Synthesis: Hills vs. Mountains

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Hills? Photo: Ujol Sherchan

Mountains? Photo: Ujol Sherchan

[The e-discussion on 'Hills vs. Mountains', sparked off by Masi's posting on the mf-asia discussion list, took place from March 27 to April 10, 2001. Masi asked if there was much difference between hills and mountains in terms of cultures and geographies. The ensuing e-discussion was, however, tilted more towards a search for the definitions of hills and mountains. Alejandro Camino, Assefa Kuru, B. K. Joshi, Bakht Jehan, Chan Jin Hooi, Elizabeth Byers, Dr. Jane Pratt, Margaret Percy, Martin Curd, Martin Price, Masi Latianara, Megh Ranjani Rai, Mervin Stevens, Muhammad Akhlas, Muhammad Ayaz Khan, Nyima Tashi, Rana Riaz Saeed, Seth Sicroff, and Shah Nawaz participated in the discussion. The main points of the discussion have been summarized.]

Issues with defining the mountain or hill

- Geologists, soil scientists, hydrologists and other physical and biological sciences need to adopt naming conventions that facilitate research and scholarly discourse. Others have definitions as per the requirements of their disciplines. Rather than we define what a mountain or hill is, let us ask the local people.

- The search for THE definition of mountains either doesn't matter or is an exercise in futility. No matter how useful it would be for lawmakers to have a definition of 'pornography', none has ever proved workable. And the same goes for 'mountain.'

- People's perception of the differences between hills and mountains are locality-specific or context-specific. In Nepal, the general distinction is hills are 'green' and mountains are 'snow-covered.' This distinction based on colour perception, however, is not universally applicable.

- Giving a new definition without accepting the existing names or describing the specific features according to the purpose only ties ourselves down to a rule that goes beyond what we have been following for years.

- How should one define hills and mountains from the human point of view (not just cold scientific point of view)? Can one define hills from mountains by the cultures that live on them? Defining hills and mountains without considering the human cultures that live on them as a vital parameter is a gross under-definition. The human network in hills and mountains combined is not as static an element as elevation and vegetation-type and geological make-up, but is rather a very dynamic and unavoidable part of what mountains and hills are.

Something like the definition

- Hills may go as high up as 3,000 feet (about 1,000 m), with grassy, scrub and broad-leaved vegetation, while a mountain may be higher than that with pine forests and snow-covered peaks.

- Han Hurni in 'Sustainable Management of Natural Resources in African and Asia Mountains' (Royal Swedish Academy of Science 1999, Ambio, Vol 28, No 5, August 1999) gives altitude and slope as the two major criteria for the physical definition of a mountain eco-region. As these two factors influence the climate, vegetation, soil formation and hydrological processes, the most significant difference between mountain area and lowland is the abrupt changes in vegetation. At any latitude, the hill area is not high enough to show a significant change in vegetation, whereas a mountain area is high enough to demonstrate various vegetation belts.

- From the kind of analysis that Mr. Hurni conducted, I believe relief maps of the terrain (characteristics) are important, not the names of the terrain.
- Hills and mountains are elevated features of the earth's surface the standard measure of which is the 'altitude'. There is an indirect relationship between altitude and vegetation, but a direct relationship between climatic conditions (temperature and humidity) and vegetation. The climatic conditions change with altitude at the same grid location (higher the altitude, lower the temperature), thus influencing vegetation. The climatic conditions also change with 'latitude' at the same altitude (generally temperature decreases from equator to poles), thus influencing the vegetation. From Hurni's analysis, it appears as if there will be similar vegetation at 500m altitude all over the world, but this is not so.

- The mountain is a landform that rises 3,000 feet vertically over a distance of 1 mile.

- 'Hills' are those landforms having more sand/soft texture of soil irrespective of height and with good vegetation; whereas the mountains contain more hard rocks irrespective of height.

- The above definition based on texture doesn't cut it. There are plenty of 'hard hills' and bountiful vegetation in the Himalayas that extend quite a bit higher than the highest Swiss Alps. Hills are often parts of mountains. Should one say a feature is a hill up to a certain point and then becomes a mountain? Or perhaps that the front of a lump is, according to the anthropocentric definition, a hill, while the backside is a mountain? And what does one do about the fact that hills may be growing into or ground down from mountains?

- Platforms and hills correspond to the 200-500m mean elevation class and have a greater degree of roughness (RR>20%). Plateaus (16.8 M km2), with mean elevations between 500 and 6,000m, have a medium degree of roughness (RR from 5 to 40%). Mountains (33.3 M km2) are differentiated from hills by their higher mean elevation, (>500 m), and from plateaus by their greater roughness (>20% then >40%) in each elevation class. Accordingly, Tibet and the Altiplano are very high plateaus, not mountains. (Source: Meybeck M., Green P., Vorosmart C. "A New Typology for Mountains and Other Relief Classes: An Application to Global Continental Water, Resources and Population Distribution", *MRD Journal*, Vol.21.1, pp 34 - 45)

- The criteria for defining mountains laid down by the World Conservation Monitoring Centre (WCMC) are:

  - >2,500 m;
  - between 1500 and 2499 m if slope is >2 degrees;
  - between 1000 and 1499 m if slope is >5 degrees and local elevation range (radius 7 km) > 300m;
  - between 300 and 999 m if local elevation range (radius 7 km) > 300m.

  While altitude and slope have commonly been used, the local elevation range (relief) criterion is also critical, as those of us who live in and near low-altitude mountains know. The slope criteria of 2 and 5 degrees were essential to remove high-elevation plains and plateaux. The resulting digital

map is beginning to be a standard reference, and is already being used as the basis for a number of other studies, both regional and global, of mountain regions.