

Introduction

Sustainable development has been almost universally accepted as a desirable development goal, despite many complex problems involved in its operationalisation. Its major achievement so far has been to serve as a questioning framework about the long-term environmental and socioeconomic viability of our present day lifestyles and activities. It has raised significant questions and doubts about present day conditions - the technologies, production systems, material priorities, myopic development vision, etc - touching upon both our day-to-day activities and development framework. Never before has humanity been engaged in such a comprehensive self examination as is being currently demonstrated through various types of global, regional, national, and even local exercises related to the promotion of sustainable development. Humanity has come to recognise that the unbridled continuation and expansion of our present day activities will soon threaten our own futures and, indeed, those of our children. In response to these problems, changes are already being introduced, albeit slowly, in some areas. In other areas, questions and debates have been initiated to find appropriate answers. The advocacy for sustainable lifestyles will go down as a historic landmark, probably as significant as the first industrial revolution, because current debates are highlighting the urgent need for a new environmentally-friendly industrial revolution. Every generation must build on the shoulders of its predecessors, but, in doing so, the wisdom lies in discarding the unsustainable, decaying, and static and holding on to the sustainable, enduring, and dynamic. Probably no other generation has been as lucky, in this respect, as the present one. The capacity, in terms of education and research, that exists for examining these questions and finding the answers has never been so extensive. The problem, as always, is with the will to deal adequately with sustainable development priorities and not to dilute them with other preferences, of which there are many.

Sustainable agriculture obviously has a major role in this debate on sustainable development. There is growing global concern about the unsustainable nature of present agricultural activities. Crucial issues in this discussion have been the inability of traditional farming systems to provide adequately for the increasing population, on the one hand, particularly in fragile, rainfed, remote, and climatically harsh areas, and, on the other hand, the environmental problems generated by the expanded use of modern agricultural inputs, including the mismanagement of natural resources in better endowed areas. Because of the environmental problems arising out of both traditional and modern agriculture, questions of food insecurity and malnutrition are once again appearing as major concerns for certain regions of the world. In addition, the health risks associated with negative environmental effects are also causing growing alarm about the continuing use of certain chemicals, misuse of natural resources, and the deteriorating conditions of the environment.

The challenge before policy-makers, scientific bodies, and development agencies to make agriculture sustainable in better-off areas, as well as in fragile resource zones, has never been greater. While returning to the good old days of the sickle and plough is highly improbable, modern technology cannot be permitted to destroy the biophysical basis on which life is sustained. Consequently, it is imperative that we find

the answers to the questions being raised regarding the sustainability of agriculture. How we can maintain food security and preserve the environment is a dilemma facing each and every ecological belt, including the mountains. While different agencies have their respective roles in facilitating the solutions, a major challenge is obviously before the research and education systems, as these not only determine the nature and type of new technologies but are also responsible for the development of human resources capable of bringing about the changes needed for sustainable agriculture.

This paper attempts to draw attention to the education and research issues in sustainable mountain agriculture. The next section provides an overview of the changing nature of mountain agriculture and the different types of questions that are emerging. This is followed by a discussion of the understanding of sustainable agricultural development in fragile resource zones such as the mountains. The conclusion here is that there are still large gaps in our knowledge, and we must develop learning systems that are more sensitive to local conditions. A brief consideration of the main conclusions of the '20-20' vision for international agriculture highlights the need for decentralised research on an ecoregional basis and the importance of greater attention to specific eco-regions, such as the mountains, for global food and environmental security. The third section describes the present set-up for education and research in the Hindu Kush-Himalayas. The last section describes priority areas to be addressed in the fields of education and research to make mountain agriculture more sustainable.