

# **PANDIT GOVIND BALLABH PANT MEMORIAL LECTURE: III**

## **Developing Human and Physical Resources of the Himalaya**



**Prof. V. Rajagopalan**

**Vice President, The World Bank  
& Chairman, Consultative Group on International Agricultural Research (CGIAR)**

### **Venue**

K.K. Nanda Memorial Hall  
High Altitude Plant Physiology Research Centre  
HNB Garhwal University, Srinagar (Garhwal)

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## **About Prof. V. Rajagopalan**

Mr. Rajagopalan joined the World Bank President's Office as Vice President and Special Advisor on January 1, 1993. His responsibilities include assisting the President's Office and three Central Vice Presidencies with the transition to the new structural arrangements announced in the fall of 1992 and the follow up on the implementation of the recommendations of the Portfolio Management Task Force (PMTF). In addition Rajagopalan continues as the Chairman of the Consultative Group on International Agricultural Research (CGIAR).

Mr. Rajagopalan received his Civil Engineering degree from Madras University in 1949 and his post graduate degree in Sanitary Engineering from the Johns Hopkins University in U.S.A. in 1954, and honorary Doctorate in Engineering in 1993 from the Anna University (formerly Madras University).

When he first joined the World Bank, in 1965, Mr. Rajagopalan's work focused on the preparation, appraisal and supervision of projects in many African, Asian and Latin American countries. Since the mid-70s, he has held several senior managerial positions, including, Director of the Projects Policy Department from 1979 to 1985, Director of the Europe, Middle East and North Africa Projects department from 1985, and as Vice President, Sector Policy and Research from 1987, which subsequently was recognized as Sector and Operations Policy in 1990, until he was named to his current position as Vice President and Special Advisor.

As Vice President of Sector and Operations Policy, Mr. V. Rajagopalan was responsible for managing five central Departments and developed the World Bank's sector policies, and the Central Operations, that developed operational policies.

Under his aegis was the population and Human Resources Department, which formulated the Bank's education, health, population and nutrition policies. The other Departments under Mr. Rajagopalan were: Agriculture and Rural Development; Environment; Infrastructure and Urban Development; and Industry and Energy, which developed policies in their respective sectors. He was also the first Chairman of the consultative Group on the Energy Sector management Assistance Programme (ESMAP) from 1990 to 1992.

Before joining the Bank, Mr. Rajagopalan, an Indian national, worked for 16 years in his home country. He taught at Madras University from 1949-53. From 1955 to 1965, he was responsible for planning, developing and helping to implement the National Water Supply and Sanitation program for urban and rural areas and for the establishment of separate Public Health Engineering Departments in Each state in India. During this period, he also developed a national program to train engineers and auxiliary personnel in water supply, sewerage and sanitation. Under this, graduate programs in Public Health Engineering were started at the Guindy Engineering College, Madras, Roorkee Engineering University and VJTI in Bombay. He was also instrumental in planning and helping to establish the Central Public Health Engineering Research Institute at Nagpur which has now become the National Environmental Engineering Research Institute at Nagpur.

## Pandit Govind Ballabh Pant Memorial Lecture

V. Rajagopalan  
Vice President, The World Bank  
Chairman  
Consultative Group on International Agricultural  
Research (CGIAR)

Thank you for the privilege and pleasure of delivering the 1993 G.B. Pant Memorial Lecture. Like my distinguished predecessors- M.S. Swaminathan and T.N. Khoshoo, who delivered the Plant Memorial Lecture in 1991 and 1992—I will share my views with you in the hope that these will do justice to the national leader whose life and vision we commemorate today. I hope, too, that some of my thoughts will be useful to the leadership of the G.B. Pant Institute of Himalayan Environment and Development, as it continues the task of developing the human and physical resources of the Himalayan region.

G.B. Pant belonged to India's first generation of leaders who played dual roles in shaping the nation's destiny. First, they led the country from servitude to freedom. Second, they put in place the institutional foundation on which an enduring structure of nationhood could be built. We are not too distant from the times in which they lived but we can already perceive the contribution they made to India's present and future. They sought unity within diversity. They believed that India should draw strength from all societies of its population—intellectuals, administrators, sons and daughters of the soil, and so on. Pandit Pant subscribed fully to these concepts, and attempted to give them life in practice. His outstanding characteristics were steadiness, stability, and integrity. He was in every sense of the phrase, a mountain of man. So it is fitting that the development of India's Himalayan region should be undertaken in his name.

The majesty of the Himalayan range usually evokes the response of awe. Poets wrote of its grandeur in ancient times, and it is the subject of a rich, pan-Asian mythology. It figures in *Mahabharat* and the *Ramayana* as well as in the folklore and literature of India's neighbours. In more recent times, it has attracted the attention of military strategists, mountaineers, ecologists, tourists, economists, and others. It has been written about as a natural fortification. The word *Himalayan* is commonly used as an expressive adjective in the English language. Scientists have written widely of how the working the Himalayan ecosystem influences productivity on the genetic plains below. Others have given it special importance because it is the home of a multitude of natural species. Interest in the region is both wide and multi-faceted.

This range of interest in the Himalayas is consistent with the sweep of its physical dimensions. The Himalayas stretch from Afghanistan to Myanmar and stand over all the countries in that area. They are part of the natural features of several Indian states. India's Himalayan region covers some 591,000 sq. km. By way of comparison, this area is greater than that of Malaysia, Thailand, Kenya, Paraguay, France, Spain, or Iraq. Let us not forget, moreover, that India's Himalayan region is home to some 51

million people. Their fate and fortune depends on how effectively the region is developed. Additionally, human development in this region and its impact on the environment will influence the lives and livelihood of millions more on the plains below. The G.B. Pant Institute 's emphasis on twinning development and the environment is therefore particularly appropriate. Conservation and growth must go hand-in-hand to benefit human lives –today and tomorrow,

## THE NATIONAL CONTEXT

The development of any singly region within a country is only partly discrete exercise. It is also- sometimes, more so –an aspect of overall national development. The development needs of the Himalayan region should therefore be approached in the context of India's development policies and prospects. These, in turn, have to be placed in their international setting.

Great changes have swept across the world in recent years. Many of the political changes that have taken place, particularly in Europe, have resulted from disillusionment with the results in practice of a particular set of economic theories. Thus, a district characteristic of global change is a growing commitment of adjust the structure of economies, to make a series of movements away from excessive state intervention and toward market orientation. The potential of private investment is recognized more clearly than before. The private sector in most developing countries is beginning to be seen as an instrument of progress. Similarly, the need for greater public identification with development, through stronger means of people's participation in both decision making and implementation, is more clearly recognized.

Another characteristic of the contemporary situation is that many traditional donors are finding it increasingly difficult to maintain flows of Overseas Development Assistance (ODA) at customary levels. Domestic trends in donor countries have resulted in calls for belt-tightening and for priority attention to the home front. Demands on ODA budgets have increased at the same time as budgets are shrinking.

India has responded to the changed situation by making its own policy adjustments. Clearly, India has noted that despite difficulties and problems, current trends offer opportunities for accelerated development. The wisdom of experience has convinced policy makers that India can benefit from taking on the challenges it faces whether in fiscal, trade, or other policies. India has entered a period of adjustment in the expectation that the eventual outcome over the mid and long term will be positive. All these changes have to be undertaken with due care for their immediate impact on people's lives.

Adjustments have to be carefully monitored to ensure that they do not increase the burdens already carried by the poorest and weakest sections of society. The world is watching India as it faces up to these tasks. At present, certainly, the world seems impressed by India's approach. As the World Bank puts it, " India is one of the few developing countries with has been able to undertake a major reform of the economy,

and reduce macroeconomic imbalances significantly, without severely disrupting growth.” While these achievements have strengthened international confidence in India’s ability to adjust, they have also laid the groundwork for the continuing dynamism needed to fulfill the tasks that lie ahead. One of those tasks is that of regenerating the agricultural sector, which is vital for poverty alleviation and is an endeavor that particularly affects development of the Himalayan region.

India’s agriculture sector, with 70 percent of the country’s population, the bulk of its poverty and a 35 percent contribution to GDP, provides its beneficiaries with only half of the country’s average per capita income. Sector growth, at 2.5 percent per annum on average since 1965, has been lagging behind, compared to that in South East Asian countries and compared to 21 percent per annum population growth over the same period. The contribution of agriculture to the national economy has been declining, even though the proportion of the population reliant on the sector has remained constant. This is an unacceptable situation, both in terms of overall development and of food security.

India’s rate of population growth has fallen but most projections estimate that India’s population will be somewhere between 970 million and 1010 million by the year 2000. by most calculations, food production will have to grow annually at a rate of over 3 percent to meet the consumption needs of the projected increase. Starting from a higher production base than in the 1960s, this challenge is likely to be more difficult than that which scientists and planners faced prior to the green revolution.

Agricultural growth is conditioned not only by the availability of suitable technologies but also by a variety of fiscal and trade policies. We know that food subsidies, fertilizer subsidies, investment incentives, and exchange rates, if inappropriate, can severely constrain agricultural growth. Moreover, the world is much more aware today than it was before of the interdependence between agriculture and the environment. The interactive process involving poverty, productivity, and the environment is also more clearly understood. When farmers and their families are desperately poor, producing more food by whatever means – including mining of resources, and exploitation of marginal lands – becomes their major preoccupation. Poverty thereby hurts the environment; and the resultant depletion of natural resources in turn aggravates poverty. This vicious circle has to be broken through the development of technologies that are friendly to the environment and appropriate to the farmer. So there is growing acceptance of the need to integrate growth with environmental protection a balance has to be struck between increasing productivity and protecting the natural resource base on which productivity depends. Farming systems, extension services, integrated pest management, improved soil nutrient management and natural resource management all have a relevance to agriculture that is now widely acknowledged.

If these issues are all considered together, it becomes clear that for agriculture to serve as a catalyst of growth, a strategic approach is needed, both in a national sense and in different ecological regions. In the Himalayan region we confront problems

arising from the need to satisfy the requirement of a growing population that depends for its livelihood on a fragile ecosystem.

No less than in the rest of India, the people of this region want better education, health facilities, nutrition, homes more income-generating activities and so on. They have a right to expect that they, too, like the rest of the population, will share in the benefits of India's new approach to development. Some of those who lived in the region have grown impatient for change and have left the region to seek their fortunes elsewhere. We do not know precisely the extent to which they might have added to the problems of the areas to which they have migrated. Those who stayed behind undoubtedly continue to hope for a better future in their own environment. Given the physical circumstances of their habitat, that future has to be ensured primarily through agricultural development. The challenge is to ensure that agriculture-based human development is consistent with sound management of natural resources; that it is truly sustainable.

## **INTEGRATED DEVELOPMENT**

Policymakers who established the G.B. Pant Institute of Himalayan Environment and Development explicitly acknowledged the connection between development and the environment. The connection is now universally recognized, although it was not always so. The Stockholm conference on the Environment (1972), for instance, concentrated exclusively on the environment. For many years, thereafter, a debate contended among those who felt that environmental protection and development were mutually exclusive, perhaps mutually hostile.

The Brundtland Commission sought to integrate these two perspectives in the unified concept of sustainability. In agriculture, the Commission urged, renewed attention should be given to problems such as the pollution caused by the heavy dependence of high productivity farming on chemical inputs; pressures that force the rural poor into marginal lands; and the consequences for agriculture of climatic changes caused by environmental pollution. Based on these considerations, the Brundtland Commission emphasized the need for sustainable use of the land as a non-renewable resource. Responding to these urgings, the Consultative Group on International Agricultural Research (CGIAR) adopted the following definition of sustainability: "Sustainable agriculture should involve the successful management of resources for agriculture to satisfy changing human needs while maintaining or enhancing the quality of the environment and conserving natural resources."

The environment/development linkage was at the center of deliberation at the UN Conference on the Environment and Development (UNCED) held at Rio last year (1992). Much of Agenda 21, the action program agreed on at UNCED deals with development, but development in a sustainable way.

There was a time when some analysts feared that the Himalayan region already faced a situation of irreversible environmental crisis in which sustainable development

was out of the question. This extreme view no longer prevails. Course corrections have been made, new policies have been shaped, and there is broad agreement that further development is both necessary and possible. Today, development planning is based on an understanding of the environmental importance of hilly terrain; and an appreciation of the economic potential of well managed hilly areas. Indigenous resources are considered of special value, and development programs have been made location specific. An Integrated management of resources is the goal, but management programs are relevant to specific areas, so that variations in ecosystems within the region are taken into account. We should not, however, minimize the dimension of the challenge that continue to confront the region. In particular, the region needs a concerted and continuing strategy for the conservation and enhancement of biodiversity, and for the management of soils, water and nutrients in ways that harmonize the goal of increased productivity with that of natural resource conservation. A pre-requisite for the creation of such a strategy is the establishment of research programs that focus sharply on the region's priority needs such as technology generation, forest resource management, and watershed management.

Let me attempt to briefly review some other aspects of the challenge.

In rural areas, a spatially-based planning approach often helps to establish a sustainable balance between population and resources. The development of this concept is relevant to the Himalayan region which has experienced both population pressure and resource degradation. Some of the pressure is external, caused by adventurous visitors who despoil the land with collection of debris. Most of the pressure however, is local. Increasing population, haphazard cultivation of increased numbers of livestock have created an imbalance between the land and those who occupy it. This is the basis of so much that affects the region—mining of the land, deforestation, floods, and soil erosion, for instance. The development of spatial planning could help to restore the balance and maintain it for the future. This requires an integrated effort encompassing a systems approach to farming, tenurial reform, the reform of land usage patterns, proper livestock management, soil conservation, watershed management, restoration of soil fertility, and the regeneration of grazing and forest land; and nurturing well endowed land by restricting it for the use of sustainable agriculture. This should include an examination of how local resources, together with selected external inputs, can address the needs of the local population in a sustainable way.

The World Bank has for some years been associated with local efforts in several broad areas. One of the earliest Bank-funded projects was for the development of sub-watersheds to support mixed species plantations, construction of soil conservation structures, livestock development and horticulture. More recently, support has been provided for forestry research, education and extension. The Bank supports the Pant Institute's emphasis on an integrated approach to development.

## *Water and Soil Conservation*

In the Himalayan region, water can be an asset as well as a problem. This will be seen as a strange paradox by farmers in the semi-arid tropics who are often the victims of drought. Water is generally plentiful in the Himalayas where there are many rivers and where water supplies are augmented by abundant rainfall. On the other hand, excessively heavy rain, primarily in the summer months, causes soil erosion and landslides. As a consequence agricultural activity is curtailed, and the long-time productivity of the soil is reduced. Drinking water, moreover is often in short supply due to poor storage, management and distribution, thus affecting the health of the people. Given the existence of water supplies, these problems do not appear insurmountable. The challenge, here, is to harvest the water by using modern engineering technology but without disturbing nature to the extent that the water-soil relationship is irreparably harmed. In addition it is necessary to encourage water-efficient cultivation, to protect water sources from excessive drawing down, and to ensure that the distribution of stored water satisfies both agricultural and human needs.

## ***Forest Resources***

The Himalayan region has been losing forest cover over the years, but there exist contrary views on the causes of deforestation. The conventional wisdom has been that deforestation is the result of human misuse. Local communities do not, however, pillage forest resources out of mischief. They use forest resources out of necessity. Forests provide them with fuel, fodder, and timber. To the extent that some of the resources can be met through other means – for example, alternate sources of energy-efficient technologies for cooking and heating, and specialized production of fodder – forest resources will be better secured. Forest Management in general and the regeneration of degraded forest land are also issues that need to be re-examined. Genetic improvement of tree species has an important contribution to make as well.

Forests serve a number of environmental services such as protection of watersheds, serving as the source of plant and animal biodiversity, and stabilizing fragile soils. Pressures on forest resources are great, and a number of connected measures are required to establish an effective forest management strategy. These include the provision of incentives for local participation, improving technologies to solve production problems establishing priority areas for protection and development, and extension services. Some of these measures are currently being taken with Bank support.

## ***Biodiversity***

The value of preserving genetic diversity in both plants and animals is now widely understood, nevertheless, genetic diversity, particularly in plants, has been lost to neglect and destruction. In this connection, the Himalayan region is a valuable storehouse of biodiversity, as it contains the “natural relatives” of many varieties of food plants and medicinal herbs. However, some loss of biodiversity has taken place and



can be traced to a number of reasons including “ mining” of agricultural, forest, and livestock resources. Moreover, there have been signs of tension between those who argue that specific areas should be earmarked as biodiversity reserves and others who claim that today’s resource needs of the human population – particularly, the very poor – are more important than conservation for the future. Both requirements need to be harmonized through a combination of *in situ and ex situ* conservation. Mining of natural resources might provide some very short term benefits, but over the medium and long term, loss of biodiversity could be a major threat to Himalayan life.

### ***Indigenous Knowledge and Practice***

Increasingly, there is an understanding that indigenous knowledge and practice can complement or be integrated with the application of modern technologies in order to promote sustainable growth. In the Himalayan region as elsewhere the nutrient potential and cultivation patterns of some plants are well known to local communities, even though these crops may be considered “exotic” by outsiders. These may be food crops such as amaranth, multi-purpose crops like the bamboo, medicinal plants, or species of environment-friendly trees and shrubs. Scientific cultivation of these plants could substantially add to the value of the region’s resources. As the requirements, capacities and use of these plants are best known to local populations, their development needs to be based on collaboration between research scientists and farmers.

The form of collaboration already falls within the interests of the Pant Institute which has sought to identify and draw up inventories of local knowledge and practice. Such studies have shown that traditional systems deal with a number of matters that are relevant to modern agriculture, such as inter-cropping, the use of manure to replenish minerals depleted by irrigation, and identifying crops particularly suited for local conditions. These efforts need to be intensified, so that the effectiveness of local practices can be improved by their integration with science and technology inputs.

### ***HELPFUL TRENDS***

An integrated response to the challenge of developing the Himalayan region and protecting its environment cannot be undertaken without sound planning and substantial investment. The role of G.B. Pant Institute is crucial, in this connection, for it must not only serve as planner, catalyst and coordinator, it can also function as a mobilizer of resources. Several trends could work to the benefit of the Institute.

**First**, wide acknowledgement of the need for India to invest in regeneration of its agriculture. Failure to do so would offset the gains made to-date in developing agriculture. Among the areas under consideration for priority attention are redirecting expenditures from subsidies to investment, improving the structure of production incentive, generating and disseminating new technologies, rehabilitating forests, and protecting non-renewable resources. These are all relevant to development of the Himalayan region.

**Second**, acceptance of the need to develop the Himalayan region as a sub-sector of the agricultural sector. The existence of the G.B. Pant Institute underscores this point. The Government of India is to be commended for this undertaking.

**Third**, the existence of a viable research community in the country. India's research system is the second largest among developing countries – 26 state agriculture universities, over 12 zonal research institutes and stations and some 64 ICAR research centers. Indian scientists have created over 500 high yielding varieties of food grains, but their research interests are not limited to that area of competence. Livestock, forestry, fisheries, for instance, are all sectors of scientific interest. The research community consists of both public sector and private sector scientists. Rates of return on agricultural research in India have been high. In the 1970s and 1980s rates of return on public research expenditures were over 200 percent, for all crops.

**Fourth**, the applicability of existing external scientific knowledge to meet domestic problems. Major issues facing the Himalayan region are matters of concern elsewhere, too, and therefore subject to international scientific inquiry. The CGIAR system has not made the Himalayan region an area of concentration, but the experience and expertise of several international agricultural research centers are relevant to efforts required here. The International Irrigation Management Institute (IIMI) works on water management, while the International Board for Soil Research and Management (IBSRAM), a non-CGIAR center, conducts research into soils. A wide spectrum of agro forestry and forestry concerns is encompassed in the programs of the Centre for International Forestry Research (CIFOR) and the International Centre for Research in Agro forestry (ICRAF). Policy research, including, land reform and tenurial matters, is the concern of the International Food Policy Research Institute (IFPRI). Institution building is carried out by all CGIAR centers, but particularly by International Service for National Agricultural Research (ISNAR). Leadership in the conservation of biodiversity is given by the International Board for Plant Genetic Resources (IBPGR). Other areas of CGIAR expertise include crop improvement, livestock, and integrated pest management.

I would urge the G.B. Pant Institute to engage in a dialogue with CGIAR centers, to set in motion exchanges of information, and to examine modes of cooperation. I would also invite your attention to be ecoregional approach to agricultural research currently being refined by the CGIAR system.

In essence, the eco regional concept touches on four basic interdependent issues facing humanity—environment, food, population, and poverty. The ecoregional approach aims at performing research in and for agro ecological zones, which are regionally defined. The regional boundary to the agroecological zone emphasizes that economic and social factors are important in balancing the research and development equation. These factors vary across regions, countries and cultures and are not necessarily congruent with the agro ecological zones used to stratify natural and physical diversity. But an essential and common feature of the approach is the increased exposure of the scientist to the farmer and his actual situation in the field.

The ecoregional concept emphasizes sustainable productivity through appropriate farming practices at the individual and community level.

Land and water degradation, the reduction of biodiversity environmental pollution, farm productivity and sustainability are affected by decisions taken at farm, community, institutional and polity level. However, these same levels also offer leverage points for solutions involving interconnected decisions. The interlocking nature of the problems faced, also requires that there be more complementarity's and less duplication among research scientists, more effective linkages between the global and regional research, and more effective transnational collaboration.

The complexity of the problems an approach requires a new set of skills to be applied and an unprecedented level of collaborative effort among a wide array of institution. Such a partnership arrangement will have to reconcile the leadership and creativity of scientists as well as policymakers with the need for a user-driven agenda. This could turn out to be the most formidable aspect of the challenge because it requires the development of institutions and the formulation of policies that will ensure people's participation in development.

A great deal is written today about "governance" and "empowerment" of the people as preconditions for effective development programs. What this means, in practice, is that unless the people feel both a sense of participation and a sense of partnership in the institutions, substance, and process of development, their involvement will be less than wholehearted and therefore unproductive. This is not a new principle. India's first operation of post-Independence leaders made the point. So did many of the experts who came here from abroad to advise them. Gunnar Myrdal was one of them. He stressed the need for greater participation at the grass roots level. He expressed surprise that this was lacking because, he said, he found a rich tradition in Indian writing about the "perfect village" in ancient times where all aspects of governance were participatory. Despite the tradition we are still working at discovering the most effective institutions for participatory development. I will not presume to tell you how to bring about such a sense of partnership because you know the region and its people better than I do. But I will leave you with the thought that participatory development is as important as research, integrated policies, investment, and all other aspects of development.

The Pant Institute has identified a number of priorities which can be dealt with effectively in a partnership among planners, researchers, and the people. These include the following.

- drawing up inventories of human needs;
- ensuring that women are encouraged to play a self-fulfilling role in development.
- Formulating effective extension programs related to sustainability issues;
- Creating technologies that are acceptable to the people; and providing the people with incentives to increase production as well as to protect the environment.

Continuous interaction among all the parties concerned is necessary if these goals are to be met, and not only outlined on paper. Given your sense of dedication and the hardy practicability of the people in hill societies, I am confident that an effective mix of theory and practice is possible. I am also confident that the international community will respond to your own efforts along these lines.

You have my good wishes as you pursue the path of partnership with people whose future is your responsibility and your commitment.

Thank you.