

Indigenous and
traditional
knowledge systems
for addressing key
environmental and
agricultural
concerns: Some
experiences from
India

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Indigenous Knowledge

- Local or indigenous knowledge refers to the cumulative and complex bodies of knowledge, know-how, practices and representations that are maintained and developed by local communities, who have long histories of interaction with the natural environment (UNESCO, 2012).
- Traditional knowledge develops within a particular community and has a non-formal means of dissemination.
- Such knowledge is collectively owned, developed over several generations and subject to adaptation, and imbedded in a community's way of life as means of survival.
- Between 25,000 and 75,000 plant species are used for traditional medicine alone, 1% of which is known by scientists, accepted for commercial purposes (Aguilar, 2011).

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- The knowledge inherently owned by the indigenous communities is used for purposes ranging from natural resource management, agriculture, medicine to other socioeconomic developments.
 - Indigenous Technical Knowledge (ITK) is responsible for improvement in many important rural enterprises such as poultry.
 - Indigenous people represent about 4 percent of world's population, about one third of world's 900 million extremely poor rural people, and live in more than 70 countries and 70 per cent of them live in Asia (Rao, 2006).
 - Despite the wide recognition of indigenous peoples' contribution to the world's cultural and biological diversity and sustainable development, many challenges still remain in the area of traditional knowledge and technologies.

Agriculture

- Agriculture plays the most vital role in Indian economy.
- However, the storage loss of the agricultural products i.e. food grains is a major concern in India.
- With Green Revolution, many improved techniques entered Indian agriculture not only for producing crops but also for storing grains.
- However, along with such methods, poisonous chemical protectants also entered the agricultural sector.
- Nevertheless, in many parts of the country, the farmers practice indigenous storage techniques possessing excellent storage structures.
- These structures are eco-friendly, cheaper and locally available and do not cause any health hazards.

Indigenous grain storage structure

Dindigul district of Tamil Nadu

Kulumai



(Sundaramari *et al*, 2011)

- “Kulumai is an indoor grain storage structure. It is an indigenous storage structure for storing various food grains, especially paddy grains (*Oryza sativa*). It is indigenously fabricated with a poultice made up of tank silt, rice bran and paddy straw. It protects the grains from pests, diseases, rats and rodents. Paddy grains could be stored in this structure for about 3 years without much deterioration in quality. It should be mentioned here that no other modern structure will exhibit same performance. In general, total storage capacity of the kulumai is about 600-700 kg”.

Underground grain storage pit



(Sundaramari *et al*, 2011)

- “This is a multipurpose and low cost structure for grain storage. The pit is dug beneath the ground usually either in the front yard or backyard of the house, with square, rectangular or circular shape. These pits are mainly used for storing the millets like sorghum, pearl millet, finger millet and other minor millets. Before filling the grains, bran or other crop wastes are spread at the bottom of the pit. Then its inner wall is lined with the dried stalks of sorghum or pearl millet. After lining, pit is filled with grains and covered with rectangular stone blocks. The structure is again covered with gunny clothes and finally with dry sand to avoid moisture. Grains are usually stored in these underground pits for about 3-5 months”.



Pisciculture: The *bari* system of farming in North-Eastern Part of India

- ‘Bari’ is an operational unit where crops are grown along with livestock such as poultry and fish production for the purpose of meeting the basic requirements of a rural household.
- Fishes are generally reared in dugout ponds.
- The aquatic plants growing inside the ponds act as sources of food for the fishes along with kitchen waste and some other household wastes: **Self-sustaining and productive unit.**
- Fish is not consumed during the monsoon months.










Conservation of natural resources and biodiversity

- There is a growing consensus that local people, using conventional scientific methods or participatory methods, can produce data sets that are just as accurate as those that are derived professionally (Fry, 2011).
- Nyishi tribe of Arunachal Pradesh has their own set of methods, which has been in use since historical past to access the soil fertility (Gosai et al., 2009).
- The tribes characterize the soil with the help of **texture, topographic positioning of land/terrain, visual appearance such as colour and yield.**
- The scientific physico-chemical analysis of the soil samples for soil characterization and appropriate land use pattern are at par with the working model of the indigenous soil knowledge of the 'Nyishis'.

Climate change and weather prediction


- Traditional or indigenous communities have, since recorded past, been utilizing their knowledge for prediction of weather and climate events.
- There are evidences of traditional communities accurately predicting extreme weather or climate events and taking necessary preventive measures consequently.
- The tribal people of the North-Eastern state of Mizoram use their traditional ecological knowledge to predict the weather (Chinlampianga, 2011).
- The study reveals 15 indicators used by traditional communities to predict weather which were based mainly on the recognition of unique situations, **behaviour of insects, birds and mammals, characteristics of plants, and location, timing and pattern of clouds, lightening, moon, sun and star.**



As stated by Chinlapianga (2011), “if winged termites come out of the soil in a group after the rainfall, it is predicted that the rain is not going to come for the next few days. However, if the same insects come out where there has been no rain for a week or a few days, it is predicted that the rain will appear quite soon [...] Similarly, cloud at the western side during the sun set indicates approaching rain [...] Moreover, the colour, time, direction and location of the clouds in the sky also help the traditional communities predict the weather”.

Conclusions

- India, as a country inhabited by a number of indigenous communities, has a wealthy pool of indigenous knowledge base.
- All the indigenous communities have their own set of unique knowledge and technologies, scores of which are at par with the modern knowledge and technology system.
- These knowledge and technologies have, since long, been providing the traditional communities with comfort and self-sufficiency.
- In many cases, the indigenous communities are not well aware of the value of their indigenous knowledge which has been passing from generation after generation.

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- There is an immediate need to document and preserve the knowledge and technologies of different indigenous communities, many of which are at the verge of extinction.
 - Actors such as scientific institutions and NGOs could play crucial role for capacity building among the indigenous communities and popularization of traditional knowledge.
 - Government schemes and ‘Research and Development’ activities should reach indigenous innovators.
 - There should be a proper collaboration between traditional knowledge and modern knowledge.
 - An appropriate alliance between the traditional and modern knowledge and technology systems has immense potential to benefit the society.



Thank you.....