

Research and innovation

The Global Forum on Agricultural Research (GFAR) brings together all those working to strengthen and transform agricultural research for development around the world. As part of this role, GFAR is working with New Agriculturist to showcase and raise awareness of important initiatives and their outcomes, to update and inspire others.



Foresight

With shifting climates, volatile markets, controversial technologies and rapidly-evolving policies, anticipating what the future will bring is not getting any easier. To deal with today's issues and anticipate and prevent future problems, forward-looking, anticipatory research and analysis (foresight) is being increasingly used to describe the possible conditions that farmers may face and to focus research, innovation and policy to make the most of them: not just anticipating the future, but shaping it. In this edition, GFAR highlights how foresight studies in Indonesia, Morocco and Argentina are having an influence on environmental and agricultural policies.

Seeking harmony in Indonesia

To help planners and policymakers balance the needs of agricultural development and nature conservation on the Indonesian island of Seram, a foresight tool was used to outline four land-use planning scenarios, each representing a possible future.

Mastering trade liberalisation in Morocco

Morocco's agricultural and rural sectors are facing new economic, social and environmental challenges imposed by globalisation. Developing a new vision and strategy for agriculture, shared by all actors, is crucial for achieving equitable and sustainable progress in the country.

Sustaining Mendoza's environmental future

In Mendoza Province, Argentina, the quality and quantity of water and soil are rapidly diminishing. Recognising the environmental vulnerability and fragility of the area, a foresight study was carried out to forecast Mendoza's environmental future up to 2030.

Seeking harmony in Indonesia



Grasslands and swamp forests on the island of Seram are being converted to oil palm production.
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In 1997 over 180,000 hectares of the Central Moluccas Regency, on the Indonesian island of Seram, was designated for conservation through the creation of the Manusela National Park. Ten years later, private companies began to cultivate oil palm on areas of grasslands and swamp forests on the north coast and displace traditional use of land, including some cash crops. Diverging demands of local livelihoods, conservation objectives and economic development, combined with issues of land boundaries, use and access, and forest resource ownership, resulted in conflict in some cases.

Across Indonesia, the lack of clear land tenure and land rights for local communities is an important issue for land use planning. To help planners and policymakers balance the needs of agricultural development and nature conservation and provide various options for the island's future, the Collaborative Land-Use Planning Project (CoLUPSIA) used a foresight tool - Participatory Prospective Analysis (PPA). PPA is a collaborative process that involves all of the stakeholders - including local government, legislative authorities, universities, NGOs, customary leaders and private companies - to identify variables related to land-use planning. The variables have been used to outline four land-use planning scenarios, each representing a possible future.

Building a shared vision

"The lands in Maluku traditionally belong to us and are a heritage from the ancestors," says Mr Lailossa, a village leader. "What we want is clear regulation on our lands." The public consultations have revealed that scenario one - in which the Government fully involves communities in the planning, implementation, monitoring and evaluation of land and forest management, and the customary system is acknowledged and accommodated - was the most desirable. In contrast, the present land use situation - and an undesirable future - was described by a combination of scenarios two and three, where a top-down approach to land use planning is implemented and land rights of communities are uncertain or ignored.

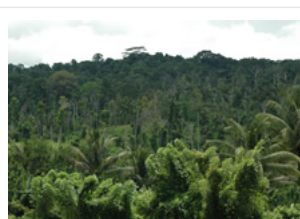


By discussing different future scenarios, stakeholders have developed a shared vision
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Use of the PPA has enabled the stakeholders to develop a shared vision and has also changed the attitudes of bureaucrats about local people's capacities and potential to contribute to land use planning. "By increasing the participation and integration capacity of all stakeholders, they are able to contribute more effectively to a better foresight for the future development, use and management of their land," says Mr. M.A.S Kelian, Director of Business Development in Seram. The local government has expressed its intention to continue using the PPA process and include scenario one in the Regency's midterm planning. CoLUPSIA is now drawing up new maps detailing land categories, in order to help with policy development and to deal with social issues such as land boundaries, ownership, and access to forest resources.

CoLUPSIA has since undertaken a second PPA in Kapuas Hulu district in West Kalimantan Province, the Indonesian part of the island of Borneo. Here similar issues exist, with oil palm plantations expanding in an area that is also home to two national parks and a large area of forest designated for conservation. "We want development," explains Mr Luther, a customary leader, "but it should benefit us local and indigenous people."

Power relations and land rights



Land-use planning must attempt to balance the needs of development and the environment.
©Yves Laumonier

In Kapuas Hulu, power gaps between stakeholders and the presence of sensitive issues hindered participation in the PPA process. Palm oil development, for example, was a sensitive issue for government officers and it was especially difficult for them to be challenged about it in a public environment. The process also revealed that while customary law is important to enforce social norms, when it comes to land appropriation by large-scale investment, customary institutions are unable to secure land rights. As a result, communities that are unwilling to surrender their land for oil palm have little power to defend their rights.

"Using scenarios to explore the development agenda in Kapuas Hulu by 2030 has awakened the public to the need for actions to be taken to achieve the desired

future - actions including revising land use planning to favour sustainable development, recognising customary rights over land, and mobilising strong commitment from all stakeholders," said Mr Baco Maiwa, a District Parliament Member. "Such actions would bridge conflicting interests over natural resource management at the district level."

The project is now developing land-use maps to provide integrated information, including land tenure and rights, to improve the decision-making process in Kapuas Hulu. "Capacity building for local government is needed for local officials to be able to decide what goods are needed for development, while at the same time protecting the environment," concludes Mr Suparman, Head of the District Planning Agency.

Links

- Seeking harmony: scenarios for nature conservation and agricultural development in Kapuas Hulu district, Indonesia
(http://www.egfar.org/sites/default/files/files/Foresight%20Briefs/Bayuni%20Shantiko_Brief%2018_Final.pdf)
- Building a shared vision: scenarios for collaborative land use planning on Seram Island, Central Moluccas Regency, Indonesia
(http://www.egfar.org/sites/default/files/files/Foresight%20Briefs/Nining%20Liswanti_Indonesia_Brief%2039.pdf)

Written by Bayuni Shantiko and Nining Liswanti, CoLUPPSIA

Mastering trade liberalisation in Morocco

Morocco's agriculture and rural sector have undergone important changes over the last 50 years. But today, these dynamics are facing new economic, social and environmental challenges imposed by globalisation and the inequalities these have generated. All of these difficulties lead to an unacceptable scenario for the future of agriculture and the rural sector. It was thus crucial to develop a new vision and conceive a new strategy, shared by all actors, for achieving equitable and sustainable progress.



A strong future for Moroccan agriculture depends on the development of a new vision and strategy.
©Guillaume Benoit

The need for policies that can ensure a productive and sustainable future for Moroccan agriculture has prompted a foresight study - *Agriculture 2030* - initiated by the country's High Commissariat for Planning in collaboration with the General Council of Agricultural Development. In a country where 45 per cent of the population works in the farming sector, the need for such policies cannot be overstated; how agriculture evolves will determine the stability and well-being of rural society and of the country as a whole because agriculture remains the pivotal support for the rural population. The sector represents about 45 per cent of the total population, employs nearly half the workforce and contributes substantially to GDP (19%) and exports (6%).

While there are several key drivers of change in Morocco's farming sector, how the country is able to manage and respond to trade liberalisation is critical, and is a major focus of the study. "The country could either suffer from rapid changes, or anticipate them and act proactively to reduce negative impacts and exploit potential benefits," says the High Planning Commissioner, Ahmed Lahlimi Alami.

Threescenarios for 2030

Agriculture 2030 focuses on three scenarios that describe possible futures. In the first scenario, called '*Surrendering to liberalisation*,' liberalisation occurs according to existing free trade agreements but reflects changes in climate and lifestyle, while conflicts over water are not anticipated. This scenario predicts that agriculture will not take off, environmental degradation will increase, inefficient water usage will lead to a water crisis and desertification will expand. As a result, growth in agricultural production will become even more volatile, non-agricultural employment opportunities in rural areas will remain minimal and rural poverty will increase. The agricultural sector will eventually regress, resulting in massive rural migration and possibly urban and political instability.



The third scenario will maintain farming activities that contribute to landscape management
©Guillaume Benoit

The second scenario, '*Accelerated liberalisation*,' describes how ultra-liberal policies and social safety nets will speed up liberalisation. Morocco will remove protection on agricultural products, and reforms will force less profitable sectors out of the market. State withdrawal will favour the emergence of highly capital-intensive agriculture, resulting in productivity gains and a concentration of production in the most favourable areas. A social safety net will reduce the impact on the 'losers' from the liberalisation process but the agricultural population will decrease dramatically and, as a result, more than 300,000 hectares of good-quality, peri-urban agricultural land will be lost to urban growth.

A plan to '*master liberalisation*' is the third scenario, where liberalisation is managed and new agricultural policies diversify the rural economy and develop a pluralistic, competitive and sustainable agricultural sector. This scenario starts with an upgrading of agriculture: structural reforms (land tenure, credit, support to young farmers) accompanying specific measures for each value chain and for small and medium farms in order to reduce the number of losers from the globalisation process. In favourable areas, commercial farms will produce high value, value-added products following socially and environmentally responsible standards. In less favourable areas, incentives and subsidies will maintain farming activities that contribute to landscape management and play a social role, giving food and income security, anchoring the population to rural areas and reducing further migration to cities.

Other priorities under the third scenario include more efficient water use practices, rural infrastructure development, eradication of illiteracy, professionalisation of small and medium-sized farms and capacity

building for young agricultural leaders. "These actions create a new relationship between citizens and the administration, which relies on local communities for the development and creation of local jobs and income," explains Guillaume Benoit, member of the High Council for Food, Agriculture and Rural Areas in France. Results foreseen by the study include a reduction in poverty and better distribution of agro-food industry development across the country.

A green plan

A few months after the study was published, Morocco adopted its new agricultural strategy, the *Plan Maroc Vert* (Green Morocco Plan). The Plan aims to invigorate high value and productive farming systems and agro-industry, and modernise small-scale agriculture by improving productivity and orienting farms toward promising opportunities. Reforms include policies on land tenure, aggregation of farmers to overcome land fragmentation and ensure access to new technologies, investment and markets, and the development of labels of origin to help farmers benefit from profitable value chains.

Agriculture 2030 contributed to various points of the Plan, in particular through an awareness of the strategic and multifunctional importance of agriculture and an acceptance of the need to support small-scale farming in marginal areas. The Plan also took the advice of the study by including new policies targeting the preservation of basic resources required for agriculture, through, for example, the introduction of a large-scale water saving programme.

"The development of the 750,000 small and medium farms in the country is a key condition for agricultural and rural progress," concludes Mohamed Ait Kadi, president of the Moroccan Government's General Council of Agricultural Development. "Most of them still have insufficient access to markets, credit, incentives and technologies, but with appropriate support, these farms - which have enough land, water and labour force - can become viable enterprises."

Links

- Agriculture 2030: A future for Morocco (http://www.egfar.org/sites/default/files/files/Foresight%20Briefs/Kadi_Morocco_Brief%2041.pdf)

Written by Mohamed Ait Kadi and Guillaume Benoit



How Morocco manages and responds to trade liberalisation is a major focus of the study
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Sustaining Mendoza's environmental future

In Mendoza Province, Argentina, oases - irrigated land in the desert - represent four per cent of the total land surface but contribute to more than 80 per cent of the gross provincial product. In these oases, life depends on water and on the quality of the soil but the quality and quantity of these essential natural resources are rapidly diminishing. In view of the environmental vulnerability and fragility of the area, the Universidad Nacional de Cuyo and the Instituto Nacional de Tecnología Agropecuaria carried out a foresight exercise to forecast Mendoza's environmental future up to 2030.



In Mendoza Province, oases represent 4% of the total land surface
©Instituto Nacional de Tecnología Agropecuaria

Three separate teams of experts were formed to debate possible future scenarios. The foresight forum, made up of 37 specialists and researchers from science and technology organisations in the province, critically analysed diagnostic information related to key physical and environmental variables. A specialist forum, formed by ten researchers, investigated and identified critical factors that impacted water, soil and air quality, while a technical team made up of six people was responsible for facilitating the process and writing the final report.

Through collaboration, the experts developed a system of indicators (structural poverty, oil and mining industries, environmental management and control, use of soil, climatic changes) that summarised the current status and the trajectory of Mendoza's environmental future in three separate areas: urban oases, the irrigated oases and low-density population oases. Through a set of workshops, using a participatory methodology, two scenarios were constructed.

Business as usual



Salt contamination could lead to irrigated areas being abandoned
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The first scenario (trend-setting) involved the continuity of stakeholders, social groups and trends. In some critical areas, this will lead to environmental deterioration, especially in regard to the quality and availability of water resources and the use of land. According to this scenario, by 2030 there will be numerous problems related to salinisation. For example, salt contamination in the aquifers of Mendoza Province's northern oases will increase in some areas, which could lead to irrigated areas being abandoned, affecting 50 per cent of cultivated land. This trend, although to a lesser degree, also applies to the southern oases.

The scenario also envisions that the availability of irrigation water will decrease, as a consequence of rising demand for domestic water and water polluted by liquid and solid waste. As a consequence of urban growth, there will also be a significant loss of land with water rights. Farmers will expand into non-irrigated areas (dry lands) where water needs to be pumped from the subsoil. This means, in the long-term, that aquifer over-exploitation will increase.

Desired future conditions

The second (desired) scenario provides a feasible description of Mendoza's environmental future and envisions that by 2030 subsoil water extraction for irrigation will be under control, putting an end to aquifer over-exploitation. Consequently, the efficiency of water conduction along irrigation canals and efficiency of application will rise from 61 to 90 per cent and from 42 to 70 per cent, respectively.

Controlling the drilling of new wells will prevent over-exploitation, and sealing wells which are in bad condition will decrease salt contamination of the aquifer in the northern oases. But middle and high levels of soil salinity will remain as at present, especially in cultivated areas. State control of liquid and soil waste in urban and peri-urban areas will increase, preventing polluted waters reaching irrigation canals. In this way, the availability of water for irrigation will also increase. Improved planning will help to slow down the use of agriculture land, with irrigation rights, for urban developments. The increase in agricultural areas with groundwater irrigation rights will be controlled so that there will be no over-exploitation of aquifers. To secure this future, Mendoza's environmental policies and spatial planning must be modified.



The objective of the strategic foresight approach has been to visualise as closely as possible what the future may hold
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Moving forward

The objective of the strategic foresight approach has been to visualise as closely as possible what the future may hold in order to make the best decisions in the present. In addition to determining two scenarios, the foresight story also developed a set of guidelines for future field work. Mendoza's Ministry of Environment has incorporated these guidelines into the Province's environmental policies and strategic development plan.

Links

- The environmental future of a province: Mendoza in the year 2030 (http://www.egfar.org/sites/default/files/files/Foresight%20Briefs/Javier%20Vitale_Mendoza_Brief%2032_English.pdf)

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