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Lowland Irrigation Practices Benefit Upland Farms

Increased dependence on irrigation practices in lowland areas in the Philippines has resulted in agricultural intensification and increased incomes for lowland farmers. Increased lowland production has also benefited uplanders by creating additional employment opportunities for upland farmers in lowland areas. This increase in economic activity has prompted researchers to explore the ties between the two areas in an effort to understand how the decisions of one affect the other. It is clear that the two areas, though different topographically, have strong economic and environmental linkages.

Photo courtesy of SANREM CRSP Phase II

Hillside farming leads to soil erosion and downstream siltation.

Investigating the links

This growing awareness of economic and environmental ties highlighted by irrigation practices has brought upland swidden (slash and burn) farming practices under scrutiny. Erosive farming practices that increase reservoir sedimentation and silting of irrigation canals in the lowlands interfere with the productivity of irrigation practices and, ultimately, the economic stability of lowland and upland households. Recognizing this potential problem, researchers conducted a series of surveys between 1994 and 2003 to gain a comprehensive understanding of the environmental and labor market linkages of upland and lowland farming.

Using data collected from the surveys, researchers developed two models to study the linkages between upland and lowland farms. This brief combines the results of these studies to provide a comprehensive look at the environmental and labor market linkages of upland and lowland farmers by asking:

- How has agricultural intensification changed patterns of labor allocation, asset accumulation, and forest use?
- How important are these links between upland and lowland farms?
- What steps can be taken to minimize potential damages from changes in farming practices?
- How can improved economic policies achieve economic development, environmental protection, and poverty alleviation?

Lowland irrigation prompts change

During the 1990s, the Philippine National Irrigation Administration targeted approximately 6,000 hectares of land for irrigation development in the province of Palawan. By 2000, 16 out of 20 proposed projects had been completed. In a 1999 survey, 93 percent of the Palawan lowland farms included in the sample had completed the transition to irrigated production. This shift towards irrigation and intensification of lowland farming increased:

- use of fertilizers and pesticides
- employment opportunities
- income for both lowland and upland households
- awareness of potential problems with environmental linkages between upland and lowland farms

With the changes in lowland farming practices, upland households benefited from a rise in off-farm employment opportunities. By 2002, 68 percent of upland households had at least one family member working on a lowland farm. This increased demand for labor on lowland farms and the increased willingness of upland households to respond to this need guaranteed a bond of mutual dependence and increased economic success for both groups.

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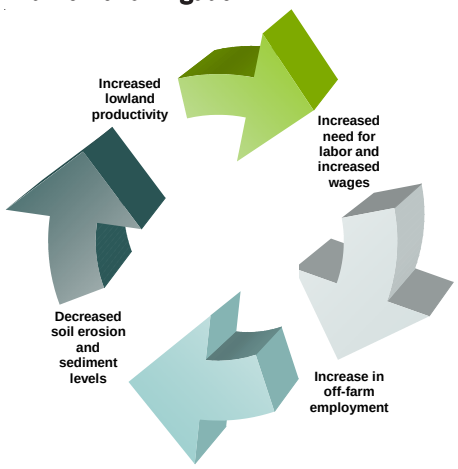
How important are these links?

Because of the erosive nature of hillside farming, researchers and policy makers are concerned about the negative effects of increased soil degradation and agricultural runoff arising in the uplands. With increased awareness of the linkages between upland and lowland production, it is important to understand how upland farming practices can impact lowland production through agricultural runoff, which reduces the quality of drinking water, as well as soil erosion, which leads to increased sedimentation. This increase creates a greater risk of flash floods, as well as accumulation of sediment in irrigation systems silt in coastal and aquatic ecosystems (streams, reefs, and estuaries), which can reduce the productivity of hydroelectric systems and irrigation systems. The impacts resulting from increased sedimentation consequently reduce the availability of off-farm employment and upland household incomes dependent on these systems.

Another impact of the linkages between upland and lowland farms is the decrease in forest clearing as a result of increased upland off-farm income and economic stability. Forest clearing has traditionally been considered an alternative income-earning strategy for upland farmers, but with the rise in lowland employment opportunities, upland farmers no longer need to clear forests for crop or timber production. Survey data suggests that upland households who allocated their labor to lowland farms ultimately decreased their rates of forest degradation. Simply put, lowland benefits to upland farmers resulted in increased intensification of upland land that was already cleared, instead of additional clearing of forested areas.

Figure 1. Upland and lowland impacts without lowland irrigation.

Figure 2. Upland and lowland impacts with lowland irrigation.



Policy implications

Upland and lowland farms are connected by the interplay of wages, prices, and economic opportunities in the general economy. Irrigation practices provide a critical point of intervention for policy makers and researchers. This practice has established the need to monitor and understand local environmental and economic dynamics to assist in developing effective and protective land management strategies. It has been suggested that lowland farmers or policy makers could provide payments for environmental services (PES) to compensate upland farmers for the provision of environmental quality for farmers downstream.

Measures that raise the incomes of upland laborors encourage agricultural intensification and discourage forest clearing. Improved upland land management practices will ensure the stability of the lowland water supply, ultimately maintaining economic stability for both lowland and upland households. By minimizing environmental damages through effective natural resource management, policy makers can minimize the impacts of erosion and deforestation while maximizing the effectiveness of farming outputs in both areas. ■

Increasing off-farm employment opportunities provides economic and environmental benefits for upstream and downstream farming households.

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For more information, see:

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