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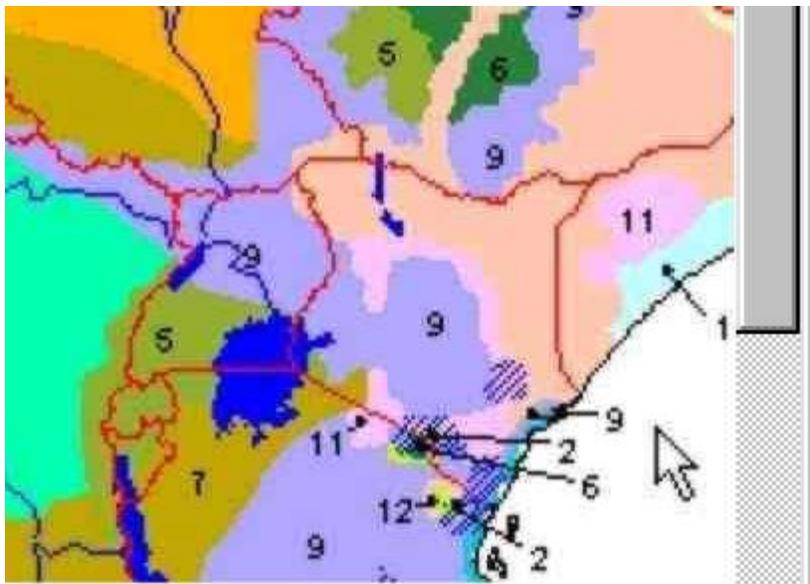
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Global farming systems

FAO's new "agricultural atlas" will help the World Bank target investment to relieve hunger and rural poverty

At his computer in FAO headquarters in Rome, **John Dixon** has a different view of world agriculture. "Take eastern Africa," he says, loading a new map from a database being developed on the FAO intranet. In addition to familiar national boundaries, the page displays what amounts to a new agricultural atlas. "That's the 'maize-mixed' system," says Dixon, indicating a long, purple contour that stretches from Ethiopia, through Kenya, Tanzania, Zambia, Zimbabwe and Mozambique, almost to the tip of South Africa. "It used to be the food basket of the subregion, and now it's in crisis - declining soil fertility, inadequate seed and fertilizer supply due to cutbacks in government spending."

With a mouse click, the page loads key data on Africa's "cereal-root crop mixed" farming system, represented by a dark orange belt running across the north of the continent, from the Atlantic coast through Ghana, Nigeria and Chad into southern Sudan. It also appears on sizeable areas of Angola and Mozambique. "Here the main source of vulnerability is drought," Dixon comments. "But it also has low population density, an abundance of potentially arable land, and very high potential for sustainable growth."



FAO's farming systems map of East Africa (detail)

The complete set of FAO Farming Systems maps is not due on-line - and CD-ROM - until mid-year. But the methodology and data underpinning it are already available - in a *Global farming systems study* commissioned by the World Bank as part of a major review of its rural development strategy. That study used extensive biophysical and socio-economic information to build profiles of 70 major farming systems covering the developing world. With it, says Dixon, a co-author of the study, the Bank, other development agencies and governments have a new means for targeting policies, technical assistance and investment to relieve hunger and rural poverty...

► ...Why is that?

"Because a farming system is the closest representation we have of how farmers think and make decisions. And the experience over the past half a century has shown, convincingly, that without that information, agricultural development programmes can go badly awry. It goes beyond the traditional commodity, or disciplinary, approach that focused on ways of increasing yields, as if that were the only important consideration farmers make. Viewing farming as a 'system' means integrating the bio-physical dimensions - such as soil nutrients and water balances - with socio-economic aspects at the level of the farm, where most agricultural production and consumption decisions are made. What this study did was apply farming systems analysis on a global scale, allowing us to define broad regional systems, the current constraints on their development, and their potential."

► How did you define those systems?

"The general criteria used were of two basic types: first, the available natural resource base, climate, topography, farm size and tenure; second, household livelihood patterns, technologies, and farm management and organization. These criteria helped us identify 72 distinct farming systems in all six developing regions, with an average agricultural population of about 40 million. That in itself was no simple exercise: almost all existing data systems are based on national and subnational administrative areas, not farming systems, which cut across those boundaries. FAO's experience in agro-ecological zoning proved invaluable in building up a farming systems database for our central, qualitative task - making expert judgements on the future evolution of farming systems and their development priorities."



Global farming systems study: Challenges and priorities to 2030 was written by John Dixon, an FAO senior farming systems officer, and Aidan Gulliver, FAO agricultural economist, with consultant David Gibbon and contributions from 30 specialists in FAO's Agriculture Department. Download here the study's synthesis and global overview (PDF, 538K) and seven regional maps (PDF, 990K)

► **In the end, you prepared detailed analyses of 20 of those systems...**

"Yes, from three to five farming systems were identified in each developing region, based on their potential for poverty reduction and agricultural growth over the next three decades. We determined that potential by looking at underlying agro-climatic and soil conditions, land-to-population ratio, current intensity of exploitation, and the feasibility of removing or reducing present constraints."

► **For example...**

"Well, take that Maize Mixed System in East and Southern Africa. Until recently, the development approach for smallholder maize growers was single-component 'quick fix' technical packages - inorganic fertilizers and improved varieties. Now, with structural adjustment, the end of guaranteed prices and the withdrawal of subsidies, high-input maize has become uneconomic and farmers have reverted to traditional varieties, and even to substitute crops like sorghum and sweet potatoes. Nevertheless, we conclude that long-term growth prospects are good, and the potential for poverty reduction is high. But a turnaround depends on a variety of factors: private sector investment in viable input and output marketing to replace government services that have been withdrawn, productive and profitable technologies for improved soil fertility management, and improved land husbandry - conservation farming, for example. Ultimately, sustainable land management and soil nutrient capitalization will depend on secure and equitable access to resources, especially land and water. A community model based on customary tenure and community control holds promise."

► **If the maize-mixed system's prospects are "good", the study seems to foresee almost a boom for farmers in Africa's moist savannah**

"The prospects there are excellent. The Cereal-Root Crop Mixed System shares some of the Maize Mixed System's climatic limitations, but has poorer transport and communications infrastructure. Nevertheless, in some parts of West Africa's moist savannah - and the Cerrados in central Brazil - there is great scope for expansion and intensification of crop production. The main constraints are the lack of infrastructure - mainly roads to markets - and suitable production technologies. But with the right policies and investment, the dominant outcome could be increased food and feed production driven by global demand, particularly in Asia. We're talking here about maize and sorghum, and legumes such as soybean."

► **Which brings us to the Rice Systems in South and Southeast Asia...**

"There, production is still high, but there are evident difficulties - little land available for agricultural expansion, declining soil fertility and, in some places, rice yields approaching their known ceilings. It's reasonable to expect that in the next 30 years, as population grows, the region will become a major importer of food and animal feed. In Southeast Asia's lowland rice system, income security in the smallholder sector will depend increasingly on diversification into higher value crops, such as vegetables, citrus and feed, and into small livestock production and on-farm aquaculture. Along with that, farmers will need improved extension, financial and marketing systems, and greater integration into the non-farm economy."

► **You've been working on the farming systems approach since the 1980s. Now that it's being incorporated into the World Bank's rural development strategy, would you say it's "an idea whose time has come"?**

"We've seen a period in which top priorities in agricultural development were structural adjustment and 'getting prices right'. There has been economic growth, and food production has increased. But levels of poverty are still high in South Asia, and high and increasing alarmingly in Africa. In our global family, one in five lives in extreme poverty and more than 800 million are undernourished. That's why the focus of the World Bank and other development agencies is now swinging back to poverty. The contribution of the farming systems approach is a framework that will help them set their priorities for investment in food security, poverty reduction and economic growth. In other words: in broad-based agricultural development that reaches and benefits the poorest, and hungriest, small-scale farming families."

- Get farming systems maps and regional papers from FAO's Farming systems web site
- See related **Spotlight** articles on Global agro-ecological zones, Zero tillage and Conservation agriculture

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