

## **Comments on P-D-E, livelihoods, and agrarian change in the Sahel**

Panel contribution to the Population-Environment Research Network  
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An interesting and incisive debate about rural livelihoods and population-environment relationships runs through these papers and email comments. I am not sure I can fit all my observations into a short comment, so I include some web links to other papers in a bibliography that make the points in greater detail.

The Sahel has 22% of the population and 15% of the land area of sub-Saharan Africa and is thus important in development terms (Mortimore 2007). It puzzles scholars of Africa, because it seems to rebound from crises, and it meshes well with regions beyond its borders through markets and through labour movements (Batterbury & Warren 2001). Reading the various reports and listening to the presentations of the authors at the PRIPODE conference in Paris earlier this year, I was struck by the strong evidence that Sahelian people continue to move and to diversify as a strategy to deal with food insecurity and the vagaries of climate, rainfall, and the social conditions of production. This runs contrary to the most simplistic forms of PDE analysis that many will be familiar with that merely correlated demographic trends with environmental indicators, for example the early UNCOD desertification reports from the 70s, and the doom-watching francophone and Anglophone pronouncements nicely exposed in books like Fairhead and Leach (*Misreading the African Landscape*, 1996) and in Mortimore and Tiffen's work (see <http://www.drylandsresearch.org.uk>) (Warren and Batterbury 2004).

As other cyberseminar contributors have shown, it is inadequate to suggest strong relationships between demographic variables and local environmental quality, biodiversity, or food supply without further qualification. The link between population density and agriculture intensification, measured in term of land use or labour input, will remain unclear. That relationship is mediated through other factors, such as land

availability, levels of available technology (agricultural and otherwise) and the presence or absence of different exit options for rural households. Land degradation is contextual (Warren 2002). Where land is ample, there can still be intensification, or indeed higher stocking rates for livestock. But as the agricultural frontier becomes closed, as is happening in parts of the Sahel and West Africa (see the Togo PRIPODE study), and fallowing or rotation options diminish under population growth or near to cities, residents pursue a range of strategies. At higher population densities we find more intensive use of inputs to maintain soil fertility – "working the land harder" (Mortimore and Adams 1999, 2001). This does not halt out-migration, but it provides a firm subsistence basis to extend into it.

It is also unhelpful in my view to issue sweeping statements about the Sahel based on regional data alone. At the regional scale, none of the local inventiveness and diversity of Sahelian systems is evident. This is one way that Sahelian farmers easily get blamed for excessive soil loss or 'desertification' (Warren and Batterbury 2004) (this was David Niemeijer's point). But if we shift to a (more realistic) analysis that considers the ensemble of livelihood strategies of Sahelian peoples as 'rooted' in a place but involving many links to surrounding towns and cities, and involving migration, remittances, and transfers of commodities, dust, water, animals, and people (and other things), a more positive picture emerges (de Haan & Zoomers 2005).

This leads me to conclude in one of the overview papers written for the PRIPODE conference (Batterbury 2007) that "it is impossible to separate out population-environment relationships from other drivers of change - most importantly the commoditization of agrarian systems and the increasing complexity of livelihood dynamics in the light of globalization, new risks, conflicts, and the profitability of particular agricultural and non-agricultural activities".

The best way to research Sahelian places, environments, and futures is through hybrid research techniques that recognise the 'diversity' of Sahelian peoples and environments. To "ground in place and territory" is an important starting point for what is becoming one of the key methodological challenges for the natural and social sciences – tracking and understanding very complex assemblages of land use and social change in places strongly affected by economic, climatic, and social changes. Multi-sited ethnographies based on particular communities - and PRIPODE has only made a start here - allow the tracing of migrants and the exploration of livelihoods and their links to "place".

This type of research is hard to do. It requires extending across the natural and social sciences. It can be seen in Claude Raynaut's work in Niger (see Raynaut, 1997 and summary paper, 2001). He argued that a "mechanically linear" model of population-environment relationships missed local variabilities and adaptive responses. Some but not all of this variability was again highlighted in the 1990s work of the OECD's Club du Sahel, who, controversially, noted the emergence of "zones of attractiveness" and "market influence", around major population centres like Kano, Niamey, Ouaga,

Bamako and Dakar (CDS, 1995). We will soon be in a position to see whether their predictions, notably the more optimistic ones of Jean-Marie Cour (2001), were accurate. Since then, climate change has become a dominant issue for policymaking and research – adaptation to drought was always an issue in the reports up to the 1990s, but adaptation to long term global warming signals was not.

Other localised or comparative studies have already been mentioned: Niemeijer and Mazzucato (Mazzucato & Niemeijer 2001), Mortimore et al (1999, 2001), Gray (2002), Netting (1993), Reenberg (2001), Adam Manvell (2005), Glenn Stone, the four PRIPODE studies and many others. Sahel researchers still meet regularly, in the region and outside (CILSS, and Møllegaard M 2007). The idea of an ‘action space’ (Painter, Sumberg and Price, 1994, Manvell 2005, Batterbury 2002) nicely sums up how near and distant activities are combined. Livelihood "strategies" are what people do to make a living, and they can be broken down in different ways, for example to show how livelihood priorities change over a life course in different "styles and pathways", even within the same community or geographical region. This has been my own approach. The pace of agrarian change in many of the regions studied by PRIPODE researchers implies that important livelihood adaptations are being made by individuals, households, and communities. These take different forms. In particular, economic diversification is rapidly occurring in several of the PRIPODE cases studies, notably in Niger (NE1), Burkina Faso (BF5) and Mali (ML2). Productive bricolage, and diversification, can lead to increased social differentiation, gender differences in livelihood dynamics, as well as broad household change. These changes can be positive or negative, but their adoption certainly challenges the classical forms of "peasant" behaviour (farming households rooted in place, in exploitative social relations) and the social and cultural norms associated with this form of livelihood. Debbie Bryceson has identified the specific responses made by households under processes of de-agrarianisation and livelihood diversification. These tendencies include the long or short-term "separation" of family members in order to insure incomes; a reduction in the size of extended families; the weakening of "dependency ties" and thus greater autonomy within families; and the use of matrilineal ties by women to improve their income security (Bryceson, 2000). And of course much earlier ethnography, by Jean Rouch, Keith Hart, Joel Gregory and others, examine the important question of Sahelian migrant behaviour and identity (Pratten 1996).

I have no expertise in satellite data (betraying my age, perhaps) which means I cannot comment to much on the discussion about ‘Greening the Sahel’. That results from some work by Chris Reij and Lennart Ollson/Greg Tappan/Stephanie Herrmann among others. Chris has argued that ‘green spots’ across the Sahel, result in part from SWC activities and tree planting. The Central Plateau of Burkina, where I worked in the 1990s emerges as ‘greening’ possibly because of the huge numbers of diguettes constructed and trees planted by Oxfam, PATECORE, AFVP, PEDI, and many other agencies and individuals since the 1980s (Reij, Tappan, Belemvire 2005). Diguettes (stone lines built across

contours), built with project assistance in Burkina Faso, are hybrid structures reflecting both indigenous and external processes of experimentation and inputs of labour and time (Atampugre 1993).

I used to build them and observe their impacts with PATECORE (Batterbury 1998). The driving forces behind their construction have less to do with population growth than with the desire of external actors to do something about extensive land degradation and "desertification" on the Central Plateau (Batterbury 2005a). They work, but it is important to recall they don't solve agrarian problems. The massive movement of labour around and out of the Sahel, that residents of the Central Plateau have developed as an economic response to local poverty (particularly to land shortage), is partially driven by lack of access to land for younger household members. As Lesley Gray and others have shown, the absence of young and middle aged men that leave to find incomes elsewhere, affects the gender balance of those that remain, such that women performed most household duties, but without the ability to "own" land" (Gray 2002, Bryceson 2000).

In Niger the story is more about trees and tenure; more secure land tenure has encouraged tree planting. But W. Cline's country level work, reported by Alex de Sherbinin yesterday, may argue that the greening signal is partially a carbon fertilization effect that will be eclipsed by warmer or harsher weather patterns in due course. Again, very hard to judge from the information we have at present but it is nice to see a more positive spin on what is usually a depressing litany of negative reports about Sahelian environments.

A team including Andrew Warren, Henny Osbahr and myself spent several years in the 1990s studying the village of Fandou Beri, on the main northeast road out of Niamey in Niger, close to the PRIPODE Niger study (Warren 2002, Warren et al 2003, Warren et al 2001, Batterbury 2001, Osbahr & Allen 2003, Batterbury 2005b). The range of methodological tools developed in the PRIPODE case studies are rich and support the claim that it is essential to conduct interdisciplinary and "grounded" methodologies rooted in "place" (milieu) but that acknowledge influences and processes at other scales. In Niger we did exactly what several email commentators are asking for – combined livelihoods analysis with soil and biodiversity measurement. Historical air photos were combined with early GPS technology to create maps of fields and land use, verified by field surveys and extensive cross-checking with Zarma residents who farmed those plots and knew them intimately. Field histories were developed, in which Caesium 137 measurements of soil flux over a 40 year period (a rough way to measure soil erosion) could be combined with livelihood information gleaned from long term surveys. The results went some way to confirm what David Niemeijer said – soil fertility and soil flux bore little relationship to household demographic trends. We did note, however, that soil erosion was highest on the fields of those with extensive livelihood diversification – they chose to prioritise livelihood sustainability over soil sustainability, often lacking labour to practice fallow in millet or to weed in the early season, when so many household members were absent. But we also found healthy capital accumulation among some households, and a range of strategies to keep at least one 'foot' in village life. We also

found a complex micro topography to the agrarian landscape, with large dust inputs as well as wind erosion (the large focus on water erosion in the Sahel is now being balanced by more research on wind and dust). The soil fertility landscape was researched by Henny Osbahr (Osbahr and Allen 2003). But, to make the above point again about needing to consider the political economy (PE) alongside population – environment (P-E), many Zarma worked elsewhere and were badly affected by the disruptions to migrant streams brought about by xenophobia and expulsions from Cote D'Ivoire in the 90s. There is much more to look at, even in this single-community study.

Interestingly at the PRIPODE conference, Mme Spiga's presentation (<http://pripode.cicred.org/spip.php?rubrique10>) brought out that Saharan-edge satellite towns have increasing numbers of Sahelians, permanently settled or en route to Europe or elsewhere. This is not a new development but seems to be increasing in extent. One of the most marked examples of "livelihood adaptations" in the PRIPODE studies is this trans-Saharan movement, usually among young males, seeking work on the Saharan edge or eventually in Europe. While West Africa has seen pulses of migration in a North-South trajectory usually allowing Sahelian peoples access to coastal labour markets, today's "globalization" of the Sahel has led to some extraordinary knowledge and skills developing among young out-migrants travelling very long distances – they are developing new links, new entrepreneurial knowledge in North Africa and further afield, and new migration possibilities (DZ1, p6).

The PRIPODE studies show that poverty, environmental degradation, and social and economic change interrelate in complex ways that provide lessons of hope as well as despair for rural areas. Human adaptations to social and economic change still take place where systems appear on the surface to be vulnerable or unsustainable. Farmers who invest in business activity or practice out-migration, are doing so for similar reasons to those who stay on the land and intensify production. Both are responses to vulnerability and risks, and in doing so they are juggling the mental physical, and economic assets that they control in their individual livelihood strategies.

Several questions remain for me – but I am not from the region and I cannot research it as thoroughly as I used to (since living in Australia these days!). So I leave the responses to others.

- Adaptive strategies – are they going to be eclipsed – no matter how inventive they are by regional level climate change? Mortimore and Manvell say not (2006)!

- In particular is, as Maxime Banoin asks, is the expected regional population growth going to stress existing and future adaptive capacities and food needs in the Sahel, despite urban growth, more urban and service jobs, and a stronger focus on a monetary rather than a subsistence economy?

- How will the pastoral, agro pastoral, and agrarian livelihoods prevalent in rural areas adapt and change? Will agribusiness and contract farming increase from its relatively small base in cotton and southern edge locations and irrigated sites? How will commercial smallholders, for example in the groundnut and cotton sectors, fare?

- If agriculture suffers in many parts of the Sahel over the next 50 years, does this really matter given the stronger monetization and stronger international linkages and to neighbouring regions and beyond? If it does not really matter, will we be following the views of the agrarian political economists, rather than the PDE experts, and seeing an increasingly 'globalised' Sahel producing less of its own food and importing more? (Toulmin and Guèye 2005)

- There is also a question about aid disbursements, which were disproportionately high after the Sahelian famines and have remained relatively strong given the poverty levels of most Sahelian nations. But today, aid is being restructured, commercialised, and wound down. If aid is responsible for some positive environmental outcomes like the 'miracle' diguettes and stone lines (funded largely from Europe, although built by local farmers), what will be the environmental, as well as the socio-political effects of its diminishment? And as Maxime asks, what will governments do in this scenario?

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