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Vectoral Fieldsites

Scales of Social Observation and Transformation in Development-Era Senegal

Abstract: The Niakhar area of West-Central Senegal has hosted regular demographic data collection as well as health and social scientific research since the 1960s. In this article, I approach Niakhar's long history of research as a window into changing relations between knowledge production and modes (and scales) of government. Through close examination of three studies conducted between 1962 and 1974, I seek in particular to capture how the utopian impulses of postcolonial national development in Senegal created epistemological opportunities and frames of meaning for social scientific research. While this development ideology was utopian in the general sense of its transformative ambitions, it was also utopian in a more specifically spatial sense, in that Senegal had to be transformed into 'another place' to break the hold of the colonial political economy and release the full potential of the nation. Social scientists evoked this emerging national territory to make claims for what I call a vectoral relation between the subjects and spaces they produced through research and those the state would generate through planning, surveying and intervention. I contrast this vectoral spatiality with the scalar claims made for post-developmental uses of Niakhar as a site of experimental and longitudinal research.

Keywords: development, history of science, postcolonial, Senegal, utopia

In 2014, a symposium was held in Dakar to commemorate 50 years of research in Niakhar, a rural area located about 140 km to the southeast of Senegal's capital. The tone was celebratory, but tensions bubbled under the surface. It was no secret among attendees that relations had, over the years, sometimes stiffened and soured over issues such as fieldworkers' employment conditions, researchers' moral obligations to the community or lapses in scientific integrity. More subtle tensions, however, hung over the meaning of Niakhar's history as a place of research and as a subject of knowledge. On the one hand, symposium participants agreed that Niakhar's history and identity as a research site was defined by five decades of routine surveys of demographic and health events, such as births, deaths and cases of disease. Such surveys have been repeated at least annually (with rare interruptions) since late 1962, albeit in an area varying from the whole administrative district to a fraction of it, stabilising, since 1981, to around 30 villages. This surveying activity, rather than intermittent research programming and institutional oversight, or precise location and shared material infrastructures



(such as labs), is what links together a succession of diverse studies, ranging from trials of vaccine efficacy to analyses of migration and agricultural practices. Most of these studies draw on the data collected by routine surveying and depend on the conditions created for and by it, such as fieldworker availability and expertise. Collecting, time and again, information about life events has made Niakhar a good place to produce different kinds of knowledge across distinct political eras.

Yet the symposium also showcased divergent ideas on who and where the knowledge produced by and with these data was about. To what extent was this knowledge about Niakhar's inhabitants and their histories, and did it speak to broader spaces of living, governance and intervention? The symposium's guest of honour, credited as the 'founding father' of Niakhar, Pierre Cantrelle, reminded the audience that routine surveying began, as part of the Sine Saloum Demographic Study, to support a Senegalese state project to improve national population statistics and vital registration (Cantrelle 2018). My own presentation explained how this early work addressed Niakhar's inhabitants as citizens-in-the-making, as examples of subjects that a state-run, nationwide system of demographic recording – which the Sine Saloum study's method and data were meant to help build – would count and plan for (Tousignant 2018). Surveying in Niakhar was thus initially aimed at propelling the collection of national statistics. Yet Niakhar and similar zones covered by routine monitoring (these were called 'population laboratories' or 'demographic surveillance systems', but since the formation of the INDEPTH network in the late 1990s are termed 'Health and Demographic Surveillance Systems' (HDSS)) came to be valued, in and of themselves, as data sources that could substitute for patchy state recording of demographic and epidemiological events. The medical scientist Jean-Philippe Chippaux (2018) described how, in the absence of comprehensive national statistics, HDSS offer crucial conditions for the conduct of randomised controlled trials (RCTs) in Africa. Using an INDEPTH graph, he showed that the rapid growth of RCTs conducted in Africa since the mid-1990s was mirrored by an expansion in the number of HDSS, and most RCTs on the continent are run in an HDSS (in 2014, 36 of INDEPTH's 47 HDSS were in Africa; 24 had been created since the mid-1990s). Cheikh Sokhna, a malariologist, recounted a particularly successful set of RCTs conducted in Niakhar in the early 2000s. Funded by the Bill and Melinda Gates Foundation, this study of seasonal preventive drug treatment of malaria in children provided a crucial piece of evidence – a 'proof of concept' or demonstration of feasibility – that led to new WHO recommendations in 2012 (Sokhna and Cissé 2018).

Demographer Richard Lalou's opening words, spoken in Sereer – the language spoken by most of Niakhar's inhabitants, but a minority in Senegal and probably few, other than fieldworkers, in the audience – underscored a rift among symposium presentations. Some, like Lalou, spoke of Niakhar's singular social and environmental histories; of Sereer families, farming or migration strategies. While Chippaux and Sokhna evoked Niakhar as a site amenable to the application

of standard scientific and ethical procedures, and that could be defined by demographic and epidemiological trends, Lalou (see also Masse et al 2018) described how the residents of one Niakhar village, Sob, responded to drought, population growth, land scarcity and the retreat of the state from rural development over half a century. For this he said he drew on and had ‘extended the traces’ of studies of Sob conducted in the mid-1960s and mid-1980s by the geographer André Lericollais. A documentary by acclaimed film director Moussa Sene Absa based on the latter study, about Sereer herding following the loss of grazing land, was screened in a corner of the symposium venue. During a break, a group of older fieldworkers huddled around the small TV set, pointing out and joking about friends and relatives. There are many ways in which these fieldworkers’ personal lives have become entangled with their scientific work (cf. Ouvrier 2014), yet here, on this screen, seems to be where they saw the Niakhar of researchers join up with Niakhar as a lived space and history, produced and experienced by its inhabitants. In this research, the ‘local’ was not displaced or overshadowed by – but neither was it connected to – national and global projects to improve health or living conditions. This is in sharp contrast with Niakhar’s use as a global RCT ‘platform’, yet it also departs from the presence and relevance of the Senegalese state and its national projects in the field-sites that Cantrelle and Lericollais delineated in the 1960s.

In this article, I explore interactions between scales of research in Niakhar, as researchers define them to cultivate specific types and qualities of knowledge, and what they imagine as the potential scales of relevance for that knowledge. The latter includes the spaces targeted by, for example, the policies or interventions that knowledge might inform; for example, national vital registration or WHO recommendations on malaria control. It also includes the spatial reach of what that knowledge is agreed to be ‘about’ – what it represents, albeit not necessarily in a statistical sense, such as Sereer ‘adaptations’ to environmental change, the Sereer as subjects of state development or a Sahelian setting of seasonal endemic malaria transmission. The core sections of the article are historical and expand on my 50th anniversary symposium paper. I examine how, in the decade or so around Senegal’s independence (in 1960), French social scientists justified the size and emplacement of their field-sites in Niakhar and elsewhere by referring to the national scales of action they envisioned as emerging from state development projects. The case studies I analyse include the abovementioned Sine Saloum study and Lericollais’ initial Sob study, as well as two studies of Sereer migration to eastern Senegal, the ‘*Terres Neuves*’ – the latter of which evaluated a pilot state-run resettlement project. My analysis of these studies seeks to illuminate how the Senegalese developmental state shaped the meaning of what was being studied in Niakhar – namely, demographic methods, density and growth, as well as Sereer migration and agricultural practices. This contrasts starkly with how ‘enclaves’ of global health research, including HDSS, have been described by anthropologists as cut off from national spaces and projects, linking up, instead, with global net-

works of investment, evidence-making and intervention design (Geissler 2014, 2015). To illuminate this contrast, I begin by briefly locating Niakhar and HDSS in the anthropological literature on global health science, metrics and standardisation. My aim is not to provide a detailed chronological account of how space and knowledge have been imagined in Niakhar from 1962 to the present. Rather, I compare Niakhar's older national and more recent global scales of relevance in order to underscore the historical specificity of the conditions for social scientific knowledge-production that were created by utopian postcolonial state projects.

Attending to scales of relevance provides a new angle for examining relations between scientists and the state, or other institutions of inter-, extra- or 'para'-statal governance. Previous studies of social scientific research in Africa have focused on relations between the goals and ideologies of researchers and those of the colonial or postcolonial state, thereby describing relations of complicity and interdependence (e.g. De L'Estoile 2000; Wilder 2003; Bamba 2010; Barré 2017) or of conflict and critique (e.g. Mann 2013). In my case studies of post-independence research, I propose that science-state dynamics can also be discerned in points of intersection between the spatial outlines of field-sites and the spatial outlines that state projects (here, for example, vital registration and resettlement) promised to generate. This approach builds on attention to how field-sites mediated and modulated relations among (social) scientists and developmental states in Africa. In Christophe Bonneuil's classic article on 'development as experiment' (2000), late-colonial and post-independence development schemes – exemplified by resettlement projects – ordered Africans, land, resources and techniques into legible spaces of knowledge production, thereby simultaneously producing field-sites and state control. Others, however, have highlighted field-sites as potentially transformative and subversive, in which social scientists 'discovered' realities that were left out of colonial discourses of African fixity and ignorance, yet which also exposed the profound effects of colonial intervention (e.g. Schumaker 2001; De Suremain 2004; Tilley 2011). In Niakhar's post-independence field-sites, scientists observed and criticised the effects of state intervention, yet they also envisioned futures for their methods and findings within a broader, transformative space arising from developmental projects. By the 1980s, however, these national scales of state action were becoming largely irrelevant to Niakhar's researchers. They now sought to document patterns of mortality causes, disease prevention or migration to inform international decision-makers and purse-string holders, or, instead, to highlight Sereer adaption, without state support, to economic and environmental crises.

HDSS as Global Health Enclaves

Paul Wenzel Geissler (2014, 2015) points to the HDSS as an example, along with securitised labs and clinical wards equipped for trials, of enclaves that compose a

new African landscape – an ‘archipelago’ – of medical science in the age of global health. While concentrated sites of scientific activity are far from new, Geissler argues that during the developmental era small-scale tests, surveys and pilots were intended to radiate, in continuous trajectories and via state action, towards the territory of the empire and nation. Drawing on James Ferguson’s (2005) updating of James Scott’s critique of state modernisation projects for Africa’s neoliberal extractive economies, Geissler suggests that, like private capital, scientific inputs and outputs no longer ‘flow’. Instead, they ‘hop’ across a global network of enclaves, bypassing proximate spaces and national institutions. This new landscape, Ferguson points out, is marked by an abandonment of the project Scott described of ‘construct[ing] national “grids” of legibility’ (2005: 379). How does the HDSS create new cartographies of legibility? Geissler suggests it is spatially configured to act as ‘sensor’ of global trends and as ‘laboratory’, as the demands of experimental validity, ‘epitomized’ by RCT methodology, enforce ‘the topography of enclosure’ (2015: 17).

The images of sensor and laboratory hint at, but do not flesh out, how the HDSS render legible what and who they encompass for the purposes of generating ‘global’ knowledge. In INDEPTH’s founding documents, HDSS were positioned as beacons in the ‘great void in population-based information’ that constrained the ‘articulation of effective [health] policies and programs’ for the poor.¹ This void has a precise history: a growing demand, from the 1990s, by emerging global health institutions for metrics of ill-health, its determinants, the theoretical cost-efficacy of interventions and their actual impact, which came up against persistently incomplete national statistics systems at a time when state budgets were being frozen and slashed by economic crisis and austerity measures (Adams 2016). HDSS and their predecessors – defined as spatially delimited populations that are surveyed at least annually – are not, their proponents insist (e.g. Bocquier et al 2017), statistically representative of any broader group such as the national population. One thing they can do, however, is illuminate long-term patterns with sufficient precision and accuracy to establish causal relations: for example, between malaria endemicity or women’s education levels and child mortality. Particular local histories are simplified and contained in (rather than erased from) the data sets that are analysed for such patterns (Reynolds 2015). Moreover, HDSS researchers also point out that their own knowledge of local particularities, acquired through long experiences in areas like Niakhar, makes them better able to disentangle the particular from the generalisable (Delaunay 2002). These same researchers, such as the demographer Valérie Delaunay, also use these data, ‘thickened’ with additional research, to study located social practices such as the temporary migration of young Sereer women who take jobs as domestic workers in Dakar (Delaunay and Enel 2009). Meanwhile, collecting even basic data depends on fieldworkers’ relations of familiarity and trust with respondents, as does the delicate negotiation of enrolment into RCTs – in Niakhar, as anthropologist Ashley Ouvrier (2014) has shown, a long history of

both medical research and demographic surveying is experienced by residents as a relation of mutual gift exchange.

Besides fieldworkers' local relations, the conduct of RCTs also relies on the data and practices of routine surveying. The robust and scalable results of RCTs, Vincanne Adams points out, make national data systems appear dispensable to those who seek to formulate evidence-based health policies (2016: 32). Yet they achieve comparability, she notes, 'not by making global claims but by making local and specific claims that can be scaled up' (2016: 34). HDSS databases contain and create knowledge of local lives – who was born when, where a specific individual might be found for monitoring – that is particular, even if simplified (and which, as above, can be used in other ways; see also Reynolds 2015). This knowledge, in addition to fieldworker tact and persuasiveness, makes it possible to define, enrol and track HDSS inhabitants as statistically valid comparison groups for RCTs. Furthermore, the networking of HDSS as part of INDEPTH and other large-scale initiatives facilitates the pooling and comparison of routine data for analysing trends, as well as the conduct of RCTs in multiple sites, simultaneously or sequentially. As anthropologists and practitioners of global health research thus suggest, it takes various forms of located work, within and between HDSS, to generate data that can become 'global'. Such work also depends on and is reinforced by imaginations of the global as a scale for action on health.

Most research conducted in HDSS, especially research relating to health, aims to produce components of 'travelling models'. As developed by Richard Rotenburg and colleagues, the concept of the travelling model invites ethnographic inquiry into how representations of specific realities are turned into 'blueprints' for intervening elsewhere. It draws particular attention to what allows a model to travel. On the one hand, models do not 'diffuse by themselves', based on any intrinsic quality: their mobility depends on located practices of de-territorialisation and re-territorialisation, performed by specific actors who must translate their meaning and put them into practice, with the support of institutional 'forms and conventions' (Behrends et al 2014: 2). On the other hand, they are assumed to 'possess an intrinsic effectiveness', anchored in causal mechanisms, which is also imagined (but not enacted) as independent from the contexts in which models emerge, are validated and are implemented (Olivier de Sardan et al 2017). HDSS can, in this view, be seen as sites where causal relations – such as the effect of preventive treatment on malaria morbidity, or how nutritional status correlates with child mortality – can be inferred by simplifying, monitoring and controlling for 'context'. This potential information about a model's mechanisms contributes to illusions of its 'intrinsic effectiveness'. It is also plugged into concrete practices and relations – which, for the case of seasonal preventive malaria treatment, would 'travel' through the Gates Foundation through Niakhar and subsequent trial sites, to a large Unitaaid-coordinated 'implementation trial', and the myriad donors funding drug supply and delivery in specific Sahelian locations – that 'carry' ideas of causality into and as models. In her study of a 'model

village' in Ethiopia, Marit Tolo Østebø (2021) uses the epidemiological metaphor of vectors as 'vehicles for transmission' to describe the actors and actions that make a model travel (or, in this case, 'go viral'). A vector, however, is also a geometrical concept referring to quantities of 'magnitude' and 'direction' (e.g. Oxford Reference 2022) – usually represented as an arrow. In this sense, the vector is not the specific actor that does the moving but rather an announced pathway of motion. Using this latter sense of vector loosely to also include potential or imagined pathways from field-sites to spaces of intervention, in the next sections I examine the very different spatial and political orientations that animated Niakhar field-sites in the 1960s and that disappeared with the retreat of the developmental state.

Space, Population and Development in Post-Independence Senegal

In 1958, Mamadou Dia, president of the Senegalese Government Council (a semi-autonomous governing body that was overseeing the transition to self-government) invited the French Catholic priest and founder of the Economy and Humanism movement Louis-Philippe Lebret to advise on the design of Senegal's first four-year plan (which would start after independence in 1960). For Lebret, Dia and their allies, the primary objective of 'the plan' was to dismantle the *économie de traite*, a system of extractive trade in which Senegalese farmers sold their peanut crops cheaply to French firms and were overcharged for imported food and manufactured goods, as well as trapped in debt cycles of seed and hungry season loans (Boone 1992). While diversification was on the agenda, a first step was to nationalise components of the peanut circuit (such as supply, credit and marketing) to make it less exploitative and more productive, and thus able to underwrite other state projects.

The colonial political economy had spatial logics that also needed, according to Dia and Lebret, to be overwritten: its administrative divisions and investments had abandoned some peripheral rural areas, while integrating others – the central 'peanut basin' – mainly to stimulate cash cropping and to move commodities between the hinterland and Metropole-facing ports and cities. A novel ordering of territory (*aménagement du territoire*) meant mapping out the nation's potentialities, to then define the levels and scales of state–citizen interaction that were best suited to its development. In Mamadou Diouf's words, *aménagement du territoire* was, for Lebret and Dia, the 'cornerstone of political intervention . . . [that] aimed at nothing less than the creation of a new rhythm and new needs . . . a new territoriality . . . of development', in other words, a 'new economic cartography and human geography' (1997: 299). Early Senegalese development was utopian in the general sense of its transformative ambitions: to improve the conditions of citizens' social and economic life through muscular state reorganisation of and participation in agriculture, industry, trade and service provision. Yet as Diouf

(1997) points out, it was also utopian in a more specifically spatial sense, in that Senegal had to be transformed into ‘another place’ to break the hold of the colonial political economy and release the full potential of the nation. Mapping this new place, Lebret insisted, required new forms of knowledge production.

One of Lebret’s first acts as development adviser was to survey the country from an army ‘bush’ plane flying at 300 metres of altitude, accompanied by the sociologist of religion Victor Martin and a forestry inspector. As Jean-Claude Lavigne (2007: 15), one of Lebret’s successors, put it, the idea was to decipher ‘life, territories and terroirs . . . the land, men and women and the cultural relationship between land and humans’; one might add by, quite literally, rising above the spatial orders of colonial trade and administration to see what lay beneath them. Lavigne further explains that, for Lebret, ‘participatory’ or ‘democratic and ascending’ planning – which, in other words, was responsive to citizens’ demands and encouraged their active involvement – depended on identifying scales of social and material organisation, which Lebret sought to do from the air. Lebret called the larger, regional units of social and economic life ‘homogeneous zones’. These served as sampling units for the ambitious set of studies (of society, economy, agriculture, health and nutrition) that he commissioned in 1959–1960. They were also the basis of new regional divisions in which to reorient economic activity. Smaller, ‘basic’ units of collective life anchored the system of rural marketing cooperatives and *animation rurale* (for village-level basic education and civic ‘consciousness raising’) which formed the centrepiece of Dia’s socialist policies.

Lebret also framed population growth as a spatial and economic problem – rather than a bio-technical one of reproduction and its control. ‘Ultra-rapid’ population growth topped his list of Senegal’s development challenges, which he presented to the Government Council in 1958 (Lebret 1958 [2007]: 96). This called for matching production and employment targets, but also for finer-grained knowledge of demographic growth and migration so that the state could identify and plan for its citizens’ needs (1958 [2007]: 112). This may seem obvious, but it was only recently, with the post-war emergence of planning, that the French colonial administration began investing in more accurate and complete demographic data (Gervais 1996; Barré 2017). Lebret referred, indirectly, to the further problem of an uneven spatial distribution of population densities. Urban migration outpaced job growth, and some soils were overused. Yet among Senegal’s ‘favourable factors’, he noted ‘the new lands . . . the existence of lands to be conquered’ (1958 [2007]: 101). As Alison Bashford points out for earlier global debates, the problematisation of population has been deeply entwined with colonial imaginaries of ‘empty space’ or ‘wastelands’ (2014: 9).

Migration into the periphery of Senegal’s agricultural heartlands was not new. Since the early twentieth century, ‘pioneer fronts’ had set out from older areas of settlement where land – in part due to French demand for peanuts – was increasingly scarce and exhausted. Most migrants were led by groups of the

Murid Sufi brotherhood, and were stimulated as well as structured by Murid spiritual doctrine and hierarchical organisation – in which groups of young men expressed their devotion through labour – and desire to profit from the colonial cash crop economy. The French colonial state actively encouraged the general drive to expand peanut farming (through taxation, for example) as well as specific Murid migration by extending transport and water infrastructure into the hinterland, granting huge tracts of land and turning a blind eye to sometimes violent conflicts with the Fulani herders living in/from the lands they treated as ‘empty’ (Cruise O’Brien 1975: 65–67; see also Pélissier 1966 [2008]). While benefiting from peanut exports, colonial authorities were ambivalent about Murid and, more broadly, Wolof (Senegal’s majority ethnic grouping, within which the brotherhood initially expanded) socio-religious dynamism and expansionist agriculture (Galvan 2004). From the 1930s, colonial anxieties about soil erosion framed Murid/Wolof farming as ecologically destructive.

Against this image, the Sereer were held up as ideal – conservative and conservationist – African peasants, deeply attached to the land and to (pre-Islamic) tradition, reluctant to migrate and prudent custodians of soil fertility (Galvan 2004). This typing underpinned a short-lived colonial resettlement scheme from the Sine to the Saloum (further east) in the mid-1930s. District authorities (with, apparently, no involvement of central authorities) aimed to create a Sereer ‘buffer zone’ protecting forest areas from Murid infringement (Dubois 1971: 25). The ‘good Sereer farmer’ reappeared in debates among agricultural experts amid pressure, after the Second World War, to increase Senegalese peanut production to offset the oilseed shortage in France (Pessis 2013). Pushing for measures of soil conservation, some proposed a generalisation of the Sereer farming model (2013: 132). Social scientists’ later interest in Sereer (responses to) demographic density was partly a product of this colonial history of ethnic typing as entangled with concerns about ecology, farming and population (re)distribution (Richard 2018).

Lebret’s invocation of ‘new lands’ brought this frontier into a developmental imaginary of national legibility and intervention. While there are clear echoes here of Scott’s description of modernist state projects, Lebret (1958 [2007]) explicitly rejected the type of experimental development, as described by Bonneuil (2000), that created and circumscribed – in sites such as those created by resettlement schemes – the realities they sought to render legible. He called instead for a laborious process of information-gathering as a precondition for defining and optimising the nation’s socio-spatial organisation. This vision underpinned the energetic programme of participatory rural development launched by Dia, who became Prime Minister under Senegal’s first President, Léopold Sédar Senghor. This vision was never actualised, as Dia, who threatened French interests, was ousted by Senghor in 1962 (Boone 1992) and the institutions he designed, notably cooperatives and the *animation rurale*, were by many accounts hijacked by elite interests and emptied of their transformative potential. Yet as

Diouf (1997) notes, the utopian rhetoric forged and written into the first plan by Lebret and Dia continued to infuse Senegalese development until the mid-1970s, as did a more diffuse optimism about the state's capacity and will to transform social and economic conditions. In the following sections, I seek to excavate the echoes of this rhetoric and optimism in Niakhar's early social science field-sites.

Repeating Observation in the Nation

Cantrelle designed the Sine-Saloum Demographic Study under contract as a UN technical assistant, whose mandate was defined by the Senegalese statistics agency. Cantrelle worked with a team of state fieldworkers to fine-tune and deploy this design – he and later colleagues recognise the essential and innovative role played in particular by one of the team supervisors, Mamadou Diagne.² The mandate was to assist and advise the agency in creating a reliable system of statistical collection (and, in the meantime, to provide a set of accurate data 'for evaluating the needs of the population to be met by the economic and social plan'), as well as in improving the civil registry (the system for recording vital events and changes in civil status: births, marriages and deaths).³ This followed on the heels of a law, enacted in 23 June 1961, to make civil registration obligatory and universal.

This last objective signals an obvious connection between the study and postcolonial state-building. In France, civil registration was instituted as a 'civic ritual' by which individuals materialise their relationship with the state (Noirielle 1993: 6). Yet, in former colonies, demographic recording evoked histories of civic exclusion (of rural non-citizens), coercion (censuses being linked to taxation and intrusive public health campaigns) and control (particularly of urban populations) (Gervais 1996; Barré 2017; Wilder 2003). Censuses and registration needed to be reframed as a civic right and obligation, and as a tool of mutual recognition between the new states and their citizens (Cooper 2016; Serra 2018). Cantrelle's reports describe a colonial history of discriminatory civil registration. With Diagne's help especially, the Sine-Saloum Study experimented with novel strategies of village-level recording as a means for expanding its reach. At least indirectly, then, the study was concerned with a postcolonial drive to enrol 'the population' as citizens into the domain of state action. It also confronted colonial legacies. In the 'villages meetings' organised ahead of the first survey, Cantrelle wrote: 'the word census, which recalls taxation, is not uttered' (1965: 6). The study's interest in village histories and genealogies – presumed to be shared by local residents – was also emphasised. On the radio, the study's objectives were announced as: 'to know the history, the evolution of the population, its natality and mortality, in order to contribute to the improvement of health and economic conditions'.⁴ Repeated visits by the same field team were also a means of cultivating trust, offering 'proof that this is not a matter of taxation and that it cannot harm' (Cantrelle 1969a: 23).

The primary goal of repetition was, however, to maximise the precision and accuracy of data. The method of repeat-surveying was novel and sought to demonstrate that accurate demographic recording was feasible in rural Africa. This goal dovetailed a post-war turn in African demography toward more precise, dynamic and predictive knowledge of population (by calculating rates and forecasting trends), which was required by development planning as a future-oriented mode of government (Gervais 1996; Barré 2017). In the 1950s, the French national statistics institute (INSEE) coordinated a series of sample surveys, first mainly of demography, then paired with economic, sociological and health investigations across West Africa. It was on two of these, in Guinea and the Senegal River Valley, that Cantrelle (who had trained as a medical doctor), had, after a brief interest in physical anthropology, cut his teeth as a demographer.

To measure change, the INSEE surveys asked respondents to remember events such as births and deaths over a recent timespan. By contrast, the repeat survey method might bypass faulty memories by instead looking forward, from one survey to the next. Repetition shortened the intervals between events and their recording (some recourse to recall was inevitable) and allowed fieldworkers to confront and compare statements (and appearances, such as visible pregnancies) between surveys. Each survey thus recalled the last and anticipated the next, creating an extended time of 'observation'. To host this extended time, a space and its inhabitants needed to be delimited and revisited. With advice from Victor Martin (one of Lebret's bush-plane companions and research collaborators), Cantrelle (1969a) selected the district of Niakhar (65 villages and a population of circa 33,000) in the densely populated Sine region, and half of the Paos-Koto district, further east in the more sparsely settled Saloum.

When Cantrelle initiated the study, only one year of funding and employment were guaranteed (which would be prolonged to three; in 1964, Cantrelle was recruited by ORSTOM, the French overseas research office that was created in 1942). Given this time limitation, Cantrelle (1965: 3) opted to repeat the surveys every trimester on these two places/populations, rather than across multiple points across the country. The surveys thus recorded specimens rather than samples of Senegalese population, a decision that privileged precision over representativity. This raises questions about what, and whom, given his mandate to advise the government on how best to register and count national population, this non-representative precision was for.

Cantrelle's answers make sense in light of an expectation of continued state investment in improving demographic data and civil registration. Cantrelle recommended, first, that the state use the highly accurate data of repeat-surveying to set a threshold at which expanding *état civil* coverage could be determined to have reached 'an adequate level for demographic use'. In other words, the repeat-survey would contribute to its own replacement by the state's routine administrative functioning. Second, Cantrelle suggested that state statistics services (Senegalese or other) take up the repeat-survey method to be deployed at

sample sites selected to represent the national scale. He even proposed that Senegal's national census, planned for 1970, serve as a baseline for further cluster studies using repeat-surveying. Responsibility for these uses of repeat-surveying, he specified, would 'normally rest with the statistics service of the country' (1969b: 7). Thus, a method developed in the non-representatively small and stable field-space of Niakhar was projected onto the territorial scale at which Cantrelle anticipated the Senegalese/African state would survey, register and plan for its citizens.

A Terroir with a (National) View

In 1965, André Lericollais joined Niakhar's demographic field team – made up, since 1964, of ORSTOM-employed fieldworkers – to select a field-site for a *terroir* study. 'Terroir', a French term commonly used to refer to a cultivated and cultural landscape (particularly in relation to winemaking), was taken up by the French geographers, Gilles Sautter and Paul Pélissier, to designate their new approach to the study of the African 'humanized landscape' by observing the agrarian practices that fashioned it (1964: 57; see also Bassett et al 2007). Pélissier, who with Sautter co-directed the newly created ORSTOM geography section, was Lericollais' PhD supervisor. Pélissier had spent the 1950s in Senegal, where he conducted the fieldwork for a comparative study, published in 1966, of how the 'human-environment dialogue' of 'rural societies' is 'transcribed' into landscape (Pélissier 1966 [2008]: ix). Building on this work, the *terroir* approach aimed to zoom in on 'the portion of territory appropriated, ordered and used by the group that resides there and draws from it its means of subsistence' (Sautter and Pélissier 1964: 57). On this scale, researchers would map, precisely, how land was divided and distributed, allocated and inhabited, farmed, built and otherwise managed. Pélissier and Sautter called for particular attention to the *terroir*'s historicity, as a result of colonial intervention, current developmental programme and rural societies' own 'active adaptation' to change (Sautter and Pélissier 1964: 71).

Pélissier's work also directed Lericollais' choice, and understanding, of a Sereer *terroir* in the Sine. Pélissier described this region's high population density as an achievement of the Sereer agrarian system. By rotating crops, combining cultivation with animal husbandry (releasing manure onto fallow fields) and nurturing a parkland of soil-nourishing trees, the Sereer maintained stability despite the introduction of peanut cash-cropping and demographic growth (Pélissier 1953, 1966 [2008]). While echoing the colonial trope of Sereer fixity, Pélissier insisted this stability was the product of agricultural 'ingenuity' and 'flexibility' (1966 [2008]: 296). Within the Sine, Lericollais chose Sob because it fell within the Sine-Saloum surveying zone, and because the ethnologist Marguerite Dupire had recently collected genealogies there and, importantly, employed

a local assistant, Joseph Diatte, who had both family ties in Sob and a primary school certificate. Diatte's collaboration would be vital to completing the rigorous work of measuring plots and crops, and to cultivating the trust needed to link these to household compositions and resources.⁵

Diatte and Lericollais also observed, over the course of two farming seasons (1966–1967) – and complemented by specialist colleagues' analyses of vegetation, soils and yields – a landscape being actively reworked by the state's newly launched programme of rural technical assistance aiming to accelerate the production of peanuts and millet. Entrusted to the French parastatal firm SATEC (*Société d'Assistance Technique et de Coopération*), this programme marked a first technocratic turn in Senegalese development, away from the broad humanistic and participatory goals of the early post-independence years (Diouf 1997).

Sautter and Pélissier made general claims for the relevance of the terroir approach with reference to territorial scales of government. Their method's focus on the 'becoming' (*devenir*) of small rural worlds, wrote Sautter and Pélissier, converged with 'the practical preoccupations of African governments and technical cooperation organisations' (1964: 71). This was assuming, of course, that these governments sought to pursue, and 'base their action on', knowledge of rural realities. Studies conducted on the scale of a terroir might, they offered, be used as 'control cases' against which the findings of broader-scale state-led sample surveys could be evaluated. Alternatively, the terroir approach could provide a 'unified methodological model' for monographic studies – which had, since the 1950s, often complemented surveys to combine coverage with depth (Barré 2017). Sautter and Pélissier set terroir studies as a priority orientation for ORSTOM geographers, among whose objectives was to 'deliver results applicable for the development actions of host countries' (Sautter 1965: 4). Abou Bamba (2010) shows that ORSTOM researchers in Côte d'Ivoire (including Sautter) actively promoted a particular 'brand' of social science – field-based, localised, sociological, comfortably straddling the basic/applied divide – as relevant to postcolonial development planning. Taking stock of terroir studies in 1970, Sautter and Pélissier specifically cited Lericollais' collaboration with an agronomist as exemplary of an ideal dissolution of boundaries between basic and applied research. They also projected, optimistically, that states' increasing willingness to 'graft' development onto the accumulated technical knowledge of peasants would fully reveal the terroir method's utility for rendering legible the logics of rural production, and thereby turn these into a 'springboard for development' (Pélissier and Sautter 1970: 34).

In Sob, however, Lericollais (1970) found that prospects for joining 'peasant' and state-provided expert technical knowledge were constrained by acute land scarcity. This scarcity was, moreover, being exacerbated by, in turn limiting the benefits of, the increases in crop production enabled by state-facilitated access to equipment, animals and fertiliser through SATEC, as well as land tenure reform (Lericollais 1964). Favouring extensive (on more land) rather than intensive

(greater yields) farming, these measures aggravated rather than resolved the effects of population growth, leading to the abandonment of fallowing and social destabilisation. While Lericollais confirmed and detailed Pélissier's account of past Sereer adaptation to population growth and peanuts cash cropping, he warned this equilibrium was breaking down under the twin assaults of population growth and technological change.

Lericollais concludes this thesis with:

it is obvious to all that the villages of the Sine are too populated while the rural zones situated in the south and east of Serer country are relatively prosperous. Public action in view of relieving the countries of the Sine must be welcomed by peasants, who understand the necessity of emigration despite the perils and uncertainty it entails. (1970: 153)

The new territory to be generated by state-led resettlement, expanding Sereer 'living space' (Bashford 2014) towards south-eastwards 'prosperous zones', thus provided a frame for interpreting and applying Lericollais' findings of 'saturation' in Sob. This was a minor concern for Lericollais: a brief mention he did not elaborate on in his reports or a later oral history interview. At the institutional level, however, it was emphasised: the ORSTOM annual report for 1966 announced that the Sob study would 'apparently serve as a pilot study to the Aménagement du Territoire Service for the reorganisation of terroirs'.

Migratory Desires

Migration to '*terres neuves*' was also a research theme Sautter and Pélissier set for ORSTOM geographers (Sautter 1965). The latter had, in *Paysans du Sénégal* (1966 [2008]), advocated a 'proactive geography' (*géographie volontaire*), whereby careful readings of landscape would serve development action. For Pélissier, a major obstacle to Senegalese development was the spatial misalignment of its population and resources. This, he instructed, 'must be corrected by a systematic policy of agricultural colonisation' (1966 [2008]: 903). Meanwhile, Senegal's second development plan (1965–1969) identified an 'urgent' need to examine population redistribution, especially away from the 'critical' Sereer zone. ORSTOM geographer Jean-Paul Dubois began studying a recent trend of 'spontaneous' eastward emigration from Niakhar in 1967.

In the report of this first *Terres Neuves* study, Dubois (1971: 25–31) warned against resettlement programmes based on coercive methods and idealisation of the Sereer as 'model peasants'. He presented the 1930s colonial resettlement scheme as a cautionary tale. Its failure had been wrongfully blamed on Sereer 'attachment to the land', while its 'very authoritarian methods' were vividly remembered three decades later. Yet he also found enduring Sereer move-

ment back and forth between the Sine and the resettlement area (in the eastern Saloum), overlaid by a recent surge that followed the 1966 drought and poor harvests in the Sine. However, migrants, especially Sereer women, found conditions in the east to be harsh. Dubois concluded that willingness to migrate could be harnessed by state investment in 'good conditions' of emigration, and a policy aiming to reinforce complementary connections between the old terroirs of the Sine and new ones in resettlement areas.

By 1967–1968, agricultural productivity and profitability were, after the gains of the early 1960s, dropping. A rural crisis, the '*malaise paysan*' (peasant discontent), was brewing (Mbodj 1992). It was becoming clear that 'input'-based productivity programmes such as that run by SATEC were inadequate. In 1968–1969, the Senegalese state designed a plan to resettle 1,000 families from the Sine to Eastern Senegal (further inland from the eastern Saloum). After evaluation, the International Bank for Reconstruction and Development (part of the World Bank Group, and often referred to simply as the World Bank), agreed to fund a pilot scheme to move 300 families. The scheme, launched in 1972, aimed to provide settlers with roads, wells, temporary shelters, partly cleared land and agricultural extension (technical) services. Such support would also be extended to 250 families that had already migrated of their own initiative (World Bank 1979: 16).

Only this latter measure was ascribed directly to Dubois's recommendations. The existence of spontaneous migration was, however, taken by World Bank experts as an indication that state action need not impose resettlement on the Sereer. That said, state support and coordination were required to ensure new lands were used 'properly', notably by diversifying crops (an explicit aim of the scheme) and managing soil fertility. World Bank experts also insisted the pilot scheme be monitored by independent researchers (creating tensions with the state agency implementing the scheme, the *Société des Terres Neuves* (STN)) to guide its subsequent phases (World Bank 1979: 19). They identified 'willingness to migrate' as a key point of interest.

The World Bank contracted Dubois, along with an ORSTOM sociologist and agronomist, to conduct the study. For World Bank observers, the results of their study indicated that 'willingness to migrate' was not just a pre-existing condition of the scheme but was also generated by it: with awareness of the 'project and its potentialities', demand had grown quickly (World Bank 1975: 6). Dubois and his colleagues wrote a more nuanced account. Initially, the departure of migrants was perceived by those left behind in Niakhar (where most migrants were initially recruited) as a 'rupture, a betrayal, a desertion of the village community', and further migration was actively discouraged. When, however, the first migrants returned with money and food, resettlement was reinterpreted as a family support net. This was not entirely to be credited to the resettlement scheme itself, whose failures and limited impact on the material conditions of migration the ORSTOM researchers highlighted. Instead, they pointed to migrants' own

‘embellished’ accounts of migration, and the deterioration of farming conditions in the Sine under prolonged drought, contrasting with more stable rainfall in the east. The study report also called for resettlement villages to be placed within the same spatial framework as Niakhar’s departure zones, one created by enduring kin relations, back-and-forth movement and evaluation of conditions for life, through which these sites were linked and mutually transformed. They also pointed to the scheme’s symbolic (rather than material) efficacy in raising awareness, in Niakhar, of soil exhaustion while demonstrating state concern with ‘the problems of Sereer society and more broadly by those of Senegalese agriculture’ (Dubois et al 1979: 19).

World Bank reports presented Sereer migratory desire as a juncture between the social research that revealed it and the forms of state action it justified. The ORSTOM researchers, however, sought to carve out a broader space around ‘willingness to migrate’ as a research finding that might be turned into a resource for development intervention. This was conceptual space, making room for social scientists and their subjects to critique the effects and exceed the objectives of the resettlement scheme. It was also a spatial framework, revealed by social research to be shaped by histories of, as well as long-distance interactions between, population growth, land availability, soil and rainfall conditions and successive waves of more or less ‘directed’ eastward migration. The field-sites of the second *Terres Neuves* study were superimposed on the state pilot programme’s recruitment and settlement sites. Yet the study’s reports also imagine its Sereer subjects, and their mobility, in relation to the future that the resettlement project might engender. It was by problematising and managing population–land–resource relations within the framework of national space that study findings of ‘overpopulation’ and ‘migratory desire’ in the Sine could be presented as relevant for state action, by which spaces of land ‘saturation’ and spaces of ‘new land’ could solve each other.

Conclusion

By calling attention to ‘vectoral’ pathways between field-sites and state projects in the Sine Saloum, Sob and *Terres Neuves* studies, I make no claims about their researchers’ personal commitments to a politics of development, utopian or otherwise, nor about specific state actors’ expectations of social science research. Certainly, at the institutional level, ORSTOM presented itself as responsive to the needs of African development, as illustrated in its 1965 annual report statement that the rapid growth, since 1962, of its social science sections was ‘essentially motivated by the demand of states themselves’. Moreover, Cantrelle, Lericollais, Dubois and colleagues (including Pélissier and Sautter) seem to have been broadly sympathetic toward a developmental impulse to collect information about its citizens and to intervene in agricultural production, including via resettlement – as long as these policies were informed by social knowledge. They

may have had faith in national development as a tool of decolonisation, as Lebret and Dia initially designed it, or as it was later moderated by Senghor and Abdou Diouf. Or they might have been comfortable with development planning as it was widely used in Europe and its empires since the 1940s, particularly in France where *aménagement du territoire*, and indeed Lebret and his allies, played an important role in post-war reconstruction (Lavigne 2007; Samuel 2017). Still, their research publications, as well as more recent interviews with Cantrelle and Lericollais, express more concern with accurately describing what was happening – methodologically and socially – within their field-sites than with imagining or prescribing how the state might intervene beyond them.

Yet as I have argued in this article, these researchers' claims about the relevance of their methods and findings invoked expectations that the Senegalese state would intervene to address the land–population problem in Niakhar, and more generally that African states wanted to expand and refine their knowledge of rural demography, social life and agricultural practice. This imminent future of national surveys, agricultural support and large-scale resettlement gave meaning to the highly precise data and methods of repeat-surveying and terroir studies – even if, to reach this precision, they had to be deployed on small, non-representative fractions of national space – as well as to findings of Sereer agricultural adaptation and attitudes towards migration in the context of Niakhar's 'saturation'. They were not only about generic, 'global' knowledge, or about Sereer singularity and adaptation – as more recent research in Niakhar has been. They were also about the potential methods and (Sereer) subjects of national development, thereby conjuring a 'vectoral' pathway toward the territorial scales at which the state would produce knowledge and redistribute population.

Acknowledgements

Research for this article was funded by the Economic and Social Research Council (grant RES-360-25-0032). The manuscript benefited from the thoughtful comments of Charles Becker, Ruth Prince, Tom Neumark, Nikolai Ssorin-Chaikov and an anonymous reviewer. I also gratefully acknowledge the research and thoughts of all members of the Memorials and Remains of Medical Science in Africa (MEREAF) Project, particularly the Niakhar team: Alice Desclaux, Aissatou Diouf, Aissatou Mbodj-Pouye, Anne-Marie Moulin, Ashely Ouvrier and Branwyn Poleykett.

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Notes

1. <http://www.indepth-network.org/about-us/governance-structure/founding-documents/founding-documents>
2. The crucial contribution of Senegalese fieldworkers is hinted at in Cantrelle and Lericollais' research reports, and explicitly acknowledged in oral history interviews with these and other researchers by the MEREAF team (see acknowledgements) conducted in 2013–2015. These records, however, are vague as to how fieldworkers shaped research design and objectives of the particular case studies mentioned here, and mute about how fieldworkers engaged with the political implications of the knowledge they produced. The particular angle of analysis I follow in this article arises from my reading of documents in which 'African perspectives' on the politics of social science are a blind-spot, and which therefore risks reproducing the hierarchies in which it was practised. I nevertheless work under the assumption that fieldworkers not only played an important role in enabling these studies but likely had a very different understanding of what stakes were in play.
3. Nations Unies, 'Demande du Gouvernement du Sénégal. Description de poste SEN-46-A', 24 August 1961, digitised and transmitted to the author (and colleagues) by Pierre Cantrelle by email on 9 June 2013.
4. Communiqué radio du 26 octobre [1962], cited in written recollections by Pierre Cantrelle, personal communication.
5. Lericollais remained close to Diatte and his family, and they continued to work together in the 1980s and 1990s.

References

- Adams, V. 2016. *Metrics: what counts in global health*. Durham, NC: Duke University Press.
- Bamba, A. B. 2010. 'Mémoires épistémiques et pouvoir d'experts dans une postcolonie africaine: Le cas de l'usage des savoirs africanistes par l'ORSTOM en Côte d'Ivoire', *Canadian Journal of African Studies/La Revue canadienne des études africaines* 44: 1–34.
- Barré, L. 2017. 'Compter pour planifier: dénombrement de la population et «capitalisme d'État» en Côte d'Ivoire (1954–1967)', *Politique africaine* 1: 109–128.
- Bashford, A. 2014. *Global population: history, geopolitics, and life on earth*. New York: Columbia University Press.
- Bassett, T. J., C. Blanc-Pamard and J. Boutrais 2007. 'Constructing locality: the terroir approach in West Africa', *Africa* 77: 104–129.
- Behrends, A., S. J. Park and R. Rottenburg 2014. Travelling models: introducing an analytical concept to globalisation studies, in A. Behrends, S. J. Park and R. Rottenburg (eds.), *Travelling models in African conflict management*, 1–40. Leiden: Brill.
- Bocquier, P., Sankoh, O. and P. Byass 2017. 'Are health and demographic surveillance system estimates sufficiently generalisable?', *Global Health Action*, 10(1), 1356621, DOI: 10.1080/16549716.2017.1356621

- Boone, C. 1992. *Merchant capital and the roots of state power in Senegal: 1930–1985*. Cambridge: Cambridge University Press.
- Bonneuil, C. 2000. 'Development as experiment: science and state building in late colonial and postcolonial Africa, 1930–1970', *Osiris* 15: 258–281.
- Cantrelle, P. 1965. *Étude démographique dans la région du Sine Saloum (Sénégal): Déroulement de la campagne 1964–65 (et des observations antérieures)*. Dakar: ORSTOM.
- Cantrelle, P. 1969a. *Étude démographique dans la région du Sine-Saloum (Sénégal): état civil et observation démographique 1963–1965*. Paris: ORSTOM (Travaux et Documents de l'ORSTOM).
- Cantrelle, P. 1969b. 'Orientations de la recherche démographique au Sénégal', *Cahiers ORSTOM. Série Sciences Humaines* 6: 3–10.
- Cantrelle, P. 2018. Le projet Niakhar (1960–1980), in Delaunay, V., A. Desclaux and C. Sokhna (eds.), *Niakhar, mémoires et perspectives: Recherches pluridisciplinaires sur le changement en Afrique*, 375–383. Marseille: IRD Éditions.
- Chippaux, J.-P. 2018. Avantages et limites de l'utilisation des observatoires de population comme plateforme d'essais cliniques, in V. Delaunay, A. Desclaux and C. Sokhna (eds.), *Niakhar, mémoires et perspectives: recherches pluridisciplinaires sur le changement en Afrique*, 375–383. Marseille: IRD Éditions.
- Cooper, F. 2016. *Citizenship between empire and nation: remaking France and French Africa, 1945–1960*. Princeton, NJ: Princeton University Press.
- Cruise O'Brien, D. 1975. *Saints and politicians: essays in the organisation of a Senegalese peasant society*. Cambridge: Cambridge University Press (online publication August 2010).
- Delaunay, V. 2002. Apports et limites de l'observation continue : le suivi de population de Niakhar au Sénégal, in B. Baya and M. Willems (eds.), *L'apport des approches renouvelées pour l'analyse du début de la transition démographique : actes du deuxième atelier du GRIPPS*, 79–100. Paris and Ouagadougou: CEPED.
- Delaunay, V. and C. Enel 2009. Les migrations saisonnières féminines : le cas des jeunes bonnes à Dakar, in J. Vallin (ed.) *Du genre et de l'Afrique : hommage à Thérèse Locoh*, 389–401. Paris : INED.
- De L'Estoile, B. 2000. 'Science de l'homme et "domination rationnelle" savoir ethnologique et politique indigène en Afrique coloniale française', *Revue de synthèse* 121: 291–323.
- De Suremain, M. A. 2004. 'Faire du terrain en AOF dans les années cinquante', *Ethnologie française* 34: 651–659.
- Diouf, M. 1997. Senegalese development: from mass mobilization to technocratic elitism, in R. Packard and F. Cooper (eds.), *International development and the social sciences: essays on the history and politics of knowledge*, 291–319. Berkeley, CA: University of California Press.
- Dubois, J. P. 1971. *L'émigration des Serer vers la zone arachidière orientale: contribution à l'étude de la colonisation agricole des terres neuves au Sénégal*. Dakar: ORSTOM.
- Dubois, J. P., P. Milleville and P. Trincaz 1976. *Opération Terres Neuves, Projet Pilote Koumpentoum-Maka. Étude d'accompagnement, rapport de synthèse*. Dakar: ORSTOM.
- Ferguson, J. 2005. 'Seeing like an oil company: space, security, and global capital in neoliberal Africa', *American Anthropologist* 107: 377–382.
- Galvan, D. 2004. *The state must be our master of fire: how peasants craft culturally sustainable development in Senegal*. Berkeley, CA: University of California Press.
- Geissler, P. W. 2014. The archipelago of public health: comments on the landscape of medical research in twenty-first-century Africa, in R. Prince and R. Marsland (eds.), *Making and*

- unmaking public health in Africa: ethnographic and historical perspectives*, 231–256. Athens, OH: Ohio University Press.
- Geissler, P. W. 2015. Introduction: A life science in its African para-state, in P. W. Geissler (ed.), *Para-states and medical science: making African global health*, 1–46. Durham, NC: Duke University Press.
- Gervais, R. 1996. 'État colonial et savoir démographique en AOF, 1904–1960', *Cahiers québécois de démographie* 25: 101–131.
- Lavigne, J. C. 2007. Le développement au Sénégal: utopie et réalisme des intuitions du Père Lebret, in C. Becker, P. P. Misséhoughe and P. Verdin (eds.), *Le père Lebret, un dominicain économiste au Sénégal (1957–1963)*, 5–18. Dakar: Fraternité Saint Dominique de Dakar.
- Lebret, L.-J. 1958 [2007]. Conférence de synthèse pour la définition de la problématique du développement au Sénégal, Dakar, lundi 30 décembre 1958, in C. Becker, P. P. Misséhoughe and P. Verdin (eds.), *Le père Lebret, un dominicain économiste au Sénégal (1957–1963)*, 93–126. Dakar: Fraternité Saint Dominique de Dakar.
- Lericollais, A. 1970. 'Sob – Étude géographique d'un terroir sérère (Sénégal)', PhD Thesis, University Paris X.
- Mann, G. 2013. 'Anti-colonialism and social science: Georges Balandier, Madeira Keita, and "the colonial situation" in French Africa', *Comparative Studies in Society and History* 55: 92–119.
- Masse, D., R. Lalou, C. Tine, M. Ba and J. Vayssières 2018. Les trajectoires agricoles dans le Bassin Arachidier au Sénégal: éléments de réflexion à partir de l'observatoire de Niakhar, in V. Delaunay, A. Desclaux and C. Sokhna (eds.), *Niakhar, mémoires et perspectives: Recherches pluridisciplinaires sur le changement en Afrique*, 311–332. Marseille: IRD Éditions.
- Mbodj, M. 1992. La crise trentenaire de l'économie arachidière, in M. C. Diop (ed.), *Le Sénégal trajectoire d'un Etat*, 93–135. Dakar: Codesria.
- Noiriel, G. 1993. 'L'identification des citoyens: naissance de l'état civil républicain', *Genèses* 13: 3–28.
- Olivier de Sardan, J. P., A. Diarra and M. Moha 2017. 'Travelling models and the challenge of pragmatic contexts and practical norms: the case of maternal health', *Health Research Policy and Systems* 15: 71–87.
- ORSTOM 1965. *Rapport d'activité pour 1965*. Dakar: ORSTOM.
- ORSTOM 1966. *Rapport d'activité pour 1966*. Dakar: ORSTOM.
- Østebø, M.T., 2021. *Village Gone Viral: Understanding the Spread of Policy Models in a Digital Age*. Palo Alto: Stanford University Press.
- Ouvrier, A. 2014. *Faire de la recherche médicale en Afrique: ethnographie d'un village-laboratoire sénégalais*. Paris: Karthala Éditions.
- Oxford Reference. 2022. "vector", available online: <https://www.oxfordreference.com/view/10.1093/oi/authority.20110815111041563#:~:text=A%20quantity%20in%20which%20both,and%20velocity%20are%20vector%20quantities>. Accessed: 15.04.2022.
- Pélissier, P. 1953. 'Les Paysans Sérères. Essai sur la formation d'un terroir du Sénégal', *Cahiers d'outre-mer* 22: 105–127.
- Pélissier, P. 1966. *Les paysans du Sénégal*. Saint Yrieix: Imprimeries Fabrègue. Electronic version prepared by C. Becker, Université Cheikh Anta Diop, June 2008: <http://semantic.scholar.org>
- Pélissier, P. and G. Sautter 1970. 'Bilan et perspectives d'une recherche sur les terroirs africains et malgaches (1962–1969)', *Études rurales* 37–39: 7–45.

- Pessis, C. 2013. 'Les sols sénégalais malades de l'arachide, 1944–1952', *Monde(s)* 2–4: 127–144.
- Samuel, B. 2017. 'Planifier en Afrique', *Politique africaine* 1: 5–26.
- Sautter, G. 1965. 'Les thèmes de recherche en géographie', *Bulletin de Liaison Sciences Humaines – ORSTOM* 1: 3–6.
- Sautter, G. and P. Péliissier 1964. 'Pour un atlas des terroirs africains: structure-type d'une étude de terroir', *L'homme* 4: 56–72.
- Schumaker, L. 2001. *Africanizing anthropology: fieldwork, networks, and the making of cultural knowledge in Central Africa*. Durham, NC: Duke University Press.
- Serra, G. 2018. "'Hail the census night": trust and political imagination in the 1960 population census of Ghana', *Comparative Studies in Society and History* 60: 659–687.
- Sokhna, C. and B. Cissé 2018. La chimio prevention du paludisme saisonnier: validation du concept à Niakhar (2002–2004), in V. Delaunay, A. Desclaux and C. Sokhna (eds.), *Niakhar, mémoires et perspectives: Recherches pluridisciplinaires sur le changement en Afrique*, 375–383. Marseille: IRD Éditions.
- Reynolds, L. 2015. 'Category and kin in "crisis": representations of kinship, care, and vulnerability in demographic and ethnographic research in Kwazulu-Natal, South Africa', *Studies in Comparative International Development* 50: 539–560.
- Richard, F. G. 2018. *Reluctant landscapes: historical anthropologies of political experience in Siin, Senegal*. Chicago, IL: University of Chicago Press.
- Tilley, H. 2011. *Africa as a living laboratory: empire, development, and the problem of scientific knowledge, 1870–1950*. Chicago, IL: University of Chicago Press.
- Tousignant, N. 2018. Les fils qui relient les passés. De l'étude démographique du Sine-Saloum à l'histoire de Niakhar, in V. Delaunay, A. Desclaux and C. Sokhna (eds.), *Niakhar, mémoires et perspectives: Recherches pluridisciplinaires sur le changement en Afrique*, 105–125. Marseille: IRD Éditions.
- Wilder, G. 2003. 'Colonial ethnology and political rationality in French West Africa', *History and Anthropology* 143: 219–252.
- World Bank 1975. *Senegal – Second Terres Neuves Resettlement and Eastern Senegal Technical Assistance Project (English)*. Washington, DC: World Bank Group.
- World Bank 1979. *Senegal – Terres Neuves Resettlement Project (English)*. Washington, DC: World Bank Group.

Terrains vectoriels : les échelles de l'observation et de la transformation sociales à l'ère du développement au Sénégal

La zone de Niakhar, dans le centre-ouest du Sénégal, accueille depuis les années 1960 une collecte régulière de données démographiques ainsi que des recherches en sciences médicales et sociales. Dans cet article, j'aborde la longue histoire de la recherche à Niakhar comme une fenêtre sur les relations changeantes entre la production de connaissances et les modes (et échelles) de gouvernement. En examinant de près trois études menées entre 1962 et 1974, je cherche en particulier à saisir comment les impulsions utopiques du développement national postcolonial au Sénégal ont créé des opportunités épistémologiques et des cadres de signification pour la recherche en sciences sociales. Si cette idéologie du développement était utopique au sens général de ses ambitions transformatrices, elle l'était aussi dans un sens plus spécifiquement spatial, en ce sens que le Sénégal devait être transformé en un « autre lieu » pour briser l'emprise de l'économie politique coloniale et libérer le plein potentiel de la

nation. Les chercheurs en sciences sociales évoquaient ce territoire national émergent pour revendiquer ce que j'appelle une relation vectorielle entre les sujets et les espaces qu'ils produisaient par la recherche et ceux que l'État générerait par la planification, les enquêtes et l'intervention. Je contraste cette spatialité vectorielle avec les revendications scalaires faites pour des utilisations post-développementales de Niakhar en tant que site de recherche expérimentale et longitudinale.

Mots clés : développement, histoire des sciences, postcolonial, Sénégal, utopie