

## **A Scientific Conceptual Framework and Strategic Principles for the GIAHS Programme from a Social-Ecological Systems Perspective**

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Thank you, Mr. Koohafkan, for inviting me to present today, and I do so on behalf of both myself and my colleagues, Dr. Puri and Dr. Smith.

Ladies and Gentlemen, esteemed colleagues: The time has come for GIAHS. Over most of the last four hundred years, indigenous peoples and ethnic minorities across the globe living in rural, subsistence societies have been attempting to adapt to a vastly changing globe. Many have been subjected to *what we recognize with hindsight* were brutal forms of colonialism. At the same time as their natural resources and labour were extracted from them, these people were often characterized as ‘primitive.’ Many such societies were in fact seriously destabilized or simply disappeared. However, in many places, such as in the Peruvian Andes, in parts of Indonesia and the Philippines, in the extreme North of North America, in the Yucatan, in mountainous areas of Nepal, in the Indian tropics, in outer Mongolia, in the deserts of Northern Africa, colonialism largely failed to very substantially alter their ways of life. However, as colonialism died out barely a generation ago, many of these same peoples were then subjected to the imperatives of ‘modernization,’ including the need to industrialize, to generate surpluses for rapidly growing urban populations, for foreign exchange to pay for the excesses of new elites and the appetites of the North for tropical products, so that the extraction of raw materials from these peoples’ territories increased. In the effort to transform agriculture through Green Revolution technologies, their production systems were often characterized as ‘backwards’ and ‘low yielding,’ and at worst as ‘environmentally degrading’. The people themselves were seen to be in need of assimilation and of development support, so that they could eventually become equal to the educated citizenry of their own capitols or of the North. Even as the ‘decades of development’ lost impetus and they accompanying ideologies began to die out, with the emergence of integrated rural development and anti-poverty approaches, most of the people living in rural subsistence societies have been portrayed as the ‘world’s poor’, who are in dire need of the benefits of Western science and of global economic growth. Underpinning this, the idea still prevails that such people’s cultures and production systems are impediments to progress, including to the eradication of poverty. Today, with the realization that global markets largely fail to reach or support many of the worlds’ 1.4 billion rural subsistence families, and with the realization that global technological solutions such as modern varieties and chemical inputs probably do more damage than good to their ecosystems, diets and productivity, a very strong new current of thinking has emerged. One could in fact argue that these people have now become globally important – it has been discovered that they conserve the vast majority of the world’s valuable agrobiodiversity and agroecosystems. It is even being realized that they contain a wealth of resilience in the form of diverse cultures, languages and knowledge.

This change is coming in large part due to the struggles of these same peoples to retain their ways of life and to defend their human rights. It is also emerging because many are coming to realize that, in spite of our vast wealth of scientific knowledge, we still seem to know very little about how to live in and with the natural world. We are facing a very large number of serious challenges and very probably crises in the 21<sup>st</sup> century: human induced climate change, energy and water crises, deforestation, desertification, soil erosion, pollution, global biodiversity loss, global disease outbreaks, global conflicts, and, even possibly, the loss of the resilience of our ecosystems that ultimately guarantees the continuity of the human race as we know it. At this moment, then, we are beginning seriously to wonder whether the 'end-point' of 'development' toward which we have been racing might not be the wrong one. We look around, and we ask ourselves: perhaps we have been trying to leave far behind us things that in fact are extremely important: belonging to a culture and to a particular place, having good social relations based on mutual support rather than on pure competition, and having a close relation with the natural world of which we are undeniably, and desirably, a part. At a global level, we realize that we need to retain the tremendous adaptive capacity, knowledge, and cultural resilience that have allowed the human race to come to occupy and thrive in virtually every ecosystem on earth over a very long period of time. GIAHS is a programme that arises not only from our consciousness that places and things of great beauty, harmony, and intrinsic value are likely to disappear: GIAHS arises from our own recognition of the need to maintain options for the human race, in case our great experiment of 'development' fails.

Ladies and Gentlemen, I cannot synthesize in the 10 minutes that I have left how to conceive of GIAHS. What I can say is that GIAHS requires a very different way of thinking, and a very different approach to those that conventional development thinking and conventional science have offered.

To start with, we need a holistic approach. GIAHS cannot be characterized as agricultural systems or ecosystems, they are not places or practices, they are not people, and they are not ideas. They are *systems* that are made up of the interaction of all of these things – people, places, biological organisms, practices, and ideas. These systems are not the product of industries, of markets, of science, of inventors, policies, ministries, development agencies, or NGOs. They are the product of cultural evolution – that is, of the cumulative knowledge, experience, ideas, and ways of organizing society that have been built up and adapted over centuries or even millennia. They represent above all the ways that people have met all of their cultural and material needs on the basis principally of local resources over time. We call these **social-ecological systems**, because this term best captures the co-evolution of humans and nature – how humans have shaped the natural world and developed organisms to meet their needs, and in turn how human culture, including religion, values, norms, and social relations have been shaped by the ecosystems in which they live. These systems are not 'primitive' or simple. They are extremely sophisticated and complex. These people may be illiterate but they certainly are not ignorant: it takes an average person living in such a society at least a third of a lifetime to accrue the minimum knowledge necessary just to support a household, and a specialist (for example, in medicines, or in the diversity of specific crops, in religion or a

political position) may require two-thirds of a lifetime to learn what she or he must know to be considered as truly learned and capable. They are based upon a very complex set of laws and behavioral norms, as well as webs of social relations. What if we did not have markets to tell us how to procure and exchange goods? People in these societies generally don't, and yet they have managed not only to procure and exchange goods within their social-ecosystems, but as well with nearby and far flung peoples. People in these societies generally don't have written legal codes, but they do know who has access to what, when, and how, and they pass these rights and duties along when people die; they also have managed their common resources so that these are not over-exploited by the few, and provide the means of subsistence for virtually all people within them and, at least until recently, on an environmentally sustainable basis. They don't have access to laboratories, or to GIS, or to libraries, or the internet, and yet they continually experiment, innovate, and adapt their knowledge, techniques, and practices to changing environmental, economic, and social conditions. They don't have formal education and yet manage to transmit the knowledge accumulated over centuries to their children. They don't have museums, or heritage laws, or zoning laws or planning ordinances to preserve their buildings, temples, and sacred groves, and yet they manage to transmit their cultures, their arts, architecture, and sense of aesthetics generation after generation, changing these, it is certain, but without losing their sense of identity or cultural continuity over time.

We don't mean to romanticize rural subsistence social-ecological systems. They are rife with difficulties and dilemmas, challenges, conflicts, inequalities, and therefore are continually changing, just as are all human societies. What they can be characterized as, however, is resilient, and unique. They have evolved nutritionally adequate and culturally significant ways of producing, procuring, and consuming food and virtually every other necessity of life. They can also be characterized, like virtually every other ecosystem on the planet, as under threat.

GIAHS-type societies are subject to the forces of homogenizing globalization, or what I and some others call 'de-localization'. De-localization means the de-linking of production and consumption from local environments. It means that most humans no longer know what the ecosystemic or social consequences are of their production and consumption patterns, since these consequences are for ecosystems and peoples who may be very far away. We consume shoes and microchips and wood furniture and shrimp without knowing how the people who produce them live or how the ecosystems that sustain them are changing, and therefore, the most concerned among us cry for 'labeling' and 'traceability'. De-localization means a very serious loss of control because, in fact, *no one* is capable of knowing what the consequences of our mass production and consumption decisions are. GIAHS-type systems are undergoing the same loss of control, and many of the drivers of this loss of control are very similar across many of these systems. But each rural subsistence social-ecological system is still very local, and the ways in which they experience such drivers, and the ways in which they deal with them, are also local. In spite of the fact that the drivers may be similar – population growth, loss of control over land and other resources, market penetration and homogenization of

production and consumption, loss of traditional knowledge, etc. – the means to maintain system resilience will be very different.

I think that the most important thing that I can say to you, ladies and gentlemen, is that no one who does not belong to these cultures, to these systems, can re-engineer them, conserve them, or otherwise adapt them. We cannot even imagine that outsiders could possibly have the knowledge, or skills, or motivations to maintain dozens to hundreds of local varieties of a single crop, or identify, process and administer hundred of plant species as medicine. Most outsiders can't even speak their languages. The only people who have the knowledge, skills, motivations, and perseverance to do so are the people who have inherited them and who are living their lives trying to pass them on to their heirs. We are not the proprietors of GIAHS. GIAHS are global heritage only in the sense that I already laid out above – they represent the resilience, and best hope, for much of the human race. Otherwise, GIAHS are LIAHS – locally important agricultural heritage systems, and very possibly they will only remain such if we, as outsiders, are able to support the people who live in these systems to maintain the resilience of their cultures and their ecosystems given so many negative drivers of change. We have no recipes for this – everything that we bring to these systems from outside, whether it be tourists, or niche markets, or agricultural extension, or a thousand good intentions – can have unexpected and unintentional repercussions. A change in one part of the system will very likely have repercussions throughout the system, and these repercussions are also very likely to involve trade-offs, and are also likely to be far-reaching. The very best that we can do is to seek to complement the knowledge of these people with scientific and practical knowledge, to help them to identify their problems, the underlying drivers of change, and a range of potential options that can help to make their systems, and their lives, more resilient both in terms of human and in terms of ecosystem welfare, and to support them in the attempt to analyze and understand the possible trajectories of change given different options. Only once this is done can we actually begin to support them to pursue such options. Globally, and within each country, the other very best that we can do is to attempt to change those processes that are *devaluing* these people and their resources, or wresting these people's control over their own futures away from them. We can best address poverty by dealing with its most pervasive and destructive dimensions: social exclusion and disempowerment.

Our approach to GIAHS must be short-term, but we cannot, and must not, rush to intervene because 'development aid' demands that 'results' be evident in the short-term. Interventions should not occur before it is clear that their repercussions are fairly well understood, and before people are absolutely committed to, and understand, such change. On the other hand, our approach to GIAHS must be far-sighted, if what we want to do is to enhance their resilience over time. Hinging the future of GIAHS on global eco-tourism or on distant niche markets for agricultural products might seem like a good idea in the short term but, if the energy crisis or geo-political conflict send fossil fuel prices skyrocketing, then the source of 'resilience' for GIAHS may suddenly disappear. The ability to think ahead is not the strongest point of the world's current political systems, but it needs to be an important characteristic of the GIAHS programme.

Ladies and gentlemen, with this I conclude. I would like to extend to you a very warm invitation to attend this afternoon's session where my colleagues, Dr. Raj Puri and Dr. Laurajane Smith, will be more systematically presenting the GIAHS conceptual framework and where you will all have ample opportunity to discuss, comment, critique and improve upon this framework.