

FINANCING AGROECOLOGY IN BRAZIL AND THE WORLD

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Abstract:

Agroecology may be a uniquely viable solution to one of the most serious dilemmas currently facing humanity. On the one hand, there are a billion malnourished people on the planet. The global population is expected to increase by two billion by 2050 at that same time that income growth increases the demand for animal protein. Failure to increase food production by at least 70% by 2050 could have unacceptable humanitarian costs. On the other hand, failure to restore global ecosystems and the life sustaining services they provide poses serious threats to human civilization. Unfortunately, with current technologies, agriculture is the greatest global threat to ecosystem services, including those that sustain agriculture. Conversely, ensuring the continued provision of vital ecosystem services requires extensive ecosystem restoration, along with reductions in nitrogen, phosphorous, greenhouse gasses, toxic chemicals and freshwater use, threatening food production. Agroecology is capable of increasing the provision of ecosystem services from farmland and the provision of food, fiber and fuel from ecological restoration while reducing the use of non-renewable and toxic inputs. Despite minimal investments in agroecology relative to conventional agriculture, numerous studies suggest that it can simultaneously increase agricultural yields and farmer incomes, ecosystem services, and resilience in the face of extreme weather events.

A similar dilemma plays out in Brazil's highly biodiverse Atlantic Forest, which generates vital ecosystem services ranging from water provision for the majority of the Brazilian population to genetic information. Deforestation has exacerbated the catastrophic flooding and landslides of recent years. Without significant ecosystem restoration, the Atlantic Forest may lose its resilience, with potentially catastrophic impacts. Markets reward conversion of forest to agriculture, but not conservation in order to provide ecosystem services, many of which are public goods that flow across political boundaries. Brazil's forest code mandates extensive restoration of the Atlantic forest, but the resulting loss of agricultural land would drive many small family farmers into poverty. At our study sites in Santa Catarina, management intensive grazing (MIG), an agroecological alternative to conventional pasture, improves ground cover, nutrient cycling, biodiversity, agricultural yields and farmer incomes while reducing erosion, fertilizer and pesticide use, and labor requirements. We expect that our current experiments with silvopastoral intensive grazing (SIG) mixed with agroforestry with native-only species will generate even greater benefits.

The challenge is to design economic institutions capable of incentivizing the dissemination of agroecology at a global scale. Market forces provide incentives to individual farmers for increasing agricultural yields, but fail to reward the provision of public good ecosystem services. Payments for ecosystem services can provide farmers with incentives for those ecosystem services that can be made excludable, such as carbon sequestration or municipal water provision, but transaction costs can be high, especially for smaller properties. Public sector payments to individual farmers for public good ecosystem services are also possible, but confront similarly high transactions costs, and depend on political will.

Both our research in Santa Catarina and the literature suggest that farmers will maintain agroecology systems due to their higher market returns, but payments to individual farmers may be inadequate to stimulate their initial adoption. Agroecology demands intensive knowledge of local ecosystems, cultures and markets. It is best spread from farmer to farmer, catalyzed and facilitated by agricultural extensionists. The major requirements for disseminating agroecology are investments in research and development, agricultural extension, infrastructure required to bring products to market and low risk, low interest financing mechanisms. Payments to individual farmers do little to provide these services, while public sector investments in these areas typically generate average rates of return of 45% or more. Brazil is now experimenting with PES and low interest credit for agroecology at both the state and national level. Rapid dissemination of agroecology however would benefit from the redesign of PES as fiscal transfers of venture capital from wealthy countries and national governments that benefit from the ecosystem services it provides to less wealthy countries and local governments otherwise unable to finance the necessary public sector investments required. Successful investments pay off in ecosystem services. A portion of the venture capital could fund minimal risk loans to farmers adopting agroecology, with repayment schedules and interest rates determined by the increase in market returns attributable to agroecology.