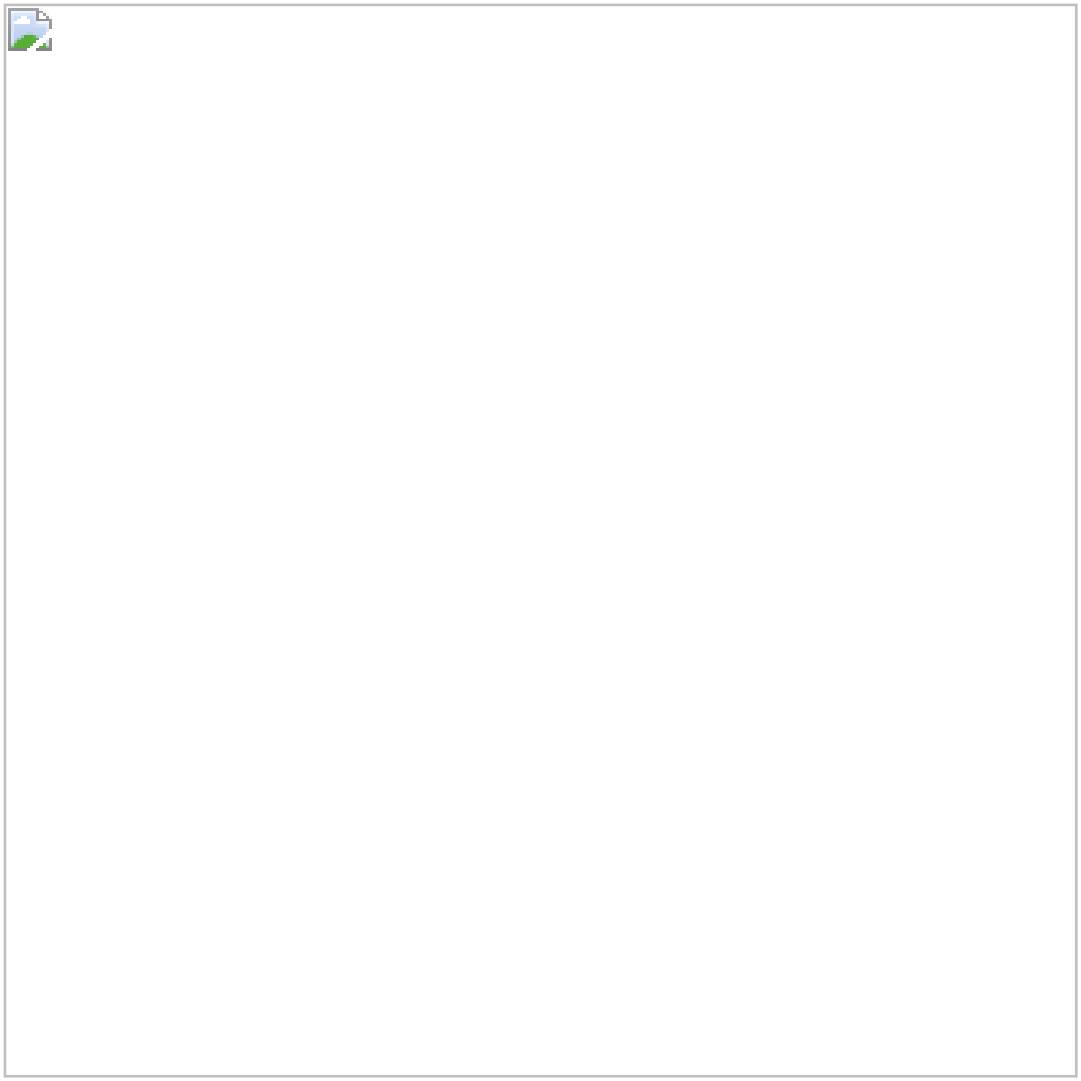

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Source: Mountain Research and Development, 27(2) : 119-123

Published By: International Mountain Society

URL: https://doi.org/10.1659/mrd.0906

Mountain Research and Development Vol 27 No 2 May 2007: 119–123 doi:10.1659/mrd.0906

Are Rural–Urban Migration and Sustainable Development Compatible in Mountain Systems?

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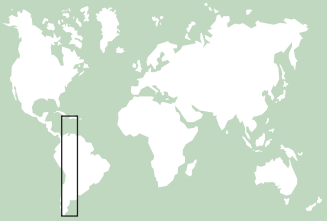
Rural–urban migration is having a considerable socioeconomic and environmental effect in mountain regions. In response, most rural development programs discourage outmigration on the grounds that it has negative social consequences and compromises ecological sustainability. However, rural–urban migration generally improves the living standards of migrants and leads to the disintensification of land use in fragile ecosystems with low productivity, thus stimulating ecosystem recovery and improving watershed and biodiversity protection—as shown by experience in the Caribbean and South America. These advantages have emerged even in the absence of any planning and could be maximized if international funding agencies, NGOs, and local governments re-evaluated rural development strategies. At a minimum, rural–urban migration is a reality that should not be ignored. More importantly, rural–urban migration provides an opportunity to improve the living conditions of marginal populations while protecting the environment.



Migration in the mountain development agenda

Rural–urban migration is one of the most widespread global demographic trends. For example, in Latin America and the Caribbean, the rural population has declined from approximately 50% in 1960 to <25% in 2000. Urbanization is not limited to long-distance migration to large cities, often in foreign countries, but includes population concentration in small local townships (Figure 1). These demographic changes greatly affect mountain regions, given that they are predominately rural; therefore, to promote sustainable development in mountain ecosystems, it is essential that the causes and consequences of migration are well understood.

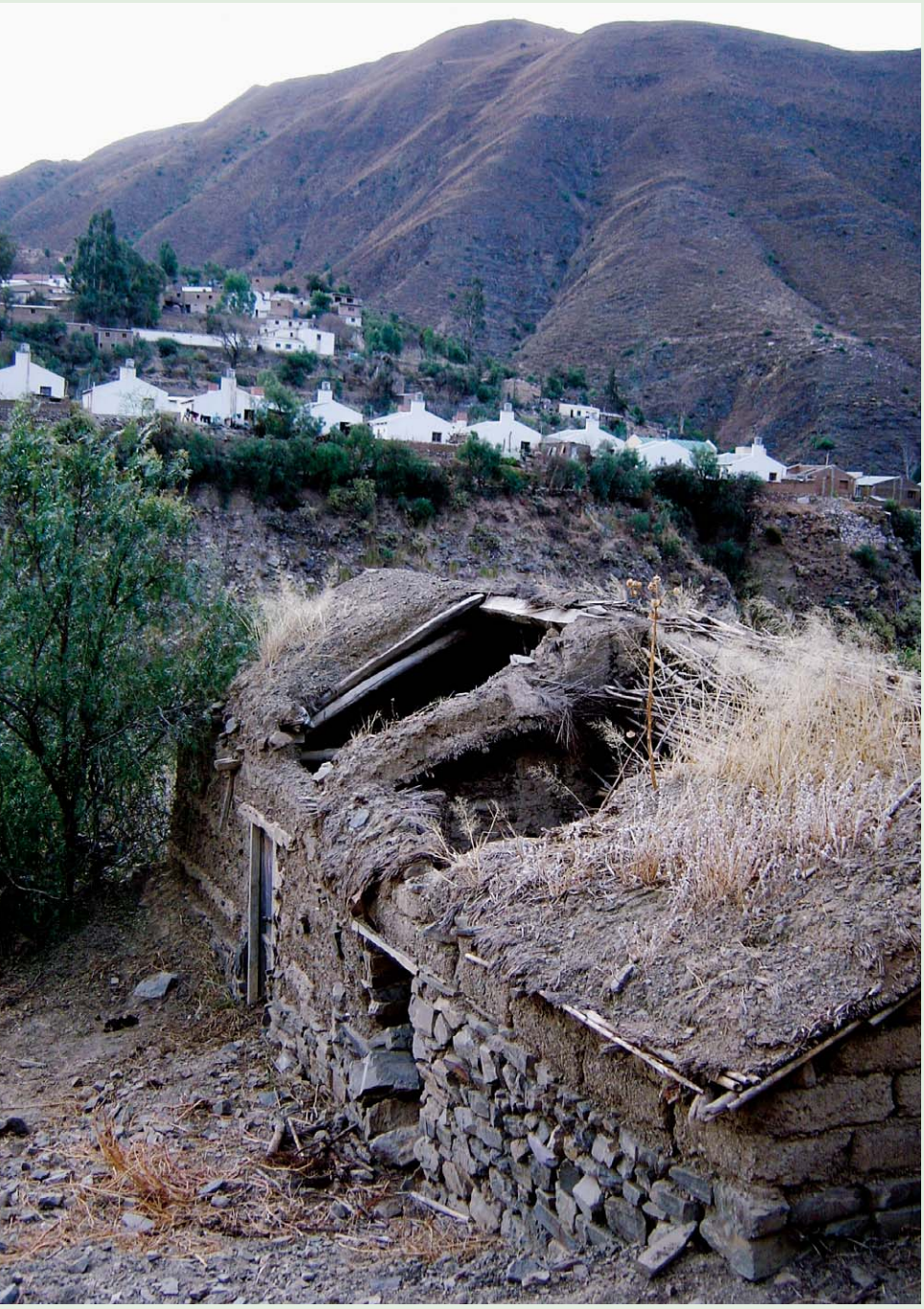
Presently, most initiatives promoting sustainable development in mountain regions tend to view rural–urban migration negatively. For example, a major goal of the Fifth International Symposium for Sustainable Development in the Andes (Jujuy, Argentina, 2005) was "to reduce depopulation." The argument is mainly based on the assumptions that: 1) migration has negative social effects (eg it does not improve the quality of life of migrants and it reduces local human capital), and 2) it contributes to environmental degradation (eg increases human environmental impact in urban areas and favors mismanagement of resources in rural areas).

The present article argues that these assumptions are largely unsupported by evidence from mountain regions in the Caribbean, Central America, and South America. In fact, in most cases the consequences of rural outmigration are positive in this region of the world. Furthermore, both economic theory and empirical evidence suggest that rural–urban migration and urbanization are inevitable; therefore, rural development programs must adjust and plan accordingly, instead of opposing or ignoring this demographic process.

Social effects of rural–urban migration

People migrate for many reasons, including seeking better jobs and education, or following family members who have migrated. The decision to migrate often results in improved conditions for migrants, and surveys conducted around the world reveal that the vast mayority of migrants are satisfied with their decision. For example, in Bolivia, even though migrants have a low level of education, they are able to find jobs which pay similar to jobs held by other urban workers, with salaries at least 4 times higher than those of rural workers. Other positive effects of rural migration in Latin America include a decrease in infant mortality (half the rate in urban areas) and an increase in life expectancy (4 to 5 years longer in urban areas). Teenage pregnancy is lower in urban areas, where primary school attendance and literacy are higher. The urban poor have much better access to water and electricity. A major contributor to these differences is the economy of scale. Providing basic services, food, clothing, health, and education in urban areas, where people are aggregated, is much

FIGURE 1 Housing trends reflecting population urbanization in local townships. Santa Victoria, northern Argentina. (Photo by H. Ricardo Grau, 2004)



cheaper than in rural areas, where people live at much lower densities in poorly accessible areas, as is often the case in mountains.

These positive effects of rural–urban migration contrast with the impressions of many middle- and upper-class urban inhabitants, who see migrants living in substandard conditions in the poorest urban sectors. This discrepancy is due to 2 groups making different comparisons. Urbanites who have benefited for generations from a stronger economy and better education have higher standards of comparison, which can hardly be achieved by migrants who have recently arrived in an urban setting. But the important comparison is the one made by migrants themselves—between living conditions and opportunities in their previous rural setting and those in their new urban setting.

The positive aspects of rural–urban migration are not without negative consequences. Rural communities lose human capital, particularly young adults who are attracted to education and job opportunities in urban centers. This often results in losses of traditional knowledge and sociocultural values, including agrodiversity and ethnobiological knowledge. In addition, the local social structure often changes as males migrate, leaving communities with children, women, and the elderly. These changes will also affect the local environment. If changes in land use and local societies cause a slow-down in the local economy, local organizations will be unable to maintain infrastructure (eg irrigation systems, cultivation terraces).

However, the migrants themselves may help to reduce some of these negative impacts. Many mountain communities already receive important economic inputs through remittances. In addition, some migrants have also organized to provide their rural communities with new resources and ideas related to conservation of their natural resources and cultural heritage. Furthermore, improved access to communication (eg cellular phones, Internet) for remote mountain areas facilitate the transfer of information between migrants and their homelands.

Environmental effects of rural–urban migration

The abandonment of traditional production systems in the mountains is an important result of rural–urban migration with consequences for ecosystem recovery. Modern mechanized agriculture in lowland plains is between 2 and 10 times more productive. When measured in

terms of productivity per worker, this climbs to more than 100 times. Moreover, feedlot-based meat production and lowland grazing are many times more efficient than extensive cattle or sheep grazing in the mountains. As a consequence, food production is much more costly in mountains and, with the exception of a few niche crops, cannot compete with modern agricultural prices. This stimulates land abandonment in the mountains.

It can be argued that modern agriculture includes hidden environmental costs due to the use of fossil fuels, fertilizers, and pesticides. While this is true, there is no doubt that fossil fuels, pesticides, and fertilizers will continue to be the basis of global food production, at least for the coming decades. Hence the goal should not be to find alternatives that are incongruent with the global economy, but to make these technologies work in the most efficient way (including their environmental costs). And this goal can certainly be more easily achieved in the lowlands, where flat areas are more suitable for mechanized agriculture, resulting in a low consumption of energy per unit of product. Low erosion and runoff reduce fertilizer losses and contamination, while large homogeneous areas favor efficient use of pesticides, for example in combination with genetically modified crops.

Conserving natural environments while also feeding the growing human population requires high productivity per hectare. Otherwise, most or all natural systems would have to be converted to agriculture. Therefore, by moving to urban areas, where the population consumes agricultural products from more efficient systems, migrants help to conserve land for nature and preserve natural ecosystems in mountain regions. In addition to a reduction in agricultural activities, rural–urban migration will lead to a reduction in grazing, hunting, and firewood collection in mountain areas, which should also promote natural ecosystem recovery. This has important consequences for sustainable development because mountain ecosystems are particularly fragile and have a disproportionate importance in terms of watershed protection and biodiversity conservation.

FIGURE 2 Forest regrowth over abandoned grasslands in the Central Cordillera of the Dominican Republic, favoring the conservation of water resources for the lowlands. (Photo by H. Ricardo Grau, 2004)

During the last decade, forests have expanded in several mountain regions of Latin America, in association with rural–urban migration. The best-documented cases of forest expansion include the Caribbean cordilleras of the Dominican Republic (Figure 2) and Puerto Rico, the Mexican pine forests of Oaxaca, the Central American forests of El Salvador, Honduras, and Costa Rica, the montane forests of Ecuador and subtropical Argentina, and the temperate forests of the Patagonian Andes. As these ecosystems recover, there will be many environmental benefits, including improved biodiversity and watershed protection.

Many non-forest mountain ecosystems (eg *puna*, *páramos*, deserts) are experiencing similar processes. Although land cover changes in these ecosystems are subtle and difficult to assess with remote sensing methods, changes in the native fauna have been observed. For example, the population of vicuñas, a heavily hunted camelid from the central Andes, has increased 20-fold during the last 30 years in Argentina's northwest highlands. This increase has been promoted by legal protection, but a reduction in the rural human population and the resulting

FIGURE 3 Vicuñas in the Argentinean Andes. Once an endangered species, the vicuña has seen its population increase rapidly during the last decades, coinciding with a decrease in rural population. (Photo by H. Ricardo Grau, 2006)

decrease in hunting and competition with domestic grazers is probably a more important factor (Figure 3).

Compatibility of rural–urban migration and sustainable development in mountain systems

Rural–urban migration is not only compatible with sustainable development; in many mountain systems it is necessary. Most traditional land use practices are not sustainable on economic or environmental grounds, especially under the conditions of rapid population growth that have characterized recent decades and will characterize coming decades. These areas often have low productivity and thus cannot compete with modern lowland agriculture. This is why they are so often subsidized by governments and NGOs. Decreases in human mortality experienced during recent decades in most mountain regions have resulted in growing populations that cannot be sustained by traditional agriculture, at least at acceptable living standards. Furthermore, agricultural activity on steep slopes generally leads to high rates of erosion, which further reduces productivity (Figure 4). Consequently, migration from rural mountain areas to urban centers, typically situated in the lowlands, favors an efficient spatial distribution of land uses, which is reflected in benefits for migrants in particular, and society in general.

However, to take full advantage of these positive trends, a new approach to rural development programs will be required. Although migration will reduce local human capital, for the community to benefit it will be important to maintain a direct link between migrants and their mountain community. In the short term, this is occurring in many communities through remittances. Although remittances can help to stimulate new activities in rural communities, they can also have the opposite effect by creating economic dependence. For this reason it is important that urban migrants not only share their economic benefits, but also maintain a strong link by sharing new knowledge and opportunities with their rural community.

The potentially negative effects of migration for local communities are certainly not enough to discourage migration, with its individual potential benefits. Poor conditions in rural areas are a key driver of rural–urban migration. But additionally, economic theory indicates that as people become more affluent, their relative demand for more urban products increases. Therefore, improving economic standards in the countryside will also contribute to rural–urban migration. Even if rural migration causes local negative effects for both communities and the environment, the process will continue and will have a strong influence on mountain regions. On the other hand, examples from regions with a long history of outmigration from mountains (eg Europe and North America) show that the process may not lead to complete depopulation, but to persistent local communities with markedly different lifestyles. To address these issues, future sustainable development projects should consider the following recommendations:

1. Acknowledge that rural–urban migration is an inevitable process. When developing long-term plans, incorporate future scenarios that specifically include the demographic changes derived from migration. When organ-

FIGURE 4 Low-productivity agricultural crops and extensive erosion on the steep slopes of the Urabamba Valley, Peru. (Photo by T. Mitchell Aide, 2006)

izing "local" communities, specifically incorporate the participation of migrants.

2. When promoting strategies to preserve cultural values and traditional knowledge, acknowledge that cultures and information evolve, and people should not be forced to continue traditions that keep them in poverty or limit their access to the advantages of the modern economy. If under today's economic system certain crops are not valued but have future potential, then it should be the responsibility of society in general to invest in gene banks, instead of putting the burden on the rural poor.
3. Minimize the failures in the migration process by preparing people for changes associated with urbanization by improving information on the diversity of opportunities provided by migration. Promote successful migration coupled with persistent local ties.
4. Promote development agendas based on strong links with the urban economy (eg tourism, specific niche crops), rather than on protecting (through subsidies and distorted markets) unproductive traditional systems that compete with modern lowland agriculture systems.
5. Recognize that migration has important social and environmental benefits for society, which should be enough to pay for the local potential negative effects. Improve the ways in which these costs and benefits are connected to minimize the negative local impacts.
6. Develop payment mechanisms for environmental services (mostly paid by urbanites) that encourage abandonment of unproductive and non-sustainable agriculture systems, and improve the living conditions of the remaining rural population.
7. Promote the formation of migrants' organizations to ensure a strong connection between migrants and their mountain communities. Use the material and human capital of these organizations to foster social and environmentally sustainable practices.

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