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The Thin Line Between Choice and Flight: Environment and Migration in Rural Benin

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ABSTRACT

Internal migration in rural Benin is not directed to the southern coastal regions as in many neighbouring countries. Instead, peasants from the densely populated and environmentally critical northwest of Benin are engaging in a process of agricultural colonization of the central region. Consequently, the predominant approach to understanding these processes of internal population movement in Benin is to focus on environmental degradation. But why do people stay in degraded areas while others leave? Why do migrants again leave the environmentally still stable destination areas and why does migration itself becomes causation for new migration? It is obvious that one needs a structural understanding of the environment in the political and cultural context of this region to understand its role as a driver for migration. On the basis of an empirical case-study the impact of progressive deterioration of environmental conditions is embedded in social and cultural structures. Being aware of this is necessary in order to really understand a migration pattern that at first glance could be misconstrued as being purely environmentally induced. Since migration theories are somehow overlooked in the debate on environment and forced migration the empirical findings will be embedded in a theoretical approach that places greater emphasis on a cumulative causation of migration and on the inter-temporal dimension of migration.

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“ENVIRONMENTAL REFUGEE”: A CONTESTED CONCEPT AND ITS APPLICATION IN WEST AFRICA

To identify the environmental refugee concept as highly problematic is nothing really new or innovative. Since the introduction of the term “environmental refugees” by El-Hinnawi in 1985, various authors (Kibreab, 1997; Black, 2001; Flintan, 2001; Castles, 2002) have written critical responses to the neo-malthusian-inspired model of environmental scarcity and forced migration by Homer-Dixon (1994) which mostly lacked empirical evidence or to the writings of Myers (1993; 1997; 2002) who predicts 200 million environmental refugees for the near future. This estimation exceeds by far the 10 million environmental refugees claimed by Jacobson (1988) for the end of the 1980s.

At large, the critique could be summarized in the following three points.

Terminological ambiguity: despite various attempts (Myers and Kent, 1995, Bates, 2002) the term itself remains poorly defined, thus making it extremely difficult to decide who could be classified as an environmental refugee. Attempts to overcome this deficit by using a less biased terminology such as ecological and environmental migrants (Wood, 2001) or distinguishing between environmentally motivated migrants, environmentally forced migrants and environmental refugees (Renaud, et al., 2007) may be useful for policy action. But given the seamless transitions between “motivated” and “forced”, this does not offer a convincing solution for the conceptual and theoretical problems.

Shortcomings in content: The core of the problems mentioned above is that most migration has manifold, interrelated and complex causes. It thus seems analytically impossible to identify a migration stream as principally environmentally-induced (with the exception of flight as direct responses to natural disasters or industrial accidents). In most cases only through simplifications can environmental factors be identified as root causes for population displacement. However, there is a good reason for the multitude of approaches in migration theory given the multitude of (political, economic and social) reasons for and the various forms and courses of migration.

Political instrumentalization: Even if it is very doubtful that the concept of environmental refugee is the result of a coordinated strategy of policy-makers in the industrialised world in order to depoliticise interna-

tional migration and to get rid of the obligation to provide asylum, as Kibreab (1997) argued, it is astonishing that such an analytically weak concept is so prominent on the agendas of various organisations as the UNEP, IPCC and UNU that are very powerful in setting the international discourse. It would be an interesting challenge in the future, especially with regard to climate change (Piguët, 2008), to analyse this discourse in order to reconstruct the internal logic of agenda-setting in international organisations as McNamara (2007) attempted for the UN en bloc.

Focusing on Africa, it quickly becomes very clear that the continent and particularly the West African Sahel are favoured playgrounds for the protagonists of the environmental refugee concept (Jacobson, 1988; Richter, 2000; Hammer, 2004). In particular, Hammer seems to handle figures quite recklessly when he argues that “hundreds of thousands of people from rural Sahel regions are displaced every year as a consequence of environmental change and desertification” (2004: 234). One has to be sceptical whether such claims could advance the debate, especially compared to studies that apply migration theories empirically using comprehensible methods and own data. Henry, et al. (2003), for example, used multivariate statistics coming to the conclusion that environmental variables can only explain 5 per cent of internal migrations in Burkina Faso. Findley (1994) argued very early that migration from Mali during the droughts of the 1980s declined instead of increased and explained this by pointing to the drought related lack of financial means for migration. Several studies, especially those using a sustainable livelihood approach, confirm the function of seasonal and circular migration as a well-established adaptive strategy rather than a knee-jerk and irreversible response to environmental stress (Condé, et al., 1986; Fall, 1998; De Haan, 1999; De Haan and Rogaly, 2002). Furthermore recent empirical case studies from Ghana (Carr, 2005; van der Geest, 2008) provide an approach to place potential environmental drivers into a balanced framework of environmental, social and political factors for migrations decisions and show that it is structural resource scarcity rather than environmental degradation that leads to migration from the north to the south of Ghana.

However, be it Africa or any other region in the world, it is obvious that environmental change or degradation can contribute to migration just as the economic, demographic, political and social situation can do. Primary causes are difficult to identify. Therefore, the challenge is to balance the multiple factors causing a given migration stream in order

to understand its internal logics and contextualise it theoretically as well as to formulate appropriate analyses enabling us to predict future migrations.

The remainder of this paper is structured as follows: After this introductory chapter the environmental refugee concept will be discussed in the context of migration theories. Against this background, I will then introduce my own approach as well as the related research questions before briefly introducing the regional context of population dynamics and environmental degradation in Benin. The next section presents the methodological approach. Analysing empirical findings addressing multiple reasons for multiple migrations, the paper ends with some concluding remarks placing the environment in migration.

BRINGING THE SOCIAL BACK IN: THEORY, OBJECTIVE AND RESEARCH QUESTION

Environmentally-induced population movement is a certain kind of migration, thus it must remain open for embedding in migration theory instead of regarding it as a distinct phenomenon. The fact that migration theories are mostly masked out in the environmental refugee debate, points at potential reasons for the weak explanatory and predictive value of the term.

Understanding migration streams as environmentally determined, connotes a theoretical positioning within the bloc of classical approaches in migration theory since it conceptualises migration, in analogy to approaches that focus on labour markets and wage and income differentials of individuals and households (Todaro, 1980; Stark, 1991), as a process of equalisation between regions of deteriorating environmental conditions and areas where the state of the environment is better. Although these classical approaches are strong in revealing causation factors for and consequences of unidirectional migration, they broadly fail to explain why migration continues without spatial differences in wages and income or, to remain in the context, why environmental degradation in a certain region never leads to emigration of all inhabitants.

Migration therefore seems to be a selective process that could develop very different patterns at the same time and in the same place. For this reason, the internal dynamic of multidirectional migration and the formation of delocalised social phenomena has become the subject-matter

of new theoretical approaches which focus on networks and social capital. But even if we have to consider social influences on migratory decisions to be more than an annoying ambient noise in modelling population movements, these new approaches should not be given the monopoly to explain migration. It is rather a question whether this rich theoretical pluralism can be utilised to formulate appropriate syntheses for empirical findings on migration that are neither under- nor over-socialised and meet the requirements which the cumulative causation of migration and its inter-temporal dimensions represent.

So the purpose of this paper is to achieve a differentiated and reflexive embedding of environmentally induced migration motives in migration theory on the basis of an empirical case-study on the immigration of peasants from regions that are affected by soil degradation in the north-west of Benin to an area that was opened up for settlement through improvements of transportation infrastructure in the central region. In respect to the five groups of factors that Lonergan (1998) identified as environmental push elements that might lead to migration, it is the progressive deterioration of environmental conditions which are on one side linked to the probably “most controversial type of environmental refugee” (Bates, 2002: 475) but are by the same token much more frequent in West Africa compared to natural disasters, industrial accidents, environmental degradation related to conflict or development projects. Thus, the research question is: do soil degradation and its economic implications really constitute the most important motives for migration from the Northwest of Benin as the monocausal explanatory approaches of scientific work and studies of development projects and government agencies argue (Boni, 1995; Chabi, 1997; Edja, 1999; Igué, 1983; MDR-ONASA, 2000; MCCAG-PD; Tchégnon, 1995)?

POPULATION DYNAMICS AND ENVIRONMENTAL DEGRADATION IN BENIN: THE CONTEXT

Demographic tendencies and migration in Benin

Three national censuses from 1979, 1992 and 2002 provide demographic data for Benin. In 2002, Benin had a total population of slightly more than 6,750,000 inhabitants (INSAE, 2003), with an average density of 60 inhabitants / km² and an annual growth rate of 3.25 per cent. However, these national demographic figures hide spatial disparities and dynamics on regional and local scales, especially between the north and

south of the country. Since 1992, the annual demographic growth rate is slightly higher in comparison to only 2.8 per cent between 1979 and 1992. The fertility rate though in slight decline, is currently at 6.3 per cent and thus is still at a high level. As elsewhere in sub-Saharan Africa fertility rates are decreasing much more significantly in the cities than in rural areas. Benin's population is very unevenly distributed. South Benin (238 inh./km²) has much higher population densities than central and north Benin (27 inh./km²), which in turn are partly characterized by higher growth rates.

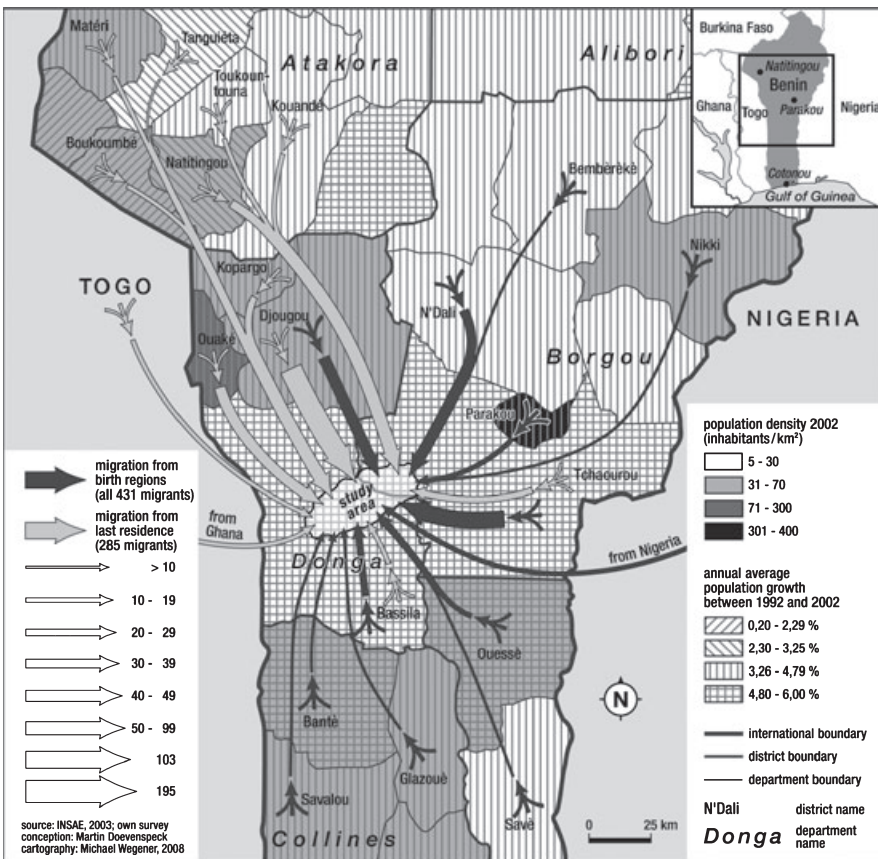
In central and north Benin, population density is below 70 inh./km² throughout the region, with the exception of the district of Parakou. The lowest densities, with less than 10 inh./km², are observed in the northernmost district Karimara and westwards in Tanguiéta, where settlement is restricted because of the large National parks. In contrast, the north western districts like Ouaké, Natitingou and Boukoumbé have relatively high densities, but also low rates of increase (see Figure 1).

Districts like Ouèssè, Bantè, Tchaourou and Bassila in central Benin have some of the highest demographic growth rates of the country. In Tchaourou, which had been the district with the lowest population density until the 1970s, growth rates have been consistently high for three decades, reaching 4.9 per cent per year. In Bassila, the strong increase of population growth has started more recently: here, the demographic growth has doubled since the 1980s, reaching 4.8 per cent in 2002. The exceptionally high growth rates in the central region are a result of internal migration flows in rural Benin that are not directed to the southern coastal regions as in many neighbouring countries. Farmers from Benin's densely-populated southern and north-western regions migrate to the historically low populated central region. The availability of land can be explained with the region's past function as buffer zone between the Wasangari of pre-colonial Borgou in the north, the powerful Dahomey kings in the South and Oyo-ruled lands in the east, as well as the slave roundups carried out until the end of the nineteenth century.

Environmental degradation in northwest Benin

Since environmental degradation is always mentioned as the most important motive for migration from northwest Benin, general soil conditions and their individual limitations in particular will be outlined roughly within the following paragraphs. Especially the Atacora region and its surroundings are mentioned regularly as hotspots of soil degra-

FIGURE 1
BIRTH REGION AND LAST RESIDENCE OF QUESTIONED MIGRANTS



dation: “This is a very sloppy semi-arid zone where an inadequate farming system is practised on the mountainsides; this causes serious erosion leaving in its wake a very stony and fragile land. Almost the whole zone has been stripped bare into a desert because of the very active streaming experienced in this area” (Republic of Benin, 2000: 36).

Humic Acrisols and dystric or humic to eutric Cambisols (according to the FAO- classification) are the typical soil types on West African crystalline rocks and dominate on the large granite shields south of the Atacora Chain. These soils show the typical signs of degradation resulting from permanent and sometimes un-adapted soil cultivation with examples ranging from linear water erosion to the complete loss of

top-soils due to hill-wash processes. As a result of strong hydrolytic alteration Cambisols, like most acidic soils in the tropics, show low contents of clay minerals, resulting in low cation exchange capacities (CEC). In turn these soils are typically poor in key nutrients.

The natural vegetation has been partially destroyed or degraded to pyrophitic species due to frequent man-made bush fires and a characteristic slash and burn cultivation system. The thin humic top-soil layer of organic matter contains only residues of bush fires like charcoal and acid ash mixed with rare foliage of sclerophytic savanna species. Only in perennial cultures like local Teak plantations with a higher rate of primary production, a thicker mollic organic top-soil can accumulate.

Due to shortened or even completely eliminated fallow periods (< 3 Y) and the low CECs, the amount of exchangeable soil nutrients in typical soils in North West Benin is very low (Landon, 1984: 113). Other studies of West African soils have shown C/N ratios in top-soils that are indicative of low amounts of nitrate (Faust, 1991; Meyer, 1992; Junge, 2004). As a result crop yields on those soils, in particularly on very poor sites on middle and hill-top positions, are very low.

In addition to their naturally poor condition permanent soil cultivation caused by regional demographic growth and the resulting need to shorten traditional fallow periods have further decreased the soils crop potential and diminished their carrying capacity.

ASKING THE MIGRANTS: METHODS

The analysis is based on a combined quantitative-qualitative approach. Fieldwork was carried out between November 2000 and May 2005 in the area between Bétérrou in the east and the western town of Bassila that remained largely untouched by migration until the second half of the 1990s, due to the absence of transportation infrastructure. Surveys were carried out in sixteen settlements whereby approximately half of all localities, old villages with allochthonous population and newly founded settlements of migrants, within the study area were covered. A total of 431 migrant households were surveyed using a partially standardised questionnaire. Additionally, 83 narrative and problem-oriented interviews were recorded, transliterated and analysed. About two-thirds of the survey was done by local research assistants (Beninese students) and three-quarters of the in-depth interviews were conducted with the assis-

tance of these students who translated from French into the different local languages spoken in the study area.

Questionnaire-based interviews as well as open interviews were conducted with heads of households at their new residence in the study area. The conceptual design of the questionnaire was geared to the recommendations of Bilsborrow (1984: 60ff.), and Standing (1984), as well as to a questionnaire that was applied in pilot study on migration of the National Institute of Statistics in Benin (INSAE, 1999). The questionnaire covered spatial and temporal criteria and served to identify selected characteristics of the interviewees: *inter alia* information on the context of origin, ethnic-linguistic affiliation, age structure, education, size of household, motives for and courses of migration and relations to the place of origin. This broad database particularly facilitated comparative statistical analysis of basic attributes of migrations on a macro level. As a first approach for a better understanding of migration motives, questions in this field were formulated in a relatively open manner, consequently there were no response categories. In order to evaluate the responses statistically they were summed up into groups of similar statements. Although this classification in categories is certainly subjective, it facilitates access to the individual and instructive formulations in any phase of the analysis.

For a deeper and more detailed understanding of migration motives and courses of migration the reductive analysis of questionnaire data, which must remain superficial to a certain extent, was completed by an explicative analysis of qualitative results whereas data collection was mainly structured by the interviewees. Narrative interviews were applied in the investigation of individual migrations courses and for the migrants' experiences at their different 'step stones'. Problem-oriented and focused interviews served primarily to check the assumptions on reasons for out-migration and factors of perpetuation of migration. The interpretation of transcripts resulted in the identification of similarities, types and structures which are justified through clarifying citations within the text.

Since only responsible heads of households were interviewed, it is solely about men with no women presiding over a household. This is mainly due to the cultivation of yam which is the principal source of income in that area and reserved for men. Hence, only the places of origin, the courses of migration and motives etc. of men were surveyed, which could certainly be different not only from the female ones but also from children or any other members of the household. Furthermore, it has to

be assumed that the answers of the migrants in such an ex post reconstruction of motives are subject to an adaptation to cultural schemata and therefore to a certain homogenization. I will get back to this point in the discussion of the results.

MULTIPLE REASONS FOR MULTIPLE MIGRATIONS

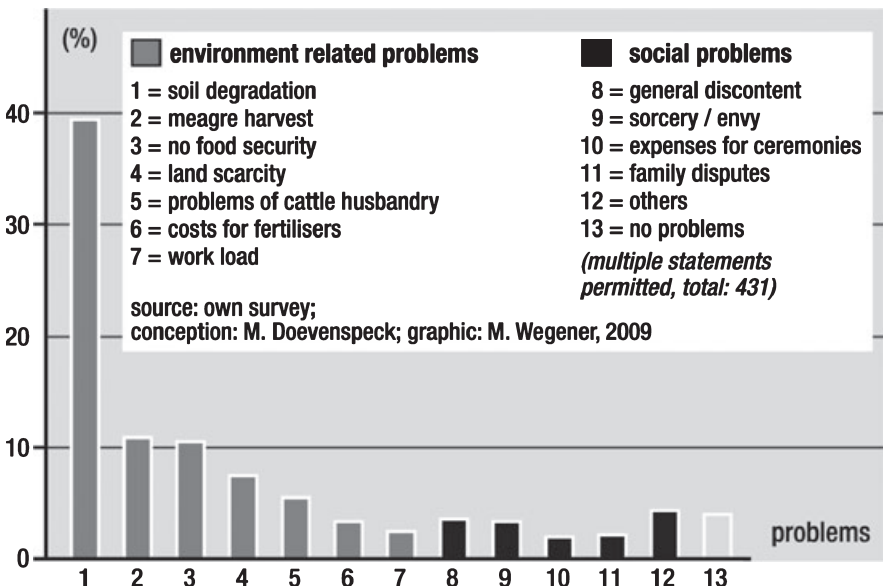
“La terre est fatiguée” only?

Fig. 2 shows the answers of the interviewed migrants concerning the question regarding the major problems in their home village. In order to get a general and subjective overview about the situation in the home villages this question was not explicitly related to migration on purpose. For reasons of clarity the data from the semi-structured questionnaire were summarised in thematic categories. A couple of quoted formulations from the questionnaire serve exemplarily for an explanation of these categories.

As one could have expected, negative appraisals of the conditions for agricultural production dominate. Soil degradation (39%; “the soil is

FIGURE 2

MAJOR PROBLEMS OF MIGRANTS IN THEIR HOME VILLAGES

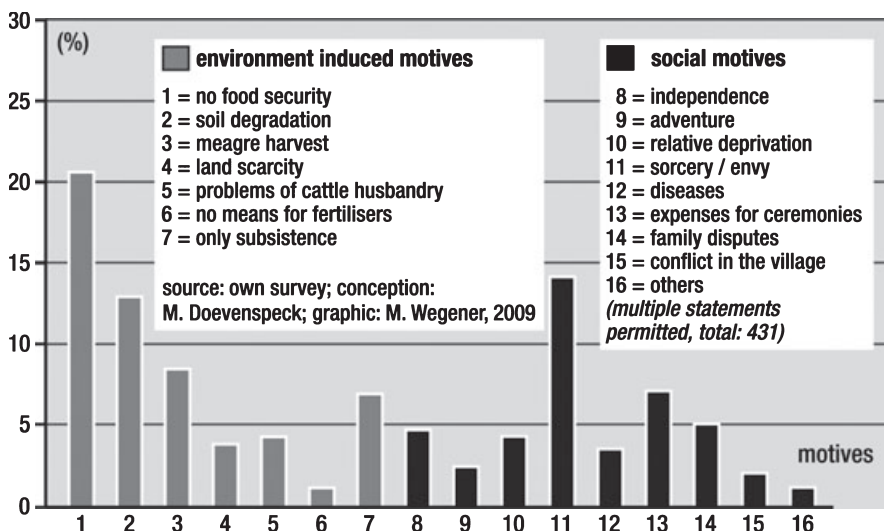


tired”, “the soils have become fragile”) is by far the most frequently mentioned problem. One has to understand other problems like meagre harvests or work load in this context as well since they are consequences of declining soil fertility. Land scarcity (8%) means less an absolute shortage than a lack of fertile and profitable cultivation areas and can therefore be regarded as a consequence of soil degradation as well. Partial food insecurity (10%; “it is difficult to live of our land”, “I do not eat enough”) is a direct result of these problems.

All in all, social conflicts (sorcery, family disputes and waste of money for expensive ceremonies) were mentioned in 8 per cent of the answers only. Lack of transportation infrastructure, insufficient accessibility to markets etc. were subsumed under “others”. Four per cent of all interviewees declared not to see any problems.

The answers to the question for the most important motives for leaving the home village (Fig. 3) give quite a differentiated picture of this migration stream. Obviously, the problems do not have to be categorically equivalent to the reasons for leaving. Whereas three quarters of the problems were related to the environmental conditions for agricultural production, only half of the motives are linked to this aspect whereby

FIGURE 3
MOTIVES FOR LEAVING THE HOME VILLAGE



food insecurity (21%), soil degradation (13%), meagre harvests (8%) and land scarcity (4%) are mutually interdependent. The danger of sorcery and envy were mentioned many times more as a motive for departure than as a problem before (14%; “I earned enough but people were jealous and threatened me”, “The healers told me that the second wife of my father killed my 4 year old children. So I left the village”). Unexplainable diseases (4%) (“I lost four children in my village and I don’t know why”) could also be classified in this category. Internal family problems and disputes over expensive ceremonies were mentioned far more often as well. New motives are relative deprivation (“I left because I wanted to earn the same money the others do by migration.”) and the wish for economic independence (“If you are with your father you do not earn anything. It’s all for him”).

These results confirm clearly that beside environmental degradation, social structures and conflicts impact heavily on migration decisions. Given the interdependency between ecological crises and economic consequences on one side and social, cultural and political conditions on the other, it is very difficult to achieve a clear differentiation: „It must be recognized that the degradation of the environment is socially and politically constructed; only through a structural understanding of the environment in the broader political and cultural context of a region or country can one begin to understand its “role” as a factor in population movement” (Lonergan, 1998: 12).

The already mentioned potential adaptation to cultural schemata may also relativize the importance of environment induced migration motives. Since the study addresses peasants who live on the cultivation of land, land availability is the dominating subject on which one can draw in an interview in order to avoid talking about delicate and displeasing themes: “I had to leave my village because my family had become a victim of sorcery. There are a lot of things that may people force to leave, but when they go they say it is because of the lack of cultivatable land” (Interview with a migrant in the village of Samba, 2 October 2003, translated from French).

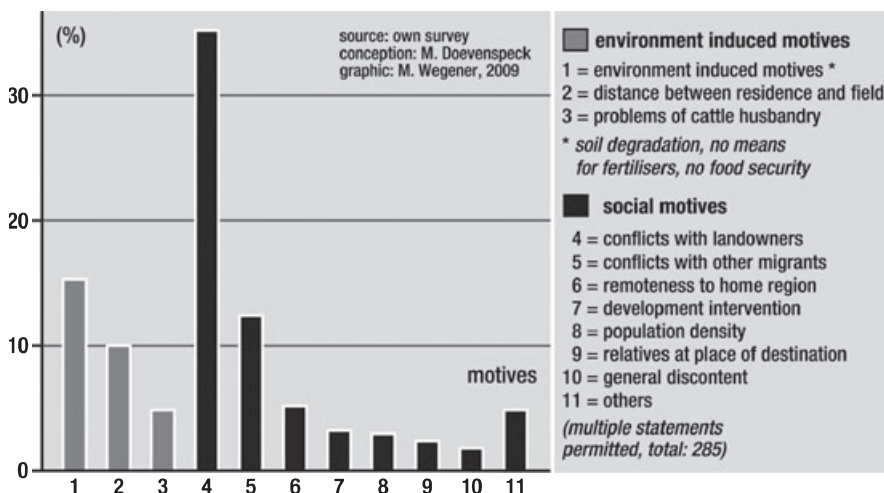
Multidirectional migrations and networks

A remarkable result of the survey was that a majority of the interviewees (67%) did not come directly from their home villages to the study region but had already migrated several times during their life course. Focusing on the last residence (Fig. 1) reveals that the respondents

moved mainly from the “typical” target regions of internal rural-rural migration to the study area. The districts involved are the cotton growing areas of Ndali, Bembèrèkè and Nikki, as well as regions of extraordinarily high food production like Ouèssè, Bantè, Savalou, Savè and Tchaourou. This fact already indicates a much weaker importance of environment-induced migration motives. Soil degradation and related motives represent only 15 per cent of all answers and a new dominant motive appears instead (Fig. 4). For one-third of all migrants, conflicts with landowners were among the motives for leaving again. This category summarises quite different aspects like despotically fixed contributions (“We have been forced to give half of our harvest to the landowners”) or arbitrary withdrawals of provided cultivation areas (“Two times they took the parcel of land that I had cleared shortly before”). But already established migrants, too, were blamed for exploiting newcomers (“conflicts with other migrants”) as cheap or free labourers on their own fields.

However, numerous interviews confirm that legal uncertainty, especially regarding land tenure, appears to be the most important social driver for multiple migrations in rural Benin. In particular, in the already mentioned cotton growing areas the withdrawal of cultivated land is quite frequent. “Initially we did not have any problems with them. But in our third year they began to take away our parcels of land. Me for example,

FIGURE 4
MOTIVES FOR LEAVING THE LAST RESIDENCE



I cultivated cotton and I took plenty of fertilisers on the field also in order to cultivate maize in the following year. The maize would have been benefited from the fertiliser. But then, after harvesting the cotton the landowners came and took it away in order to plant without any justification. It's a system you know?" (Interview with a migrant in the village of Kpawa, 16 November 2003, translated from French).

Beside these new structural causation factors there is another important aspect that explains the perpetuation of migration in rural Benin although migrants did rarely mention it explicitly as a motive for migration: the importance of social networks and social capital. More than two-thirds (71%) mentioned to be related with at least one member of other migrant households in the new settlement. Barely half of all migrants had relatives in other settlements in the study area. Roughly two-thirds of the interviewees (63) stated that they visit the home village at least once per year and support the family at home by sending cash remittances or foodstuff; and half of the respondents indicated at least one person who plans to migrate to the study area. In some migrant villages there were family relations between roughly 80 per cent of all households. To have a relative or at least an acquaintance is an indispensable condition for being accepted in the new villages and chain migration is the dominating pattern of these migrations streams (Doevenspeck 2005: 151-162).

PLACING ENVIRONMENT IN MIGRATION: CONCLUSION

The study has shown that spatial disparities with regard to the availability of non degraded and productive agricultural land alone could not explain internal migration in rural Benin. Problems of environmental degradation are similar in the entire northwest, but not all inhabitants migrate. A restriction on environmental degradation without taking into account social conditions is only of limited value for a deeper comprehension of rural-rural migration. Even the fact that people choose less populated regions with a higher agrarian potential is not an argument that backs a one-sided ecologic-demographic interpretation of these migration streams. Why should peasants migrate to areas with conditions even worse?

However, environmental degradation certainly is part of the structural conditions within the contexts of origin. These structural conditions bring out migrations which are partly explainable with classical theoretic-

cal approaches. At the same time the affected people perceive and cope with these conditions differently, whereby migration becomes a selective process, driven by factors on different levels (demography, economy, ecology, society). These factors interact, may accumulate, decrease or increase in importance as time goes by and maybe even be overlaid by completely new factors. Once the process of migration begins, mechanisms of social structuring bring about self-strengthening of migration, whereas the accumulation of drivers and its temporal and spatial variations contribute to its perpetuation. Drivers of migration may change during time and may be different for each single migration. At the same time drivers may be reproduced: Judex (2008) modelled land-use dynamics in the study area and could show that massive immigration of peasants leads to deforestation and decreasing soil fertility.

Migration itself causes and enforces social and economic change and brings about new migration as a consequence. Thus the unidirectional perspective is superseded by an analysis of transmigration. Related to this is the acknowledgment of social ties which contribute to the shaping and persistence of migration patterns. In consequence migration is neither an atomised phenomenon that can only be understood on the micro-level nor a sole result of macro-structural conditions.

With regard to external intervention in general, and to development practice in particular, these results imply that migration will continue even if environmental degradation is stopped or reversed, and that migration can not be prevented totally, if this is desirable at all. This does not mean that efforts to battle the ecological crisis in the regions of origin should be abandoned. However, one important result of this study is that legal uncertainty, especially regarding land tenure, is one of the most important social drivers for multiple migrations. Thus, migrants should be given clear legal status in order to promote sustainable resource management and to avoid a perpetuation of environmental degradation in the target regions of internal rural-rural migration in Benin. This is, however, legally (land rights) and logistically challenging.

REFERENCES

Bates, D.C.

- 2002 "Environmental refugees? Classifying human migrations caused by environmental change", *Population and Environment*, 23(5): 465–477.

- Bilborrow, R.E.
1984 "Survey design", in R.E. Bilborrow, A.S. Oberai and G. Standing (Eds), *Migration Surveys in Low-Income Countries: Guidelines for Survey and Questionnaire Design*, ILO, London: 60–87.
- Black, R.
2001 "Environmental refugees: myth or reality?" *New Issues in Refugee Research*. Working Paper No. 34. United Nations High Commissioner for Refugees (UNHCR), Geneva.
- Boni, S.B.
1995 *Impact de la colonisation agricole sur le milieu dans la Sous-Préfecture de Tchaourou..* Mémoire de maîtrise de Géographie, Université Nationale du Bénin, Abomey-Calavi.
- Carr, E.R.
2005 "Placing the environment in migration: environment, economy, and power in Ghana's central region", *Environment and Planning*, 37(5): 925–946.
- Castles, S.
2002 "Environmental change and forced migration: making sense of the debate", *New Issues in Refugee Research*, Working Paper No. 70, United Nations High Commission for Refugees, Geneva.
- Chabi, M.
1997 *Impact de la Colonisation Agricole Sur Le Milieu Rural en Pays Tchabè*, Mémoire de Maîtrise, Université Nationale du Bénin, Abomey-Calavi.
- Condé, J., P. Diagne, N.G. Ouaidou, and A. Kader
1986 *South-North International Migrations: A Case Study. Malian, Mauritanian and Senegalese Migrants from the Senegal River Valley in France*. OECD, Development Centre, Paris.
- De Haan, A.
1999 "Livelihoods and poverty: the role of migration. Critical review of the migration literature", *The Journal of Development Studies*, 36(2): 1–47.
- De Haan, A., and B. Rogaly
2002 "Introduction: migrant workers and their role in rural change", *The Journal of Development Studies*, 38(5): 1–14.
- Doevenspeck, M.
2005 "Migration im ländlichen Benin. Sozialgeographische Untersuchungen an einer afrikanischen Frontier", *Studies in Development Geography*, 30, Verlag für Entwicklungspolitik, Saarbrücken.
- Edja, H.
1999 "Colonisation Agricole Spontanée et Milieux Sociaux Nouveaux. La migration rurale dans le Zou-Nord au Bénin", *Farming Systems and Resource Economics in the Tropics*, 35, Kiel.
- El-Hinnawi, E.
1985 *Environmental Refugees*, United Nations Environment Programme, Nairobi.

- Fall, A.S.
1998 "Migrants' long-distance relationships and social networks in Dakar", *Environment and Urbanization*, 10(1): 135–145.
- Faust, D.
1991 *Die Böden der Monts Kabyè (N-Togo). Eigenschaften, Genese und Aspekte ihrer agrarischen Nutzung*, Frankfurter Geowissenschaftliche Arbeiten, 13.
- Findley, S.E.
1994 "Does drought increase migration? A study of migration from rural Mali during the 1983–85 drought", *International Migration Review*, 28(3): 539–553.
- Flintan, F.
2001 "Environmental Refugees – a misnomer or a reality?", a contribution to the Wilton Park Conference Report on Environmental Security and Conflict Prevention, 1–3 March 2001, http://www.frameweb.org/ev02.php?ID=13114_201&ID2=DO_TOPIC > .
- Hammer, T.
2004 "Desertification and migration. A political ecology of environmental migration in West Africa", in J.D. Unruh, M.S. Krol and N. Kliot (Eds), *Environmental Change and Its Implications for Population Migration*, Kluwer, Dordrecht: 231–246.
- Henry, S., P. Boyle, and E.F. Lambin
2003 "Modelling inter-provincial migration in Burkina Faso: the role of socio-demographic and environmental factors", *Applied Geography*, 23(2–3): 115–136.
- Homer-Dixon, T.
1994 "Environmental scarcities and violent conflict: evidence from cases", *International Security*, 19(1): 5–40.
- Igué, J.
1983 *Les migrations de population au Nord du Bénin et leur impact socio-économique*, FAO, Cotonou.
- INSAE
1993 *Deuxième Recensement Général De La Population Et De l'Habitation*. INSAE, Cotonou.
1999 *Enquête pilote sur les migration au Bénin. Résultats et Analyse*, INSAE, Cotonou.
2003 *Troisième Recensement Général De La Population Et De l'Habitation*, INSAE, Cotonou.
- Jacobson, J.
1988 "Environmental refugees: a yardstick of habitability", *World Watch Paper* 86, World Watch Institute, Washington, DC.
- Judex, M.
2008 Modelling the land use dynamics in Central Benin with the XULU-framework, University of Bonn, Bonn, http://hss.ulb.uni-bonn.de/diss_online/math_nat_fak/2008/judex_michael/.

- Junge, B.
2004 *Die Böden des oberen Ouémé-Einzugsgebietes in Benin/Westafrika - Pedologie, Klassifizierung, Nutzung und Degradierung*, electronic dissertation, Faculty of Agriculture, University of Bonn, Bonn, http://hss.ulb.uni-bonn.de/diss_online/landw_fak/2004/junge_birte/
- Kibreab, G.
1997 "Environmental causes and impact of refugee movements: a critique of the current debate", *Disasters*, 21(1): 20–38.
- Landon, J.R.
1984 *Booker Tropical Soil Manual. A Handbook for Soil Survey and Agricultural Land Evaluation in the Tropics and Subtropics*, Booker Agriculture International, London.
- Lonergan, S.
1998 *The Role of Environmental Degradation and Population Displacement*, Global Environmental Change and Human Security Project, International Human Dimensions Programme on Global Environmental Change, Research Report 1, IHDP, Bonn.
- MCCAG-PD (Ministère Chargé de la Coordination de l'Action Gouvernementale, de la Prospective et du Développement & FNUAP (Fonds des Nations Unies pour la Population)
2001 *Rapport sur l'état et le devenir de la population du Bénin (REP 2001). Population et Développement: Quels Défis pour le Bénin?* MCCAG-PD and FNUAP, Cotonou.
- McNamara, K.
2007 "Conceptualizing discourses on environmental refugees at the United Nations", *Population & Environment*, 29(1): 12–24.
- MDR-ONASA
2000 *Atlas de sécurité alimentaire du Bénin*, MDR-ONASA, Cotonou.
- Meyer, B.
1992 "A detailed soil differentiation of slopes with slight inclination in the Niamtougou plain in Nord-Togo", *Zeitschrift für Geomorphologie*, 91: 123–134.
- Myers, N.
1993 "Environmental refugees in a globally warmed world", *Bioscience*, 43(11): 752–761.
1997 "Environmental refugees", *Population and Environment*, 19(2): 167–182.
2002 "Environmental refugees: a growing phenomenon of the 21st century", *Philosophical Transactions of The Royal Society B*, 357(1420): 609–613.
- Myers, N., and J. Kent
1995 *Environmental Exodus: an Emergent Crisis in the Global Arena*, The Climate Institute, Washington, DC.

- Piguet, E.
2008 "Climate change and forced migration", *New Issues in Refugee Research - Research Paper 153*, United Nations High Commissioner for Refugees, Geneva.
- Renaud, F., J.J. Bogardi, O. Dun, and K. Warner
2007 "Control, adapt or flee. How to face environmental migration?", *InterSecTions no.5*, UNU Institute for Environment and Human Security (UNU-EHS), Bonn.
- Republic of Benin, Department of Regional Planning
2000 *National Action Plan for Desertification Control*, Republic of Benin, Department of Regional Planning, Cotonou.
- Richter, R.E.
2000 "Umweltflüchtlinge in Westafrika. Ursachen, Ausmaß und Perspektiven", *Geographische Rundschau*, 52(11): 12–17.
- Standing, G.
1984 "Conceptualizing territorial mobility", in R. Bilborrow, et al. (Eds), *Migration Surveys in Low-Income Countries: Guidelines for Survey and Questionnaire Design*, ILO, London: 31–59.
- Stark, O.
1991 *The Migration of Labour*, Basil Blackwell, Cambridge.
- Tchégnon, P.
1995 *Migrations rurales, stratégies foncières et gestion des ressources naturelles dans le Département du Zou: cas de la sous-préfecture de Savè*. diploma thesis in Agronomy, Université Nationale du Bénin, Abomey-Calavi.
- Todaro, M.P.
1980 "Internal migration in developing countries. A survey", in E.A. Easterlin (Ed), *Population and Economic Change in Developing Countries*, University of Chicago Press, Chicago: 361–402.
- Van der Geest, K.
2008 "North-South migration in Ghana: what role for the environment?" paper presented at International Conference on Environment, Forced Migration and Social Vulnerability, Bonn, 9–11 October.
- Wood, W.B.
2001 "Ecomigration: linkages between environmental change and migration", in A. Zolberg and P.M. Benda (Eds), *Global Migrants Global Refugees - Problems and Solutions*, Berghahn, New-York: 42–61.