and disputes. In fact it is interesting to see that much of treatise of *Charaka Samhita* is in the form of a symposium wherein groups of Ayurvedic scholars take up a series of topics for discussion. Therefore, there is every indication that Ayurveda is indeed a scientific knowledge system by all the above criteria.

However, to the modern trained mind there are a lot of questions and doubts since the manner of discourse and presentations of knowledge in Ayurveda is vastly different from modern sciences. Some of these pertain to issues such as – can we examine Ayurvedic tenets by modern scientific systems and validate them, what kind of experiments do people make in Ayurveda, how do they measure and quantify things and above all are indigenous medical theories changing and evolving to meet the changing situation in the manner of modern medical theories. We shall try to answer some of these questions.

Experimental Method

The essence of the modern laboratory method is to isolate any predicament from its environment, to eliminate the interlinkages that it has with diverse other factors in nature and to reduce it to the minimum possible number of “controllable” parameters. After this, the parameters are varied (generally one at a time) and its effect on the system is studied. In contrast, the traditional approach attempts to solve problems by taking them in their entirety with all their interlinkages and their complexity. This method of solving problems in their natural setting seems to be efficient in providing balanced solutions. The traditional Indian sciences seem to adopt this holistic method of looking at the world in its integrity. It appears that they seek to systematise common-sense and to make it rigorous rather than destroying its essential unity and its multifacetedness. Thus, according to Charaka, science is dependent upon “Yukthi” – a quality of the intellect that enables it to perceive

phenomena brought into existence by a multiplicity of causes. Again it means, using Yukthi to bring together appropriate actions and material at the appropriate time and place. Thus the traditional system even in its theoretical formulation, seeks to find ways of living in good health rather than to dissect it or change it in any major manner. Hence it appears that while traditional sciences are indeed built upon a stupendous amount of detailed and minute observations, experiment (in the modern laboratory sense of the word) perhaps does not have a clear counterpart in Ayurvedic tradition.

Measurement and Quantification

Measurement and quantification are indeed present in traditional sciences though they occur in a manner which is somewhat different from the modern notions on the matter. Most measurements made in indigenous medicine use units which are normalised to a given individual. For example, while measuring the height of a person's body or the length of his limbs, it is expressed in units of *Anguli* – that is the dimension of a finger of the same person rather than an arbitrary standard external to the individual – like the standard international metre. Such normalised units exist for measurements of not only length but also volume and even for the measurement of time.

The Stagnation of Theory in Traditional Sciences

A feature of Ayurveda that often puzzle anyone trained in modern science is the apparent constancy of the theories. It appears that in key areas nothing has changed for centuries or millennia. It is sometimes said that theories have been fossilised because no growth took place after some “dark ages”. It has often escaped the observer that there may be a different approach to a scientific endeavour or a different way of organising science which may lead to a certain “constancy” of the fundamental theories. The subject of Etiology provides us with a striking illustration of this characteristic feature of Indian thought. That causation of diseases can be agencies outside of oneself is common ground between Etiology of both Ayurveda and Allopathy shows the characteristics differentiating viewpoints. In the medical context, Ayurveda classifies as being those caused by *Vata*, *Pitta*, *Kapha*. Any disease can be understood in terms of how it affects the *doshas* singly or in combination. Such an approach is useful not only in disease of yore, but also new disease of today or tomorrow.

There is a need to understand and regard the distinction and *sui generis* of each scientific system. There is room for a dialogue between various systems and a need to avoid crude and quick equations or the judgement of one system by another. Various civilisations have evolved sciences, technologies and knowledge systems having their own individual characteristics and bearing the stamp of the world view and values of the society which gave rise to them. Ayurveda constitutes a body of scientific knowledge in the most rigorous sense

of the term. An open minded study of the indigenous systems of knowledge is likely to provide us with a valuable point of reference in quest for a holistic approach not only to Life Science but also in various other areas of human endeavour.

Whose Interests Served? Corporate or People

There are two questions that need to be addressed. (1) Who will benefit from indigenous medicine? (2) Will it go back to the people or the managers? Prior to globalisation and commercialisation, knowledge came from the people. But now the indigenous health traditions are on the verge of getting lost due to modern medicine's onslaught. If you examine the Hippocratic Oath, it deals with the whole person. In the Hippocratic system the body caused the diseases and the body has the ability to heal itself. The practitioner and diet are aids in the process of healing¹⁰. But from the 19th century, the body is seen as a battlefield between the disease and an external agent. As a reaction to all this, we have turned towards alternative systems of healing. But the larger questions are: is it possible to take indigenous health traditions, refine it and give it back to them? If we are to take this knowledge, refine it and propagate it, whom will it benefit? We can be sure that even this resource will be lost to them. More likely, it will benefit the corporates, (look at medicinal plants which are being lapped up by the few big corporations and restricting access to such knowledge). As medicinal plants and herbs have far-reaching implications (see Table 2) industry has turned its attention to patents.

Table 2. Prioritised Medicinal Plants in the State of Odisha

Ailment	Common Name	Suggested Formulation
<i>Gastrics</i>	Gastritis	Leaf juice of <i>Justicia adhatoda</i> along with black pepper
<i>Jwara</i>	Fever	Juice/Decoction of <i>Nyctanthes arbor-tristis</i> , <i>Tinospora cordifolia</i> & <i>Andrographis paniculata</i> along with black pepper
<i>Kachhu Kundia</i>	Skin disease	Leaf paste of <i>Andrographis paniculata</i>
<i>Kata Gha</i>	Cut & Wound	Leaf juice of <i>Eupatorium triplinerve</i>
<i>Krumi</i>	Worm infestation	Leaf juice of <i>Andrographis paniculata</i>
<i>Munda bindha</i>	Headache	Leaf pulp of <i>Aloe Vera</i> application externally
<i>Nala Rakta Jhada</i>	Dysentery	Leaf juice of <i>Kalanchoe pinnata</i> along with black pepper
<i>Poda Gha</i>	Burn Wounds	Leaf pulp of <i>Aloe Vera</i> application externally
<i>Raktahinata</i>	Anaemia	Fruit pulp of <i>Carica papaya</i> or leaf soup of <i>Moringta oleifera</i>
<i>Taral Jhada</i>	Diarrhoea	Leaf juice of <i>Coleus amboinicus</i> along with black pepper
<i>Thanda Kasha</i>	Cold Cough	Leaf juice of <i>Justicia adhatoda</i> along with black pepper

Source: Reproduced from Progress Report by SAMBANDH.

The corporate sector's basic interest lies in patents and profits. Patent is an important tool to evaluate the strategies followed by industries and public research organisation, it provides landscape of actors involved, their research interest area and technological trends going on in the research needs and gaps of a specific field which is helpful to researchers and policy-makers to develop policy or agenda to deal with situation of country. Eventually, several pharmaceutical companies have transformed themselves into biotechnology firms. What the companies typically do is to utilise existing available knowledge in the public domain and bring in minor modification and claim proprietary rights over the whole. Biologically rich tropical countries of the southern hemisphere, particularly from African and Asian equatorial rainforest regions, are arguing that their biodiversity is a national heritage available in the 'common pool' and cannot be privatised. But the exploiters are using casuistry and pro-OECD legal instruments like trade-related intellectual property rights (TRIPS) to smother these claims. The Rosy Periwinkle plant of Madagascar enriched the expropriating Eli Lilly company due to its cancer curing traits, but left the impoverished people and cultivators of the variety in Africa as poor as always, and in fact worse off because the patent now requires farmers to pay for using this plant for natural therapy. Another example is the Thaumatococcus plant in West Africa, which is now denied to villagers, thanks to a patent bagged by the University of California, USA.

Every Indian remembers the feeling of national outrage and personal helplessness as international patents were granted for the wound-healing properties of *haldi* (turmeric) and the anti-fungal properties of *neem* (*Azadirachta indica*). The use of *haldi* and *neem* for such purposes, as Indians protested, was household knowledge. The medicine chests in Indian homes always had a basket of medicinal herbs for immediate use. *Haldi* and *neem*, along with *tulsi* (basil leaves) and some other medicinal plants were greatly valued for their healing and health-giving properties. The patenting of *haldi* or the patenting of *neem*, *amla* (*Phyllanthus emblica*) and *karela* (*Momordica charantia*) put severe strains in the custodial transfer from the people to the 'inventors' in western laboratories. This is fundamentally concerned with the logics of economic engagement: the way global economic shifts are brought to bear on, altered or kept at bay by states and rural economic actors and institutions.

What is, however, more important from the perspective of evolving such 'knowledge-exchanges' is to first ensure protection of intellectual property rights (IPRs)¹¹ for these other knowledge systems. The Convention of Biological Diversity (CBD) that India ratified in 2002 requires to "respect, preserve, maintain and promote indigenous knowledge" with the consent of indigenous communities. But with globalisation, [medicinal] plants viewed as a *means of production* and market good rather than public good. They have become raw materials and source of knowledge. While the knowledge is needed to promote health has expanded enormously, paradoxically, so have the attempts to restrict

access to such knowledge (Sengupta 2013). The current regime of IPRs seeks to exercise monopoly control over the production and reproduction of knowledge. For example, majority of drugs in the US market today are, derived from plants/plant based raw materials. Drug firms do take great care to screen the pharmacological properties of herbs. Pharmaceutical and biotechnology multinational corporations like Dupont, Novartis, Pfizer, Eli Lilly and Dow Chemical try to identify the active ingredient and chemical analogue of every new found herb. The innovation strategy of these corporations is dovetailed into monopolistic (oligopolistic) strategy of market domination.



Source: Photography by Subhasis Sahoo

This is manufactured, packaged, marketed and prescribed by the medical profession, what Shiv Viswanathan (quoted in Kraak 1999) argues the case for what he calls 'cognitive justice'¹² which entails the cohabitation of western science (with its rationalist logic) with indigenous knowledge.

Yet modern medical professionals look at the indigenous medicine as unproven or half-proven and neither do drug companies make any effort to promote herbs directly. In the words of Shiva et. al. (1996) this is nothing sort of 'biopiracy' and 'bio-colonialism' to deny prior art and indigenous knowledge forms of the South and to convert discoveries into 'inventions' and exclusively owned private property. So, knowledge freely available to all does not benefit all equally. Like Edward Said's (1978) Orientalists, who had the power of knowledge to sit in judgement over native societies, pharmaceutical and biotechnology multinational firms have the opportunity as collaborative partners of the 'scientific establishment' to build upon their riches and boss over the under-informed and illiterate parts of the world. Should they be allowed to 'play god'?

Concluding Observations

This paper began with the idea of 'knowledge wars' while by questioning

the presumed distinction between scientific knowledge and indigenous knowledge as the carriers of practical and epistemological basis. The interrogation attempted to show with differing logics. Second, the paper further argued that indigenous medicines are called primitive, mystical and esoteric due to our education does not prepare us to comprehend their sophistication. Third, knowledge can only be useful whether anchored in institutional genesis and moorings. However, indigenous medicines still require rigorous modern testing standards, and some may be judged as unsatisfactory. Fourth, the globalisation process is vast, heterogeneous, and rife with contradiction. IPRs, as a force of late capitalism and post-industrial economic change, are in a process of restructuring. Rather than singular in form, they contain within them multiple trajectories, both expanding long-established modes of indigenous medicine commercialisation and moving into new areas, generating new types of products, values and types of consumer. Finally, the paper finds the re-emergence of indigenous medicine as a charged site for the negotiation of state-society relations as well as the state's obligations to international bodies.

One of the greatest challenges in the 21st century concerns the protection of indigenous cultures/knowledge from powerful forces of standardisation and integration. Constant efforts were being made by civil society organisations like *Sambandh* to bring together different local healers/*vaidyas* at a common platform in order to strengthen the process of mainstreaming of the indigenous knowledge system/traditional system of medicine in the state of Odisha. Yet more than 30 block level associations have already been formed along with district level coordination committees in 11 districts covering more than 2000 local healers. Further, *Sambandh* has facilitated by providing seed money (Rs. 15,000-Rs. 20,000) to as many as 34 associations of local healers. These healers felt that the regular meetings of various block level associations had been empowering and enabling them in terms of knowledge-sharing and raising their voice towards safeguarding indigenous knowledge. Eventually, an enterprise called Healing Heritage Producers Company Ltd. (HHPCL) has been created in the year 2005 under the Company's Act 2002 with the collective efforts of the local healers/herbal producers, farmers and self-help groups (SHGs). The HHPCL has been able to offer alternative avenues for livelihood earning to more than 1,500 producers, facilitating harnessing and mainstreaming of indigenous knowledge and supporting both *in-situ* and *ex-situ* measures of conservation of medicinal plants in the state of Odisha. For the local communities the HHPCL facilitates processes like procurement of the raw material directly from the collectors and growers at a price comparable to the market, involving local people in value addition and marketing, ensuring availability of effective herbal medicine and organic products at cheaper rates, and transparent sharing benefits among stakeholders.

However, irrespective of what path a state/country chose to safeguard

its indigenous knowledge, acquiring prior informed consent was a non-negotiable and mandatory requirement. It can be emphasised that the ownership rests with the indigenous knowledge holder. This is an ethical issue which is beyond doubt. TKDL is community knowledge and one of the mechanisms for protection of indigenous knowledge. TKDL can serve as a beacon illuminating the way forward in the global fight against bio-piracy and preservation of IPRs of the people. In the context of sustainable management of land resources, there is an increasing realisation of the value of indigenous medicine, and therefore interest in indigenous knowledge and technology has been revived (Gadgil and Guha 1995) in terms of establishing green health clubs in schools and promoting ethno-tourism.

The call for 'Science for the Nation' is not a purely utilitarian slogan where science is seen as an instrument to fulfil immediate national needs. It also includes the call to create a scientific enterprise in the country which is part of the international scientific endeavour. It is an affirmation of our essential human quality, our ability to enter into a dialogue with nature, to comprehend the laws of nature. We conclude by suggesting that indigenous medicine does have the potential of being considered a culturally and socially embedded form of innovation that can be found across many regions of India. More needs to be done to confirm this and to get a better, more comprehensive idea what Manheim (1952) proposed that sociologists of knowledge attempt to understand the "existential basis" of *all* forms of thought, whether "ideological" in Marx's sense of the word or not, by means of analysis of the socio-historical experiences of groups of intellectuals. The ultimate aim of the sociology of knowledge was not only to understand the knowledge production process, but also to inject a new kind of rationality into political and moral life, forcing individuals to interrogate the social bases of their beliefs. This paper has, by raising questions, highlighting issues and pointing directions, been an effort at doing precisely that. It has attempted to lay the ground for what can follow; for a journey that promises to be as exciting as it will be challenging.

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Notes

1. For clarification, the paper employs terms such as indigenous, traditional, local, primitive or western, rational, scientific, modern, and civilised, without the use of quotation marks. These terms remain, however, deeply problematic. We use them without a simultaneous textual indication of their questionable nature only to prevent awkwardness and encourage fluency in reading. Further, these bunches of terms mean the same things, we deploy them almost interchangeably, as usually done in the literature we are engaging.
2. Kochilanuagaon site was identified during a visit in 2011 as part of a wider study of 'Innovation to bring clean energy technology for livelihood generation in India' sponsored by the Norwegian Ministry of Foreign Affairs, Oslo.
3. Throughout the paper, the convention is adopted whereby 'he' stands for 'he or she', 'men' for 'men and women' as is common practice.
4. Relativist assumes neither fixed points in the physical world nor a fixed realm of logic which would compel agreements between unbiased observers or thinkers from radically different cultures. In other words, neither Nature nor Rationality is taken to be a self-evident universal of human culture. Investigation based in this approach concern how certain views about the physical and mathematical world come to count as correct within a society, rather than how a society can be arranged so that truth will emerge.
5. Social constructivism holds that the evidence from nature is never free from contextual values and thus cannot override or contradict the scientists' enculturation.
6. Bloor's work is an extension and application to the ideas of Lakatos and Wittgenstein.
7. The thematic emphasis on science – especially the natural sciences (what is being called the "natural world") – and the *scientific* community, an emphasis which often fails to appreciate the variety of sources of public knowledge and the communicative dynamics in other fields of popular culture.
8. The IKDM was a journal which served the international development community and all scientists who share a professional interest in

indigenous knowledge systems and practices (IKSP). The IKDM, produced by CIRAN (Centre for International Research and Advisory Networks), the Netherlands in cooperation with the indigenous knowledge resource centres in various parts of the world. The publication of the IKDM has ceased as of December 2001. Further information; please see <https://app.iss.nl/ikdm/ikdm/ikdm/> (accessed on 23 October, 2019, 12:13 AM)

9. Parsons (1951) was one of the first sociologists viewed health as part of the social system.
10. The term healing is primarily associated with health and illness. Healing is more than recovery from illness; more than alleviation of physical pain.
11. According to World Trade Organisation (WTO), IPRs are the rights given to individuals for the creation of their minds, exclusively use for specific period. It is categorised into many forms: copy rights, geographical indications, trademarks, trade secrets, patents, etc. In this paper, we use IPRs as patent right for medicines. The patent is the right given to the creators for solely manufacture their product, without any competition for twenty years of time from the date of filing.
12. Cognitive justice does not imply that all Western forms of knowledge are of no use and that all indigenous forms of knowledge need privileging.

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