Sustainable policy for energy, land and natural resources

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This thesis consists of four papers which are related to critical natural resource issues from a developing and emerging country perspective. All four papers demonstrate the importance of financial incentives in driving behaviour and investments. Two of the papers apply cost-benefit analysis to complex decisions in the energy and land use sector and two papers model the behaviour of agricultural households.

Determining an optimal strategy for energy investment in Kazakhstan
We analyse energy policy options facing the Kazakhstan government which is seeking to diversify and deliver sustainable development. We use cost-benefit analysis informed by expert testimony to support critical decision-making over the necessary $67 billion in electricity investments to 2050 that can simultaneously contribute to a sustainable economy. The results indicate that for commercial, economic and sustainability reasons policymakers should switch from further investments in coal-based electricity generation to a focus on investments that harness gas and hydropower.

Fuelwood scarcity, energy substitution, and rural livelihoods in Namibia
We seek to improve understanding of the impact of rural energy demand on standing forests. Specifically, we analyse the energy profile of rural households in Namibia, with a focus on fuelwood demand from open-access forests and energy alternatives such as cow dung and open-market fuelwood purchases. The results show that households are largely inelastic in their fuelwood demand, and respond to fuelwood scarcity by reducing energy consumption just slightly more than by increasing labour input to collection, with limited shift to available substitutes. Policy-makers in semi-arid countries should be alert to the potential for predicted population growth to increase fuelwood collection, even in the face of apparent scarcity and substitutes, which in turn risks degrading the integrity and extent of the forest.

Economic Efficiency and Incentives for Change within Namibia's Community Wildlife Use Initiatives
We appraise the economic and financial viability of five community wildlife conservation and utilization initiatives, or conservancies, on communal land in Namibia. For each conservancy, we examine financial profitability, returns on investment and economic efficiency, as well as private returns to project investment made by all stakeholders – community, donor and government. The results illustrate that conservancies are economically efficient, profitable and able to contribute positively to national income and the development process. Crucially, conservancies provide decent financial returns for communities, including income from wildlife use. Conservancies also provide a channel for the capture of international donor grants (reflecting global wildlife non-use values) as income, further strengthening financial returns for communities.

Formal microlending and adverse (or non-existent) selection: a case study of shrimp farmers in Bangladesh
We study the commercial activities and incentives for shrimp farmers in Bangladesh. Shrimp farmers are rural, poor, work entirely in the informal economy, and practice a form of mono-culture. The limited credit access of these farmers is rightly seen as a weakness. The results show that all farmers over-utilise labour to reduce the need for working capital and that informal lenders – with their closer ties to the individual farmers – remain more successful than formal lenders in identifying those smallholder farmers most likely to use the borrowed funds successfully. Informal lenders have an information advantage that formal microlenders lack: the latter need to find routes to access this information for formal microcredit schemes to succeed.

Keywords: Environmental economics, natural resources, energy, climate, microcredit, poverty, sustainability, cost-benefit analysis, agriculture

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