

# Are Migrant Associations Actors in Local Development? A National Event-History Analysis in Rural Burkina Faso

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**Summary.** — The objective of this paper is to provide quantitative evidence on the impacts of migrant associations on local development in rural Burkina Faso. We exploit a national retrospective community survey of 600 settlements conducted in 2002. Using longitudinal data and event-history models, we show significant effects of migrant associations on the creation of schools, health centers, and roads, while the direct effects on other facilities and on modernization of agriculture are non-significant. The paper also explores whether the impact of migrant associations varies according to the period and to some characteristics of the associations (location and age of the association).

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**Key words** — Africa, Burkina Faso, rural development, migrant association, event-history analysis, community survey

## 0. INTRODUCTION

The question of whether migration has a positive or a negative impact on sending areas has become a classic. This topic is often tackled through the lens of migrants' remittances. Beyond the micro level, migrants can also have an impact on their place of origin through the influence of collective organizations such as migrant associations. These organizations are usually described in the literature as important actors in local development. Yet, with few exceptions, conclusions are based on case studies (a village, a region at best) and are drawn from qualitative investigations. There is still a need to establish more general conclusions. This observation echoes a strong policy concern. In a large range of developing countries, governments have become less and less able to provide communities with the basic facilities they need and to give economic incentives for local development. In this context, migrant associations are nowadays seen as intermediary actors that could collaborate with, if not take the place of governments to ensure the development of sending areas (Portès, Escobar, & Walton Radford, 2005). More generally, migrant associations have attracted considerable attention in the development community: both non-governmental organizations (NGOs) and international organizations have already formed innovative partnerships with migrant associations in order to promote development (Orozco & Rouse, 2007). Yet, it is not clear so far whether migrant associations actually contribute to the local development of origin communities. The objective of this paper is to gather some quantitative evidence to assess their range of contribution. Results are provided at the national level and are related to Burkina Faso,<sup>1</sup> a land-locked country in Francophone West Africa, that has been affected by various and intense migration flows within the country (from rural to urban areas, but also largely rural-to-rural streams) and toward Côte d'Ivoire. Migration out of Burkina Faso toward Europe being anecdotic at the time of the survey, this national

case study gives no insight on the specific impact of collective investments of migrants based in developed countries. The paper aims at estimating the effects of migrant associations, based within Burkina Faso and/or in Côte d'Ivoire, on the local development of migrants' places of origin. We use a national retrospective community survey of 600 settlements conducted in 2002. Using longitudinal data and event-history models, we test whether the existence of a migrant association has an influence (1) on the provision of public services such as schools or health centers, (2) on the creation of other community amenities such as mills or boreholes, (3) on agricultural modernization through the development of market gardening and the use of tractors, and (4) on the availability of infrastructure (all-season roads). The general hypothesis to be tested is that the impact of migrant associations varies according to the type of indicator of local development. Overall, we show significant effects of migrant associations on the creation of schools and health centers, and on the development of all-season roads, while the effects on other facilities and on modernization of agriculture are non-significant. The paper also explores whether the impact of migrant associations varies according to the period and to some characteristics of the associations (location of the migrants and age of the association).

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## 1. REVIEW OF LITERATURE

### (a) *Migrant associations and sending communities in developing countries*

Migrant organizations have classically been described by anthropologists and historians as “migrant village associations” made up of domestic migrants moving from rural areas to towns and cities in developed as well as in developing countries (Fitzgerald, 2004). The development of international migration flows also resulted in the creation of migrant organizations in destination countries. Migrant associations are nowadays quite common institutions among migrants within and from developing countries. They are constituted of migrants sharing the same “place of origin,” hence the expressions “*association d'originaires*” or “*association de ressortissants*” in Francophone Africa. The literature also refers to them as “home-town associations” (HTAs). But this terminology tends to overshadow the fact that migrant associations often have rural bases and may also have regional instead of local bases. Specifically studying the associations of Latino migrants settled in the United States, Portès and colleagues (2005) have proposed another term: “Immigrant Transnational Organizations.” In West Africa, and especially in Burkina Faso, migrant associations are the initiative of both domestic and international migrants. We thus prefer to use the more neutral expression: “migrant association.”

In West African countries, the first associations were created under colonial rule. British administrators encouraged the creation of HTAs in Nigeria: they championed migrant associations as a way of fostering local improvements, as part of their strategy of indirect rule. In colonial times, migrant associations were thus ways of mobilizing development efforts in Nigeria. This function remained after decolonization (Honey & Okafor, 1998). In Francophone West Africa, no research has yet revealed that migrant associations were similarly encouraged by colonial officers. And the first associations were not primarily turned toward origin communities. Apparently, associations were spontaneously created by migrants settling in towns and cities and were essentially aimed at providing a supportive environment for new arrivals (helping people to find a job or adequate housing) (Mande, 1996). Their activities were mainly turned toward destination areas, although they also aimed at maintaining the migrants' connections with home. Migrant associations' objectives were primarily social, but the scope of their activities progressively broadened (informal insurance, rotating credit, organization of sports and cultural events, etc.). Following the same model, African migrant associations appeared in Europe in the 1970s, when West African trans-border flows became significant. This was especially the case in France with migrants originating from Mali and Senegal (Daum, 1995; Lavigne-Delville, 2000). At first, these organizations were vehicles of integration in the host country, as were their domestic counterparts in cities decades earlier. Today, members of a same migrant association may be scattered all over the world, the important link being the fact of sharing the same place of origin. Regardless of their place of residence, all members originate in the same community (i.e., share the same ancestry) to which they are supposed to have a strong commitment. Migrant associations are voluntary organizations, however, social control is usually so important that participation is often virtually an obligation (Honey & Okafor, 1998; Quiminal, 1991).

In the 1970s and 1980s, in West Africa, sending areas began to receive more attention from migrant associations of both the international and the domestic variety: promoting the

development of origin communities became one of their explicit objectives (Bierschenk, Chauveau, & Olivier de Sardan, 2000). Existing organizations broadened their agenda and new associations were also created to contribute to the development of sending areas. Basically, the new priority objective of the migrant associations is to take care of the needs of their village or town of origin, that is, to promote the creation of services such as schools and health centers, to implement social projects, and to participate in productive investments. One way to do this is through the organization of a collective remittances system. This characterizes most Malian and Senegalese migrant associations in France (Quiminal, 1991). Another way to fulfill this objective is to act as brokers between the origin community and potential sponsors, that is, governmental or non-governmental organizations (Bierschenk *et al.*, 2000; Honey, 1998). This is a strategy adopted by domestic migrant associations, whose urban-based leaders are usually well instructed and often have jobs that bring them into contact with public or private support organizations. International migrant associations also play a broker role since they have good access to developed countries' institutions (NGOs, municipalities). These ways of helping origin communities (collective remittances systems and lobbying practices) are not exclusive to Africa. Such strategies are also applied by migrant associations in other parts of the world (Orozco & Rouse, 2007; Portès *et al.*, 2005).

In the 1980s, the role of migrant organizations as development agents was reinforced by the interest they raised within NGOs, national governments, and international agencies. They have become privileged partners of NGOs that prefer them (1) to individuals because they appear as structured organizations (Jacob & Lavigne Delville, 1994) and (2) to governments because the latter are often alleged to use funds in an ineffective manner (Mande, 1996). State withdrawal, implemented in most West African countries in line with structural adjustment programs (SAPs), has reinforced further the role of migrant associations as development actors since public authorities have become less and less able to provide basic infrastructure and facilities. In Nigeria, migrant associations have been clearly designated by the government as community development agencies (Honey & Okafor, 1998). In fact, migrant associations have taken on a share of the tasks that the Nigerian state can no longer assume. For this reason, Honey and colleagues (1998) have come to consider Nigerian migrant associations as local “*shadow states*.”<sup>2</sup> Beyond Nigeria, West African governments appeal for international migrants to invest in the development of their region of origin.<sup>3</sup> Migrant associations are thus nowadays expected by governments to play an important role in this area. This is true in African as well as in Latin American countries (on the various kinds of support the governments give to migrant associations, see Portès *et al.*, 2005). In a large number of countries, migrant associations have already accomplished various projects. Qualitative and often monographic studies have been done on their impact (Orozco & Rouse, 2007). It has been shown in some contexts that (1) they contribute to social change (Kossi, 2000; López, Escala-Rabadan, & Hinojosa-Ojeda, 2001; Quiminal, 1991), (2) they partly compensate for the lack of public investments in infrastructure and services (Daum, 1998), but (3) they rarely engage in productive projects (Honey & Okafor, 1998; Lavigne-Delville, 2000; López *et al.*, 2001). All in all, migrant associations are expected to have a significant impact on local development because when they fund the construction of public infrastructure, such as roads and bridges, they improve local economies by facilitating economic transactions. Similarly, their funding of educa-

tion and health projects is a direct investment in human capital. And finally, their efforts to introduce modern agricultural techniques (e.g., irrigation or mechanization) contribute to environmental change. But these effects are still uncertain. Qualitative studies have highlighted a large range of obstacles that limit the success of migrants' collective efforts to develop their place of origin (Diawara, 1996; Kossi, 2000; Mande, 1996; Quiminal, 1991). As a result, most researchers have reached mixed conclusions. And, beyond local case studies, there is no assessment of the impact of migrant associations on a larger scale.

(b) *The case of Burkina Faso: state of the art and new questions*

(i) *A short history of Burkinabè migrant associations*

Compared to other countries, Burkina Faso seems to be particularly well endowed with migrant associations (Bierschenk *et al.*, 2000). But, contrary to other West African countries, such as Senegal and Mali, migration from Burkina Faso to European countries has been very limited, and few Burkinabè migrant associations exist outside Africa (not a single one in our data set).<sup>4</sup> Most organizations have been created by domestic migrants, even though international migrant associations have also been created by Burkinabè migrants in Côte d'Ivoire since the 1960s (Deniel, 1967).<sup>5</sup>

The very first associations of domestic migrants were created after World War II and especially after 1956, when a loi-cadre "enlarged the political arena in the Upper-Volta territory and stimulated practically every possible group [...] to organize for its own advancement." (Skinner, 1974). According to their constitutions, these new organizations were mostly aimed at providing mutual aid between their own members. But Skinner (1974) showed that politics was responsible for the rise and fall of most of these associations. They were created by servants and clerks who lost interest in them as soon as they gained some political power. Finally, these pioneer migrant associations did little except mobilize people for political purposes (Skinner, 1974).

Migrant associations remained quantitatively marginal until the 1970s. Then, according to official registers, the number of associations devoted to the development of sending communities dramatically increased from 58 in the 1970s to 119 in the 1980s (Diawara, 1996). At this time, Burkina Faso was severely affected by droughts, especially in the north. According to Mande (1996), this climatic context is responsible for the switch of migrant associations from cultural and adaptation purposes (in destination areas) to local development objectives (in sending areas), both because of a higher local demand (community needs were crucial) and because of new opportunities (international NGOs who rushed into the country were seeking local institutionalized partners). The NGOs saw migrant associations as valuable partners in local development for various reasons (Mande, 1996). First, they were supposed to know the field and the needs of the population. Second, they were believed to be known and supported by the population and as a result offered a better guarantee of success. Third, they had light management structures, in contrast with the heavily bureaucratic public organizations.

In the 1980s, migrant associations continued to flourish. Within this decade, they became more numerous than other types of associations. While sports associations were dominant in the 1940s and 1950s, migrant associations took the lead during the two following decades until the emergence of migrant associations, especially those dedicated to local development, in the 1980s (Diawara, 1996).

The 1990s confirmed this trend. Diawara (1996) observed a sharp progress in the number of newly created associations at the beginning of this decade. Within only 4 years (1990–93), 269 new migrant associations dedicated to local development were created in Burkina Faso, against 119 in the 1980s, 59 in the 1970s, and 19 in the 1960s. Diawara suggests that this sudden surge is linked to the democratization process that took place in the 1990s. On the one hand, the political parties encouraged the creation of satellite associations in order to increase the chances of their candidates being elected to the various institutions created by the new Constitution. On the other hand, educated migrants seeking to establish their reputation without the initial support of a party used the migrant associations as instruments to promote themselves on the local political scene. Analyzing the 1990s, Diawara comes to the same conclusion as Skinner (1974) in the 1940s and 1950s: migrant associations emerged as political tools for their leaders. In this political context, the question of whether or not they are effective organizations for promoting development is all the more relevant.

(ii) *Objective and hypotheses*

The goal of our paper is to provide a global and quantitative assessment, at the national level, of the impact of migrant associations on origin communities in Burkina Faso. Our primary hypothesis, in line with policy expectations, is that migrant associations are actors in development in sending communities, in which they provide investments or seek public or private support to invest in social projects (health and education), to supply new infrastructure (paved roads, electricity, telephone, and hydraulic system), and to introduce new activities or to modernize agriculture. By all these means, migrants are expected to induce changes in their community (in a broad sense, including social, economical, and environmental changes). From a theoretical point of view, this hypothesis is in line with the New Economics of Labor Migration (NELM), according to which migration is not simply the result of individual decisions aimed at maximizing personal benefits, but is much more the result of collective decisions aimed at overcoming market failures that threaten the material well-being of origin communities. This main hypothesis must be qualified, however, as the impact of migrant associations is likely to vary according to what is considered as local development (various indicators of local development will be used in this study), to the context (especially the period), and to some of the associations' characteristics (location of their migrant members, age of the association...). Four specific hypotheses will thus be tested in this paper (they are summarized in Table 1).

(1) In line with the review of literature, we globally hypothesize that migrant associations have more impact in providing facilities and infrastructure than in directly promoting economic change (Honey & Okafor, 1998; Lavigne-Delville, 2000; López *et al.*, 2001).

(2) The history of migrant associations in Burkina Faso shows that the incentives to create such organizations have varied over time. The development of origin communities was the primary objective of associations created in the 1970s and 1980s, while political ambition appeared as an important driver in the 1990s. In political terms, investments for local development might be less profitable than other forms of redistribution. Indeed, clientelism is presented as a common practice of leaders of migrant associations by both Diawara (1996) and Mande (1996). This kind of practice is not contradictory with effective local action by migrant associations, but it might diminish the potential scope of their activity. Thus our hypothesis is that the impact of

Table 1. *Main explanatory variables of the models*

| Model series | Hypothesis                                                                                                                                               | Main explanatory variable                                                                                                                |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| 1            | Migrant associations have more impact in providing facilities than in promoting economic change                                                          | Presence of a migrant association (yes/no)                                                                                               |
| 2            | The development impact of migrant associations grew from the 1960s till the 1980s, but decreased in the 1990s in times of political competition          | Interaction: period (decade) * presence of a migrant association (yes/no)                                                                |
| 3            | Associations of migrants residing in Côte d'Ivoire are less effective than domestic migrant associations in improving local development in sending areas | Location of the association (no association, association(s) based only in Burkina Faso, at least one association based in Côte d'Ivoire) |
| 4            | Older associations have a greater development impact than newly created associations                                                                     | Age of the association (<5 years, 6–10 years, >10 years)                                                                                 |

migrant associations on local development rose in the 1970s and 1980s compared to the 1960s, but decreased in the 1990s. (3) The effect of migrant associations is also likely to vary according to the migrants' characteristics: age, education, *etc.* (Orozco & Rouse, 2007; Portès *et al.*, 2005). The migrants' location might be an important predictor of their ability to promote local development. In the west African context (notably Mali and Senegal, see Lavigne-Delville, 2000), the associations of international migrants are alleged to have a stronger influence than their domestic counterparts mainly because the former have access to more resources in terms of (1) personal earnings (of obvious importance to determine remittance amounts used for community investments) and (2) institutional opportunities (contacts with NGOs, with municipalities interested by decentralized cooperation, *etc.*). However, in Burkina Faso, we hypothesize that international migrant associations have a weaker impact than their domestic counterparts. This is grounded on several arguments. First, unlike Senegalese and Malian migrants who are largely settled in Europe, Burkinabè international migrants mainly live in Côte d'Ivoire where the above-mentioned opportunities are more limited. Burkinabè migrants in Côte d'Ivoire have much lower incomes than their Malian or Senegalese counterparts in Europe. Furthermore, they have much more restricted access to support organizations (international NGOs, national institutions from developed countries). Second, almost 50% of Burkinabè people living in Côte d'Ivoire were born there, so that their links to their origin community may be weak, even though research in other countries has shown that second-generation migrants are sometimes involved in migrant transnational organizations (Lacroix, 2005; Portès *et al.*, 2005).<sup>6</sup> Third, field observations have concluded that Burkinabè international migrant associations are poorly organized in terms of collective remittances and that Burkinabè people living in Côte d'Ivoire are usually reluctant to invest in their country because they do not trust their public authorities (Blion & Bredeloup, 1997).

(4) Finally, the age of the associations may also be a factor that influences their effects on local development. In line with observations in the Latin American context (Portès *et al.*, 2005), we hypothesize that associations may take some time to become sufficiently organized and powerful to get funding for the construction of schools, health centers, *etc.* Put in other words, their activities might be visible only some time after their creation.

## 2. DATA AND METHOD

In order to test all these hypotheses, we use a unique quantitative data set that allows us, firstly to draw a picture of the

migrant associations in Burkina Faso since 1960 and, secondly, to carry out event-history analyses on the connections between migrant associations and local development (measured through the presence/absence of social amenities, basic facilities, infrastructure, and indicators of agricultural modernization).

### (a) *Data source: a national retrospective community survey*

The data used in the following analyses come from a retrospective community survey of 600 settlements in Burkina Faso conducted in 2002 (out of approximately 8,000 settlements in the whole country). This community survey was part of a larger project, *the Migration Dynamics, Urban Integration and Environment Survey of Burkina Faso* (EMIUB).<sup>7</sup> The first part involved the collection in 2000 of about 9,000 individual life histories (migration, activity, fertility...) of males and females aged between 15 and 64 at the time of the survey (Poirier, Dabiré, Le Jeune, Piché, & Wane, 2001). The community survey was designed to be linked with individual life histories for analyzing the determinants of migration (see Beauchemin & Schoumaker, 2005). However, this survey can also be used on its own to describe and analyze the determinants of changes in rural and urban settlements since the 1960s (Schoumaker, Dabire, & Gnoumou-Thiombiano, 2006).

Retrospective data were collected from groups of community informants, consisting of "délégués de village" (administrative representatives), village chiefs, and other knowledgeable informants. The survey covered a broad range of topics including transportation, health centers, schools, employment opportunities, development projects, agricultural mechanization, and, of specific interest for this paper, migrant associations. Efforts were made to obtain retrospective information since 1960 for most village characteristics. Respondents were asked to recall, for instance, the years when the schools opened or the year in which a migrant association was created. Several tests have shown that recall problems were minor and that most of the retrospective community variables are reliable (Schoumaker *et al.*, 2006).

Data on migrant associations include four variables: (1) the full name of the association, (2) the year of its creation (and the year of dissolution when the association no longer exists), (3) the place(s) where the association is located—that is, the place where the migrant leaders are settled—(name of city or town, country), and (4) the type of activities it carries out at the time of the survey (economic help in place of origin, integration of migrants in the place where the association is located, organization of cultural activities...). These variables have some limitations: they provide information neither on the precise activity of the association (type of cultural activities, funding of specific facilities, *etc.*), nor on their means of action (collective remittances, lobbying with public authorities, acting as brokers with NGOs...), the scale of their inter-

vention (local or regional), or their degree of formality (registered association or not).<sup>8</sup>

The community survey nonetheless provides rich information to test the relationships between the existence of migrant associations and the level of development of Burkinabè villages. A large range of variables, associated with local development, are included in the survey: at any time, the data set indicates whether each community is provided with various types of public facilities (primary schools, secondary schools, and health centers) or infrastructure (roads, electricity, telephone, mills, and boreholes) and whether economic changes have occurred (agricultural mechanization, irrigation, market gardening; other new activities such as commercial services). In this paper, we focus on seven variables that are considered as good indicators of local development, and that are also commonly cited in the literature as outcomes of migrant associations in West Africa (Daum, 1995; Diawara, 1996; Honey & Okafor, 1998; Kossi, 2000; Lavigne-Delville, 2000; Mande, 1996; Quiminal, 1991). Two of them are related to social services (primary schools and health centers); two others correspond to basic facilities (mills that reduce women's chores and offer them more time to take care of their children or to invest in productive activities; and boreholes that are of vital importance as a source of drinking water); two others are indicators of agricultural modernization (market gardening and tractor use); and the last one refers to a public infrastructure essential to modernize the local economy; that is, all-season roads (paved roads are too rare in Burkina Faso to be solely taken into account in our analyses). Facilities are taken into account only in periods when they actually function. This is an important detail because there are cases where migrant associations have built a school or a health center that the state does not provide with staff. In this case, facilities are just empty shells (Aguda, 1998).

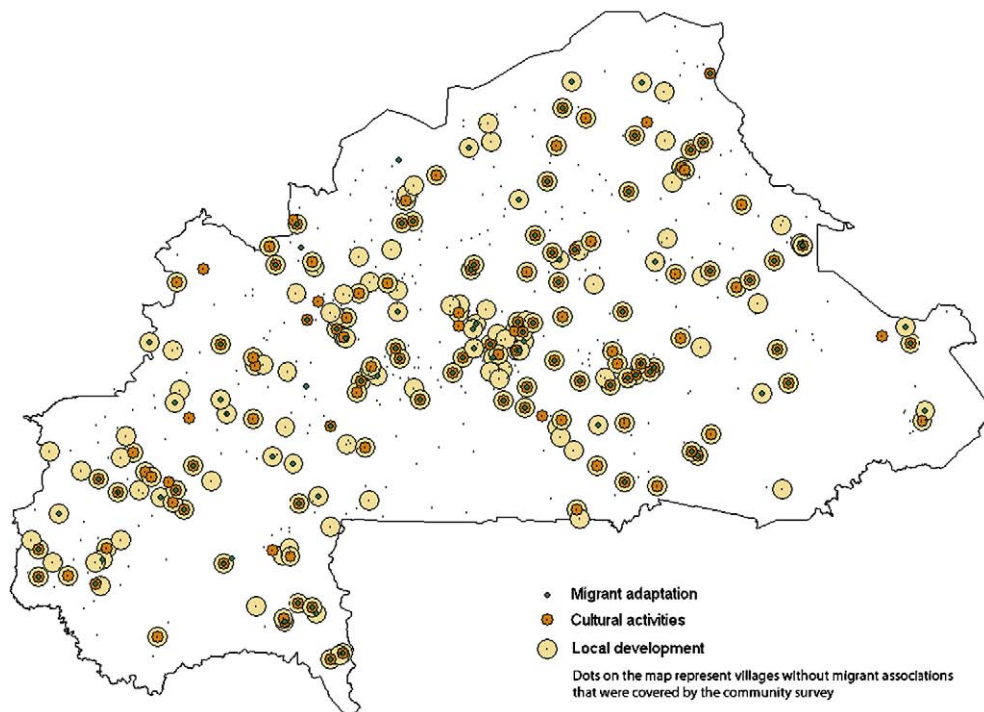
While the survey covers a large number of settlements all over the country (Map 1), they do not constitute a random sample of the 8,000 Burkinabè settlements. This is because

the community survey was primarily designed to be linked with the individual survey: the sample of communities is based on the settlements in which respondents of the individual survey had lived for at least three months. For logistic and financial reasons, only the communities cited at least three times in the individual survey were selected for the community survey (600 communities out of a total of 1,700 villages and towns reported in the individual retrospective survey<sup>9</sup>). As a result, places where migration is more prevalent are over-represented in the survey. In the end, large villages and small and medium-sized towns are over-represented in the community sample, as well as villages close to large towns and cities.<sup>10</sup> To correct for this bias, post-stratification weights were computed to adjust the sample to match the distribution of settlements in the country according to three stratification variables: population size (<5,000 inhabitants, 5,000–10,000, >10,000 inhabitants), province (45 provinces), and administrative status (*chef-lieu* of province or department).

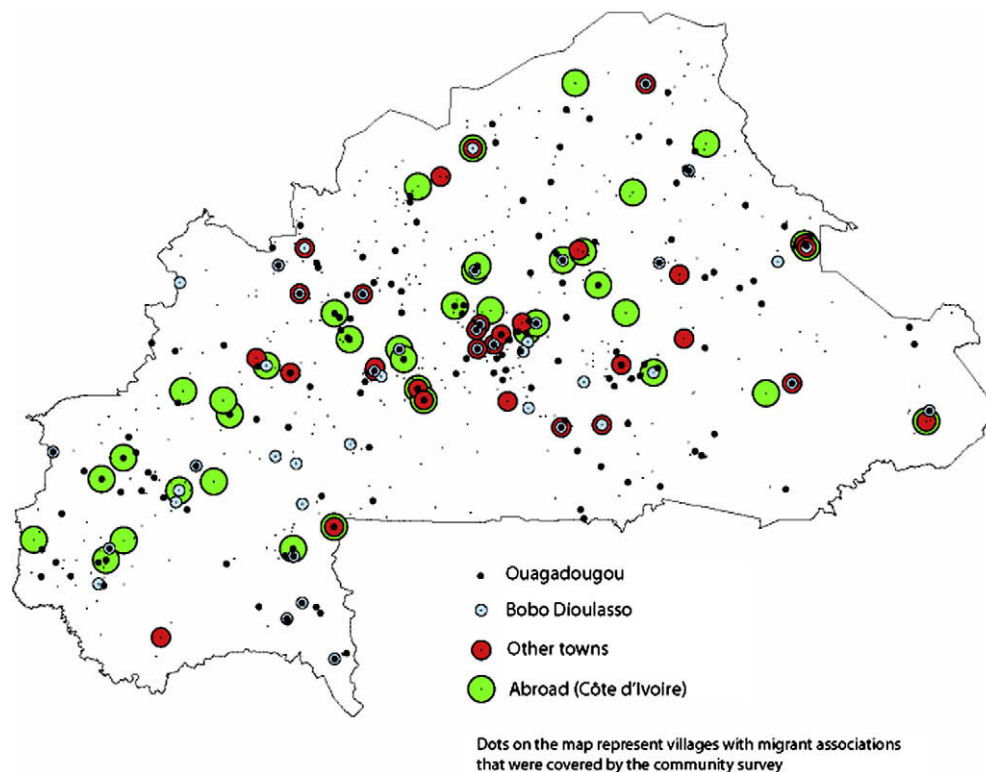
All in all, to what extent could this sample scheme bias our results? There might be an impact on the descriptive results: the prevalence of migrant associations at the national level might be over-rated since places with a lot of migrants are over-sampled. But there is no induced bias on the analyses that explore the relationships between the presence/absence of an association and the various indicators of local development. In summary, despite the limitations of the variables included in the data set and the fact that the sample is not strictly nationally representative, this survey offers a unique opportunity to assess, at a national level, the impact of migrant associations on local development through *longitudinal quantitative* analyses.

#### (b) Method

Using the community survey, we first provide descriptive analyses of the Burkinabè migrant associations in 2002 (number, types of activities, location...), and of their evolution



Map 1. Migrant associations in Burkina Faso according to their activities (communities surveyed in 2002).



Map 2. Migrant associations in Burkina Faso according to the location of their members (communities surveyed in 2002).

since the 1960s. We then turn to the relationship between the existence of migrant associations and the level of development of the villages (1) by comparing the evolution of the different above-mentioned amenities (schools, boreholes, roads, *etc.*) with the spread of migrant associations and (2) by providing bivariate analyses at the time of the survey. Finally, because of the limitation of cross-sectional analyses to infer causation, the community data are next analyzed using a longitudinal approach, namely discrete-time event-history analysis.

In this paper, discrete-time event-history models are aimed at determining whether the presence of a migrant association at time  $t - 1$  has an effect on various indicators of development at time  $t$ , that is, on the provision of a social service (school and health center), on the creation of a basic facility (borehole and mill), on an indicator of agricultural change (market gardening and tractor), or on the availability of an all-season road. A series of models were designed to test the various above-mentioned hypotheses (Section 1.b.ii). In these models, the seven indicators of development are dependent variables. Two models are computed for each of them: we test the effect of migrant association first without controlling for other explanatory variables except the period (Models a) and then controlling for extraneous effects (Models b). Four series of this set of models were computed in order to test our various hypotheses about the impact of migrant associations. Table 1 displays the various forms of the main explanatory variable related to the migrant associations.

Control variables are divided into two types: (1) those related to the general context (period and region<sup>11</sup>) and (2) those related to the local context (population size of the settlement, existence of a road in the village, existence of facilities in neighboring villages, *etc.*). Most control variables are common to all the models. But the models also include some control variables specifically related to the indicator of development

which is taken as a dependent variable. For instance, the presence of a dam or a lake is included as an independent variable in the models related to market gardening or boreholes, but not in the others. For the sake of parsimony, results of control variables are displayed only for the first model.

Most of the control variables are time-varying, so that the models assess if their existence and their characteristics at time  $t - 1$  have an impact on the probability that specific amenities will be built or activities will start in the community at time  $t$ . This 1-year lag between explanatory variables and the dependent variable limits possible problems of endogeneity.

Each model relies on a specific “village-year” data set, in which each village appears several times (a line per year). The number of lines is equal to the number of years during which the village is at risk of experiencing the event (e.g., first school). The time origin in this study is the year 1960 (first line in the data set). The last line corresponds either to the year during which the event under study occurred (construction of the first school, of a borehole...), or to the year of censoring. Censoring takes place (1) at the end of the last year before the survey (2001), or (2) when the village becomes a town.<sup>12</sup> For example, a village in which a school was first built in 1968 will appear nine times in the data set (from 1960 to 1968), and the dependent variable (construction of a school) will take the value 0 for each year during 1960–67, and take the value 1 for the year in which the school was built (1968). A village in which no school has ever been built will appear 42 times in the data set, with the value of the dependent variable equal to 0 from 1960 till 2001. Only the villages that had not experienced the event before 1960 were included in the data set. As a result, the number of villages in the data set varies depending on the models (see Table A.1). For instance, 590 villages are included in the model for boreholes, but only 299 villages are used in the model for all-season roads, as all the

other villages were already connected by an all-season road in 1960.

The discrete-time event-history model, estimated through binary logistic regression (Allison, 1995), is specified as follows:

$$\log \left( \frac{p_{it}}{1 - p_{it}} \right) = \alpha_t + \beta' \cdot \mathbf{X}_{it-1} \quad (1)$$

where  $p_{it}$  is the conditional probability that the village  $i$  experiences the event under study (first school, first health center, ...) in year  $t$  (starting from 1960), given that the event has not already occurred.  $\alpha_t$  represents the baseline hazard function.  $\mathbf{X}_{it-1}$  is a vector of time-constant and time-varying community-level covariates in year  $t - 1$ .

In the various models, only migrant associations reported of having a local development focus are taken into account. Thus, those associations whose only purpose is to carry out cultural activities or to promote migrants' integration in destination communities are not included in our analyses. We also limit our analyses to the effects of migrant associations on local development in rural areas (i.e., in settlements under 10,000 inhabitants). Their effect in the urban context is not completely without interest but (1) most migrant associations are specifically geared toward rural development (Mande, 1996) and (2) it is much more difficult to assess the associations' impact in urban areas because towns and cities are already provided with the essential amenities the models are looking at. Boreholes, schools, or health centers are present in all towns. Our indicators of agricultural modernization are not either relevant in the urban areas, not because there is no agriculture but because tractor use and market gardening are already quite common.

### 3. RESULTS

To assess the extent to which migrant associations are true actors in local development, three sets of results are presented in this part. Section 1 presents descriptive results on migrant associations: it shows the kind of activities they are involved

in at the time of the survey and how they have developed over time. Section 2 explores, still with descriptive analyses, the links between migrant associations and local development. Finally, this section presents the results of the various above-mentioned event-history models. It thus analyzes the causal relationships between migrant associations and the level of development of home communities.

#### (a) Descriptive analyses of Burkinabè migrant associations

In 2002, according to the community survey data, 20% of all the Burkinabè settlements had at least one migrant association.<sup>13</sup> Even though this result could be over-rated due to sample bias (over-representation of places affected by migration), it suggests that a significant proportion of villages can potentially benefit from the collective help of migrants organized into associations.

#### (i) Migrant associations are primarily devoted to local development

The types of activities reported in the community survey show that a large number of migrant associations are multi-functional. They combine at least two activities among the following: local development in the sending community; integration of migrants in the receiving communities (migrants' adaptation); cultural activities. . . When several types of activities are organized by the same association, local development is virtually always part of the combination. 01, in which each plot represents a community of our sample, is especially explicit in this matter. It clearly shows that (1) when organizations are multi-functional, local development is virtually always mentioned (the larger circle in Map 1) and (2) when they are mono-functional, they are almost always devoted to local development.

Table 2, which shows the weighted distribution of migrant associations by location, activity, and period of creation, confirms these results. At the national level, 62% of the migrant associations are involved in more than one activity, and 92% of all the migrant organizations are geared toward local development. Interestingly, this intention to promote development

Table 2. Description of the Burkinabè migrant associations (2002), rural areas

|                             | Location of the migrant association |              |                |              |                 |              |        |              | Total  |              |
|-----------------------------|-------------------------------------|--------------|----------------|--------------|-----------------|--------------|--------|--------------|--------|--------------|
|                             | Ouagadougou                         |              | Bobo-Dioulasso |              | Secondary towns |              | Abroad |              | Number | Weighted (%) |
|                             | Number                              | Weighted (%) | Number         | Weighted (%) | Number          | Weighted (%) | Number | Weighted (%) |        |              |
| <i>Type of activity</i>     |                                     |              |                |              |                 |              |        |              |        |              |
| Local development           | 137                                 | 92.4         | 37             | 72.2         | 30              | 86.4         | 33     | 100.0        | 237    | 92.1         |
| Cultural activities         | 78                                  | 48.5         | 16             | 27.3         | 18              | 63.5         | 9      | 25.8         | 121    | 44.2         |
| Migrants' adaptation        | 53                                  | 38.0         | 26             | 54.2         | 16              | 47.0         | 19     | 52.9         | 124    | 43.9         |
| Other activities            | 23                                  | 15.5         | 3              | 8.6          | 2               | 3.0          | 4      | 7.5          | 32     | 10.7         |
| <i>Number of activities</i> |                                     |              |                |              |                 |              |        |              |        |              |
| 1                           | 51                                  | 34.7         | 9              | 48.6         | 16              | 39.2         | 11     | 40.5         | 87     | 37.6         |
| 2                           | 57                                  | 38.0         | 21             | 40.9         | 13              | 35.1         | 12     | 32.7         | 103    | 34.4         |
| 3                           | 40                                  | 26.4         | 9              | 10.1         | 8               | 21.6         | 10     | 26.8         | 67     | 27.5         |
| 4                           | 4                                   | 0.9          | 1              | 0.4          | 0               | 0            | 0      |              | 5      | 0.5          |
| <i>Period of creation</i>   |                                     |              |                |              |                 |              |        |              |        |              |
| 1960s                       | 6                                   | 0.8          | 0              | 0.0          | 0               | 0.0          | 4      | 15.7         | 10     | 4.2          |
| 1970s                       | 9                                   | 3.7          | 4              | 6.3          | 2               | 5.4          | 10     | 41.8         | 25     | 13.3         |
| 1980s                       | 37                                  | 23.6         | 10             | 26.0         | 3               | 8.1          | 8      | 13.0         | 58     | 18.0         |
| 1990s                       | 100                                 | 71.9         | 26             | 67.7         | 32              | 86.5         | 11     | 29.5         | 169    | 64.4         |
| Total                       | 152                                 | 100.0        | 40             | 100.0        | 37              | 100.0        | 33     | 100.0        | 262    | 100.0        |

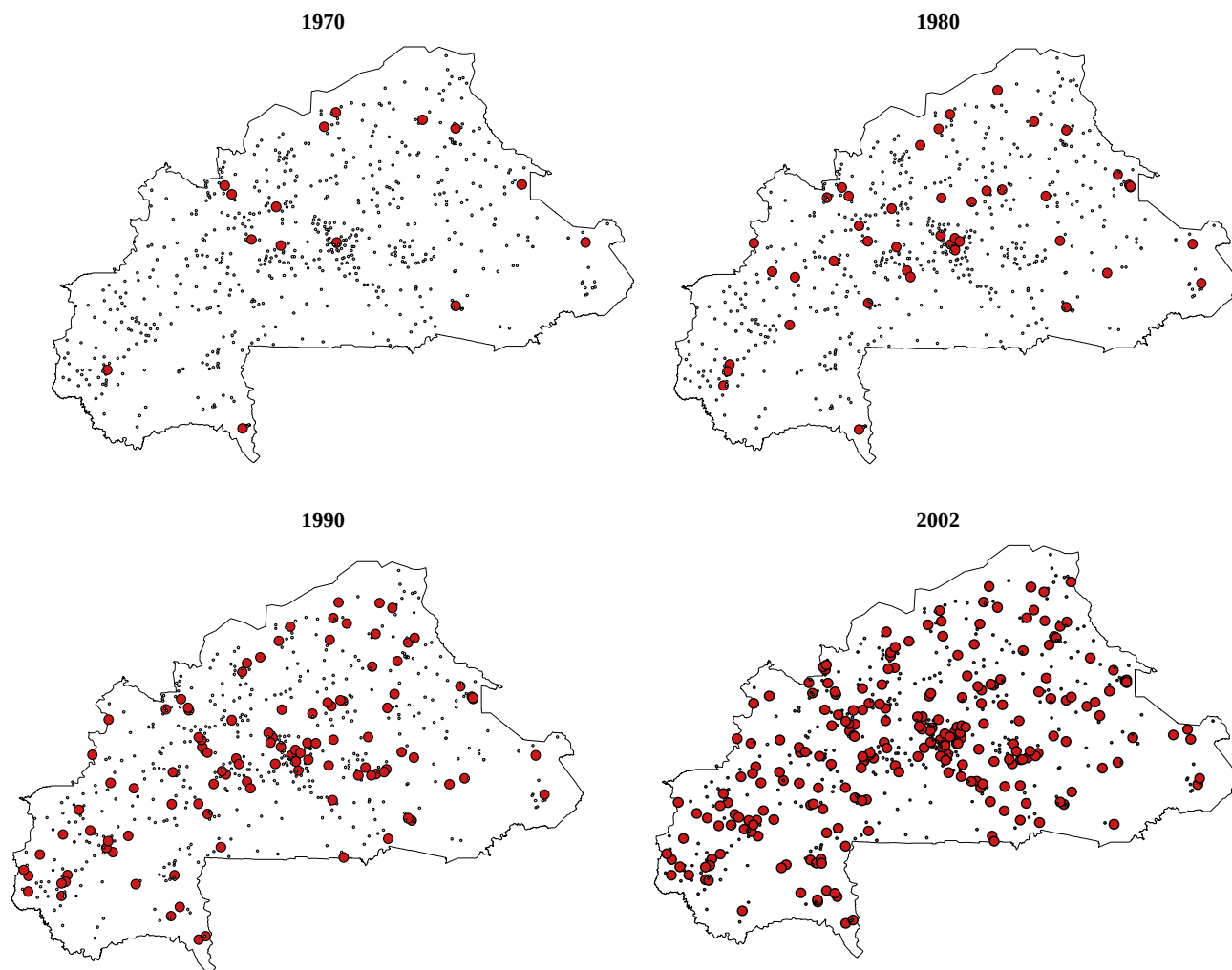
in the sending community is even larger for associations based abroad: all of them are involved in local development. Thus, it seems that migrant associations of the international type are more oriented toward local development than their domestic counterparts, a result which apparently contradicts our initial hypothesis about the differential role of the associations according to the place of settlement of their members.

(ii) *How migrant associations have spread all over the country (1960–2002)*

Regardless of their activity, the majority of migrant associations in 2002 are quite young organizations: 60% of them were created in the 1990s and <15% were created before the 1980s (Table 2). Map 3 confirms the late development of migrant associations among the communities of our sample. It also shows that this development covers the whole country. Even in the 1970s, at a time when migrant associations developed supposedly to help communities affected by droughts, the driest part of the country (the north) did not have an especially large concentration of villages possessing such organizations. On the contrary, the areas surrounding the country's cities, Ouagadougou and Bobo-Dioulasso, were hot spots for migrant associations, something that Mande (1996) had already stressed in his review of the migrant associations devoted to development officially registered during 1959–82.

Figure 1 shows more specifically how migrant associations devoted to local development spread across Burkina Faso during the last three decades of the 20th century. This figure largely echoes the history of migrant associations presented above. It recalls three facts. First, migrant associations started to develop in the early 1970s, at the time of the most severe droughts.

Second, their number grew steadily during the 1970s–80s. A first possible explanation for this progression is related to the process of urbanization: rural inhabitants migrated to towns and cities from various regions of the country, forming a reservoir of potential members for new associations (Mande, 1996). The migrant association movement may also have developed a better understanding of the institutional framework. The years following the droughts can be seen as a period of apprenticeship for migrant associations: working with NGOs, they progressively learned how to deal with international aid and how to raise money. Their success explains the ensuing spread of these organizations. Besides, they benefited from the new principles of the development ideology: they were in line with the participative approach encouraging grassroots development and they were also intermediate organizations in a period when neither the State nor the individuals appeared as valid partners for most international organizations (Bierschenk *et al.*, 2000; Diawara, 1996; Mande, 1996).



Map 3. *The geographical spread of migrant associations in Burkina Faso (1970–2002).*

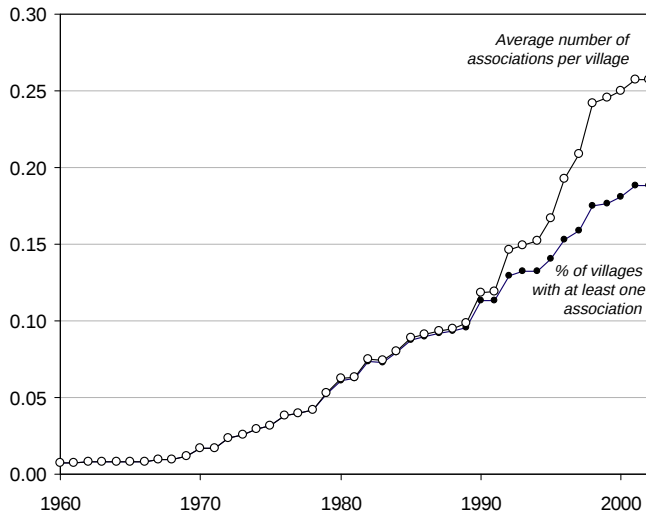


Figure 1. Evolution of migrant associations dedicated to local development (1960–2002), rural areas.

Third, the 1990s represent a turning point, with a continuous rise in the proportion of communities with at least one association (lower curve of Figure 1) and, more strikingly, with a sharp increase in the average number of associations per community (it doubled within 10 years, upper curve of Figure 1). Why did several associations begin to coexist in a single village? Two competing hypotheses can be formulated. It could simply reflect the diversification of the migrants' destinations: over time, as migrants leave for increasingly diverse destinations, the number of organizations in the origin community grows because migrants set up an organization at each particular destination.<sup>14</sup> But, as suggested by Diawara (1996), it could also reflect a growing political competition in times of democratization: the 1990s correspond to a time when migrant associations were created as instruments to support local political parties in a newly competitive context.

(b) *Migrant associations and local development: descriptive results*

The spread of migrant associations is contemporary with the development of the various services, amenities, infrastructure, and activities considered as indicators of local development in this paper (Figure 2). This tends to globally support the idea that migrant associations are actors in the development of their origin communities. More specifically, the period of regular growth in the proportion of villages with an association (1970–2000) coincides more or less with the progress in the proportion of villages equipped with schools, health centers, boreholes, and mills. The coincidence is less obvious for indicators of agricultural modernization (market gardening or tractor use) and infrastructure (roads). The comparison between Figures 1 and 2 thus tends to confirm our first hypothesis according to which migrant associations are more effective in providing facilities than in promoting economic development.

The results displayed in Figure 3 provide additional insight on the correlation between migrant associations and local development. At the time of the survey, villages with at least one migrant association are always better equipped with amenities than those without such an organization. Furthermore, the relationship is clearly stronger for social services (schools and health centers) than for other indicators of local develop-

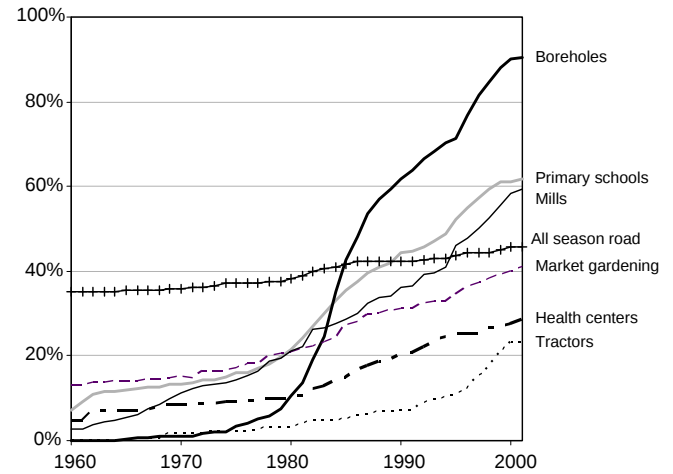
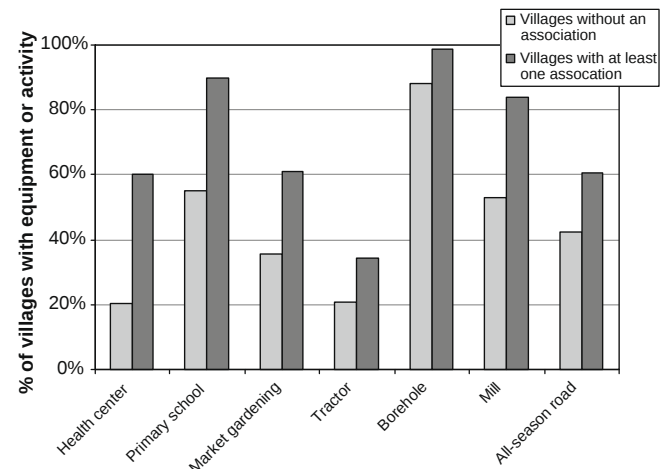


Figure 2. Evolution of selected amenities and activities in rural areas (1960–2001).



All differences are significant at the 1% level.

Figure 3. Proportion of villages equipped with selected amenities and activities by the presence or absence of a migrant association.

ment. For instance, 61% of the villages with at least one association have a health center, while the proportion is three times lower (21%) for villages without an association. Regarding tractor use, the gap is only from 21% for villages without an association to 33% for villages with an association. More surprisingly, the difference is also quite small for boreholes. This is simply because this kind of facility had become very common at the end of the 1990s (90% of all Burkinabè villages in 2000). Still, while 12% of villages remain without access to a clean drinking water among those with no association, almost all villages (98%) with a migrant association have a borehole. The correlation is also clear for roads.

In short, despite noticeable differences between the various indicators of development, all descriptive results suggest that migrant associations may be vectors of development in rural communities. But these results do not allow us to infer causation, as they are cross-sectional. Furthermore, they do not control for potential confounding variables. In order to refine the results on the influence of migrant associations on the local development of sending communities, multivariate longitudinal analyses have been carried out.

(c) *Migrant associations and local development: event-history analyses*

(i) *Public amenities and roads are the priorities of migrant associations (Hypothesis 1)*

The results of the models confirm the existence of a link between migrant associations and local development of home communities (Table 3, Model a for each dependent variable). Beyond correlations, these results give an insight into the sense of the relationship. Controlling only for the period, it appears that villages with a migrant association at time  $t - 1$  are around twice as likely to get a road, a mill, a borehole, a tractor, or to begin to practice market gardening, four times more likely to obtain a primary school, and five times more likely to be equipped with a health center at time  $t$  than villages without a migrant association. All these results confirm that migrant associations have an impact and that this impact varies according to the type of local development indicator considered. The effects are especially large and significant for social services (schools and health centers) but are still noticeable on the other dependent variables.

Controlling for all variables (Table 3, Model b for each dependent variable), the effects of migrant associations globally weaken: the odds ratios concerning the variable "presence of an association" diminish in all models and lose their significance in many models. They finally remain positive and significant only for social services (schools and health centers) and roads, two types of amenities that are indeed very commonly cited in the literature as outcomes of migrant associations. In the end, neither the variables related to other community facilities (mills and boreholes), nor those related to the agricultural modernization (market gardening and tractor use) are significantly influenced by migrant associations (although all the effects are positive). Actually, the presence of these amenities is mainly influenced by community variables at the local level (presence of a road, a market, etc.). Considering the history of migrant associations in Burkina Faso, and especially the acknowledged role of the droughts in their initial development, the absence of a significant effect of these organizations on the provision of boreholes might appear as puzzling. Actually, this result echoes our observation about the localization of migrant associations (Section 3.a.ii). Droughts may have encouraged migrant associations to turn their attention toward origin communities. But their main actions were not aimed at overcoming climatic uncertainties: they were and remain essentially turned toward public amenities, such as schools, health centers, and roads. Economic direct development appears as a marginal domain of action for them. This orientation is easily understandable. Schools and health centers are priorities for migrant associations probably because they have a sense that investment in social capital, through education and health improvement, is a prerequisite to economic development. This explanation stands for roads as well: they are premises of local development by multiplying economic opportunities.

(ii) *The impact of migrant associations varies according to the period (Hypothesis 2)*

Regardless of the indicator of local development, the effect of migrant associations is expected to vary according to the period. Basically, the history of migrant organizations in Burkina Faso suggests that their impact grew over the decades from the 1960s to the 1980s and decreased in the 1990s, when associations—at least some of them—became political instruments in times of growing competition between parties. Results on the crossed effect of the period and the presence/

absence of an association are displayed in a series of graphs (Figure 4). These graphs show the predicted annual probabilities that specific amenities will be built or activities will start in the community in the four decades. Predicted probabilities were computed from regression coefficients by holding constant the values of all the independent variables,<sup>15</sup> except the time period and the presence/absence of an association. The graphs show quite varied patterns of evolution. They are commented decade by decade, starting with the more recent period.

In the 1990s, the striking result is that there is no significant difference between villages with and without a migrant association, except in the case of health centers for which migrant associations have a positive impact, as in the previous decades.

In the 1980s, results are significant only for public amenities. In this decade, villages with a migrant association had significantly higher chances to obtain a road, a school, or a health center than the other villages. For instance, villages without an association had an annual probability of obtaining a new school of around 2% against 8% for those with an association.

In the 1970s and 1960s, results are significant in all domains but are contrasted. The direction of the relationship between migrant associations and local development depends on the nature of the indicator. Migrant associations had a positive effect on mills and on public amenities (road, school, or health center). They had virtually no impact on boreholes in a period of severe droughts, a result that confirms again that migrant associations did not aim at overcoming climatic uncertainties. Finally, and more surprisingly, they had a negative effect on indicators of agricultural modernization. Indeed, in the 1960s and 1970s, villages without a migrant association had higher probabilities of using a tractor or practising market gardening than villages with such an organization. Actually, it is possible that the variable "presence of an association" captures the effect of a low potential for agricultural development, since migration might well have been especially significant in this kind of place.<sup>16</sup> A competing explanation hypothesis would be that migration had a disruption effect on the local agricultural systems, especially through labor force loss, so that the communities affected by migration were not able to engage in modernization especially when migration became especially significant (in the 1960s and 1970s).<sup>17</sup> This effect seems to have diminished in the following decades, when indicators of agricultural modernization became more common features and when migrant associations had already accomplished social investments.

All in all, our hypothesis of an increasing impact, from the 1960s till the 1980s, of migrant associations on local development is not clearly confirmed. Results show a much more complex story. As for the 1990s, results are not clear cut either, even when looking only at the indicators on which associations have usually a positive impact. Gaps between villages with and without an association literally shrunk during the 1980s–90s for the provision of schools and roads, but results are not significant for these indicators. Actually, results are only significant for health centers, for which the difference between villages with and without an association has remained constant, those endowed with an association conserving their advantage. In the end, our hypothesis of a decreasing impact in times of political competition is not really confirmed.

In any case, this set of results on the impact of migrant organizations according to the period confirms that the effect of migrant associations is specialized in the domain of social services (schools and health centers) and roads. These are the only indicators for which the annual probabilities of being

Table 3. *Event-history models to test the effects of the presence or absence of a migrant association (Model series 1)*

| Odds ratios                                    | Social amenities |          |                |         | Agricultural modernization |         |         |         | Basic facilities |         |         |         | All-season road |         |
|------------------------------------------------|------------------|----------|----------------|---------|----------------------------|---------|---------|---------|------------------|---------|---------|---------|-----------------|---------|
|                                                | Health center    |          | Primary school |         | Market gardening           |         | Tractor |         | Boreholes        |         | Mills   |         |                 |         |
|                                                | Model a          | Model b  | Model a        | Model b | Model a                    | Model b | Model a | Model b | Model a          | Model b | Model a | Model b |                 |         |
| <i>Economic association (ref = no)</i>         |                  |          |                |         |                            |         |         |         |                  |         |         |         |                 |         |
| Yes                                            | 5.63***          | 4.05***  | 3.91***        | 2.80*** | 2.15*                      | 1.06    | 2.35*** | 1.54    | 1.77**           | 1.48    | 1.96**  | 1.23    | 2.71*           | 2.58*   |
| <i>Period</i>                                  |                  |          |                |         |                            |         |         |         |                  |         |         |         |                 |         |
| 1960–69                                        | 0.48             | 0.53     | 0.17***        | 0.16*** | 0.14***                    | 0.15*** | 0.54    | 0.74    | 0.01***          | 0.01*** | 0.41*** | 0.40*** | 0.14***         | 0.17*** |
| 1970–79                                        | 0.18***          | 0.19***  | 0.23***        | 0.21*** | 0.52*                      | 0.54    | 0.36*   | 0.48    | 0.08***          | 0.08*** | 0.55**  | 0.55**  | 0.39*           | 0.45    |
| 1980–89 (ref)                                  | 1.00             | 1.00     | 1.00           | 1.00    | 1.00                       | 1.00    | 1.00    | 1.00    | 1.00             | 1.00    | 1.00    | 1.00    | 1.00            | 1.00    |
| 1990–2001                                      | 0.89             | 1.02     | 1.04           | 1.36    | 0.87                       | 0.80    | 3.82*** | 3.39*** | 1.33             | 1.76*** | 1.87*** | 2.01*** | 0.55            | 0.54    |
| <i>Region</i>                                  |                  |          |                |         |                            |         |         |         |                  |         |         |         |                 |         |
| <500 mm (ref)                                  | –                | 1.00     | –              | 1.00    | –                          | 1.00    | –       | 1.00    | –                | 1.00    | –       | 1.00    | –               | 1.00    |
| 500–699 mm                                     | –                | 1.28     | –              | 1.11    | –                          | 0.35**  | –       | 0.71    | –                | 1.01    | –       | 4.37*** | –               | 1.03    |
| 700–899 mm                                     | –                | 1.38     | –              | 1.48    | –                          | 0.30**  | –       | 0.85    | –                | 0.66    | –       | 6.07*** | –               | 3.54*   |
| 900+ mm                                        | –                | 1.09     | –              | 0.87    | –                          | 0.75    | –       | 0.79    | –                | 0.43*** | –       | 3.38**  | –               | 1.98    |
| <i>Village size</i>                            |                  |          |                |         |                            |         |         |         |                  |         |         |         |                 |         |
| <5,000                                         | –                | 1.00     | –              | 1.00    | –                          | 1.00    | –       | 1.00    | –                | 1.00    | –       | 1.00    | –               | 1.00    |
| 5,000–10,000                                   | –                | 1.97     | –              | 4.86*** | –                          | 1.95    | –       | 1.44    | –                | 1.53    | –       | 2.22*   | –               | 4.42**  |
| <i>Road (ref = no)</i>                         |                  |          |                |         |                            |         |         |         |                  |         |         |         |                 |         |
| All-season road                                | –                | 2.40***  | –              | 1.66*** | –                          | 1.53*   | –       | 2.02**  | –                | 1.31    | –       | 1.24*** | –               | –       |
| <i>Market (ref = none)</i>                     |                  |          |                |         |                            |         |         |         |                  |         |         |         |                 |         |
| At least one                                   | –                | 6.53***  | –              | 3.15*** | –                          | 4.21*** | –       | 2.10**  | –                | 1.77*** | –       | 4.73*** | –               | 0.92    |
| <i>Non agricultural employment (ref = no)</i>  |                  |          |                |         |                            |         |         |         |                  |         |         |         |                 |         |
| Some                                           | –                | 1.99***  | –              | 1.69**  | –                          | 1.09    | –       | 0.96    | –                | 1.02    | –       | 1.80*** | –               | 1.49    |
| <i>Distance to the nearest similar amenity</i> |                  |          |                |         |                            |         |         |         |                  |         |         |         |                 |         |
| <5 km                                          | –                | 1.00     | –              | 1.00    | –                          | –       | –       | –       | –                | –       | –       | –       | –               | –       |
| 6–10 km                                        | –                | 9.94***  | –              | 1.85*** | –                          | –       | –       | –       | –                | –       | –       | –       | –               | –       |
| >10 km                                         | –                | 19.63*** | –              | 2.60*** | –                          | –       | –       | –       | –                | –       | –       | –       | –               | –       |
| <i>Development project (ref = no)</i>          |                  |          |                |         |                            |         |         |         |                  |         |         |         |                 |         |
| At least one                                   | –                | 1.78*    | –              | 1.99*** | –                          | 1.96*   | –       | 2.49*** | –                | 1.01    | –       | 1.99*** | –               | 1.60    |
| <i>Cash crops (ref = no)</i>                   |                  |          |                |         |                            |         |         |         |                  |         |         |         |                 |         |
| Yes                                            | –                | –        | –              | –       | –                          | 1.44    | –       | 2.38*** | –                | –       | –       | 1.91*** | –               | –       |
| <i>Damllake (ref = no)</i>                     |                  |          |                |         |                            |         |         |         |                  |         |         |         |                 |         |
| Yes                                            | –                | –        | –              | –       | –                          | 4.79*** | –       | –       | –                | 1.53*   | –       | –       | –               | –       |

\*\*\*  $p < 0.01$ ; \*\*  $p < 0.05$ ; \*  $p < 0.10$  (Significance level, two-tailed tests).

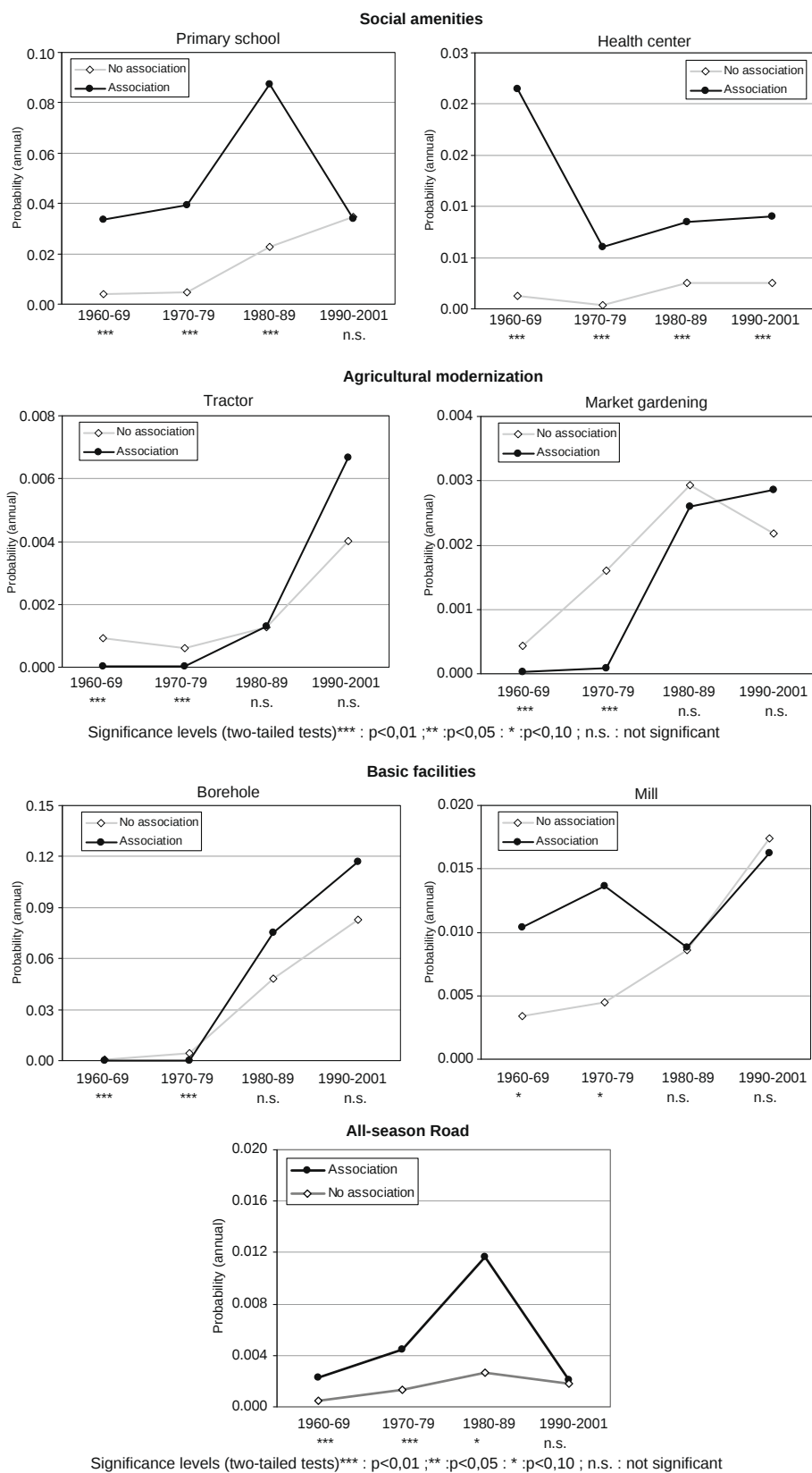


Figure 4. Predicted annual probabilities that specific amenities are built or activities started in the village, by decade and presence/absence of an association.

Table 4. *Event-history models to test the effects of the characteristics of migrant associations (Model series 2–4, results of control variables not shown)*

| Odds ratios                                                                        | Social amenities |         |                |         | Agricultural modernization |         |         |         | Basic facilities |         |         |         | All-season roads |         |
|------------------------------------------------------------------------------------|------------------|---------|----------------|---------|----------------------------|---------|---------|---------|------------------|---------|---------|---------|------------------|---------|
|                                                                                    | Health center    |         | Primary school |         | Market gardening           |         | Tractor |         | Boreholes        |         | Mills   |         |                  |         |
|                                                                                    | Model a          | Model b | Model a        | Model b | Model a                    | Model b | Model a | Model b | Model a          | Model b | Model a | Model b | Model a          | Model b |
| <i>Period * presence/absence of an association (Model series 2) – see Figure 4</i> |                  |         |                |         |                            |         |         |         |                  |         |         |         |                  |         |
| 1960–69                                                                            |                  |         |                |         |                            |         |         |         |                  |         |         |         |                  |         |
| No association                                                                     | 0.45             | 0.49    | 0.18           | 0.17    | 0.14                       | 0.15    | 0.50    | 0.72    | 0.01             | 0.01    | 0.39    | 0.39    | 0.16             | 0.19    |
| Association                                                                        | 11.21***         | 8.74**  | 2.01***        | 1.49*** | 0.01***                    | 0.01*** | 0.02*** | 0.03*** | 0.00***          | 0.00*** | 1.90**  | 1.20*   | 0.71**           | 0.67*** |
| 1970–79                                                                            |                  |         |                |         |                            |         |         |         |                  |         |         |         |                  |         |
| No association                                                                     | 0.13             | 0.14    | 0.22           | 0.20    | 0.53                       | 0.55    | 0.36    | 0.48    | 0.09             | 0.08    | 0.51    | 0.52    | 0.41             | 0.48    |
| Association                                                                        | 3.28***          | 2.41**  | 2.42***        | 1.77*** | 0.03***                    | 0.03*** | 0.01*** | 0.02*** | 0.00***          | 0.00*** | 2.47**  | 1.59*   | 1.82**           | 1.67*** |
| 1980–89                                                                            |                  |         |                |         |                            |         |         |         |                  |         |         |         |                  |         |
| No association (ref)                                                               | 1.00             | 1.00    | 1.00           | 1.00    | 1.00                       | 1.00    | 1.00    | 1.00    | 1.00             | 1.00    | 1.00    | 1.00    | 1.00             | 1.00    |
| Association                                                                        | 5.02***          | 3.40**  | 6.02***        | 4.12*** | 1.61                       | 0.89    | 1.26    | 1.03    | 2.01**           | 1.60    | 1.46    | 1.02    | 4.21*            | 4.40*   |
| 1990–2001                                                                          |                  |         |                |         |                            |         |         |         |                  |         |         |         |                  |         |
| No association                                                                     | 0.90             | 1.00    | 1.18           | 1.55    | 0.77                       | 0.75    | 3.42    | 3.16    | 1.35             | 1.77    | 1.88    | 2.04    | 0.69             | 0.68    |
| Association                                                                        | 4.38***          | 3.61*** | 1.73           | 1.51    | 2.40**                     | 0.98    | 9.05*** | 5.28    | 2.18             | 2.60    | 3.02    | 1.90    | 0.81             | 0.77    |
| <i>Location of the migrant association (Model series 3)</i>                        |                  |         |                |         |                            |         |         |         |                  |         |         |         |                  |         |
| No association in Burkina                                                          | 1.00             | 1.00    | 1.00           | 1.00    | 1.00                       | 1.00    | 1.00    | 1.00    | 1.00             | 1.00    | 1.00    | 1.00    | 1.00             | 1.00    |
| At least one association in Burkina Faso                                           | 5.35***          | 3.16**  | 4.97***        | 2.48*   | 1.58                       | 0.60    | 3.26*** | 1.93*   | 2.28**           | 1.66    | 2.39**  | 1.19    | 1.01             | 0.82    |
| No association in Côte d'Ivoire                                                    | 1.00             | 1.00    | 1.00           | 1.00    | 1.00                       | 1.00    | 1.00    | 1.00    | 1.00             | 1.00    | 1.00    | 1.00    | 1.00             | 1.00    |
| At least one association in Côte d'Ivoire <sup>a</sup>                             | 5.42***          | 4.94*** | 3.24***        | 2.71**  | 2.73*                      | 1.75    | 0.98    | 0.78    | 1.55             | 1.36    | 1.49    | 1.09    | 2.94             | 3.40*   |
| <i>Age of the migrant association (Model series 4)</i>                             |                  |         |                |         |                            |         |         |         |                  |         |         |         |                  |         |
| No association                                                                     | 1.00             | 1.00    | 1.00           | 1.00    | 1.00                       | 1.00    | 1.00    | 1.00    | 1.00             | 1.00    | 1.00    | 1.00    | 1.00             | 1.00    |
| Association <5 years old                                                           | 11.34***         | 7.97*** | 3.56**         | 2.11    | 1.50                       | 0.69    | 2.46*   | 1.49    | 1.22             | 0.94    | 1.20    | 0.78    | 0.04***          | 0.03*** |
| Association 6–10 years old                                                         | 1.39             | 1.11    | 7.35***        | 4.88*** | 0.45                       | 0.22*   | 0.99    | 0.64    | 1.96             | 1.52    | 1.87    | 1.14    | 1.75             | 1.74    |
| Association older than 10 years                                                    | 3.90***          | 2.60*   | 1.62           | 1.89    | 3.48***                    | 1.90    | 2.77**  | 1.90    | 2.23**           | 2.13**  | 2.57**  | 1.64    | 4.94**           | 4.49**  |

<sup>a</sup> Including two cases: (1) villages with only one association in Côte d'Ivoire and (2) villages with several associations (some within Burkina Faso and another abroad). See Map 2.

\*\*\* $p < 0.01$ ; \*\* $p < 0.05$ ; \* $p < 0.10$  (Significance level, two-tailed tests).

equipped remained constantly higher for villages with an association than for those without.

(iii) *Does the impact of migrant associations grow with their age? (Hypothesis 4)*

The idea that “the older the associations are, the more efficient they are” is quite intuitive: over time, they are supposed to increase their membership, to gain experience, and to extend their network of potential sponsors. However, our results do not exhibit such a pattern. After introducing control variables, the results are quite heterogeneous. The impact of the associations is especially high on health centers for young associations (up to 5 years old), on primary schools for medium-aged associations (between 6 and 10 years old), and on boreholes and roads for the older associations (over 10 years old), while there is no effect of migrant associations on mills, tractors, and market gardening. These specific results are difficult to explain, but the main outcome is that, contrary to common wisdom, no linear effect of age is perceptible on the impact of migrant associations. The results also confirm the same old story: migrant associations have no significant impact on agricultural modernization, whatever the age of the organization.

(iv) *Domestic versus international organizations: a differential impact? (Hypothesis 3)*

Based on the review of literature, we initially hypothesized that associations based in Côte d’Ivoire have a lesser effect than their domestic counterparts. However, descriptive results have shown that migrant associations rooted in Côte d’Ivoire have a stronger interest in matters of local development than those based in Burkina at the time of the survey (Section 3.a.i). In reality, beyond declared interest, and looking back over a 42-year period (1960–2001), are associations based abroad more or less effective than their domestic counterparts in promoting the development of their origin communities?

The third model series (Table 4) provides some balanced results. To some extent, both types of migrant associations have similar effects: be the associations located in Burkina or in Côte d’Ivoire, there is no significant result regarding community facilities (mills and boreholes) and a significant and positive effect regarding social amenities. However, there are also some contrasting results regarding the effects of the associations’ location. First, in contradiction with our initial hypothesis, associations based abroad have a stronger impact on the provision of social amenities and roads than their domestic equivalents. For instance, a village with at least one association based in Côte d’Ivoire in a given year is five times more likely to be equipped with a health center the following year than a village with no association at all. The odds are only multiplied by three when the village has a migrant association of the domestic type. The second contrast, related to agricultural modernization, is more surprising. When location is not taken into account, migrant associations have no impact at all on the use of tractors (Table 3). But when villages with at least one migrant association based abroad are separated from the others, villages with associations based only in Burkina Faso are two times more likely to use a tractor than the villages with no association. In this specific case, villages with an association in Côte d’Ivoire seem to be less advantaged than those with a connection abroad. Albeit in line with our initial hypothesis, this differential result is all the more difficult to explain given that it is the sole case of associations’ impact on agricultural modernization in our entire set of results.

## 4. CONCLUSION

### (a) Results summary

All in all, do migrant associations act as vectors of local development in home communities? Migrant associations have no significant impact either on agricultural modernization (measured through the practice of market gardening and the use of tractors in the community<sup>18</sup>), or on the provision of basic facilities (boreholes and mills). However, the presence of a migrant association is a powerful factor to explain the building of a primary school, a health center, or an all-season road in a village. Obviously, migrant associations are not primarily local growth machines, coordinating efforts across the community to increase the levels of economic activity. Apparently, they contribute little to improving working conditions and material comfort. Still, they are powerful instruments of change in rural areas: by bringing medical services, they contribute to reducing morbidity and mortality; and by bringing schools, migrant associations provide educational opportunities for children. In doing so, they act undoubtedly as progressive organizations. All in all, even if they are not direct vectors of economic development, they nonetheless invest in *human resources development*. In addition, by contributing to the building of all-season roads, they obviously extend local economic opportunities. All in all, even though migrant associations do not invest directly in economic activities, they appear to contribute to the pre-conditions for economic take-off. In short, albeit indirectly, migrant associations may well promote economic change in home communities.

### (b) Policy implications

It is worth noting that migrant associations seem especially effective in domains (education, health, and roads) which are normally matters of public policies in Burkina Faso. The impact of migrant associations can thus be understood as a symptom of the inadequacy of the state in meeting the needs of citizens. To some extent, migrant associations in Burkina Faso, as in other countries, act as substitutes for the state: “HTAs perform for their members and hometowns those functions that the state does not perform at all, or does not perform satisfactorily” (Honey, 1998, about Nigeria). But is it reasonable to rely on migrant associations to ensure the local development of sending areas? Actually, the question raises several issues. One issue is related to the limited impact of migrant associations: we have already largely demonstrated that migrant associations have no impact in a large range of domains. A second issue is related to the durability of the associations’ impact. A major factor in the efficacy of the migrant associations is the commitment of the migrants to their home community (Honey, 1998). But this commitment tends to wane over time and especially from one generation to another. Hence, in the population history of a country, there is probably only a short period during which migrant associations can be relied on to develop the sending areas. Basically, it would correspond, with a probable lag, to the period when migratory flows become “massive” from rural to urban areas, that is, during phase B of the mobility transition theory (Zelinsky, 1971). When international out-migration occurs in a country, a similar pattern may appear. But, in any case, to rely on migrant associations can only be a transitory strategy for governments.

A third issue is related to the interactions between migrant associations and public authorities. In Burkina Faso as in numerous countries, when a migrant association invests in a

school or a health center, its role is limited to the actual building of the facility. The state is supposed to provide the staff. Thus migrant associations cannot be considered as complete substitutes for the state. More precisely, they replace the state for the initial investment but rely on state funding for the operating budget of the amenity. The migrant associations and the state have thus to collaborate. The critical question is: to what extent are the associations' actions congruent with public planning in the areas of education and health? To what extent do the ambitions of migrant associations match with those of the government? Unfortunately, our data do not allow us to assess the proportion of associations' investments that are not followed up by the state, that is, the proportion of health centers or schools that are built but remain empty shells.<sup>19</sup> It could be the case when an association invests in a village or neighborhood where the government had not planned the provision of this precise amenity. From the reverse viewpoint, our data do not allow us to assess whether the public services promoted by migrant associations have modified the initial development schemes of the ministries of Education and Health. In the Nigerian context, Honey (1998, p. 140) have shown that "*HTAs can become agents of prebendal politics, with those in governmental positions of power*

*often expected to co-operate with their fellow indigenes.*" More generally, an association's success in obtaining the desired staff for an amenity it has built might depend more on its lobbying capacity than on the national development schemes. In the Burkina Faso context, as in other countries, the associations' actions raise the issue of the decision-making level in the area of public services provision. If migrant associations were able to mark out the direction of government spending through their investments, it would raise at least two problems. First, a problem of spatial equity: there would be a cumulative inequality between communities with and without migrant associations, the former receiving the assistance of both associations and the state, at the expense of the latter. Second, a theoretical problem of policy coherence: were the state to assist more specifically communities with migrants, it might indirectly encourage communities with a low prevalence of migration to develop out-migration as a strategy for ensuring their local development. Were this hypothesis true, it would contradict the government's intention to curtail migration, especially toward cities (Burkina Faso, 1991). In any case, further research is needed to explore how public authorities manage their collaboration with associations involved in development.

## NOTES

1. Burkina Faso is the former Upper Volta. The country adopted this name in 1984. However, for the sake of simplicity, the current name is also used in this text for the years preceding 1984.

2. "*HTAs are clearly instruments of local governance because they are locally based and because they do the kinds of things that governments do: they extract 'taxes' from their 'citizens' in order to provide the public goods that the duly chosen leaders decides, they have constitutions and elections, they regulate behaviour and provide protection, they even have territories*". (Honey, 1998).

3. See, for instance, the Dakar Declaration pronounced in 2001 at the West African Regional Ministerial Meeting on the Participation of Migrants in the Development of their Country of Origin.

4. Qualitative works have mentioned the rising importance of international migration from Burkina Faso to Europe, especially from specific region (Bissa region, Boulgou province), but there is no statistical evidence on this emergent trend. These new trends are supposed to be associated with the growing ethnic tensions that started to occur in Côte d'Ivoire in the 1990s and that those issued in the civil war (Beauchemin, 2005). Note that the analyses contained in this paper are related to the pre-war period in Côte d'Ivoire.

5. Until civil war broke out in Côte d'Ivoire in 1999, this country was the main destination of Burkinabè international migrants. Burkinabè people still constitute the largest foreign community in Côte d'Ivoire.

6. From a demographic point of view, a large proportion of Burkinabè people in Côte d'Ivoire are in fact not migrants, but foreign residents.

7. The project was initiated by the Institut supérieur des sciences de la population (Burkina Faso), the Université de Montréal (Canada), and the CERPOD (Mali). This research has been supported by the Canadian International Development Agency, the Andrew Mellon foundation, and the Agence Universitaire de la Francophonie.

8. We do not know whether the associations cited by our informants are formally recorded or not in the national associations registers; some of

them might be "informal". It could explain why the number of associations reported in our data set is higher than the number reported in the previous studies based on the national association register (Diawara, 1996; Mande, 1996). This apparent over-estimation could also be due to the method of data collection. In the community questionnaire, an association can be located only in a single place. As a result a multi-located association (for instance, with influent members both in Ouagadougou and in Côte d'Ivoire) is recorded as two separate organizations in our data set (one in Ouagadougou and, the other in Côte d'Ivoire), even though it is formally recorded as a unique association in the official register.

9. Sample design of the individual EMIUB survey (Poirier et al., 2001). The country was divided into 8 strata (two cities, Ouagadougou and Bobo-Dioulasso; a secondary town, Banfora; and five regions covering the rest of the country). At the first stage, 157 primary sampling units (census enumeration areas) were randomly selected with a probability proportional to their estimated size. The sampling units were selected independently in each stratum with a different sampling fraction in each one. In each selected primary sampling unit, 20–25 households were randomly selected. Within households, life histories were collected for every individual aged 25 and over and for one person out of two among those under 25.

10. The sample includes 86% of the country's towns (settlements above 10,000 inhabitants), 60% of its large villages (5,000–10,000 inhabitants), and only 6% of Burkinabè villages (under 5,000 inhabitants).

11. The region is defined according to the mean annual amount of rainfall (established during 1960–99). The reference to the climate is relevant for two reasons. First, Burkina Faso is a Sahelian country in which rainfall is a strong determinant of the regional organization. And second, this type of regional division presents the advantage of being time-constant, contrary to the vagaries of the administrative divisions during our period of analysis.

12. Rural areas are defined as settlements of under 10,000 inhabitants. With such a definition, the type of settlement (rural or urban) is not a time-constant variable. Villages which grow to more than 10,000

inhabitants during the analysis period (1960–2001) become towns, and are treated as right-censored cases.

13. This is the case for 58% of towns and 20% of villages.
14. In some African contexts, at the same association may have several locations, one in each destination place where the people originating from the same village live. Within the EMIUB community questionnaire, only one place is associated to each association.
15. The modal values of the independent variables were chosen in order to represent typical situations.
16. The “low potential of agricultural development” is not referring to the availability of water or markets (as places to sell the products) since

these variables are controlled in the models. It could refer to the quality of the soils or other contextual conditions.

17. To test this hypothesis, it would have been useful to introduce a variable consisting in an annual—or at least decennial—measure of the migration prevalence in each village. Unfortunately, no such data are available.
18. Although there seems to be a positive effect of Burkinabe migrant associations on the use of tractors, the effect is offset by a negative relationship with migrant associations in Côte d’Ivoire.
19. The EMIUB community data provide only information on functioning amenities.

## REFERENCES

- Aguda, A. S. (1998). The hometown association as a community development agent: The Ijebu-Jesa Union. In R. Honey, & S. Okafor (Eds.), *Hometown associations: Indigenous knowledge and development in Nigeria* (pp. 17–24). London: Intermediate Technology Publications.
- Allison, P. (1995). *Survival analysis using the SAS system. A practical guide*. Cary: SAS Institute.
- Beauchemin, C. (2005). Les migrations et l’effritement du modèle ivoirien: Chronique d’une guerre annoncée?. *Critique Internationale*, (28), 9–20.
- Beauchemin, C., & Schoumaker, B. (2005). Migration to cities in Burkina Faso. Does the level of development in sending areas matter. *World Development*, 33(7), 1129–1152.
- Bierschenk, T., Chauveau, J.-P., & Olivier de Sardan, J.-P. (2000). Les courtiers entre développement et Etat. In T. Bierschenk, J.-P. Chauveau, & J.-P. Olivier de Sardan (Eds.), *Courtiers en développement: Les villages africains en quête de projets* (Vols. 5–42). Paris: Karthala-APAD.
- Blion, R., & Bredeloup, S. (1997). La Côte d’Ivoire dans les stratégies migratoires des Burkinabè et des Sénégalais. In H. Memel-Foté, & B. Contamin (Eds.), *Le modèle ivoirien en questions: Crises, ajustements, recompositions* (pp. 707–738). Paris: ORSTOM-Karthala.
- Burkina Faso (1991). *Politique de la population au Burkina Faso*. Ouagadougou: Ministère du plan et de la coopération.
- Daum, C. (1995). *Les migrants, partenaires de la coopération internationale: le cas des maliens de France*. Working papers from OECD Development Centre, No. 107. Paris: OECD Development Centre.
- Daum, C. (1998). Développement des pays d’origine et flux migratoires: la nécessaire déconnexion. *Hommes et Migrations*, (1214), 58–72.
- Deniel, R. (1967). De la savane à la ville: Essai sur la migration des Mossi vers Abidjan et sa région. Aix en Provence: Centre africain des sciences humaines appliquées.
- Diawara, M. (1996). Mouvement associatif et transformations du champ politique. In R. Otayek (Ed.), *Le Burkina entre révolution et démocratie* (pp. 229–246). Paris: Karthala.
- Fitzgerald, D. (2004). *Ethnographies of migration*. Theory and research in comparative social analysis. Paper 19. Los Angeles: Department of Sociology, UCLA.
- Honey, R. (1998). Structure, agency and the modification of indigenous institutions. In R. Honey, & S. Okafor (Eds.), *Hometown associations: Indigenous knowledge and development in Nigeria* (pp. 142–153). London: Intermediate Technology Publications.
- Honey, R., & Okafor, S. (1998). *Hometown associations: Indigenous knowledge and development in Nigeria*. Intermediate Technology Publications.
- Jacob, J.-P., & Lavigne Delville, P. (1994). *Les associations paysannes en Afrique. Organisation et dynamiques*. Paris: Karthala/APAD/IUED.
- Kossi, A. (2000). Dynamique associative, courtage en développement et stratégies d’insertion: l’association des ressortissants d’Enouli-Kodzo-Aza au Togo. In T. Bierschenk, J.-P. Chauveau, & J.-P. Olivier de Sardan (Eds.), *Courtiers en développement: Les villages africains en quête de projets*. Paris: Karthala-APAD.
- Lacroix, T. (2005). *Les réseaux marocains du développement. Géographie du transnational et politiques du territorial*. Paris: Presses de Science-Po.
- Lavigne-Delville, P. (2000). Courtiers en développement ou entrepreneurs politiques. In T. Bierschenk, J.-P. Chauveau, & J.-P. Olivier de Sardan (Eds.), *Courtiers en développement: Les villages africains en quête de projets? Les responsables d’associations villageoises de développement dans une région d’émigration interantionale (Mali, Sénégal)*. Paris: Karthala-APAD.
- López, F. H., Escala-Rabadan, L., & Hinojosa-Ojeda, R. (2001). *Migrant associations, remittances, and regional development between Los Angeles and Oaxaca, Mexico*. Research report series. Paper 10. Los Angeles, UCLA: North American Integration and Development Center, School of Public Policy and Social Research.
- Mande, I. (1996). Les associations d’originaires, promoteur du développement régional en Haute-Volta de 1959 à 1982?. In C. Coquery-Vidrovitch, H. D. Almeida-Topor, & J. Sènechal (Eds.), *Interdépendances villes-campagnes en Afrique: mobilité des hommes, circulation des biens et diffusion des modèles depuis les indépendances* (pp. 113–138). Paris: L’Harmattan.
- Orozco, M., & Rouse, R. (2007). *Migrant hometown associations and opportunities for development: A global perspective*. Migration Information Source, February 2007.
- Poirier, J., Dabiré, B., Le Jeune, G., Piché, V., & Wane, H. R. (2001). Projet d’étude des stratégies de reproduction des populations sahéliennes à partir de l’enquête “Dynamique migratoire, insertion urbaine et environnement au Burkina Faso”. *Cahiers québécois de démographie*, 30(2), 289–309.
- Portès, A., Escobar, C., & Walton Radford, A. (2005). *Immigrant transnational organizations and development: A comparative study*. CMD working paper (p. 66).
- Quiminal, C. (1991). *Gens d’ici, gens d’ailleurs: Migrations Soninké et transformations villageoises*. Paris: C. Bourgois.
- Schoumaker, B., Dabiré, B., & Gnomou-Thiombiano, B. (2006). Collecting community histories to study the determinants of demographic behaviour. A survey in Burkina Faso. *Population-E*, 61(1–2), 77–106.
- Skinner, E. (1974). Ethnic interaction and the role of associations. In E. Skinner (Ed.), *African urban life: The transformation of Ouagadougou* (pp. 195–217). Princeton, NJ: Princeton University Press.
- Zelinsky, W. (1971). The hypothesis of the mobility transition. *Geographical Review*, 61, 219–249.

## APPENDIX A

See Table A.1.

Table A.1. *Number of village-years for each category of the variables included in the event-history models*

| Variables and indicators                       | Health center | Primary school | Market gardening | Tractor | Boreholes | Mills  | All-season road |
|------------------------------------------------|---------------|----------------|------------------|---------|-----------|--------|-----------------|
| <i>Economic association</i>                    |               |                |                  |         |           |        |                 |
| No                                             | 13,596        | 10,647         | 14,411           | 19,347  | 14,096    | 13,102 | 10,160          |
| Yes                                            | 742           | 287            | 1,330            | 2,133   | 732       | 606    | 585             |
| <i>Period</i>                                  |               |                |                  |         |           |        |                 |
| 1960–69                                        | 3,716         | 3,286          | 4,131            | 5,237   | 5,268     | 4,454  | 2,661           |
| 1970–79                                        | 3,827         | 3,327          | 4,275            | 5,655   | 5,525     | 3,886  | 2,804           |
| 1980–89                                        | 3,412         | 2,489          | 3,692            | 5,263   | 3,086     | 2,989  | 2,523           |
| 1990–2001                                      | 3,383         | 1,832          | 3,643            | 5,325   | 949       | 2,379  | 2,757           |
| <i>Region</i>                                  |               |                |                  |         |           |        |                 |
| <500 mm                                        | 1,082         | 980            | 1,086            | 1,405   | 888       | 1,306  | 1,026           |
| 500–699 mm                                     | 4,432         | 3,576          | 4,957            | 6,231   | 3,968     | 4,635  | 3,742           |
| 700–899 mm                                     | 5,809         | 4,068          | 6,358            | 8,989   | 6,342     | 4,855  | 3,414           |
| 900+ mm                                        | 3,015         | 2,310          | 3,340            | 4,855   | 3,630     | 2,912  | 2563            |
| <i>Village size</i>                            |               |                |                  |         |           |        |                 |
| <5,000                                         | 14,106        | 10,874         | 14,963           | 20,128  | 14,236    | 13,473 | 10,449          |
| 5,00–10,000                                    | 232           | 60             | 778              | 1,352   | 592       | 235    | 296             |
| <i>Road</i>                                    |               |                |                  |         |           |        |                 |
| No                                             | 8,759         | 7,111          | 8,154            | 10,430  | 7,526     | 8,233  | –               |
| All-season road                                | 5,579         | 3,823          | 7,587            | 11,050  | 7,302     | 5,475  | –               |
| <i>Market</i>                                  |               |                |                  |         |           |        |                 |
| No                                             | 7,955         | 6,951          | 6,687            | 8,366   | 6,344     | 7,439  | 5,760           |
| At least one                                   | 6,383         | 3,983          | 9,054            | 13,114  | 8,484     | 6,269  | 4,985           |
| <i>Non agricultural employment</i>             |               |                |                  |         |           |        |                 |
| No                                             | 12,147        | 9,438          | 13,119           | 17,309  | 12,440    | 11,677 | 9,034           |
| Some                                           | 2,191         | 1,496          | 2,622            | 4,171   | 2,388     | 2,031  | 1,711           |
| <i>Distance to the nearest similar amenity</i> |               |                |                  |         |           |        |                 |
| <5 km                                          | 2,269         | 2,973          | –                | –       | –         | –      | –               |
| 6–10 km                                        | 4,070         | 3,295          | –                | –       | –         | –      | –               |
| >10 km                                         | 7,999         | 4,666          | –                | –       | –         | –      | –               |
| <i>Development project</i>                     |               |                |                  |         |           |        |                 |
| No                                             | 12,612        | 10,033         | 13,753           | 18,349  | 13,983    | 12,341 | 9,225           |
| At least one                                   | 1,726         | 901            | 1,988            | 3,131   | 845       | 1,367  | 1,520           |
| <i>Cash crops</i>                              |               |                |                  |         |           |        |                 |
| No                                             | –             | –              | 13,289           | 18,027  | –         | 11,904 | –               |
| Yes                                            | –             | –              | 2,452            | 3,453   | –         | 1,804  | –               |
| <i>Dam/lake</i>                                |               |                |                  |         |           |        |                 |
| No                                             | –             | –              | 15,015           | –       | 13,330    | –      | –               |
| Yes                                            | –             | –              | 726              | –       | 1,498     | –      | –               |
| Total of village-years                         | 14,338        | 10,934         | 15,741           | 21,480  | 14,828    | 13,708 | 10,745          |
| Number of villages in data set                 | 431           | 390            | 468              | 587     | 590       | 537    | 299             |

The number of villages is equal to the number of villages that had not experienced the event (obtained a school, started market gardening. . .) at the start of the period covered by the survey (1960).

The total number of village-years is equal to the number of lines in the data set. It includes, for all the villages, all the years during which the village was at risk of experiencing the event. The number of village-years is also given for each category of the variables included in the event-history models.

