DESERTIFICATION AND DROUGHT RELATED MIGRATIONS IN THE SAHEL – THE CASES OF MALI AND BURKINA FASO

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INTRODUCTION

Migration on the African continent occurs mainly internally within countries as well as subregionally across borders, with West Africa representing 42 per cent of all regional movements (Black et.al, 2004). Farmers have historically moved mainly between neighboring countries due to "artificial boundaries demarcating socially homogeneous units into separate states" (Adepoju 1991:45; qtd. Ammassari, Black, 2001). Both Malian and Burkinabé farmers that straddle agricultural and political borders have long employed a substantial part of their household labor force to work on secondary cocoa and coffee fields in the Ivory Coast during the Sahelian dry season¹ (De Haas et.al, 2002; Konseiga, 2007).

While having long engaged in migration as a livelihood diversification strategy against the fragile Soudano-Sahelian climate, low-income and landlocked Mali and Burkina Faso have found it difficult to liberate their populations from the debilitating episodes of recurrent droughts and erratic rainfalls that have plagued the Sahel for the last half-century. Since the 1969-73 droughts, both countries have experienced increased north-south internal migration, as farmers and herders escape the descending "sahelization" of the countries' northern regions (Albergel, Valentin, 1990).

That the two neighbors rely on rain-fed agriculture for sorghum and millet staples as well as for cotton exports, makes their economies and food security highly vulnerable to changes in temperature and rainfall. In light of the 2012 Sahelian food crisis following a major drought that has thus far affected 19 million people in the region, and a projected 135 million people worldwide at risk of being displaced from desertification, land degradation, drought (DLDD) (Almeria 2006), the need to bring to the forefront the complex, yet widespread impacts of slow-onset climate events, is crucial. This paper considers how mobility patterns, already part of a traditional survival strategy in this climatically adverse region, are affected by recurring droughts and ongoing desertification. The first section describes the climatic, environmental and population conditions in the Sahel region, and briefly shows how closely their impact on migration is related to food security issues. Two successive case studies of migration patterns in Mali and Burkina Faso are here presented, including data collected from Pearson's field study in Burkina Faso in 2012. The final section summarizes existing policies related to migration and environmental issues and provides some recommendations.

1. ENVIRONMENTAL THREATS AND MIGRATION

1.1. Variability of Sahel rain conditions

Normal Climate Variability

Situated in the Western Sahel, between the Sahara Desert to the north and coastal rainforests to the south, Burkina Faso and Mali are intertropical countries marked by a Sudano-Sahelian climate, and are prone to strong geographic variation in annual rainfall as presented in the table below:

Table T. Annual raintait in Mail and Burkina Fas
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Regions	Mali	Burkina Faso	
Annual rainfall in North	50 mm	350 mm	
Annual rainfall in the	More than 1000 mm	More than 1000	
South		mm	

Source: Authors; Data Source: Hummel et al., 2000; World Bank Dashboard Overview Burkina Faso, 2013

Rain is mostly concentrated in 3-4 months of summer rainfall (May-September), when temperatures are high, thus accelerating evaporation rates. Intra-seasonal droughts are common, since rainy seasons consist of many high intensity storms (OSS, 2007).

I. They would return to cultivate cotton and grain at home during the rainy season July-September.

Figure 1. Annual rainfall variability in Sahel



Time-series of Sahel (10°N–20°N, 18°W–20°E) regional rainfall (April–October) from 1920 to 2003 derived from gridding normalised station anomalies and then averaging using area weighting (adapted from Dai et al., 2004a). Positive values (shaded bars) indicate conditions wetter than the long-term mean and negative values (unfilled bars) indicate conditions drier than the long-term mean. The smooth black curve shows decadal variations. [WGI Figure 3.37] Extracted from IPCC, 2008:80, fig. 5.2



Figure 2. Annual mean of daily mean temperatures in Western Africa

Extracted from Hummel et al., 2000: 22

Increasing climate variability

UNEP (2011) classifies the major drought events of 1968-1973 and 1982-1984 as part of an ongoing drought period starting in the 1970s, and interrupted occasionally by one-off seasons of adequate rainfall. But while precipitation rates have improved since 1993, there have been longer successions of dry years, and single humid years, particularly 1994, 1999, and 2003 (Ali 2010). Furthermore, this increased humidity has not been uniform across the Sahel. Rain indices show that isohyets have increased in the eastern Sahel (from Chad to eastern Niger) in the period 1994-2006, while they remain low in the western Sahel (from Senegal to western Mali) (Ibid). Additionally, the timing of annual rain cycles is increasingly variable as precipitation may decrease only at the end of dry seasons rather than in the beginning (*Ibid*).

On the temperature side, the Intergovernmental Panel on Climate Change (IPCC) predicts a warming of Africa by 0.2° C to 0.5° C per decade, with even higher temperatures expected in Sahelian, Central and Southern Africa (IPCCC, 2007). In the Sahel, the rise of temperature could reach +2.7 to +4.5°C between 2000 and 2025. These predictions are still uncertain, and their distribution unequal between Sahelian countries, but the potential for amplified evaporation of surface water² and penury of water resources would strongly impact food security, whether in agricultural, pastoral or fishing sectors.³ In Mali, the production of rice by con-

^{2. 40} per cent of the rainwater in the Sahel is not absorbed by the land and runs off.

^{3.} For instance, fish captures in the Malian Niger Delta went from 110,000 tons in an average year (as in 1966) to

trolled submersion, organized mainly by the Office du Niger in the Ségou, Mopti and San Region, is bound to disappear by 2025 if the IPCC predictions of rain reduction are realized (UNFCCC Mali, 2000).

1.2. Desertification and land degradation

Arid West African soils inherently suffer from poor fertility, exhibiting limited water retention capacity, limited nutrient value, and reduced depth for root extension (Lahmar, 2011). When erosive crusts, or zipelle, develop, they block infiltration, initiating a vicious cycle of desertification (Valentin, Casenave, 1992). The chemical depletion of soils sparked by the human elements of deforestation, bush fires, and over-cultivation, all help to reduce organic material through oxidation and the leaching of unused nutrients (PAN-LCD, 1999). Such soils, having lost their physical and chemical integrity, are more easily swept away in the dust storms or violent rains that occur during the later part of the rainy season (World Bank Dashboard Overview Burkina Faso, 2013).

According the UNCCD (2008), 47 per cent of Burkina Faso's land is degraded, while 37 per cent is at high risk of degradation, most of which in the densely populated Central Plateau. Likewise, Mali has witnessed a strong degradation of the vegetal cover since the 1950s, leaving only 14 per cent of its total surface arable (UNFCCC Mali, 2011).

1.3. Population Pressure

Following the trajectory of Sub-Saharan Africa, the total Sahelian population has increased fourfold since the 1950s, growing at a 2.7 per cent rate between 1960 and 1990, and will likely double between now and 2030 (Ozer and al., 2005).

In Mali, the total population grew from 4.6 million in 1950 to more than 15.3 million today (UN World Population Prospect, 2010). If this extremely rapid rate is maintained, the Malian population could reach 30 million by 2030 and more than 42 million in 2050. This population is increasingly concentrated in the cities, with the capital city of Bamako having already reached 1 million inhabitants. Southern regions are the ones experiencing the fastest growth, as shown in Figure 3.



Figure 3. Evolution of the Malian population by region



Similarly, Burkina Faso has one of the fastest growing populations in Africa, with an annual increase of more than 3 per cent in 2001-2010 (UNEP, 2011). As in Mali, migrants move southward from the populous Mossi plateau in northern and central Burkina, where naturally erosive soils are further degraded by longer dry seasons, driving farmers to the fertile East and West (PAN-LCD, 1999; Brown, Crawford, 2008). But while rural regions are emptying out in Mali, thereby posing a threat to its primary sector that constitutes 47 per cent of the country's GDP, studies have shown that rural out-migration is beginning to stagnate in Burkina Faso, while internal urban out-migration is on the increase (Beauchemin, 2004).

These trends put a serious additional pressure on land resources and production. Sahelian farmers have had to expand their farmland despite declining soil fertility and increasing weather vagaries.⁴ Researchers have linked the rate of rural population growth (35.6% in 2007) to the rate of increase of cultivated surfaces (40.8%) (Cambrézy and Sangli, 2011). Ouedgraogo et. al's (2010) study in Sissili province in southern Burkina Faso found that the annual rate of conversion of forest land to cropland at 0.96 per cent has increased simultaneously alongside population density from 17 inhabitants/km² in 1986 to 30 hbts/km² in 2006, due in part to migration since the 1980s droughts.

This phenomenon is also present in Mali where the FAO estimates a loss of forests of 100,000 ha/ year. Here, it is mainly due to biomass energy

^{4.} The primary sector employs over 80% of their active populations and represents 35% GDP in Burkina Faso and 47% GDP in Mali. This share is bound to be reduced as the rural regions are emptying out (see Fig. 3). Food insecurity could be experienced in the coming years, further triggering migrations, whether from northern to southern regions or towards foreign countries.

^{54,000} tons in a dry year (as in 1984), which represents a diminution by 50% (UNFCCC Mali, 2000)

consumption: wood and wood coal covers almost 90 per cent of energy production in Mali, and consumption is rapidly growing alongside population rates (respectively +21% and +50% between 2000 and 2006). Additionally, landclearing thousands of hectares of land by brush fires contributes to rapid deterioration of soils (UNFCCC Mali, 2000, 2011).

Furthermore, in Burkina Faso, despite the persistent droughts in the region, cattle populations have doubled from 1997 to 2008, to 8,072,420, leading to disequilibrium between the number of livestock and available resources.⁵ In the Central Plateau where Mossi farmers and Fulani herders have long cohabitated, mounting pressures on natural resources and converging production systems (mixed cropping and pastoral farming) are increasingly ending in conflict (Breusers, Nederlof, Van Rheenen, (1998).

1.4. Environmentally-induced migrations are framed by food security concerns

Desertification and droughts represents a major risk for food security

The 'distress migration' that followed the 1980s Sahelien drought was characterized by ruralrural flows over shorter distances, serving as a key survival strategy for keeping poor households from starvation (Black *et al*, 2004). The most recent drought of 2012, which has affected 18.7 million people (FAO, 2012), on top of the 10 million people affected by the 2010 drought (Aljazeera, 2012), may be having the same effect.

Burkina Faso has been considered one of the most affected countries of the 2012 Sahel food crisis, which inflicted a 20 per cent loss in cereal production from the previous year due to droughts and environmental degradation (FAO, 2012). Similarly, Mali could lose up to 30 to 40 per cent of its agricultural capacity due to climatic changes (Hummel et al., 2012). Furthermore, declining national harvests could raise world market prices, leading to longterm food insecurity. Already, millet prices had increased by 104 per cent in Bamako, and 91 per cent in Ouagadougou between 2007 and 2012, the highest increases in the sub-region (Oxfam, 2012).

Migration flows in Burkina Faso and Mali - Key figures

Mali:

Around 200,000 permanent migration flows per year Almost 300,000 displaced by the 2012 conflict and 177,000 refugees (including 48,000 in Burkina Faso). 46 000 total international migrant stock 2005 **Burkina Faso:** 2,2 million permanent internal migrants total counted in 2006

230,000 recent internal migrants 2006

773.000 total international migrants 2005

54,000 recent international immigrants 2006

Sources for Mali: 1992-1993 Malian Survey on Migrations and Urbanization (EMMU), quoted by Hummel et al., 2012, UNHCR, OCHA, 2013. Sources for Burkina Faso: RGPH, 2006

The link between slow-onset events and migration

Severe, irreversible forms of slow-onset events that have a lasting impact on natural resources tend to lead to permanent moves while sudden natural disasters spur more temporary migration (IOM, 2011; Tacoli, 2011). However, the initial coping strategies of seasonal and circular migration during extended periods of drought and loss of agricultural production can very well evolve into permanent migration as a survival strategy when food security becomes problematic (IOM, 2009). Jónsson (2010:12) puts it bluntly: "permanent abandonment of an environmentally degraded area is rather a solution, and immobility would indeed be a major constraint, in some cases certainly resulting in continuing degradation and death from starvation".

Reactive food security strategies exacerbate soil deterioration

In response to the normal climate variability and related food vulnerabilities of the Sahelian region, rural populations tend to resort to adaptation strategies to survive in the short term, hoping for a milder rainy season the following year, regardless of the long-term impacts. Smit and Skinner's (2002) climate change behavior typology differentiates spontaneous responses such as selling off livestock as short-range and operational, while structural changes in management such as livelihood activities is strategic and long term (cited, Stringer *et al.*, 2009). However, short term adaptive strategies leading up to migration, or failure to migrate, can worsen longterm soil fertility loss.

Farmers often face deteriorating environmental conditions by expanding their fields onto marginal lands, which has put forests as well as wetlands in

^{5.} Given that each square kilometer of national territory could nourish 16 bovins, 23 ovins, and 29 caprins. Based on statistics presented by Dr. Augustine Kaboré from INERA, Ouagadougou





Source: Authors, 2013.

danger (IUCN, 2010). Mali counted 1.967 million ha cultivated in 1970 against 3.472 million ha in 1990, with the same productivity levels (UNFCCC Mali, 2000). Likewise, new land cultivation has led to a reduction of Burkina Faso's savannahs from 93,113 km² to 83,801 km² between 1992 and 2002 (Cambrézy and Sangli, 2011). Earlier planting seasons, often during the dry season, precipitate soil regeneration. Traditional fallow periods, sometimes as long as several decades, allowing lands to "rest" and recover fertility, have been shortened to as little as five years, risking complete soil exhaustion (IUCN, 2010).

Overgrazing is another important cause of environmental degradation. This relationship remains unclear: while a stronger concentration of animals on small pastoral areas further deteriorates the vegetation cover,⁶ their manure and urine are excellent fertilizers. However, herd movements can lead to the export of animal manure, thereby depriving grazing areas of much needed fertilizers that could compensate for vegetation loss.⁷ The graph above attempts to conceptualize the linkages between desertification, migration and food security:

Increasing climate irregularities and the resulting soil degradation linked to recurrent droughts and demographic pressures become particularly problematic in poor countries like Mali and Burkina where livelihoods and daily sustenance are heavily dependent on natural resources. Migration remains a common survival strategy. Yet, new challenges such as increased risk of conflict resulting from resource competition and tenure insecurity in destination areas, as well as new vulnerabilities presented by the feminization of urban migrants, are being met with alternative migration patterns and adaptation strategies.

2. IMPACTS ON MIGRATION FLOWS

Mali and Burkina Faso present highly similar profiles, on climatic, social and economic levels, and on the effects climate change and environment deterioration are impacting their already fragile populations. On the migration aspect, both countries experience more internal than international migration, and more short-distance

^{6.} See examples in UNEP 2006; Mortimore 2000

Phone Interview With Mr. Manda Sadio Keita, Field Program Officer, And Mr. Modibo Touré, National Expert Supporting The Program, FAO Mali, March 29th, 2013

region	migration rate (%)	destinations of migrants (%)					
		rural areas	Bamako	other cities in Mali	other countries in Africa	outside Africa	
Kayes	0,16	8,9	19,6	16,3	31,5	23,8	
Koulikoro	0,12	15,2	25,1	29,9	27,8	2,0	
Sikasso	0,16	6,6	26,2	21,4	39,7	6,2	
Ségou	0,12	7,9	46,2	24,2	21,7	0,0	
Mopti	0,16	22,6	30,7	15,0	28,0	3,7	
Tombouctou	0,32	6,6	50,6	16,8	24,8	1,1	
Gao	0,23	4,3	25,0	30,1	35,9	4,7	
Kidal	0,34	19,0	2,4	11,9	66,7	0,0	

Table 1. Destinations Destinations of migrants according to the region of origin in Mali, 2005

Source: Hummel et al., 2012: 45; Database: CFSVA, 2000

than long-distance mobility. They also see their urban population growing as a result of the cities' economic and demographic dynamism. Nevertheless, when looking at migration patterns, divergence is clear. In Mali, most of the mobility forms part of a seasonal migration of rural populations towards the city during the dry season, more of these movements becoming permanent and thereby amplifying the phenomenon of rural exodus (Hummel et al., 2012).⁸ In Burkina Faso, while seasonal migration is increasingly permanent, rural outmigration is slowing down while migrants are starting to leave urban areas for rural ones (Beauchemin, 2004; Pearson, 2013; UNEP, 2011).

2.1. Internal migration flows in Mali: cyclical and adaptation mobility

Seasonal rural-urban migration in Mali: the environment as a normal cause for mobility Internal migration represents 43% of total Malian migration (EBSAN, 2009)⁹. Since the 1960s and the rapid growth of the cities (Denis, 2010), stimulated both by demographic expansion and the rural population movements, seasonal migration has become part of the agricultural population's normal livelihood strategy. During the nonharvesting dry season, when less labor is needed in the countryside, a part of the rural population moves to the cities, earns money through shortterm jobs (Konaté, 2013), and eventually returns to their fields to plant during the rainy season. Most often, farmers do not permanently abandon their land to live in the cities (Jónsson, 2010).¹⁰ Today, the majority of the Malian population (66%) remains in rural areas (Hummel et al., 2012).

A large scale study launched in 2009 by the Malian government (ESBAN, 2009) showed that 40 per cent of the households had sent one member away and had received remittances in the previous six months. Upon return to their villages, seasonal migrants bring home their savings to support the family. In this way, seasonal migration serves to alleviate financial strains on the household budget, particularly in regards to diversifying livelihood sources and risks like climate vulnerability (Jónsson, 2010).

Origin and destination

Permanent internal migration in Mali is interregional (ESBAN, 2009). Cities are the main destinations for migrants, as illustrated in figure 5, except for the Kidal region, where two-thirds of the migrants leave to neighboring countries like Niger or Algeria. Bamako is the principle destination for most migrants, who comprised 33 per cent of its population in 2009 (Hummel et al., 2012). The second 'hotspot' for permanent internal migration is the central region of Ségou, where the activities of the Office du Niger attract more than 40 per cent of internal migrants. The Office du Niger,

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See also Phone Interview With Mr. Manda Sadio Keita, Field Program Officer, And Mr. Modibo Touré, National Expert Supporting The Program, FAO Mali, March 29th, 2013

International migration represents thus 57%, mainly towards other African countries, and only 8% for migration outside of Africa (EBSAN, 2009).

^{10.} See also Phone Interview With Mr. Manda Sadio Keita, Field Program Officer, And Mr. Modibo Touré, National Expert Supporting The Program, FAO Mali, March 29th, 2013

created by the French colonial authorities in 1932, is today an 800,000 ha irrigated land dedicated to ensure Malian food security, mainly through rice-cropping. Its dynamism and job opportunities explain its power of attraction in terms of internal migration (Hummel et al., 2012).

The Mopti region, situated at the cross-section of northern and southern regions, is estimated to bear a moderate migration deficit, compensated by immigration from the north. Generally speaking, a clear north/south movement appears when studying Malian permanent internal migration (see map below). This mobility is impacted by three main factors: first, the northern regions are dryer than the southern ones¹¹; second, northern regions, whose population density is lower, are poorer than southern ones; third, the majority of the economically dynamic cities are in the southern half of the country (see figure 6 below). Seasonal migration movements follow the same general North/South and rural/urban areas pattern (Hummel et al., 2012).

Consequences of desertification and food insecurity on mobility patterns

The consequences of desertification on migration are not immediate, but progressive, which makes it difficult to establish a strong correlation between the two phenomena. Nevertheless, it has been established that a degradation of environment conditions do increase migration rates. According to a 2009 study, an estimated 42 per cent of households intensify their seasonal mobility in the event of poor harvests, sending more members on the roads, while 17 per cent migrate when there is crop destruction, and 13 per cent leave in the case of strong climatic events or shocks such as extreme droughts or floods (EBSAN, 2009).

Episodes of extreme drought increase the numbers of inter-regional migrants. Moreover, international and long distance migration shifted to migration over shorter distances in order to sustain the aggressive cereal and livestock shocks caused by the 1983-85 droughts (Findley 1994).

Alternative patterns

The arid Kidal region, populated by a majority Tuareg population, is a notable exception to the general migration patterns in Mali: 85 per cent of

The Tuaregs and the Fulani – Mali and Burkina Faso's Fluid Populations

The traditional way of life of the nomadic and seminomadic Fulani pastoralists and Tuareg merchants living in both Burkina Faso and Mali, involves transhumance migration, i.e., long-distance movement with cattle in search of pasture and water, thought of as a traditional coping strategy in vulnerable climates (De Brujin, Van Dijk 2003). In Mali, these movements have occurred between the Sahel regions (namely the Kidal, Gao and Timbuktu regions) and areas closer to the Niger River during the dry season, whereas in Burkina Faso they have occurred mainly in the Sahel and Central Plateau regions. However, the practice of transhumance has been substantially affected by the droughts of 1973 and 1984.

Distances have decreased substantially (often to less than 10km a year), and movements are more confined to the rainy season. Instead of whole families leaving, transhumance has been limited to a few young men going alone with cattle. However, with fewer cattle to tend to in the dry season, seasonal urban migration has been reluctantly pursued by Fulani men as a survival strategy.

In Burkina Faso, this group has engaged the most in permanent out-migration from the Sahel due to a failure of pastoralist livelihoods, or feelings of shame, which made it difficult for seasonal migrants to return (Hampshire, 2006).

Still, in Mali, a large portion of this population has become sedentary and diversified its way of life, settling mainly in northern cities where they practice agropastoralism (Hummel et al., 2012). Today, the distinction between farmers and pastoralists is no longer as strict as it used to be (Interview FAO Mali, 2013). The herders still following transhumance paths are entering more and more in competition with farmers for the use of land, as desertification reduces the available arable and grazing land.

migration movements are occurring within the region (EBSAN, 2009). The remaining migrants are mainly crossing the nearby border with Algeria, often for transhumance and nomadic purposes (see table below). The region's capital city, Kidal, is rather isolated from the rest of the country, as 1,200 km separate it from Bamako and 300 km from the nearest city, Gao.

Specific attention must finally be dedicated to a relatively new trend in internal migration: women now account for almost half of the migrants (Hummel et al., 2012). Going to work in the cities during the dry season is now a general custom for many young women, often between 13 and 18-years-old, to earn financial resources to support their family, but also to gather the content of their wedding trousseau (Sieveking, 2009). Local



II. They are also the ones affected by desertification. Green savannahs surrounding the cities of Kaarta and Bélédougou in the North-West, the Niger Delta, Dogon country and Liptako-Gourma have become semi-desert. The Sahelian steppe that used to reach Timbuktu and Menaka are now parts of the advancing desert (UNFCCC Mali, 2000).

Map 1. Migration and Demographic Dynamics in Mali



Source: Authors. Datasource: UN World Urbanization Prospects: the 2009 Revision - Mali Country Profile by the FAO, 2013 - Hummel et al., 2012 - Jónsson, 2010 - UNFCCC Mali, 2000, 2011 - Mortimore, 2000 - OSS, 2007 - UNEP, 2006 - IPCC, 2007

populations appear to be more concerned about female migration, as many never return to their native village.

The 2012 political and security turmoil has weakened the national food system

The conflict in Northern Mali in 2012 and its occupation by Islamic groups have provoked the crossborder movements of thousands of displaced populations and refugees. The military confrontations in January 2013, following the French intervention, triggered even more people to move away from their native region.

In February 2013, the United Nations reported 177,000 refugees, mainly in Mauritania (75,000), Niger (54,000) and Burkina Faso (48,000) (UN Dashboard, 2013), provoking troubles for the host regions, including in terms of food security. In March 2013, according to the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), more than 280,000 people were displaced within Mali because of the conflict. Almost 30 per cent of Internally Displaced Persons (IDPs) were in the Northern regions of Gao, Kidal and Timbuktu, the most difficult ones to reach by emergency aid and the most unsafe.

Unlike many other similar situations of internal conflicts, IDPs do not gather in massive humanitarian camps, says Mr Keita from the FAO Mali.¹²

^{12.} Phone Interview With Mr. Manda Sadio Keita, Field Program Officer, And Mr. Modibo Touré, National Expert

Figure 5. Burkina Faso Migration Balance by Region 2006 Figure 6: Burkina Faso Migration Balance by Region



In the country, solidarity and networks are channels that are absorbing the flows of migrants: in southern cities such as Bamako or Ségou, families are hosting many of their relatives and former neighbors who are fleeing the conflict. In Bamako itself, only two small buildings owned by the Catholic Church and overcrowded, were converted to host IDPs. This absorption by local populations makes it extremely difficult to count and provide the migrants with humanitarian support. Local associations of migrants coming from the same city ("associations de ressortissants") are quite active in this process. Many families left one or two members in the North to look after the household house and fields. The division of the country temporarily disrupted the normal movements of population and distribution of food, seeds and other products between the two halves of the country.

Mr Keita is convinced that most of the IDPs are waiting for the end of the conflict and will eventually return home. Following the French intervention under the "Serval" Operation and the progressive pacification of the North, this return movement has slowly begun. Moreover, thanks to the "humanitarian corridor" established by the Islamist occupants and according to the national expert of the FAO interviewed, a massive hunger crisis in Northern Mali was avoided. The 2012 harvests were considered to be good ones, at sufficient levels (OCHA, 2013).

Meanwhile, Mali is facing a critical moment in terms of food security, with 10.3 million Malian people estimated to be food insecure and 1.4 million children at risk of severe malnutrition (UN Dashboard, 2013). The World Food Program is already assisting 200,000 people on a daily basis in Mali since the beginning of 2013, including 90,000 in the North.This situation is also particularly fragile for Malian refugees and Burkinabés in Oudalan and Soum provinces of the Sahel region in Burkina Faso, where large animal influxes are putting enormous pressure on areas still recovering from the 2012 Sahelian drought and the resulting Sahelian crisis. The UNHCR Burkina Faso office has issued an appeal for additional international aid, as refugees' living conditions are in some camps considerably below emergency standards – i.e. receiving less seven liters of water per day (UNHCR, 2012).

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2.2. Burkina Faso's Permanent internal flows – Adaptation through Migration & Improved Farming

Increased climate variability as cause for more long term rural-rural migration

While Burkina Faso was still an emigration country between 1969 and 1973, internal ruralrural migration over short distances played a key role in survival strategies to the drought. Rural zones represented 41 per cent of destinations and 68 per cent of departures in 1969-73 (Coulibaly et. al., 1975), reflecting the difficulty for households to afford long-distance migration in times of scarcity. Unlike Mali, where most internal migrants ends up in cities, internal migration in Burkina Faso has remained strongly rural-rural, with 75.3 per cent of migrant settlement in rural zones in 1985 and 70.4 per cent in 1996 (Coulibaly et. al 1975).

While an increasingly variable climate has intensified households' dependence on extra-farm activity like seasonal migration (Peyraut, 2012), environmental migration is gradually becoming a permanent response (UNEP, 2011). Short-term

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rainfall deficits tend to increase the risk of longterm migration to rural areas and decrease the likelihood of short-term moves to distant destinations (Henry, 2004).

Origin and Destination

As in Mali, a north-south trajectory describes Burkina's more permanent flows (Lindqvist, 1993). 61.8 per cent of long-term internal migration in Burkina Faso occurs between regions, the outflows stemming from the dry Central North, North, and the densely populated Central (Mossi) Plateau, (figure 6). Migrants are headed mainly to seek jobs in the capital Ouagadougou in the Center (35.7%). Comparable to Mali's industrious Ségou region that hosts the Office du Niger cotton administration, the cotton-producing zone in the western region of Haut-Bassins, home to the country's second biggest city, Bobo-Dioulasso, attracts 17.9% of these migrants (RGPH-Theme 8, 2006).

Figure 6. Burkina Burkina Faso population figures by region 1997-2009



Thieba (2003) characterizes the scarcely populated south-western regions as new recipients of migrants, particularly returnees from the Ivory Coast, since the unstable political climate and antiforeigner sentiment in this country have diverted many seasonal Burkinabé workers towards the capital (Wouterse, 2008). Migration has lead to population growth in the 1980s-1990s in previously sparsely populated areas like the East and Central West.

Case Studies of the Lan, Bakaribougou, Tagou destination villages

Migrants in destination areas have been threatened by tenure insecurity and increasing demographic pressure. The 1984 RAF law, which had intended to allow agricultural land access to all citizens regardless of their origin (Mathieu et al, 2002), has been largely ignored by indigenous populations. Meanwhile, the rapid conversion of forests into farmland areas, which coincides with substantial land acquisitions by private investors encouraged by the government, have also increased pressures on migrants who now have to operate in a harsher tenure environment.

Field studies conducted by Pearson in 2012, in three villages in the southern, western, and eastern destination regions of Burkina Faso for migrants coming from northern and central provinces reveal the migration trajectories and coping strategies of migrants at their destinations (Pearson 2013).

Migration Trajectories : fieldwork conclusions

The studied villages of Bakaribougou, Lan, and Tagou, are diverse examples of host villages located in Burkina Faso's cotton basin in Haut Bassins, the fertile Central West region that began attracting migrants after the droughts in the early 1980s (Ouedraogo et.al 2011), and the East region, whose weak immigration rate allows for greater tenure availability for land-seeking migrants (RGPH-Monography of the East Region, 2006).

A host to large migrant flows since the 1960s, Haut Bassins is Burkina Faso's oldest agricultural colonization zone. However, the rate of migration to the region has since fallen as migrants are heading farther south to less densely populated areas like Comoé, Kénédougou, and Poni (Lignon, Leclère, undated). Migrants now often make up the majority of villages, while some have created new ones. With seven out of its eight hamlets comprised of migrants, Bakaribougou was created by returning migrants forced to work in Mali under the French colonizers (Pearson, 2013; PCD-AEPA 2010).

In contrast to the populous cotton region, a historically low population density (29.2 hbts/km²) and abundant forest cover made the Central West region a preferred destination for herders and farmers fleeing the droughts in the North and Central-North (Ouedraogo et. al., 2010). Rapidly decreasing forest cover has led to many studies linking population growth to deforestation in the region (Ouedraogo et. al 2011). In 2006, migrants made up 25.7 per cent of Sissili Province, where Lan is located (RGPH-Theme 8, 2006). Now one of the most densely populated villages in the rural commune of Léo, Lan grew from 1,016 inhabitants in 1996 to 1,840 in 2006 (INSD Onsite Database, 2006), reflecting both natural increase and continued migrant flows.

Also characterized by low population density (26.2 hbts/km²) and relatively abundant land, the east of Burkina Faso has a migrant population of only 4.8 per cent though this percentage has been steadily rising (RGPH-Monography of the East Region, 2006; INSD Online Database, 2013). Tagou,



Map 2. Distribution of the population by region of birth and area of residence in Burkina Faso, 2006

Source: Authors; Data Source: RGPH-Theme 8, 2006

located in Gourma Province, whose population comprises of 13 per cent migrants, has attracted much of this flow. Its population – 3,006 in 2006 -- constituted 11 per cent Fulani migrants, and 54 per cent Mossi migrants, compared to the native Gourmantché population (26%) (RGPH-INSD Onsite Database, 2013).

Situation in the villages

A north-south step pattern of migration due to land scarcity in traditional destinations

For many study respondents, their current villages were not the first place they had settled. In Lan, migrants had moved in a north-south step pattern, forced out of more populous communes like Koudougou (237 hbts/km²) (RGPH-Monography of the Central West Region, 2006) to areas further south. This pattern is also reflected in the intraprovincial southward movements within the East region, with migrants leaving heavily populated Gnagna province to settle in Gourma, from where farmers emigrate south to Kompienga (RGPH-Monography of the East Region, 2006).

In all three villages, the Fulanis were the latest to arrive, with average settlement duration of 21.9 years compared to 34.5 years for Mossis and 39 years for Samos. In Lan, Miriam Barry's family of herders had stayed 12 years in Sapouy, an area further North in the province, but faced difficulties when attempting to sedentarise. Souleman Barry's family spent 27 years in Koudougou in Northern Sissili, before heading to Zoro, where they spent 39 years before moving even further south to Lan 14 years earlier, largely because of declining pastoral space for their animals (Pearson 2013). These observations suggest the need for improved policies to protect migrant pastoralists and to improve their integration as farmland expansion increases in destination areas.

Tenure insecurity

Despite habitual tensions over crop damage caused by Fulani animals, or field expansion, and a fragile hierarchical relationship between the migrant *étranger domicilié* and the local *tuteur*,¹³

^{13.} Only local villagers belonging to the patrimonial lineage of the village (tuteurs) have access to tenure rights, and are allowed to delegate them to foreigners ("étrangers domiciliés"), who in their turn are expected to demonstrate their willingness to integrate in the village by various forms of social commitments. See more in Hochet, Peter, Saïdou, Sanou, 2012. « Reconnaissance des droits fonciers locaux Enjeux opérationnels de l établissement

fieldwork was part of a larger spirit of cooperation, in which migrants were included in village decision-making.

Located in the densely populated region (82.6 hbts/ km²) of Haut Bassins, Bakaribougou has undergone a widespread monetization of land rights with most migrants renting their land for 15,000 CFA under an annually renewable contract (Pearson, 2013). However, such land practices theoretically allow locals to reclaim land when they need it, by not renewing contracts, or exchanging good land for marginal land, a process that may intensify inequality between migrants and locals.

Moussa Drabo, a migrant farmer in Bakaribougou interviewed during Pearson's field studies, explained:

"Before, during my father's time, you could access land by offering a sacrifice of a chicken. Now it's money that makes things turn. No money. No field. Before, [land] was free. [...] Each year, you must [now] work in the owner's field if you can't pay the 15,000 CFA. You could cultivate one ha of the proprietor's land yourself, and one ha of the tutor's land" (Ibid).

Tenure insecurity may have indirectly lead to longer land use especially among migrants, though this has often come with intensification efforts through the use of manure and SWC techniques, as migrants fear the loss of rights to land re-inserted into the bush for fallow.

Limits to migration: Scarcity leads to adaptation

Such efforts to adapt by increasing yields in a drying South-western climate is linked to a sense of scarcity in the mind of migrant farmer, Adama Sawadogo, another study respondent:

"Because of the growth of the population, the cultivatable surface of the land is insufficient. I don't blame the locals. Now we have to give back our land. We're scared of no longer having any land. But if we lack land, we have to adapt. The problem [of scarce land resources] is everywhere. We can use the manure technique to improve the land. We can't run anymore; there is no more land" (Ibid).

Adama's account displays a more nuanced understanding of population pressure and the ability to contextualize the behavior of local actors even when such actions negatively affect him (Ouedraogo et.al., 2010; Benoit, 1982). De Zeeuw's (1997) observations of the high value placed on peaceful social relationships in western Burkina Faso helps us to frame the cultural values at work in village structures of authority.

Table 2. Average Total Soil & Water Conservation (SWC) Techniques Practiced per Household in the Three Destination Villages

	L		Migrants				
	Sissala	Bolons	Native Gourmantché	Fulanis	Samos	Mossis	Migrant Gourmantché
Lan	4.6*			3.8		7.4	
Bakaribougou		9		5.3	9.2	18.5	
Tagou			7.2	12.3		15	6.7
Average	4.6	9	7.2	7.1	9.2	13.6	6.7

Source: Authors; Data Source: Pearson, 2013

*Numbers based on survey responses from 90 farmers in the three villages. SWC techniques were based on CILSS documents on "Bonnes Pratiques" and informant interviews with extension agents as well as farmers. Techniques do not include synthetic fertilizers or pesticides.

In general, study results show that migrants tend to be more tenacious farmers. Mossis, who are particularly perceived by locals in all three villages as problematic due to their aggressive land-clearing and rapidly expanding populations, engage in the greatest variety of SWC techniques introduced by the extension services. An agent at the Provincial Agricultural Service in Lan said that Mossis were 'innovative': "They come from far to search for their livelihoods.... The natives are born here so they're not worried about the competition." The village's Parcelle Vitrine de Producteur, an experimental farming plot to demonstrate good practices, is owned by a Mossi migrant farmer. Indeed, similar results were found by Gray and Kevane (2001) who showed how income levels improve the likelihood of SWC investment, a way to secure land rights in Haut Bassins.

In the absence of robust national adaptation policies, populations in both Mali and Burkina Faso are continuously applying autonomous insights to adapt to an increasingly volatile Sahelian climate. Farmers continue to move in search of fertile areas abundant in land and better livelihood opportunities, creating new routes where old ones have become congested, and adapting to their new environments where fewer resources demand better land management and cooperation. National policies have to some extent supported these grassroots responses, though there remains work to be done.

des accords de prêt prévus par la loi burkinabè portant régime foncier rural N°16 », GRN Notes, GRET website.

3. POLICY RESPONSES AND THEIR INSUFFICIENCIES

Burkina Faso and Mali have taken many steps at the international and regional levels to protect their migrants on the one hand and to deal with environmental transformations on the other. But despite efforts to take into account the environmental cause for migration, they fail to bring an integrated response to this multidisciplinary issue.

3.1. International legal responses to displacement

Labor migration and development

Given the importance of labor migration to income diversification in the environmentally unstable Sahel, the ratification approach to international and legal frameworks is clearly dedicated to the protection of labor migrants and to endorse migration as a development strategy.

Ratified by both Burkina Faso and Mali in 2003, the 1990 UN General Assembly of the Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families (entered into force in July 2003), while not specifically identifying cross-border migration as an adaptive strategy, does define rights for international seasonal workers (Article 59).

Focusing further on facilitating intra-regional migration, the 1979 Economic Community of West African States (ECOWAS) Protocol Relating to Free Movement of Persons, Residence and Establishment is a particularly relevant instrument in an area where seasonal cross-border is of greater scope than long-distance international migration.

The EU-African migration policy partnerships foster migration as a development strategy to reduce intercontinental flows. The Migration for Development in Africa (MIDA) programme, launched by the IOM and endorsed by the African Union (AU) in 2001, aims at encouraging African nationals and highly qualified professionals to directly contribute to the development of their countries of origin, combating brain drain. Along the same lines, the ILO and NEPAD launch of the 2002 "Africa Labor Migration Policy Initiative" assists African countries in developing local labor migration frameworks. Additionally, the AU Common Position on Migration and Development and its Strategic Migration Policy Framework, adopted in 2001.

IDPs and Refugees

On the crucial topic of internal displacement, both Mali and Burkina Faso signed and ratified the 2009 AU Convention for the Protection and Assistance of Internally Displaced Persons in Africa. Also known as the Kampala Convention, this mechanism identifies the environment as a cause for forced displacement, but only in the case of "*natural disasters*", without much attention dedicated to slow onset events¹⁴.

Finally, both Mali and Burkina Faso ratified the 1951 United Nations Convention relating to the Status of Refugees and the 1969 Organization for African Unity (OAU) Convention governing the specific aspects of refugee problems in Africa. Neither policy instrument explicitly states the environment as a cause for the forced crossing of international borders.

3.2. Protecting the environment and enhancing agricultural resilience

There is no evidence that national authorities recognize the growing desertification as a direct "push factor" for migration, whether permanent or seasonal. However, they acknowledge that this phenomenon is a threat for development and food security of rural areas and implement policies through National Plans to prevent it, in the framework of the 1994 United Nations Convention to Combat Desertification (UNCCD Mali, 2004; UNCCD Burkina Faso, 2004).

Measures to combat drought effects on food security through scientific research have been substantially influenced by the creation of the Club du Sahel/CILSS (Permanent Interstate Committee for Drought Control in the Sahel) partnership in 1973 that, despite its shortcomings, has helped to draw attention to agriculture and ecological issues, increase aid flows, and improve dialogue on development assistance in the region (OTA, 1986). While CILSS has found it difficult to infiltrate government policy, the organization's Director of Natural Resources Management (NRM), Edwige Botoni, has said that both Mali and Burkina Faso have actively engaged in efforts to improve agriculture to better adapt to climate change (Interview-in-Person, 2012).

Both countries are also rather active in the implementation of the 1992 United Nations Framework Convention on Climate Change (UNFCCC),

^{14.} In article 4.2 of the Convention, States commits to prevent internal displacement related to environment issues by "devis[ing] early warning system, in the context of the continental early warning system, in areas of potential displacement, establish[ing] and implement[ing] disaster risk reduction strategies, emergency and disaster preparedness and management measures and, where necessary, provid[ing] immediate protection and assistance to internally displaced persons."

with several reports published since the 2000s, detailing the sources of greenhouse gas emissions (GHGs) and how to mitigate them. Given that Mali and Burkina Faso contribute very little to global GHGs, the reports focus on adaptation strategies rather than mitigation. The link between climate change impacts and environmental migrations is not explicitly referred to neither does it appear clearly in the targets of the actions implemented (UNFCCC Mali, 2000, 2011; UNFCCC Burkina Faso, 2001).

In 2007, Mali and Burkina Faso presented their National Adaptation Programmes of Action (NA-PAs) in the framework of the implementation of the UNFCCC. The primary objective of these NA-PAs is to identify a set of priority projects¹⁵ to cope with the most urgent dangers of climate change. Developing the agro-pastoral sector, protecting crops and cattle, and promoting food security are among the top five priorities for both countries. None of the reports quote migration triggered by environmental changes as a long-term policy adaptation strategy. It is only briefly mentioned in the Burkina Faso NAPA as an endogenous practice to cope with a deteriorating environment (NAPA Burkina Faso, 2007).

3.3. The insufficient management of rural development and seasonal migration

Enhancing the development of rural regions: an indirect tool against migration?

The answer largely proposed to mitigate environmental pressures is the development of rural regions and poverty reduction through improved infrastructure and local job opportunities. This is clearly aimed at reducing rural exodus for economic reasons.

The 1989 Bandiagara PRBP project in Mali (rehabilitation of dykes, dams and roads) has enabled the opening up of many isolated Dogon villages and the development of local small businesses, with the reduction of permanent migration as one of its declared objectives. The results, according to the 2003 Impact Report, are ambivalent: on the one hand, the new resources enabled young people to finance their trip to the cities; on the other hand, the return rate of seasonal migrants is higher since the development of the region (Sieveking, 2009).

Across the border, in Burkina Faso, the National Programme against Desertification (PAN/LCD, 1986), the Programme for Improvement of Living Conditions (PC-ACV, 1991), and the National Environmental Action Plan all tout the development of infrastructure and public services as a way to retain migrants (Beauchemin, 2005). While Burkina Faso's Poverty Reduction Strategy mentions the role of migration and/diasporas in stimulating trade, it fails to report any net gain in human capital as a result of migration (Black, 2009), promoting instead job creation and rural road construction (Beauchemin, 2005).

Furthermore, agricultural intensification is one of the main lines of action to develop rural areas and ensure food security in the long term (FAO Mali Interview, 2013), and prevent north-south migration flows. A 2005 Report by the Malian Ministry of Agriculture champions improved agricultural mechanization as a means to improve the countries agricultural production system for which only 35 per cent of the "Agriculture Production Units" in the central zones of Sikasso and Ségou are equipped with elementary material such as animal-towed ploughs.

Likewise, access to ploughs in Burkina Faso was made available by government programs aimed at increasing the production of cotton (Ouedraogo et. al., 2010), while the promotion of 'agribusinessmen stakeholders' by the government to invest in large, mechanized farms (50-400 ha), has been touted as a means to improve food security (Ouedraogo, 2002). Investing generously in agriculture, the government plans to increase sorghum and maize yields by 322 per cent and 187 per cent respectively by 2015 (AGRA, 2013).

Adaptation in Burkina Faso: examples of state-led resettlement, improved farming and rural development strategies

Conceptualized in the aftermath of the severe Sahelian droughts of 1970-72, the Volta Valley Development (AVV) program was primarily an attempt to resettle families from the densely populated Mossi Plateau to repopulate the valleys of the three Volta rivers that had been ravaged by the onchocercose cattle epidemic in the 1960s (FAO, 1987). While the state initially failed to relocate the desired populations due to high costs and unresolved tenure tensions between migrants and locals, these newly developed areas would eventually attract spontaneous migrants fleeing the droughts in the 1980s (Thieba, 2003). Migrants were responding to what Henry (2004) analyses as interconnected economic and environmental factors, whereby natural resources were economically valorized (cash crops), and development initiatives such as hydroagricultural installations and production systems were organized in destination areas. Such areas around the

^{15. 19} in the case of Mali, 12 in Burkina Faso.

Kompienga and the Bagré barrages have since become centers of diversified activities resulting from new farming hamlets, the development of horticulture, tree plantations, etc (Marchal, Quesnel 1996).

The importance of natural resource management in Burkina Faso's climate adaptation policy approach, spurred by SWC campaigns led by NGOs and foreign donors since the 1970s (Kondé, 2011), is reflected in its numerous national plans and programs such as the National Biodiversity Strategy (1999), the National Action Plan to Combat Desertification (1999), the National Action Plan for Integrated Management of Water Resources (2003), and the Environmental Plan for Sustainable Development (PEDD-2002). SWC campaigns have lead to at least 200,000 ha of rehabilitated land (CILSS 2009), while crop yields increased by 63-74 per cent in fields treated with rock bunds and zaï (Sawadogo 2011).

Although such scientific studies have been nationalized under the Institute of the Environment and Agricultural Research (INERA), R&D in Burkina Faso largely depends on financing from international donors like the World Bank, and fluctuations in funding since 2004 have raised sustainability issues (Stads et. al. 2010).

While development of rural areas and improved farming techniques are perceived as better adaptation policies, migration is recognized as one of the principle risks of natural disasters in the country's national platform for the Hyogo Framework for Action - the National Council of Emergency Relief and Recovery (CONASUR, 2009; UNISDR, 2013). Moreover, the PAN/LCD (1999), which classifies migration as a survival and livelihood diversification strategy, focuses on the need to control migration which it links to environmental degradation in destination areas.

Mali: accompanying seasonal migration

As previously analyzed, migration is part of a regular livelihood strategy for many rural populations through seasonal mobility between rural and urban areas. This cycle is well known by the authorities, which try to better accommodate it. When the rainy season approaches, national media broadcast messages in the cities to encourage the migrants' return to the countryside and support the farmers' efforts in the fields. This campaign appears relatively efficient: during the harvesting period, there is sometimes a lack of houseboys and housemaids in the cities, positions that are commonly occupied by temporary rural migrants.¹⁶

However, most of these movements escape the attention of national authorities and rely only on individual efforts, networks and solidarity. For example, after the last rain of the season, many young women leave their village as a group, are then accommodated by a host family in town and come back together after the dry season. This system also puts pressure on each member of the group to return to the village at the same time as the others.¹⁷

Despite these solidarity links and the support of seasonal migrant networks, living in the cities as housemaids and houseboys¹⁸ can be highly dangerous, and the youth often experience abuses from their employers or new neighbors¹⁹. There is a clear lack of national policy to protect seasonal migrants: national authorities do not clearly recognize the social and financial insecurity for often very young migrants.

There is some evidence of rural communities attempting to regulate the migration of their own population, acting on behalf of the national government. According to Sieveking's (2009) study on the very dry and isolated Bandiagara region, local authorities, worried about the development of female migration and its more and more permanent characteristic, adopted rules, whether financial or social, sanctioning any woman migrating without prior authorization from their father or husband.

In conclusion, the current national and international policy framework adopted by both Mali and Burkina Faso provide some level of protection for migrants abroad, but internal migrants, who constitute most of the environmentally-induced flows, remain vulnerable. While policy efforts promote rural development and agricultural resilience to climate change, little is done to integrate migration into this formula of adaptation.

Phone Interview With Mr. Manda Sadio Keita, Field Program Officer, And Mr. Modibo Touré, National Expert

Supporting The Program, FAO Mali, March 29th, 2013

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^{18.} Some rural young men for example travel everyday outside of Bamako, pick up hay and plants, come back to the city and sell their findings to local livestock farmers for very little money (Konaté, 2013).

^{19.} For instance, the sexual abuse of under-aged girls who may end up getting pregnant or ill during their time in the cities sometimes prevents them from returning to their village at the next rainy season, partly out of shame. Also, recovering their salary is often extremely difficult, as employers may take advantage of their youth and inexperience (Dembélé, 2013).

3.4. Coping with environmental migrations in the Sahel region: Policy Recommendations

The first challenge emerging from the policies' assessment conducted in this article is the lack of legal protection for migrants facing the specific challenges of an environmentally and socioeconomically fragile Sahel. The insecurity derived from farmland expansion in destination areas in southern Burkina Faso calls for improved policies to protect migrant pastoralists. Likewise, in Mali, policy instruments must be applied to protect seasonal migrants and to reinforce support networks in cities. The few steps taken to protect IDPs are encouraging, but they make no reference to slow-onset events like desertification as a cause for displacement; moreover, they need to be integrated in national policies in order to provide concrete protection on the field for Burkinabé and Malian citizens.

In both countries, most environmental migrants remain within national borders and are thus not covered by international frameworks protecting labor migrants and refugees. Furthermore, though instruments like the ECOWAS Protocol provide frameworks to foster regional migration, which may in turn help to relieve population pressures in countries of poor climate and few natural resources like Burkina Faso and Mali, systematic denial of rights and expulsion of foreign workers in key countries like the Ivory Coast demonstrate how such policy instruments are often at the whims of national politics (Black et.al 2004). While such regional mechanisms should be improved and expanded to uphold permanent residence rights and to protect environmental migrants, national policies must first address internal migration, as this has been the most common trend of environmentally-induced migration in both countries.

Simply considering environmental migration a problem to be fought is counterproductive. Its integration, for example, in NAPAs is essential to better understand the phenomenon particularly in the context of more voluntary, slow-onset events. Issues related to permanent internal migration such as tenure security in destination areas must remain a priority for governments in a way that incorporates decentralization and participatory processes involving both migrant and local decision making and customary consideration. Policies must be equally accompanied by effective legal support and the upholding of property rights, whether this involves property titles²⁰, monetarised tenure, or temporary contracts.

20. See for example Maitre Abdoulaye Harrissou's *Simplified Secure Title*, an innovative instrument to provide land security to African populations (Heard at the conference The emphasis placed on the regulation of internal mobility, rather than on the promotion of flows, can be understood by the lack of governments' capacities and funds to support urban population growth. Additionally, the desertion of poor rural areas is not a long-term solution to fighting climate change or reducing adversities linked to it. Both local and migrant populations have a major role to play in the sustainable management of resources and to stop the advancing desert. Furthermore, the studies we have cited show that an unchecked rural exodus can simply shift environmental degradation from origin to destination areas.

Yet, examples from Burkina's AVV program have demonstrated that development of rural areas has indirectly facilitated permanent rural-rural migration, relieving population pressures on environmentally stressed areas. Field observations show how newfound scarcity in rural destinations has spurred the cooperation and exchange of improved farming techniques between local and migrant communities (Pearson, 2013). These efforts could be better applied if the potential role of environmental migration in climate change was better studied and more integrated into adaptation policy. With their use of sustainable strategies (supported by the State) to increase productivity, environmental migrants appear less as an ecological burden and more as a potential solution in reducing risks and vulnerabilities to climate change.

CONCLUSION

Evidence from both Mali and Burkina Faso points out that the migration in response to environmental problems is almost never entirely forced or voluntary, but rather a gradual response to environmental changes that alter the capacity to response.

An even more intense version of this phenomenon is occurring today with the recurring Sahelian environmental crises of 2005, 2008, 2010, and 2012 continuing to weaken the coping capacity of highly vulnerable populations (FAO, 2013). Furthermore, the flight of 170,000 Malian conflict refugees in recent months has substantially disrupted farming activities in the drought-sensitive and migrant-senders Provinces of Timbuktu, Gao, and Kidal. Moreover, the settlement of these migrants in neighboring countries has exacerbated local vulnerabilities in Northern Burkina.

[&]quot;Access to land in Sub-saharan Africa, key to development", on June 24, 2013, at Ifri, Paris)

Less media-grabbing examples of droughtinduced migration in Burkina Faso has shown similar impacts of migration on scarcity in traditional destination regions. However, the "population-degradation" (Kevane, Gray, 2001) paradigm is nuanced by examples of innovation and investments in sustainable agricultural among both migrants and local farmers in the face of resource scarcity, which point further to the need to protect vulnerable groups such as women and the poor.

Indeed, it is here where the nexus of mitigation and adaptation form a continuum. Whereas, the UN Special Reporteur for the Right to Food, Olivier de Schutter, advocates agro-ecological farming methods that are better equipped to absorb expected climate shocks (De Schutter, 2010), better managed remittances from seasonal and permanent migration may be key funding sources for scaling up such farming methods and building up resilience. Furthermore, Pretty et. al's (2011) study show links between the implementation of SWC practices and decreased rural exodus as young men choose to become day laborers on degraded land owned by farmers rather than migrate. More efforts should be made to measure the linkages between the migration and other efforts to build resilience against climate change and how such strategies may be mutually reinforcing.

While the FAO responses to the crisis has attempted to minimize migration, which it perceives to be a negative mechanism of adaptation (FAO, 2012), Mr. Modibo Touré of FAO Mali offers that permanent migrations, especially international movements, are also positive as they allow for numerous resources that would otherwise not be generated to pay for seeds and farming inputs.²¹ Moreover, if migration is to be seriously considered in policy responses to environmental degradation and food security in the region, care must be taken to coordinate the linkages between migration, survival, mitigation, and adaptation, but at the same time involving rural communities in the planning process in order to help populations build resilience against an ever-evolving climate.

Phone Interview With Mr. Manda Sadio Keita, Field Program Officer, And Mr. Modibo Touré, National Expert Supporting The Program, FAO Mali, March 29th, 2013

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