UNIT 13 COMMUNITY KNOWLEDGE

Structure

13.1 INTRODUCTION

Community knowledge refers to the knowledge possessed by the different communities and societies all over the world that is utilised to carry out the day to day activities. Community knowledge includes i) scientific and codified knowledge associated with occupations and life-styles influenced by industrialisation and ii) knowledge associated with traditional occupations, practices in local cultures still engaging a large majority of populations, especially in developing countries. For simplicity, these two types of knowledge are broadly categorised as modern scientific knowledge and traditional experiential knowledge. In general, modern scientific knowledge is codified, systematically classified, is acquired through institutionalised learning and in many ways has a universal character. Traditional knowledge, on the other hand, is empirical, is acquired through practice and experience and is therefore related to cultural and physical resources of the location.

We have seen in the earlier units that many of the sustainable development concerns arise out of the industrialisation trajectory. Traditional knowledge, not being connected to industrialisation, is thus seen as providing alternate and additional approaches to achieving sustainable development. Several indigenous or traditional knowledge and practices developed through the centuries by different indigenous and local communities being sustainable are also receiving attention of sustainable development efforts. Community knowledge includes scientific knowledge that is the basis of industrial development and traditional knowledge and both have separately contributed in their own way towards the process of development of mankind. Industrialised societies rely mainly on scientific knowledge whereas others are rich in traditional knowledge. In this unit, we discuss some aspects of traditional and scientific knowledge of societies, and the need for their integration in relation to sustainable development.

Objectives

After studying this unit, you should be able to:

- comprehend and describe the importance of traditional knowledge in sustainable development of the communities;
- describe the benefits of partnership between scientific and traditional knowledge for sustainable development; and
- suggest ways of innovation in the indigenous techniques of your region using scientific methods to meet the aims of sustainable development.

13.2 TRADITIONAL KNOWLEDGE

Traditional knowledge is the indigenous knowledge possessed by various local communities accumulated through traditional and present day to day activities. The basis of this knowledge lies in relating community and its social, economic and cultural activities to local environment.

The term "Traditional Knowledge" is described in literature as follows:

"Traditional knowledge is a cumulative body of knowledge, know-how, practices and representations maintained and developed by peoples with extended histories of interaction with the natural environment. These sophisticated sets of understandings, interpretations and meanings are part and parcel of a cultural complex that encompasses language, naming and classification systems, resource use practices, ritual, spirituality and worldview."

Fig.13.1: The many facets of traditional knowledge

Traditional knowledge develops within certain cultural groups or communities over a given period of time and within specific environmental and social settings. At the same time, these communities have accepted and adopted elements from other

knowledge systems. The practitioners of traditional knowledge tend to view people, animals, plants and other elements of the universe as interconnected by a network of social relations and obligations. Traditional knowledge provides the basis for many aspects of everyday life and occupations.

For example:

1. hunting, fishing and gathering,
2. agriculture and animal husbandry,
3. preparation, conservation and distribution of food,
4. location, collection and storage of water,
5. coping with disease and injury,
6. interpretation of meteorological and climatic phenomena,
7. manufacture of clothing and tools,
8. construction and maintenance of shelter,
9. orientation and navigation on land and sea,
10. management of ecological relations of society and nature,
11. adaptation to environmental/social change.

It is not in the scope of this unit to document the storehouse of information on traditional knowledge available in our societies, which is fast disappearing (see Fig. 13.2). You could undertake this as a worthwhile pursuit if you are interested.

SAQ 1

Document the relevant aspects of the indigenous knowledge or traditional practices prevalent in your surroundings in any of the above areas of your interest. Use local sources of information.

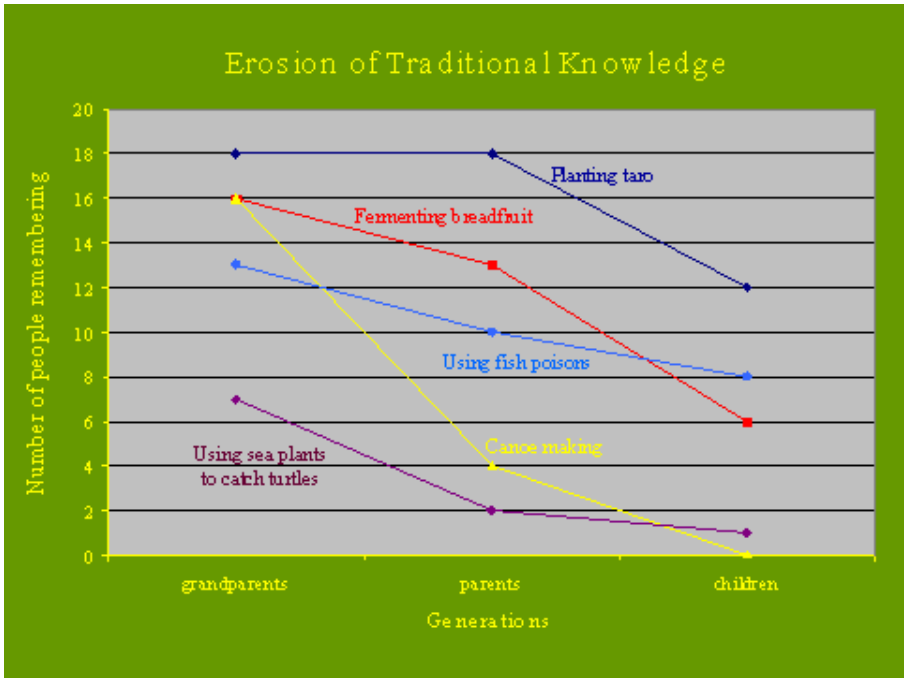

Fig.13.2: The results of a survey on Pohnpei, an island in the Federated States of Micronesia about generational knowledge covering various components of traditional knowledge such as planting taro; using plants to stun and capture fish; fermenting breadfruit as a method to preserve it as a famine food; using marine plants as turtle bait; and, constructing outrigger canoes show the loss of information between generations on this island (Source: law.wustl.edu/centeris/ Confpapers/balick1.gif)

13.3 MODERN SCIENTIFIC KNOWLEDGE

Science and technology have contributed immensely in the process of development especially in the western countries and in regions industrialising along that trajectory. Mankind has taken tremendous strides in the understanding of nature and in the fields of medicine, agriculture, industry, engineering etc. that were unimaginable without science and technology (S&T).

Information and Communication Technology (ICT) that uses telecommunications and computers have made it possible to connect people across nations with speed and ease as never before. This powerful scientific knowledge needs to be harnessed for generating strategies for sustainable development.

Modern science often builds on traditional knowledge and through methodical testing and experimentation expands and deepens the observed knowledge. For example, several medicinal properties of plants prescribed by local healers and practitioners of indigenous medical systems after scientific research have been developed into drugs. Similarly, in other fields like agriculture, astronomy, chemistry, engineering etc., the perfection of the traditional empirical methods gave rise to scientific technology.

Such mutually beneficial and enriching exchanges between these two distinct knowledge systems requires active involvement of the scientific community to raise awareness about the unique values of traditional knowledge systems and to establish a foundation upon which to build partnerships that can constructively couple modern science and traditional knowledge.

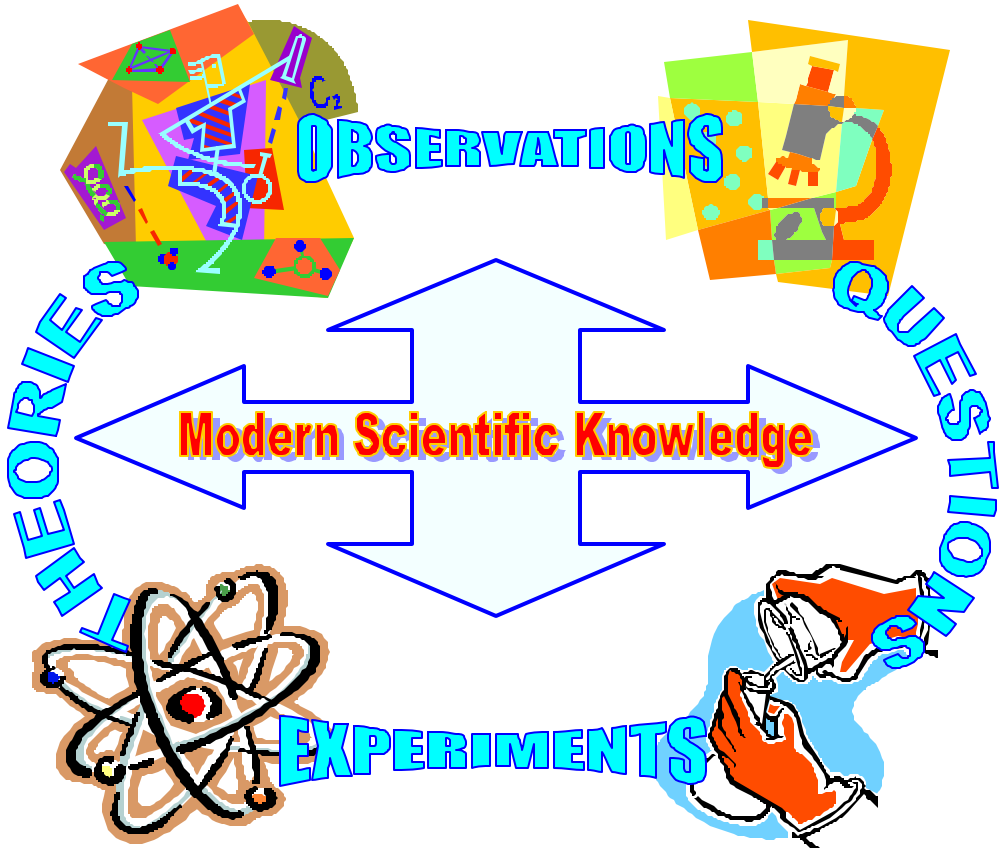

Fig.13.3: Some facets of modern scientific knowledge

13.3.1 Measures to be taken by the Scientific Community

Scientists and scientific institutions should build awareness and understanding within the scientific community about traditional knowledge and its relationship to science.

Specifically, they need to:

1. Recognise that scientists are also influenced by their own cultures in which they learn and work. To broaden their outlook, institutions should encourage research into the history and philosophy of science and promote interaction of scientists with those who although trained in modern science and technology, work with communities at the grass-roots levels.

2. To identify and highlight the contributions of traditional knowledge systems in the development of science.

3. Recognise that traditional knowledge systems and grassroots practices offer unique and valuable approaches to the construction of scientific technologies that can be utilised by the specific cultural milieu within which they are reproduced.

4. Promote and support research into traditional knowledge systems that represent considerable stores of, as yet "undiscovered", knowledge and potential for mutually beneficial exchanges with science.

5. Actively support and strengthen the systems of acquisition, transmission and maintenance of traditional knowledge in the societies that are keepers and developers of that knowledge, specifically with respect to building appropriate bases to enable exchanges between traditional knowledge and science.

6. Understand that knowledge in traditional societies is also dynamic and constantly evolving.

7. Recognise that traditional processes exist for transmitting and acquiring traditional knowledge, and that these processes deserve to be maintained and supported.

8. Recognise, support and encourage research into the role of women's traditional knowledge that has often been neglected.

9. Organisations like UNESCO, International Council of Scientific Unions (ICSU) and other scientific bodies should work together to advocate and implement these measures.

13.4 INTEGRATION OF SCIENTIFIC AND TRADITIONAL KNOWLEDGE FOR SUSTAINABLE DEVELOPMENT

Experience has demonstrated that quite often scientific methods and resulting approaches in specific communities or localities do not work. For example, several genetically engineered new varieties of plants have failed to give expected results in different localities. Several biodiversity conservation methods have failed as the strategies adopted were not compatible with the local system. The process of change is not accepted by the people, it cannot be sustained. On the other hand if the people are able to contribute their local resources and practices into the process of change, the development becomes not only sustainable but also gets accelerated.

The attainment of sustainable development calls for balanced interrelated policies aimed at economic growth, poverty reduction, human welfare and social equity amongst all nations and communities. Governments all over the world and other stakeholders have realised that it is not only necessary to respect varied cultures and traditions but also that the enrichment of diversity is in itself the path for overall

sustainable development. Accordingly the two forms of knowledge should be combined, enhanced and harnessed and greater use of both scientific knowledge and technology and traditional knowledge and practices need attention. Many issues related especially to sustainable natural resources management and biodiversity conservation require the partnership between scientific and traditional knowledge. Thus, moving towards sustainable development in many areas will require a closer cooperation between scientists in formal organised institutions and the holders of traditional knowledge in informal unorganised sector such as communities in non-industrialised regions.

This new and emerging understanding was also deliberated upon in the World Conference on Science (WCS) organised by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) in 1999 in Budapest, Hungary, to address the issue of knowledge and sustainable development. The conference recommended enhancement and harnessing of both traditional knowledge and scientific capabilities for sustainable development. In this conference, The Declaration on Science and the Use of Scientific Knowledge was adopted which affirms that:

> *"Scientific knowledge has led to remarkable innovations that have been of great benefit to humankind. Yet at the same time it also notes the challenge remaining to use this knowledge in a responsible manner to address human needs and aspirations. This is a task that needs many partners, and which calls for a broad collaboration between science and society in meeting the challenges of the future."*

In paragraph 1 of the Declaration, it is stated:

> *"The sciences should be at the service of humanity as a whole, and should contribute to providing everyone with a deeper understanding of nature and society, a better quality of life and a sustainable and healthy environment for present and future generations."*

Scientists need to be aware of the social and cultural settings of their research policies. For finding viable solutions to many sustainable development problems at the local level, proper interaction between science and local and indigenous cultures is important. In this context paragraph 26 of the Declaration (Annex 1) observes:

> *" … traditional and local knowledge systems as dynamic expressions of perceiving and understanding the world, can make and historically have made, a valuable contribution to science and technology, and that there is a need to preserve, protect, research and promote this cultural heritage and empirical knowledge."*

The WCS report under the section entitled "Modern science and other systems of knowledge" recommends (Annex 1):

> *"Governmental and non-governmental organisations should sustain traditional knowledge systems through active support to the societies that are keepers and developers of this knowledge, their ways of life, their languages, their social organisation and the environments in which they live, and fully recognise the contribution of women as repositories of a large part of traditional knowledge."*
>
> *"Governments should support cooperation between holders of traditional knowledge and scientists to explore the relationships between different knowledge systems and to foster inter-linkages of mutual benefit."*

In recent years, representatives of the international scientific and technological communities, Non-Governmental Organisation (NGO) community of traditional knowledge and practices and people from business and industry have initiated a

dialogue and have agreed to explore, together with UNESCO, the possibility of developing partnership projects in different parts of the world.

Efforts are being made to harness the traditional practices and knowledge in the local communities along with scientific inputs in various areas to bring about the process of sustainable development faster.

13.4.1 Agriculture and Forestry

Indigenous knowledge in agriculture is vast and diverse. This knowledge has been accumulated and perfected over centuries. The indigenous methods of soil management, cultivation methods, irrigation systems, crop breeding, animal husbandry and other agricultural practices like harvesting and storage have been traditionally used successfully and in a sustainable manner. The significance of indigenous knowledge for sustainable development in agricultural productivity was recognised by the researchers as early as 1980s, and the scientists in CGIAR (Consultative Group on International Agricultural Research) started focusing on traditional practices and indigenous knowledge of local populations in different parts of the world.

In Africa, with the participation of the local people, indigenous soil characterisation and soil management to increase agricultural productivity was carried out successfully. The Centre for Indigenous Knowledge for Agriculture and Rural Development (CIKARD) has promoted indigenous knowledge systems as a critical resource base for development and the design of sustainable agricultural systems. Other agricultural organisations worldwide have also started focusing their research on the locally available plant strains to increase disease resistance and other favourable attributes in the crops.

In India, the agricultural universities have focused their research on indigenously available plant strains for their hardiness, resistance to pests and other desirable attributes in collaboration with the local farmers. The information about the plants is obtained from the farmers. Sustainable crop cultivation and irrigation methods (e.g. drip irrigation) have been promoted by NGOs and further developed by scientists in collaboration with the local communities.

13.4.2 Conservation of Biodiversity

Recently, there has been renewed recognition of indigenous knowledge as a potential source for conservation of biodiversity. Local people are knowledgeable about their indigenous flora and fauna and with their help, scientists have been able to discover new species (e.g. primate species recently discovered in Central and South America, ungulates in Southeast Asia, and plant species throughout the tropics). Since the 1980s and 1990s, this taxonomic knowledge has been attracting the interest of pharmaceutical and agricultural companies for bio prospecting.

In India and Mexico, ethno-botanical research has focused on “sacred groves” occurring throughout these countries that are protected and managed by local communities. These groves are specific pockets of forests occurring in various parts of the country that are considered sacred and common people are prohibited to use these pockets. In these forests, trees are not felled. These prohibitions have ‘managed’ to preserve the ecosystems.

In the Pacific Islands, research was initiated on traditional knowledge and systems in the area of marine resource. These studies focused on traditional knowledge on marine species including their habitat, aggregation behaviour, spawning migration and classification. In addition, elaborate indigenous conservation and management practices relating to marine biodiversity were observed that could be effectively adapted.

Fig.13.4: Adivasi with Phyllanthus, traditionally used for jaundice: there is a need for alternative protection regimes for indigenous knowledge (Source: www.hinduonnet.com **)**

13.4.3 Artisanal Technologies

Artisans in villages and non-industrialised settings have been producing and continue to produce a variety of products. Artisanal products like handicrafts, carpet weaving, leather work, metal work, pottery, wood work etc have been used by mankind since the advent of civilisation. The knowledge and skill of their production methods and processes (technologies) is mostly possessed by particular individuals, families or communities and is acquired through 'learning by doing' apprenticeship. These have mainly been family occupations. The knowledge is passed from one generation to the next in the same family. These indigenous technologies have been perfected over hundreds of years using locally available materials and designs appropriate to the culture of the region. Such production units are widespread in rural and tribal areas and have often been the basis of small-scale industries.

Besides, communities in rural and tribal areas use forest and plant products, to construct houses, boats, clothing, storage and other household goods. The technology used by them has sustainability features like the use of locally available biodegradable and replenishable resources, maximum utilisation of renewable energy and low capital inputs. These technologies are, however, facing extinction under the impact of industrialisation. The artisanal goods face stiff competition from the industrially manufactured goods. The artisanal methods of production have remained static and have not been adopted and improved to meet the requirements of developing economies and changing demographic patterns.

Fig.13.5: Some artisanal products from India

In India, realising the significance of artisanal technology to sustainable development, commendable efforts have been made by NGOs to infuse new life into the dying artisanal crafts. A large number of projects and programmes in the Asian region under the general title of 'Science and Technology for Rural Development' provide a rich and useful base to build upon. For example, the laboratories of the Council for Scientific and Industrial Research (CSIR) are working with several rural communities to understand their specific problems and upgrade their traditional skills with inputs of scientific tools and approaches. The approach is to identify prevailing traditional practices, study problems specific to particular regions and provide scientific inputs to arrive at ecologically and culturally acceptable technologies for these regions.

Among the broad areas covered by these efforts are:

1. Post-harvest agro technologies
2. Cultivation and processing of medicinal and aromatic plants
3. Food technologies
4. Drinking water, health and sanitation
5. Low cost housing
6. Leather and animal waste utilisation
7. Upgradation of skills and rural artisans
8. Technologies for other small-scale industries

13.4.4 Health and Medicine

Medicinal practices based on traditional knowledge provide for the primary health care needs of around 80% of the world's population. In India, traditional systems of medicine and healthcare such as Ayurveda, Siddha and Unani, is actively supported and researched. In China, the Chinese and Tibetan systems of medicine predominate the healthcare scene. These indigenous systems of medicine have now gained recognition and acceptance in the western countries where they are much in demand. Even western medicine, founded on Greek traditions, continues to be strongly influenced by traditional knowledge. In the USA, plant materials continue to be an important component in 25% of prescriptions.

Historically, the scientifically backed allopathic system of medicine also has its roots in the traditional knowledge which continues to this day. The early medical practitioners gained information about the herbs used by the local healers and tested the effects on their patients. Based on these empirical observations, subsequent chemists identified the active components present in the particular herb. The individual active chemical compounds were synthesised in the laboratory by the technique of chemical engineering and were given the form of allopathic medicine. Medicines like aspirin, quinine, reserpine, digoxin etc. are all derived from plants. The method of investigating plants for new drugs is known as bioprospecting. Today, bioprospecting has become an area of tremendous interest to the pharmaceutical and nutraceutical companies that are involved in healthcare and cosmetics. Considerable amount of money is invested in bioprospecting and developing new drugs from plants. Traditional knowledge is available not only in curative medicine but also in the preventive medicines, cosmetics and nutraceuticals that are taken as supplements to diet.

Indigenous knowledge in medicines is therefore extremely valuable for the scientists who are involved in drug discovery. Collaboration and partnership with the local people possessing the knowledge would be beneficial for the scientists, the local people and the entire mankind.

SAQ 2

Describe the importance of indigenous knowledge of agriculture and medicine in today's context.

13.4.5 Partnership between Scientific Community and Indigenous People

Partnerships between the Scientific and Technological (S&T) communities and indigenous people in many areas are essential to promote sustainable development. The collaboration must be founded upon mutual respect and understanding, transparent and open dialogue, and informed consent and just returns for the holders of traditional knowledge through rewards and benefits. These commitments are important as the fields of traditional and scientific knowledge extend into areas involving business, government and development processes.

In the first place the S&T community must be ready to collaborate with the holders of traditional knowledge and implement the necessary changes in the conduct of scientific research. A much greater share of research must be problem oriented and interdisciplinary, addressing the social, economic, and environmental issues of sustainable development. Traditional divides between the natural, social, economic, and engineering sciences and other major stakeholders must be bridged. Research policies should include broad-based participatory approaches involving the holders of traditional knowledge and those in need of scientific information.

In the formulation of partnerships the issue of ownership of knowledge must be understood and acknowledged. The holders of traditional knowledge must be fully recognised as the rightful owners of their intellectual heritage. Scientific research must pay due attention, and give due credit, to those people who produce and hold that knowledge. The setting up of National Innovation Foundation (NIF) with a corpus fund from the Government of India is an important step in this direction. NIFs approach is to convert the intellectual and innovative knowledge at grassroots level to enterprise and wealth shared between the entrepreneur and the owner of knowledge.

Beyond the building of collaborative partnerships at the local level between members of the scientific community and holders of traditional knowledge, it will be necessary to expand these collaborative partnerships to include national government agencies, local authorities, business, industry, NGOs and, appropriate intergovernmental organisations.

In this respect, the following principles should be applied:

1. Ensure the full and effective participation of traditional knowledge holders during all stages of sustainable development policies, plans and programmes, alongside the scientific and technological community.
2. Acknowledge and respect the social and cultural bases.
3. Recognise the rights of traditional people to own, regulate access and share benefits of their unique sets of knowledge, resources and products.
4. Ensure that traditional knowledge holders are fully informed of potential partnerships and that these are only entered into with prior informed consent.
5. Promote training to equip young scientists and indigenous people to carry out research on traditional knowledge.

13.5 SUMMARY

- Community knowledge refers to the combined traditional and scientific knowledge. It is known that traditional knowledge is sustainable as it has evolved after thousands of years of observation and experience. This form of knowledge interlinks and establishes a holistic relationship between man and nature. It has supported life in a sustained way and continues to do so today. However, with globalisation, this form of knowledge has been ignored completely and is gradually becoming extinct.
- Scientific knowledge has evolved over a period of a few hundred years and has its roots in traditional knowledge. However, it has adopted a path of separating human beings from their environment. The development process based on science and technology is no doubt faster but it has proved to be detrimental for our environment as is evident from the present dismal scenario of the global environment.
- Today, the greatest challenges which the world community is facing are the issues of socio-economic growth, poverty reduction, human welfare and development and

the protection of the Earth's resources, commons and life-support systems. People, governments and the scientific communities all over the world have now realised the importance of sustainable developmental strategies. These groups have stressed the need for harnessing both scientific knowledge and technology on the one hand, and traditional knowledge on the other to solve many issues related to sustainable natural resources management and biodiversity conservation. Thus, formulating policies for sustainable development will require a closer cooperation between scientists and the holders of traditional knowledge which include local people in general and indigenous people in particular.

- Efforts are being made towards this endeavour and in India, already several scientific and technological laboratories are working towards this goal. They are identifying locality specific problems, collating the information about the indigenous knowledge and upgrading this knowledge for local use. This has resulted in the generation of employment and an overall elevation in the socio-economic status in selected areas.

13.6 TERMINAL QUESTIONS

1. What do you understand by community knowledge?
2. How has the traditional knowledge contributed to the survival of the communities through the ages?
3. How has traditional medicine contributed to modern medicine?
4. Why is the traditional knowledge considered important for sustainable development?
5. What efforts are needed by the scientific community to integrate traditional knowledge into their research policies and how will it help in sustainable development?

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