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**TITLE: Indigenous Knowledge Systems and Technologies among artisans in India  
and South Africa.**

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**Abstract.**

The knowledge base and indigenous technologies within which craftsmen produce their artefacts has been transmitted through generations using ancient technologies and the oral traditions. The advent of modern institutions, including western science and technology, has left these craftsmen isolated due to their marginal role in the world-market economy. The realisation that craft based knowledge systems may have ecological and economic sustainability in the modern world has led to a re-evaluation of their contribution to society. Indigenous Knowledge Systems and Technologies (IKS and T) in the developing world has only recently been recognised as being a part of the S&T wealth of the former colonised countries. At the same time researchers realise more and more that none of these colonised countries were spared the deployment of colonial manipulation of science and technology. In an effort to de-colonise research and research methodology on IKS, the motivation for the implementation of an organised structure within which such research can take place needs to be formalised. A need exist for the documentation of these knowledge

bases. Such a documentation process forms part of a debate around the re-formulation of the basic concept of what research and research methodologies entails. The cultural gap between the socio-economical conditions of the west and the developing world is currently recognised as a problematic aspect that impacts greatly on IKS research methodologies. The inability to understand culture also inhibits the pace of acceptance of science and technology in a society.

This paper describes the development of a research methodology to study IKS in combination with the study of the public attitude towards and understanding of science (PAUS). The role of culture, tradition, colonialism and education systems within changing political dispensations was initially studied and then developed into the formulation of a suitable questionnaire to use during field surveys.

The research project consisted of two teams. The one team consisted of scientists with experience in doing research on PAUS at the National Institute of Science, Technology and Development Studies (NISTADS), CSIR, New Delhi, India for the past 12 years. The other team consisted of artists from the Arts Faculty, Technikon Pretoria, South Africa.

A book was published as a result of this project : Raza. G & du Plessis. H. 2002. *Science, Crafts and Knowledge*.Pretoria. Protea Boekhuis.

### **Introduction:**

This aim of this international collaborative project was, in the first place, to look at the problematic environment in which research is being conducted within developing countries. Aspects like culture, traditions, colonialism and modern science and technology all play a significant role in the desire to find solutions to related problems in research activities like, for instance, research methodology and multicultural research within a developing country.

To look at the phenomena of ‘*culture*’ within its social context serves as an important academic link in such cross-cultural studies. In acknowledging the complexity of culture and the layers existing within culture on national level, ethnic level, gender level, generation level and social class levels (Hofstede.1997:10), there is an additional important aspect to consider. This was to break through the ‘*cultural distance*’ that consist of “*literary intellectuals at one pole- at the other scientists, and as the most representative, the physical*

*scientists. Between the two a gulf of mutual incomprehension-sometimes (particularly among the young) hostility and dislike, but most of all lack of understanding. They have a curious distorted image of each other. Their attitudes are so different that, even on the level of emotion, they can't find much common ground”* (Snow,1995:4). This attitude, combined with the scientific developments during the industrial revolution, led to the perception that the modern era was *‘the heroic age of science’* (Snow.1995:5). This however, was not the only factor to consider. The combination of a number of factors had an influence on research activities. *“The development of scientific thought, the exploration and ‘discovery’ by Europeans of other worlds, the expansion of trade, the establishment of colonies, and the systematic colonisation of indigenous peoples in the eighteenth and nineteenth centuries are all facets of the modernist project. Modernism is more than a re-presentation of fragments from the cultural archive in new contexts. ‘Discoveries’ about and from the ‘new’ world expanded and challenged ideas the West held about itself. The production of knowledge, new knowledge and transformed ‘old’ knowledge, ideas about the nature of knowledge and the validity of specific forms of knowledge, became as much commodities of colonial exploitation as other natural resources”* (Smith, 1999:59).

It was thus important to firstly establish the role and influence played by Colonialism on past research principles and methodologies. The important investigative and critical role played by current post-modern writers and philosophers like Michel Foucault and Edward Said forms an important aspect of this debate and had to be acknowledged and discussed. Concepts like *‘discourse’* and the identification and subsequent marginalisation of the *‘other’*, was looked at. Edward Said identified and then addressed the problematic issue of the role of the *‘other’* within institutionalised discourse in the following way: *“As an object of research, however, the Other became more and more problematic when scholars became aware of the obscuring barriers of power between their own subjective gaze and the Other as an object of research in a western (white, colonial) history and culture. Because so many mistakes had been made in the past and because western researchers were said to be descended from slave traders as well as colonialist and sexist ancestors, a new generation of scholars, (emphasising at the same time their political correctness) began to assume a distance from this cultural and academic heritage, showing how wrong and disgusting their predecessors had been. The Other became so fashionable in western academy that words such as ‘difference’ and ‘Otherness’ have come to function as a talisman, serving to guarantee political correctness”* (Schipper,1999.3).

Edward Said questioned the dangerous assumptions made by intellectuals within the various disciplines, discourses and cultural practises on the notion of truth and purity. He attacked the western systems as uninformative and oppressive and his writings challenged intellectual conformism to change and to recognise the place of the non-western world in its self-image. He is instrumental in conceptualising the idea and identity of *'the other'* as a necessary role in identifying *'the self'*.

To write about and investigate such topics within context of the needs of developing countries led to *"shifts in notions of what constitutes culture, the role of science as a body of organised knowledge, and technology as a universal tool for development"* (Rose, 1991:30).

The South African research community deliberately became part of this debate and acknowledged this need to accommodate and investigate the indigenous practises and technologies of developing world societies. Researchers also acknowledged that these investigations must take place within the specific society's cultural context. This importance given to the indigenous knowledge systems as well as indigenous technologies is reflected in the policy of the main research-funding agency of the country, the National Research Foundation (NRF). Research focussed on IKS forms part of their 9 identified focus areas within their research organisational structures. It was therefore seen as imperative to establish the true meaning and definition of indigenous knowledge and technologies and its relationship with science and technology within the appropriate cultural context.

The concept of culture is a complex and at times a politicised phenomenon. This becomes apparent when the formative and restrictive part played by colonial structures in South Africa and India as two developing countries ((and the additional apartheid system in South Africa) is acknowledged. Dr. Ben Ngubane, South Africa's Minister of Arts, Culture, Science and Technology, proposed some steps to be taken to rectify this problem. First of all, through the transformation of education where science education can lead to a scientifically literate community, and secondly through the implementation of appropriate research and development programmes. *"I am not only talking of what is sometimes wrongly called Western or 'first-world' science. South Africa, like many countries, is recognising the unique potential of the knowledge resources of our people. Indigenous knowledge systems, as they have been called, hold great promise in providing a way of lowering the alienation many people feel from science and technology as traditionally*

*taught. Indigenous knowledge projects in South Africa have already shown a rich potential for better curriculum development, as well as new technological innovation” (Sunday Times, November 11.2001).*

The debate around colonialism is extensive. It played a crucial role in the formulation of research methodologies, research attitudes and research results. The debate around science is as complex as the one around colonialism. *“Science, contrary to widespread belief, is not a European creation. Almost every civilisation and culture, whether ‘great’ like Islam, China or India, or ‘complex’ like those in Africa, have produced its own science. Modern, western science is the heir to the sciences of all non-European civilisations. The history of the evolution and development of modern science as well as the origins of Europe were rewritten to make both the enterprise of modern science as well as Europe per se self-generating and autonomous of all Other cultures’ (Sardar,1998.202)*

Within this framework the sciences can be seen as being both a knowledge system and a way to deploy epistemological methods and scientific achievements. This world-view of science legitimize politics, culture and in a way colonialism. Science on the one hand must become legitimized within the traditional practices and be recognised as: *“‘scientia sacra’, that is, being a part of organised knowledge of a particular domain or reality that was inseparable from the immutable nature of the larger cosmos. It is, at the same time, necessary to look at modern science as science that is based on the secularisation of scientific theory and in this way, located within a dissimilar cultural context” (Riana,1996,30).*

No colonised country was spared the deployment of colonial manipulation of science and technology. In an effort to de-colonise research and research methodology the motivation for the implementation of an organised structure within which such research can take place was formalised.

This led to the start of an African Arts and Artefact Research and Development Centre at the Arts Faculty of the Technikon Pretoria. African Studies was at the same time introduced as part of the Department of Fine and Applied Art’s Art Theory course. The need to study Africa from within Africa for the sake of Africa is eloquently expressed by Paulin Hountondji. *“This plea for inclusion of African knowledge within the institutionalised systems is not just for form’s sake but also for the very survival of such knowledge. This logic of extroversion, which commands the so-called modern scientific activity in the third world and singularly in Africa, has a binding corollary, a logic marginalisation. Peripheral to science in the*

*metropolis, institutionalised research in Africa entrails in its turn a further push of endogenous elements of knowledge to the periphery, thus regulating those to the periphery of the periphery, as mere survivals, intellectual and technological curiosities and lifeless, inert culture objects, only fit for exhibition in museums for the titillation of antiquaries and other lovers of exoticism” (Hountondji,1997.15).*

To initiate research activities the research project with the National Institute of Science, Technology and Development Studies (NISTADS) of the CSIR in India was formulated. The team of scientists at NISTADS specialise in the field of the public attitude towards and understanding of science (PAUS) and their research methodologies on doing surveys in rural areas were tried and tested over a period of ten years. The research team concentrated on the development and application of this suitable research methodology to be used within a developing country context to do research on the activities of rural artisans (potters) and their use of Indigenous Knowledge (IKS), their implementation of indigenous technology as well as their Attitude towards and Understanding of Science (PAUS). A questionnaire was developed by the two research teams consisting of artists from South Africa and of scientists in India.

The questionnaire was used to do a survey in Janakpuri, Delhi in India and a similar survey was done in Venda in the Limpopo Province, South Africa. The results of the survey do not form part of this paper.

The project aimed at generating the following tangible outcomes:

- A literature research on past influences and conditions which impacted on research and research methodologies within developing countries – in this case South Africa and India.
- The structuring of research activities at the Arts Faculty, Technikon Pretoria, South Africa by the initiation of an African Arts and Artefact Research and Development Centre..
- Development of an appropriate and practical research methodology to use for quantitative and qualitative research in developing countries.
- The formulation and application of a questionnaire to be used for comparative studies on crafts between India and South Africa.
- Investigated the use of such research methodology to conduct field surveys locally, nationally and internationally.
- Link research on Indigenous Knowledge Systems and Technologies (IKS) with research projects on the Public Attitude towards and Understanding of Science (PAUS).

In the South African context this focus is compatible with, and forms part of the National Research Foundation (NRF) research focus area on IKS as well as with the aims and policy of research done on PAUS, an initiative initiated by the Department of Arts, Culture, Science and Technology (DACST) and currently run by the Foundation for Education of Science and Technology (FEST).

The project partners initiated the research by concentrating on artisans involved in the production of pottery. The research methodology was developed to gather specific information on the socio-economical and cultural environment of the artisans as well as the potter's technological production methods. The methodology was developed on the concept of practical field surveys. This will assist future researchers in conducting field surveys. The questionnaire was divided into two parts. The first section of the questionnaire established the general cultural and socio-economic circumstances of the artisans within their community. The second part of the questionnaire addressed the specific technological aspects of the selected craft.

The questionnaire broadly addresses cultural and scientific aspects within the rural community. In order to feed into governmental policy mechanisms, a study based on IKS needs to be essentially '*community centric*'. Community here is defined as a collective who is the repository of knowledge that has been generated through the process of distillation of abstract ideas extracted from experiential episodes. The spectrum of such communities is quite wide in third world countries. "*On the one end of the spectrum are those communities, which live in harmony with nature without disturbing the regenerative capabilities of eco-systems, and who, for example, practise indigenous systems of health care (medicine) developed over centuries.*" (Hountondji, 1997:191). On the other end of the spectrum are those artisans who have developed what are often referred to as '*rural or indigenous technologies*' - Hountondji's so-called ethnotechnology.

The role of the socio-economic aspects of the artisan's community is also an important factor to take into account. "*Factors such as the economic status of an individual or a community, significantly moulds the educational, social and technological conditions. The extent of interaction with modern ideas and the pace of response to changes occurring in various related fields, are also a function of the economic level.*" (Raza, 1995).

Careful planning needs to be done for future research in the light of a perceived lack of background knowledge about IKS. Researchers need accurate understanding and documentation of the history of indigenous technology to help plan social and even economic research and development programmes. *“They need an urgent revival of research in the humanities (cultures) along with research on ancient technologies. Like science, technology – which is the application of ‘knowledge’ or discovery to practical use – is also a feature or product of culture. Technology is an enterprise that can be said to be common to all human cultures; it can certainly be regarded as among the earliest creations of any human society”* (Eze, 1997:35). Researchers need to incorporate innovative contemporary scientific resources with innovative indigenous technologies. *“We have to cultivate an interdisciplinary approach through the creation of multidisciplinary teams working on a series of national, regional and international programmes, serially or in parallel.”* (Hountondji, 1997:77).

The irony in this situation is that the two aspects of science, the modern and the traditional, need each other to be of any use to the researcher. As a final word of caution we need to reflect on the words of Eze; *“As European expansion turned the world into a laboratory for emerging European sciences, Europeans could test the hypothesis they developed about how to explain nature’s regularities over vastly larger and more diverse natural terrains than could other cultures. Moreover, second, European sciences could ‘forage’ in other cultures for elements of those cultures’ ethno sciences to incorporate into European sciences. ‘Native informants’ taught Europeans about the local flora and fauna, minerals and ores, climates, diseases and other threats to health, pharmacological remedies, agriculture, fishing and engineering practises, land and sea routes, and much of the rest of the knowledge traditions developed and stored in local cultures. At the same time, third, European expansion suppressed or destroyed – intentionally and unintentionally – competitive local knowledge systems. There were many examples of the European’s intentional destruction of local craft traditions, with their knowledge of nature and their technologies, to make way for the European practices that were more profitable to the Europeans – for example, Indian textile manufacturing. A fourth feature is what one could refer to as European sciences’ predatory conceptual framework. Persistent substitution of abstract for concrete, locally situated, and historical concepts of nature and the processes of science sucks up local features of local knowledge systems into apparently universal features of ‘real sciences’.”* (Eze, 1997:64).

## **Conclusion.**

The inherent human struggle for survival and the intrinsic human need to innovate led to increasing acculturation among developing countries and within communities. “*These sub-systems, especially technology or trait based structures, more often than not, continually interact with other systems including the ‘modern’*” (Schipper, 1996:170). In this way Indigenous Knowledge becomes a universal heritage and a universal resource. It is diverse and varied. The relevance and the importance of IKS is recognised globally and many resource centres and information sources on IKS are being established world-wide. It is within this framework that the present Indo-South African cross-cultural and comparative project on craft production is based.

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