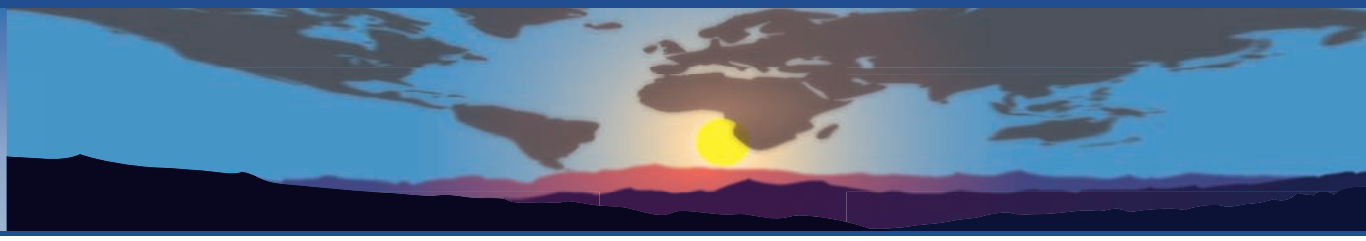
Food and Agriculture Organization of the United Nations



Climate change, biofuels and land

Climate change and expanding biofuel production is likely to lead to greater competition for access to land. For the millions of farmers, pastoralists, fisherfolk and forest dwellers with no formal land tenure rights, this increased competition poses a tremendous threat to their livelihoods. Sound land tenure policies and planning will be crucial to ensuring that these men and women do not fall into even greater hardship.

Unfamiliar territory

Climate change threatens to uproot many rural communities. For example, rising sea levels may force many communities living in low-lying coastal areas and river deltas in developing countries to move to higher ground. Similarly, increasingly frequent droughts brought on by climate change may leave farmers and pastoralists who rely on rainfall to raise their crops and livestock with no alternative but to abandon their lands.

This displacement of people is likely to result in competition between migrants and established communities for access to land. Reconciling diverse land use needs presents daunting challenges for governments at all levels. In cases where land rights are informal and different customary land tenure systems coexist, governments will need to work closely with local communities to establish fair and equitable systems of land tenure and develop mechanisms for resolving disputes. For many displaced communities, it may be impossible to maintain their farming or pastoral traditions. Land tenure policies designed to facilitate resettlement will need to be incorporated into a broader programme that provides opportunities for the displaced to earn livelihoods outside the agricultural sector.

Changing values

The expansion in cultivation of biofuel crops, driven not only by efforts to mitigate climate change but by high oil prices and national efforts to achieve energy self-sufficiency, will also trigger greater competition for land. Countries seeking to capitalize on heightened demand for biofuels may choose to expand biofuel production by expropriating land being used by small-scale and subsistence farmers and allocating it to outside investors. From the perspective of national economic planners, the land may be considered "idle" or may not satisfy requirements for "productive use". For local farmers and pastoralists, however, access to this land may be their most valuable asset. When the land is expropriated, it can be difficult for local users, especially if they hold no formally recognized tenure rights, to negotiate sufficient compensation to ensure a sustainable livelihood.

In some areas, the move to expand biofuel production may provoke a shift in customary land tenure systems. Individual rights to the land acquired through a commercial real estate market may replace communal lands rights. In these cases, those who can afford market prices will secure greater control over the land, but many more risk losing their access to the land. In situations where real estate markets already determine land values, expanded biofuel production may drive up land prices. Low-income farmers may find themselves priced out of the rental market and see their access to land and their livelihoods disappear.

Rights denied

As land availability and land values change, some groups are at a greater disadvantage than others. Indigenous communities for example are particularly vulnerable because many governments do not recognize the legitimacy of their land and territorial rights. In addition, many indigenous peoples occupy territories that are particularly vulnerable to climate change, such as mountain and polar lands where melting glaciers and ice sheets may disrupt the supply of fresh water available and significantly alter the distribution range of fish and

Key facts

- In Africa more than 90 percent of land remains outside the formal legal system.
- Women produce about half of the world's food but they own only about two percent of all land.
- It is estimated that low-lying river deltas, which are at risk from flooding due to rising sea levels brought about by climate change, are home to nearly 300 million people.
- Projected growth in biofuel production to 2030 will require 35 million hectares of land (*see table*), an area approximately equal to the combined area of France and Spain.

wildlife populations. In the world's remaining tropical rainforests, long-term drying trends will have a tremendous bearing on plant and animal species and the natural resources on which indigenous forest communities depend.

As competition for land increases under pressure of climate change and the expansion of biofuel cultivation, women are also disproportionately disadvantaged. In many parts of the world, because of entrenched legal and institutional discrimination, women do not hold formally recognised land rights. They often may face discrimination in customary tenure systems as well. Although women play a major role in agricultural production, childcare and gathering domestic water and fuel supplies they often have little control over how the land and other natural resources are managed. When populations are forced to resettle to new lands or communally held land is appropriated, it is rare that women's needs and priorities are considered.

Security and flexibility

Given that climate change and the expansion of biofuel production is likely to affect access to land by the poor, there is a need for land policies that provide greater land tenure security to disadvantaged groups. Greater land tenure security also serves to mitigate climate change. Farming and forest communities are more likely to invest in agricultural practices that sustain healthy forests and fertile fields, both of which are important carbon sinks, if they have secure land tenure.

As competition for land increases, there is a need to ensure that the land rights of vulnerable communities are respected. In this regard, Mozambique has introduced legislation requiring investors to consult with local communities holding rights to land before undertaking major commercial enterprises such as biofuel production.

Governments also need to establish clear and fair criteria for determining "productive use" requirements and legal definitions for what constitutes "idle" land. The biofuel industry could provide support for implementing land tenure policies that safeguard the rights of local farmers by adhering to sustainable biofuel certification schemes. However, land tenure policies that secure the rights of disadvantaged communities to land can only serve their purpose if these communities understand these rights and have access to legal support services.

Although land tenure policies need to provide security to those in need, these policies also need to be flexible enough to accommodate anticipated transformations in land use and settlement patterns. It is important for planners to understand how rural communities have already begun to adapt to climate change and how this is affecting existing land tenure systems. Governments should work to completely integrate land policy considerations into their climate change adaptation strategies.

Land requirements for biofuels production

	2004[1]		2030 Reference scenario[2]		2030 Alternative policy scenario[3]		2030 Second-generation biofuels case[4]	
	million ha	% arable	million ha	% arable	million ha	% arable	million ha	% arable
United States and Canada	8.4	1.9	12.0	5.4	20.4	9.2	22.6	10.2
European Union	2.6	1.2	12.6	11.6	15.7	14.5	17.1	15.7
OECD Pacific	neg.	neg.	0.3	0.7	1.0	2.1	1.0	2.0
Transition economies	neg.	neg.	0.1	0.1	0.2	0.1	0.2	0.1
Developing Asia	neg.	neg.	5.0	1.2	10.2	2.5	11.5	2.8
Latin America	2.7	0.9	3.5	2.4	4.3	2.9	5.0	3.4
Africa and Middle East	neg.	neg.	0.8	0.3	0.9	0.3	1.1	0.4
World	**13.8**	**1.0**	**34.5**	**2.5**	**52.8**	**3.8**	**58.5**	**4.2**

Sources: farm land — FAO; land requirements — International Energy Agency analysis

1 land used for biofuel production in 2004 and as a percentage of total arable land;
2 situation in 2030 if current trends remain unchanged;
3 situation if countries adopt all of the policies they are currently considering related to energy security and CO_2 emissions;
4 situation in which some biomass for biofuels production comes from non-arable land and residues, reducing arable land requirements. neg = negligible; ha = hectares.

Contacts

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