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Bruno Messerli was one of the key actors responsible for the inclusion of Chapter 13 (sustainable mountain development) in Agenda 21 and is still a leading proponent of mountain issues and concerns at the international level. He was invited by FAO, the UN Task Manager for IYM2002, to submit the speech he delivered at the IYM launch as part of this contribution to MountainPlatform. Ed.

At this official launch of IYM2002 it is fascinating indeed to observe a gathering of government leaders, delegates from UN organizations, representatives of mountain people and NGOs, mountaineers, and scientists and hear their statements about the mountains as "a major ecosystem representing the complex and interrelated ecology of our planet, essential to the survival of the global ecosystem" (Agenda 21, Chapter 13). Ten years ago, the situ-

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ation was very different: during the 1992 Earth Summit in Rio de Janeiro, mountains were fairly low on the political agenda, and only a relatively small number of decision makers, development experts, and scientists were interested in them. This situation has changed completely since then.

From amidst all the new knowledge we have about mountains, I wish to draw attention to just two elements: *population* and *water resources*.

Population—A much higher figure

We should remember that mountains not only cover around 25% of the Earth's land surface, but also that approximately 26% of the global population lives in or very close to mountain areas. Since the first international mountain conference in Munich (Germany) in 1974, we have been using the unproven figure of 10% to refer to the proportion of the world population living in the mountains.

The new figure of 26% comes from a database at 0.5° resolution, derived from a 1 km–gridded polygon file that defined the spatial extent of all countries for which 1995 country-level population statistics were available (Meybeck et al 2001, *Mountain Research and Development* 21(1):35–45). The results of this research mean that mountains are not characterized only by remote, poor, and disadvantaged people and communities but also by urban centers inside and immediately outside mountain valleys as in the Alps and the Pacific region or even by the megacities of Latin America, from Mexico City to Santiago de Chile. In this sense, we must rethink the highland–lowland interactive system in a new, global perspective.

Critical water resources

Perhaps even more important for humanity in the 21st century, we have to consider the natural resources of mountain regions such as water, biodiversity hotspots, recreation areas for an increasingly urbanized world, mineral resources, hydropower, agriculture, forestry, etc. Let us focus on water resources. Just a few days before the official launch of IYM2002, the Freshwater Conference in Bonn, Germany, drew to a close. Some organizations called on the world governments meeting in Bonn to take urgent action to head off a global water crisis that is expected to result in shortages for 2 out of every 3 people in the world by 2050. The question of water must be given a much higher position on the global political agenda.

Most significant was the conference statement that 70% of the freshwater available today is used for irrigation and food production. In some areas such as North Africa, Central Asia and South Asia, this figure is as high as 95%. This statement provokes a personal comment: Why do these conferences and government representatives not acknowledge mountains as the water towers of the above-mentioned areas? In the arid and semiarid regions of the tropics and subtropics, which are home to possibly more than half of the world's population, 80 to 100% of the available freshwater comes from mountain areas. Surface- and groundwater in the Aral basin, the Nile, the Indus, the Euphrates, the Jordan, and the Yellow rivers, among others, comes from mountains and uplands. Evaporation in the lowlands can be much higher than rare precipitation. This means that the water balance in the lowlands may be negative, even without diversion of water for households, industries, and irrigation. Dutch scientists made the astonishing finding that in the dry summer of 1976, 95% of the Rhine water flowing into the North Sea came from the Alps, from melting snow and ice at high altitudes. And in California, scientists estimate that two thirds of the available freshwater for this highly industrialized state comes from winter and spring snow accumulation in the Sierra Nevada.

These findings mean that mountains as water towers play a fundamental role in water supply and food security. If the prediction is correct that we shall face a serious water crisis by the middle of the 21st century, then the mountains will play an absolutely central role, not only in terms of the quantity and quality of water, but also with respect to conflicts over water.

A multiplicity of tasks and challenges

Managing fragile ecosystems to achieve sustainable mountain development is the theme of the mountain chapter of Agenda 21. It is not sufficient to define sustainability in terms of its environmental, economic, and social dimensions. We must also consider the specific characteristics of nature and human societies in the mountains, with respect to climate variability and natural hazards, highland–lowland interactions, economic vulnerability, the value of mountain resources and products, cultural diversity, demographic problems and migration, policy, law and governance, etc. Management of mountain watersheds for sustainable use of mountain ecosystems and resources, with the ensuing benefits for populations in the surrounding lowlands, is a highly complex and multisectoral process.

It is now up to us to create the necessary awareness of mountains, mountain resources, and mountain people during the International Year of Mountains 2002 and beyond.

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