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Kerala's achievements in the social sector have met most of the criteria envisaged under social sustainability. However, on the ecological front, there are perceptible gaps that warrant due attention in the course of transiting to a knowledge society.

The natural resource base provides the foundation for economic development. The nature and type of these resource use, changes with the progress of civilization and technological advancement. The social, cultural, economic, and ecological orders of the world are changing with the production of knowledge and its useful application. The transformation from a resource-intensive society to a knowledge-intensive society is deeply innovative, dependent on the use of human knowledge, sensitive to natural and environmental resource use, and ecologically resilient.

Kerala is blessed with strong natural resource endowments. The state has successfully harnessed the traditional natural resources including hydropower generation. However, management of natural resources is not prudent always. There is a complex ecological interdependence among the components of natural resources. A linear approach often fails to take into account this complexity. As a result, several problems crop up and ecosystem services are affected. The change that is taking place with respect to natural resource use in Kerala warrants proper attention to improve the knowledge base. Natural resources-based economic development trajectory in several countries underscores the importance of combining useful knowledge with strategies to develop capabilities by transferring technology and knowledge from other (leading) economies as well as local scientific organizations relevant for natural resource-based industries.

It is important for Kerala to examine the present use of natural resources and reorient present practices, wherever necessary, for contributing to the knowledge economy. Here, we attempt to briefly indicate some of the areas to initiate actions.

1. Bridging the knowledge gap in existing natural resource used sectors

Bridging the knowledge gap assumes great significance in pursuing a natural resource based knowledge economy. For example, it is important to search for a coastal tract to site a seaport, which is neither accreting nor eroding. Accretion and erosion along the coastline are related to sediment movement. The sediment transport pattern along the Kerala coast varies temporally and spatially. Some parts of the Kerala coast experience domination of net northerly drift whereas in some cases the movement is southerly. Although, there are some studies pointing that the site-specific knowledge is lacking in many cases. It is important to generate a detailed knowledge base to suggest appropriate locations for siting of ports, particularly fishing ports. Otherwise, the port may be affected and will need huge investment for keeping it operational.

2. Precision management for traditional natural resources

Precision management is an emerging area in traditional natural resource management of land and water. Agriculture is one sector where precision management has brought out significant results manifested in enhanced productivity and optimum use of inputs. Irrigation, water management, fertiliser use and cropping system are areas warranting the introduction of precision management.

3. Harnessing new natural resources

Kerala has a long coastline of 560km. The exclusive economic zone spreads over 2.18 lakh K.M. There is huge scope for developing the blue economy. It not only the fisheries sector, tourism, and maritime transport but also the offshore renewable energy, aquaculture, seabed resources, marine biotechnology, and bioprocessing. The tapping of wave energy deserves urgent attention. Experimental data have been gathered for the Vizhinjam area. It may be explored for other areas also. Solar power is another energy-producing sector with huge potential for the state as it enjoys long hours of sunshine.

4. Green economy

Knowledge-based economy, green economy, green technology and creation of green jobs are interrelated. The importance of a green economy is well appreciated to transit into a low carbon economy and reducing environmental risk and ecological drawdown. Many countries are gradually shifting to a green economy as part of the knowledge economy. It warrants the involvement of higher education centres and sustainability-oriented research departments.

5. Reorientation and building of institutions

To accomplish all these tasks it is necessary to set up processes that support interactions among the existing organisations, facilitates access to the existing knowledge, creates new scientific knowledge, build-up capabilities and new institutions for interactive learning, and disseminate and share knowledge. One of the strengths of Kerala is its education system and academic base with strong focus on science and technology. There are professional organisations dealing with every major sector of natural resources like land, water, forest, fisheries, minerals, etc. University departments are imparting higher education in many of these sectors and allied disciplines. Natural resource-based industries are set up. However, there is hardly any meaningful interactions/ collaborations among these organisations. Strengthening of collaboration and sharing of useful knowledge is important. Thank you.