

Natural Resources Management Strategies in the Sahel

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Question

What is the overall context, and the evidence on the efficacy of interventions to improve extractives and natural resource management strategies in the Sahel?

- *Pay particular attention to extractive resources and revenues from these*

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1. Summary

Natural resources, both renewable and extractives are extremely important to the livelihoods and economies of the Sahel (defined as Burkina Faso, Chad, Mali, Mauritania and Niger). For example, agriculture accounts for over 30% of Mali's GDP and cotton and gold account for over 80% of exports (IMF, 2018, p. 6). There is potential for conflict between renewable and extractive natural resource sectors. For example, pastoralists in Niger have lost access to migration routes and land due to enclosure by mining corporations (Larsen & Mamosso, 2014).

The region is one of the richest in the world in terms of natural resources, including oil, gold and uranium (UN, 2018, p. 7). However, the Sahel, a semi-arid region, is one of the poorest and most environmentally degraded in the world (USAID, 2017, p. 1). For example, Niger, despite its abundant extractive resources is ranked 187/188 on the Human Development Index (Sangare & Maisonnave, 2018, p. 581).

Agriculture, both rain-fed subsistence farming and livestock herding (pastoralism), dominates livelihoods in the five Sahel countries (Liehr, Drees, & Hummel, 2016, p. 147). Given the importance of agriculture, its development remains a matter of urgency (Ferdinand, 2016, p. 62). However, the share of international aid directed at renewable natural resources in the region is comparatively low: in 2014, only 6-7% of French and American aid and 16% of multilateral programme aid was devoted to agriculture, fisheries and forests (Ferdinand, 2016, p. 62).

The Sahel's renewable resources are under pressure from population growth and climate change, which could increase land degradation, reduce agricultural productivity and increase food insecurity (Liehr et al., 2016, p. 148). For example, the World Bank argues that land pressures in the Sahel are contributing to the region's fragility trap¹. Donors are concerned that these pressures and their impacts on natural resources could drive instability and conflict in an already fragile region, increase marginal communities vulnerability to violent extremism and increase out-migration from the region (USAID, 2018, p. 3).

Key challenges in terms of the management of renewal resources include:

- increasing conflict between pastoralists and farmers due to competition for land and water;
- poor soils and soil erosion, which impact agricultural productivity and crop yields;
- land-use and land-cover changes, for example, forest cover in West Africa decreased by 37% between 1975 and 2013 due to deforestation for agricultural expansion (USAID, 2017);
- the inter-connected nature of environmental issues. For example, limited access to water constrains agricultural and livestock production (USAID, 2018). Water scarcity is fuelled by unsustainable natural resource use and population pressures, which in turn propel the degradation of agricultural and pasture land. This fuels natural resource-based conflicts, loss of livelihoods, and food insecurity (USAID, 2018).
- Climate change is identified as a key challenge in the literature, however, it is largely outside the scope of this report.

¹ <http://www.worldbank.org/en/region/afr/brief/world-bank-group-sahel-and-great-lakes-initiatives>

Effective strategies to improve renewable natural resources management have focused on land rehabilitation and water management. Projects such as the World Food Programme Cash for Assets in Niger have increased the number of hectares under cultivation in targeted areas. Successful strategies involve local communities and need to be scaled-up to the national or regional level.

Extractive resources, including uranium in Niger and oil in Chad, are extremely important export commodities for the countries of the Sahel. However, NGOs, civil society and donors are concerned about the transparency and governance of extractive industries as well as the generation and use of revenues (Larsen & Mamosso, 2014). For example, the IMF (2016) argues that more work is needed to improve the transparency of Chad's oil sector. Larsen & Mamosso (2014) argue that development cooperation needs to do more to foster a properly functioning domestic governance regime for Niger's uranium mines. There are a number of concerns surrounding uranium mining in Niger including: a lack of transparency around the revenues and taxes it receives from mine operating corporations, how these revenues are spent and environmental concerns including soil and water contamination (Larsen & Mamosso, 2014).

Practitioners, donors and academics have suggested a number of strategies or interventions to improve the effectiveness of extractive resources management. These include improving the flow of information about extractives; greater disclosure of information and compliance with the Extractive Industries Transparency Initiative; and, building the capacity of government staff to monitor compliance with regulations (IMF, 2016; Larsen & Mamosso, 2014). The World Bank and IMF are key actors working to improve governance of the extractives sector.

There is a vast literature on the Sahel's natural resources in both English and French. Due to the broad nature of natural resources management, it is not possible to cover all the issues relating to land, water, forests, fisheries and extractives in this report. Consequently, the following sections largely focus on land-use, land degradation and competition between pastoralists and farmers, and on the governance of extractive resources. The final section of the report presents a number of evidence-based and recommended strategies for improving land and water management as they pertain to agriculture and livelihoods, and strategies for improving the management of extractive resources. In agriculture, particular attention is needed to the role of women as gender has been shown to impact agricultural productivity, with land owned by women being less productive than land owned by men (World Bank, 2018).

2. Renewable natural resources

Renewable natural resources are extremely important for agricultural production in the Sahel. Agricultural production, both in terms of crops and livestock herding are central to the livelihoods and economies of the Sahel peoples and countries:

- 86% of Niger's active population are engaged in agriculture, livestock herding and fishing (Go, Robinson, Thierfelder, 2016).
- 75% of Chad's working age population are engaged in agriculture (World Bank, 2015).
- 52% of the workforce in Mauritania are engaged in agriculture (USAID, 2017, p. 3).
- Agriculture (crops and livestock) accounts for 40% of Niger's GDP (World Bank, 2018, p. 9).

- Agriculture accounts for about 1/3 of Chad's non-oil GDP (World Bank, 2015, p. 13).

Farming

Agriculture in the Sahel is mainly rain-fed with small field sizes (Doso Jnr, 2014, p. 68). Key subsistence crops across the Sahel include sorghum, millet, rice, cassava and millet (Doso Jnr, 2014, p. 68). Variations across the region include higher levels of agricultural diversification in the southern part of the Sahel; and the importance of harvesting tree products in the parkland areas of the northern Sahel (Doso Jnr, 2014, p. 68). Exports of primary products have been the main driver of economic growth in the Sahel and rural regions, especially those in the north have seen few benefits from growth (Ferdinand, 2016).

Cotton is the most important cash crop in the Sahel, employing approximately 15 million people, including in indirect jobs (Ferdinand, 2016, p. 64). Poor governance and competition from producers in other regions of the world have limited the profitability of Mali's cotton industry (Ferdinand, 2016, p. 64). Cotton is also vulnerable to the effects of climate change (Diarra, Barbier, Zongo & Yacouba, 2017). Cotton is Burkina Faso main export: largely grown on small-scale family farms it generates income for approximately 3 million people (Diarra et al., 2017, p. 495). Further increases in global temperature could significantly reduce cotton yields in Burkina Faso, which would have economic impacts for both farmers and the national economy (Diarra et al., 2017, pp. 500-501)².

Agricultural productivity in the Sahel is low: for example, the World Bank argue that in Niger there is a large gap between actual and potential yields of sorghum, millet and rice (2018, p. 9). Cereal yields have also stagnated in Chad, whilst cotton output has fallen by 75% in the last decade (World Bank, 2015, p. 8). The World Bank (2015 & 2018) argues that limited land and water resources management mean that significant parts of the population cannot effectively exploit the region's agricultural potential and increase yields. Go, Robinson & Thierfelder (2016) argue that lack of water is a major problem in Niger (p. 565). Increases in agricultural production have, to date, largely been achieved by extending surface areas rather than yields (Ferdinand, 2016, p. 63). For example, in Mali, increases in production of millet have been due to extensification (Doso Jnr, 2014, p. 68).

Across the Sahel region, between 1961 and 2012 there was a 76% increase in farmed land and a small increase in grazing land (Ferdinand, 2016, p. 62). Human density in many regions in the south of the Sahel exceeds 150 inhabitants/ km², while the extensive agriculture systems currently in use destroy the supply of land as soon as human density exceeds 40 inhabitants/ km² (Ferdinand, 2016, p. 63).

Trends affecting natural resources include:

- Population growth: estimated at 2% annum in rural areas, there is also a youth bulge in the Sahel as 40-50% of the population are under 14. The percentage of the population between 15 and 29 will continue to grow, peaking at 28% in around 2030 (the peak will come later in Niger, 2050) (Ferdinand, 2016, p. 30).

² Diarra et al. (2017) recommend that strategies for reducing the impacts of climate change on cotton should focus on the development of heat resistant cultivars not drought resistant ones as cotton production is more sensitive to temperatures that changes in rainfall (p. 501).

- High levels of rural poverty: for example, about 2/3 of Niger's rural poor live in the semi-intensive agricultural and livestock rearing regions of Maradi, Dosso and Zinder in the south, where soil fertility is a major challenge (World Bank, 2018). Food insecurity is higher in rural areas and exacerbated by the effects of climate change (World Bank, 2018). Across the Sahel, 40-50% of the population live in extreme poverty (Ferdin, 2016, p. 30).
- Gender: women have less access to productive assets including land and agricultural inputs (e.g. fertilisers and opportunities to hire paid male farm labour), which helps to confine them to subsistence agriculture and traditional farming (World Bank, 2015, pp. 9-10). In Niger, plots managed by women produce 19% less per hectare than plots managed by men (World Bank, 2018, p. 9).
- Climate change and variability: during the 2011 drought in Niger, a 21% decline in rainfall led to a 28% decline in cereal production and an 8% reduction in the stock of animals (World Bank, 2018, p. 7).
- Regional and internal instability: for example, Niger and Chad are both home to refugees fleeing conflict in neighbouring countries (World Bank, 2015; World Bank, 2018). Mali has also suffered from severe instability in the recent past. Internal migration is also common (see section 4). Conflict in Nigeria has disrupted Chad's cross-border livestock trade with Nigeria, its second largest source of foreign revenues after oil (World Bank, 2015).

These trends interact in a number of ways. The World Bank (2015 & 2018) argue that in Chad and Niger vulnerability to climate shocks and rapid population growth have increased competition for resources, exacerbating pressures on arable lands and animal pastures, leading to land disputes amongst farmers and completion and (localised conflict in Niger) between sedentary farmers and pastoralists. In Chad, dispute resolution mechanisms have proven ineffective (World Bank, 2018, p. 1).

Doso Jnr (2014) outlines how population growth has contributed to land-use changes including the intensification of agriculture on existing farmlands and increased cultivation of marginal lands (p. 70). Fallow periods have decreased, which contributes to declining soil fertility and leads to a decline in productivity, forcing farmers to cultivate new lands, including clearing woody areas (Doso Jnr, 2014, p. 70). Population growth, greater climate variability and conflicts have combined to accentuate food insecurity amongst the poorest populations (Ferdin, 2016, p. 30).

Pastoralists and farmer-herder conflict

Pastoralism is an important activity across the Sahel and the region is home to approximately 20 million pastoralists (World Bank, 2015b). Rainfall is lower in the north of the Sahel (100-200 mm a year) than the south (500-600 mm a year) (USAID, 2017, p. 2). Farming largely occurs down to the 350mm rain belt, whilst pastoralism is the principal livelihood below this threshold (USAID, 2017, p. 3). Livestock herding contributes between 10-15% of GDP in Burkina Faso, Chad, Mali and Niger (USAID, 2017, p. 3). Half of Mauritania's population are pastoralist (USAID, 2017, p. 3). Livestock herding also brings indirect economic benefits including grazing as a means of ecological regeneration as part of the collective management of natural resources (World Bank, 2014).

Pastoralism is broadly regional in nature and analysis of transhumance and marketing routes reveal the interdependence between the Sahel countries (World Bank, 2014). The World Bank

(2014) argues that a strong pastoral system may act as a bulwark against insecurity: the vulnerable nature of pastoralist groups, their political and social marginalisation and the increased circulation of firearms, can leave them prone to radicalisation and recruitment by insurgent groups, as in the case of Mali in 2012.

Competition over natural resources, particularly land is a major issue and a cause of conflict between pastoralists and farming communities on the fringes of the Sahara (World Bank, 2014). The Tuareg peoples (largely in the northern part of the Sahel) and the Fulani peoples (largely in the southern part of the Sahel) are pastoralists (Doso Jnr, 2014, p. 68). They are a mix of agro-pastoralists, who stay close to their fields and transhumant herders (Doso Jnr, 2014, p. 68). The Tuareg rear camels, whilst the Fulani peoples rear sheep for personal meat consumption and cattle for capital, investment and prestige (Doso Jnr, 2014, p. 68). Transhumant Fulani peoples are increasingly settling in the southern parts of the Sahel and clearing trees and bushes to control tsetse flies (Doso Jnr, 2014, p. 68). Across the Sahel, grazing lands have been damaged through human population increase, expansion of cropland into marginal areas and deforestation for firewood (Doso, 2014, p. 68).

In Chad, pastoralism accounts for 80% of the national herd and includes herding on national grazing lands with some transhumance, often with a regional dimension (World Bank, 2015, p. 13). Chad has become hotter and drier since 1975 with erratic rainfall patterns nationwide and substantially decreased precipitation levels in the eastern part of the country (World Bank, 2015, p. 13). Pastoralists have responded by pushing their herds further south earlier in the year: longer herd routes have consequences for pastoralists' health and have caused conflicts with farming communities in the south (World Bank, 2015, p. 13).

In Niger, pastoral people have struggled for legal recognition (Larsen & Mamosso, 2014, p. 67). In 1961, the pastoral zone, reserved entirely for livestock herding, was established and runs west to east of the country: agriculture activity and the holding of private property are excluded activities in this zone (Larsen & Mamosso, 2014, p. 67). South of this zone are legally recognised livestock corridors and grazing territories, including on agricultural land (Larsen & Mamosso, 2014, p. 67). The 2004 Pastoral Law lacked formal recognition of fundamental rights of pastoralists and herders, including pastoral land use and informal management arrangements, which distribute water and grazing rights (Larsen & Mamosso, 2014, p. 67). This weakness was partly addressed in 2010, when the Pastoral Law, prohibited appropriation of pastoral land and provided the possibility for herders to register use rights in common property regimes in order to protect collectively owned areas against privatization (Larsen & Mamosso, 2014, p. 67). However, this has proved problematic particularly in uranium mining areas (see section 4).

Conflict between farmers and pastoralists has increased due to climatic variability.

Historically, pastoralists migrated their herds south during the dry season (October to June) and north during the wet season and pastoralists and farmers worked together (pastoralists benefitted from grazing cattle on crop residues and farmers used the cattle droppings as manure) (USAID, 2017, p. 4). In response to erratic rainfall and recurrent drought, pastoralists have altered their traditional migratory corridors in search of new seasonal watering holes and rangelands, resulting in conflicts with farmers (USAID, 2017, p. 4). Land degradation and competition over water and land resources for grazing or crops has increased (USAID, 2017, p. 4). In Burkina Faso, there were 4,000 farmer-herder conflicts between 2005 and 2011 (USAID, 2017, p. 4).

Concurrently, the pressure on arable land has led to an extension of cultivated areas to the north into livestock areas and as a result, has increased conflicts between farmers and pastoralists (Ferd, 2016, p. 63). For example, in Niger and Burkina Faso the Hausa people are increasingly moving further north to find new farmland to grow millet (Ferd, 2016). This brings them into conflict with livestock farmers who also grow millet for their own reserves (Ferd, 2016).

Environmental degradation

Environmental degradation makes the Sahel region vulnerable to crises and violence and leads to rural-urban and north-south migration (Ferd, 2016, p. 14; USAID, 2017, p. 3). The most common form of land degradation in the Sahel is soil erosion, due to both wind and water (Doso Jnr, 2014, p. 68). Causes of land degradation include climatic factors and human activities (e.g. agricultural extensification and intensification and population growth) and the interplay between the two (Doso Jnr, 2014, p. 70). For example, in Burkina Faso, as a response to the severe drought in the 1980s, internal migration increased: the size of cropland in the southern part of Burkina Faso has increased at annual rate of greater than 1% since 1986 to 2006 (Doso Jnr, 2014, p. 70).

The Sahel's soils are generally nutrient-poor and are at risk of degradation due to deforestation, overgrazing and continuous cropping (USAID, 2017, p. 3). For example, deforestation alters the moisture content of the soil, increasing water stress and lowering crop productivity (USAID, 2017, p. 3). Much of this deforestation occurs during drought years as people cut trees for additional income (USAID, 2017, p. 3).

The World Bank (2015) estimates that the annual cost to Chad of environmental degradation, in the absence of mitigation is between 3-4% of GDP (p. 13). Losses arise from: human health consequences of poor indoor air quality due to widespread use of charcoal; poor water quality; land degradation due to over-grazing; deforestation caused by clearance for cultivation and wood harvesting; and, soil depletion and erosion caused by poor crop management (World Bank, 2015, p. 13). Studies cited by UNEP suggest that due to changing rainfall patterns and land degradation, Chad and Niger could potentially lose their entire rain-fed agriculture by 2100 (USAID, 2017, p. 3).

Lake Chad and water resources

Two million people in Chad and neighbouring countries including Niger rely on Lake Chad (World Bank, 2015). Lake Chad's environment varies from shallow, open expanses of water and flooded marshland to areas of vegetation depending on the season and rainfall (Ferd, 2016, p. 26). The lake's surface area is approximately 10% of its size in the 1950s (World Bank, 2015). Both human activities (population growth and unsustainable irrigation projects), and climatic changes (changing rainfall and increased temperatures) have shrunk Lake Chad (USAID, 2017, p. 5).

Key activities of the lakeside economy include fisheries, agriculture and livestock farming (Ferd, 2016). Until 2014, the region was a net exporter of food within the Sahel and an important source of employment (Ferd, 2016, p. 26). Existing farmland is saturated: either additional land or new ways to increase productivity are needed (Ferd, 2016, p. 27). Disputes over access to water, fish catches and land ownership of the land exposed by receding waters have dramatically increased (USAID, 2017, p. 5).

In addition to Lake Chad, there are concerns that other surface water bodies are running dry or becoming seasonal water bodies (USAID, 2017, p. 5). For example, Lake Faguibine in Mali has been nearly dry since the 1970s and this has forced more than 200,000 farmers and fishermen to abandon their livelihoods (USAID, 2017, p. 5). Increasing water demands from population growth and planned irrigation schemes on the Niger and Senegal Rivers have resulted in 25-60% reductions in flows over the last 30 years (USAID, 2017, p. 5).

Drought

There were food crises following severe droughts in 2005, 2008, 2010 and 2012 (USAID, 2017, p. 1). In the 1970s and 1980s, the Sahel experienced the most dramatic drought observed in the twentieth century due to a 30% decrease in rainfall (USAID, 2017, p. 2). Whilst rainfall has recovered since the 1980s, it has not returned to pre-1960s levels and certain characteristics have changed: rainfall events are less frequent and shorter but with greater intensity (USAID, 2017, p. 2). However, Chad and eastern Niger have seen a return of wetter conditions (USAID, 2017, p. 2). Increased drought events could threaten flora and fauna as they dry out land and water resources (USAID, 2017, p. 6).

Water is a limiting factor in the Sahel's development (USAID, 2017, p. 5). However, USAID (2017) argue that the problem is not necessarily one of absolute water scarcity but rather a lack of infrastructure to ensure an adequate supply of water in dry seasons/years due to underdeveloped supply systems (USAID, 2017, p. 5). Groundwater is a primary source of water for many people in the region as surface water is limited and often seasonal (USAID, 2017, p. 5). Studies suggest that Chad and Mauritania have significant groundwater reserves in desert areas (USAID, 2017, p. 5).

Fisheries

Fishing is an important livelihood activity in the Sahel, but both inland and coastal fisheries are suffering from overfishing and habitat degradation (USAID, 2017, p. 4). Inland fishing occurs along all major rivers and lakes of the region, including the Niger River (Mali and Niger), the Senegal River (Mali and Mauritania), Lake Volta (Burkina Faso), and Lake Chad (Chad and Niger) (USAID, 2017, p. 4). The coastal and maritime zones of the Sahel are among the richest fishing grounds in the world (UN, 2018, p. 6). In Mauritania, fisheries account for 10% of GDP and 50% of export earnings (USAID, 2017, p. 4). Important species for Mauritania include lobster, shrimp, crab and octopus (USAID, 2017, p. 4). However, estimates suggest that Mauritania's fisheries are being exploited at a rate of 30-40% higher than the maximum sustainable yield (USAID, 2017, p. 4). Its fisheries are exploited by both domestic fishermen and foreign fleets (USAID, 2017, p. 4).

3. Extractive Natural Resources

Mali

Gold is Mali's leading extractive industry, representing 95% of its mineral production (Antil, 2014, p. 10). Mali is Africa's third-largest gold producer and in 2013, gold accounted for over two-thirds of the country's total export revenues (Traore, 2016, p. 367). Mali's gold mining activities are chiefly export orientated and offer little in the way of value-added opportunities (the gold is

exported to South Africa and Switzerland to be refined), which is one of the reasons the economy is in a precarious state (Traore, 2016, p. 367; Antil, 2014, p. 22).

There are 10 industrial gold mines owned and operated by multi-nationals including AngloGold Ashanti (Traore, 2016, p. 367). On average the country has exported over 50 tonnes annually over the past decade (Traore, 2016, p. 367). In addition small-scale artisanal mining officially produces around 4 tonnes of gold per year (some actors believe the true figure is 3 times as high as this) and exports are estimated at USD 140,000 (Traore, 2016, p. 367).

The gold mining industry was insulated from the security and political crisis of 2012 (Traore, 2016, p. 367). The gold mining sector is largely in the south of the country, unrest was largely in the arid north and the government took steps to protect multinational mining companies' infrastructure, including providing security forces to protect mine sites (Traore, 2016, p. 367).

The international gold market is experiencing a down period, which along with relatively high energy prices could mean pedestrian production for some time in Mali (Traore, 2016, p. 367).

Niger

Niger is the world's fourth largest producer of uranium and exported over EUR 348 million in 2010, equivalent to twice the total development assistance it received in the same year (Larsen & Mamosso, 2014, p. 65). Niger also has gold, phosphate and coal (Larsen & Mamosso, 2014, p. 65). Oil production began in 2011, with operations governed by a production-sharing agreement between the government and the China National Petroleum Company (Sangare & Maisonnave, 2018). The Agadem oil field is linked to the Zinder refinery by a pipeline and there are plans to export large amounts of oil through a pipeline via Chad (Sangare & Maisonnave, 2018, p. 581).

As of 2012, 40 mining corporations were registered in Niger and the government had plans to double exports from mining by 2016 (Larsen & Mamosso, 2014, p. 66). There are four mining corporations are engaged in extraction:

- Subsidiaries of AREVA, a French owned nuclear giant (the second largest uranium company in the world) operate three mines- Akouta, Arlit and Imouraren. Exploitation of the Imouraren deposit was scheduled to commence in 2017 and will make Niger one of the largest uranium producers in the world as it will have an estimated annual production of 5-6,000 tonnes (Sangare & Maisonnave, 2018, p. 581)
- Azelik mine is owned by a Chinese company, but is not operational due to numerous problems (Larsen & Mamosso, 2014, p. 66; Volberding & Warner, 2018, p. 295).

A number of factors limit Niger's benefits from uranium mining, including:

- The asymmetrical power relationship with Areva, who have dominated uranium extraction since before Niger's independence (Volberding & Warner, 2018, p. 294). This includes Areva locking Niger into a series of unfavourable procurement contracts that undervalue Niger's uranium (Volberding & Warner, 2018, p. 294).
- International regulation of uranium, which stops Niger from moving up the value-added ladder: it is unlikely the IAEA would approve conversion or enrichment facilities in Niger (Volberding & Warner, 2018, p. 299). This limits the amount of revenue Niger can generate from uranium (Volberding & Warner, 2018, p. 299). Niger only has the legal and technological ability to engage in the first two stages of uranium processing- mining and

milling, neither of which provide any substantial profit margins (Volberding & Warner, 2018, p. 299).

Chad

In 1988, Chad granted a 30-year concession to the multi-company Doba Consortium (ESSO Exploration and Production Chad Inc), of which ESSO is the lead company and operator (IMF, 2016). The Doba oilfields, in the south of the country, produced 145,000 barrels per day in 2015 (IMF, 2016). The oilfields are linked to the coastal city of Kribi in Cameroon by a pipeline: the World Bank and the European Investment Bank funded the Chadian and Cameroonian stakes in the pipeline (IMF, 2016). Ongoing development of new oil and gas fields is taking place in areas adjacent to the Doba oilfields³.

Since 2011, two new producers have begun operating: the China National Petroleum Company International (CNPCI) and Glencore, whilst a dozen other companies have exploration permits (IMF, 2016). In 2006, the Chadian state oil company, the Société d'Hydrocarbures de Tchad or SHT, was established and has become a key player in the sector (IMF, 2016). The SHT is 100% government owned and manages the government's oil assets as well as marketing its own and the government's oil (IMF, 2016).

The World Bank helped Chad with a Petroleum Revenue Management System (PRMS), designed to ensure that oil revenues would benefit development and poverty alleviation (IMF, 2016). This system included a mechanism to pay royalties into an offshore account and another for paying income tax into the central bank, plus the earmarking of revenues for investment spending (IMF, 2016). This system meant that initially oil revenue collection was relatively transparent (IMF, 2016). This was partly because at the time there was only one consortium operating with two licenses, one set of oilfields and one oil fiscal regime (IMF, 2016). However, since 2006, Chad's oil sector has become more complex and the IMF (2016) argue that there is now a need for stronger transparency and integrity arrangements.

In addition to the oilfields, there is minor mining of mineral commodities such as gold (mainly in the West of the country) and limestone: since 2015, the government has encouraged new exploration for deposits of non-hydrocarbon minerals⁴.

Burkina Faso

In 2009, gold overtook cotton as Burkina Faso's main export and the country became the continent's fourth biggest producer (Antil, 2014, p. 14). By 2010, 300 mining prospects had been issued and 60 international firms were engaged in mining exploration and exploitation (Antil, 2014, p. 14). Burkina Faso also has a manganese mine (exploited by a branch of an American company) and a zinc mine (exploited by company majority owned by Glencore and Blackthorn Resources, and 10% owned by a Burkina Faso company) (Antil, 2014, p. 14). Antil (2014) argues

³ <https://eiti.org/chad>

⁴ <https://eiti.org/chad>

that corruption and bad governance may limit Burkina Faso's ability to realise its mining potential (p. 16).

Mauritania

Mauritania has vast mineral wealth including iron and copper, which it has been exploiting since the 1960s (Antil, 2014, p. 16). The Société minière de Mauritanie (SNIM) has its roots in mining pre-independence: after independence it was nationalised and became the flagship of the Mauritanian economy (Antil, 2014, p. 16). SNIM is the largest private employer in the country producing more than 10 million tonnes of iron a year: the state owns a 78.35% share of the company (Antil, 2014, p. 16).

Antil (2014) argues that Mauritania is the Sahel country most likely to be rapidly transformed into a real mining economy (p. 16). SNIM in partnership with Xtrate (one of the largest mining companies in the world) plans to produce 50 million tonnes of iron a year at three sites (Antil, 2014, p. 16). SNIM is also undertaking a joint venture with the Industrial Bank of Kuwait to mine gypsum (Antil, 2014, p. 17). Exploitation of Mauritania's natural gas could supply electricity to the mining sector and be exported to Senegal and Mali (Antil, 2014, p. 17). The World Bank is working with Mauritania to design a robust fiscal framework to manage the revenues from the development of offshore gas (IMF, 2018b). However, there are a number of problems in the mining sector, which could limit its potential including corruption, poor governance and low wages (Antil, 2014, pp. 24-25).

4. Management of extractive resources

Key debates about the extractives sector include transparency, pricing and how mining revenues are disbursed and the benefits that countries derive from mining (Antil, 2014; Alliot et al., 2017). The African Union has stated that the actual extent of benefits that African states derive from extractive industries are lower than countries elsewhere due to issues around taxing company profits and their limited ability to participate in extraction industries (Antil, 2014, p. 19). The countries of the Sahel have often offered tax incentives to mining companies.

Extractive industries pose a number of problems for the countries of the Sahel including localised environmental impacts, low levels of job creation for national workers, the lack of spill-over economic effects, the ability of states to ensure their environmental and social standards are followed and the distribution of revenues between regions (Antil, 2014, p. 19). Revenues from mining are dependent on a number of factors including production/extraction amounts (it is sometimes in companies' interests to slow down production when world prices are depressed) and demand for resources (for example, mining in Africa generally is predicated on demand in China) (Antil, 2014, p. 21). As the countries of the Sahel do not process their own raw materials, the only way they can benefit from mining is through the tax regime (Antil, 2014, p. 27).

International actors have recently recognised the importance of increasing transparency in the extractives sector (Volberding & Warner, 2014, p. 300). For example, the World Bank is providing support for implementation of the Extractive Industries Transparency Initiative (EITI) and supporting contract negotiations through the Extractive Industries Technical Assistance Facility and the new Africa Extractive Industries Facility (Volberding & Warner, 2014, p. 300).

Child labour is high in artisanal and small-scale gold mining in both Mali and Burkina Faso (O'Driscoll, 2017). In Mali, it is estimated that 20% of labourers are children and up to 30-50% of

labourers in Burkina Faso are children (O’Driscoll, 2017). There is limited data on child mining Niger, but one source estimated 22,000 children may be working in Niger’s mines (O’Driscoll, 2017).

The following sections consider the management of extractive resources in Mali, Niger and Chad: Burkina Faso and Mauritania were outside the scope of this study due to the short timeframe.

Mali

Traore (2016) argues that for Mali to derive greater benefits from its gold three things are needed: greater transparency, sounder investment of gold revenues, and more robust partnerships between companies, governments and local populations (p. 367). Bad contract negotiations, mismanagement of revenues, corruption and inequitable reinvestment of revenues mean that gold has not necessarily lead to poverty reduction (Traore, 2016, p. 367). Civil society organisations have also called for greater transparency and accountability in the mining sector, including details of revenue flows and better working conditions for indigenous operators (Traore, 2016, p. 367). Efforts to improve transparency include the 2015 development of a publicly accessible, online repository of mining licences, statuses, locations and revenues, funded by GIZ and managed by the National Department of Geology and Mines (NDGM) (Traore, 2016, p. 367).

Legal and governance framework

A number of taxation laws and policies apply to the mining sector: the General Tax Code (CGI), the tax of industrial and commercial profits (the CTI), three Mining Codes (1991, 1999 and 2012⁵), the Investment Code and recent transfer pricing regulations (IMF, 2018, p. 30). The IMF (2018) argues that the overlapping tax rules have created complexity and inhibited the government’s ability to undertake effective tax reforms (IMF, 2018, p. 31).

The Mining Code defines the main taxes, duties, levies and royalties applicable to mining companies and grants fiscal stability of up to 30 years to eligible multinational enterprises (IMF, 2018, p. 31). The IMF (2018) argues that whilst the Mining Codes were designed to provide incentives for investment and employment, they have created opportunities for tax avoidance strategies that shift profits outside Mali or from taxable to lightly taxed companies within Mali (p. 31). Mali also does not tax indirect transfer of mining rights (as opposed to the direct sale of the rights), which could be a potentially significant source of profit shifting (IMF, 2018, p. 33). Another potentially significant risk is that Mali’s transfer pricing regulations do not apply to intercompany transactions within Mali: this creates incentives for companies to manipulate the transfer price within Mali between a profitable mine reaching the end of its life and a new mine (organised as different but related subsidiaries) (IMF, 2018, p. 34).

The Mining Codes and the Investment Code grant exemptions from VAT and custom duties, including during the exploration phase and the first three years of operation (IMF, 2018, p. 31).

⁵ In 2018, Mali undertook negotiations with mining companies to draft a new Mining Code. The government stated in March 2018 that it will unilaterally implement a new law if no compromise is reached. For more information, see <https://www.reuters.com/article/us-mali-mining/mali-says-negotiating-mining-code-revision-but-could-act-unilaterally-idUSKCN1GS2O6>

Customs exemptions, such as the one on import duties for petroleum products during the entire operation phase, provide opportunities to artificially increase the prices of intercompany purchases and thus reduce the CIT base (IMF, 2018, p. 31).

The 2012 revision of the Mining Code removed the five year holiday from CIT: this was a particularly generous exemption given the average life expectancy of a mine is 10 to 15 years (IMF, 2018, p. 31). However, seven out of the ten mines operate under the 1991 Mining Code (and three under the 1999 Mining Code), so several companies continue to benefit from this exemption, including for mine extension projects (IMF, 2018, p. 31).

The 2012 Mining Code reduced the rate of CIT that applied to 30% (with a reduced rate of 25% for the first 15 years of a mine's operation) from 45% in the 1991 Mining Code (IMF, 2018, p. 32). This rate is comparable with others in Africa, for example, Tanzania and Niger apply 30% (IMF, 2018, p. 32).

Mining companies are also subject to royalties of 6% under the 2012 Mining Code (IMF, 2018, p. 32). Royalties are split into two taxes: one based on turnover and an ad-valorem tax based on mine gate prices (IMF, 2018, p. 40). Whilst Mali's authorities have good control over the quantity and quality of gold exports by multinational enterprises, they have less information about export prices, which companies may understate, thus affecting CIT and royalty revenues (IMF, 2018, p. 40).

The Mining Code details companies social and development responsibilities to the areas where mines are located (Antil, 2014, p. 22). For example, the company Morila SA has built schools and mosques in the four communes near its gold mine, as well as financing the electrification of the maternity hospital (Antil, 2014, p. 22). However, there are social and environmental problems associated with the mines including the spread of HIV, the use of environmentally harmful chemicals, and one company subsidising the salaries of the local gendarmes, who later repressed protests against the company (Antil, 2014, pp. 22-23).

Niger

Most of Niger's proceeds from mining are generated from revenues as a result of the mining fee and the extraction tax (Larsen & Mamosso, 2014). In 2016, fiscal revenues from mining were 26% of government income (Sangare & Maisonnave, 2018). In 2011, uranium represented 75% of the value of Niger's total exports (Larsen & Mamosso, 2014, p. 67). However, the revenue the government receives is equivalent to approximately 20% of the import value (Larsen & Mamosso, 2014, p. 67). The mining fee (royalties) is between 5.5% and 12% depending on corporate profitability and derived from a formula in the 1999 Mining Law (Volberding & Warner, 2018, p. 295).

In 2007, the state committed to returning 15% of mining revenues to the affected areas, with the amount relative to the impacts borne by each commune (Larsen & Mamosso, 2014, p. 67). The communes are required to allocate 90% of funds to investments e.g. infrastructure, education, 5% to staff and operational costs and 5% to monitoring activities (Larsen & Mamosso, 2014, p. 67). For example, the region of Agadez, which hosts most of the uranium mining activities received 283,989 Euros in 2010 (Larsen & Mamosso, 2014, p. 67).

Legal and governance framework

Mineral wealth is the property of the state according to the 1993 Mining Law. The state has the right to expropriate and endow corporations with the permits to establish necessary infrastructure, alter the landscape, and withdraw water resources (Larsen & Mamosso, 2014, p. 67). Expropriation for public purposes should follow rules on compensation and is applicable to all types of land tenure (Larsen & Mamosso, 2014, p. 67). The 2012 Code General des Collectivités describes sub-national competencies for environmental protection and management and outlines how proposals for new mining sites should be included in Commune Development Plans, the key instrument in local planning (Larsen & Mamosso, 2014, p. 67).

In order to obtain a permit, mining prospectors must submit an EIA including a social and environmental management plan and a plan for rehabilitating the site to the Bureau d'Evaluation Environnementale et des Etudes d'Impact (BEEEI), who verify it and undertake a mission to the site (Larsen & Mamosso, 2014, p. 68). The EIA must also be presented in a public consultation and corporations must submit regular reports on environmental impacts and radioactive exposure (Larsen & Mamosso, 2014, p. 68).

The Centre National pour la Radiation protection, part of the Ministry of Health, is responsible for surveillance and control with regard to radiation protection, including specification of maximum exposure doses for workers and local populations (Larsen & Mamosso, 2014, p. 68). Mining operations are expected to follow international protection norms and be ISO certified for environmental management and occupational health and safety standards (Larsen & Mamosso, 2014, p. 68).

Lack of capacity

Larsen & Mamosso (2014) argue that the Nigerien government lacks the capacity to effectively monitor and implement its governance framework for the mining sector (p. 69). For example, in terms of the BEEEI, at the time of Larson & Mamosso's study there was only one person responsible for verifying and responding to all mining project applications (p. 69). Other issues identified in their study include:

- mining corporations issuing terms of references for EIAs that did not adequately include pastoral land impacts;
- lack of capacity undermining the repatriation of revenues to communes and the application of Commune Development Plans as in some cases mayors cannot read or read;
- government agencies lacking the capacity to take measurements independently of the companies' own assessments, for example the state does not have the resources to collect and analyse water samples and it does not have its own lab;
- in some cases mining corporations funded or supported the training of the very agency staff who are responsible for monitoring their operations;
- Regional BEEEI and Centre National pour la Radiation protection units lack the staff and technical equipment to monitor radioactivity (Larsen & Mamosso, 2014, pp. 69- 70).

As mentioned in section two, in Niger there is legal recognition of pastoral rights. This includes compensation for encroachment by mining companies, however, the 2010 Pastoral Law is largely ineffective and is not being implemented (Larsen & Mamosso, 2014, p. 69). Few, if any

pastoralists have applied for legal recognition of their land: if the claim is recognised locally it is unlikely the pastoralists will bother with the cumbersome registration process, if the claim is disputed then experience shows that legal recognition will not be granted (Larsen & Mamosso, 2014, p. 69). Pastoral groups are also disadvantaged by their transience as opposed to settled villages who may be able to mobilise to negotiate with a mining corporation. As of 2014, AREVA had not involved any pastoral NGOs in their local partnerships (Larsen & Mamosso, 2014, p. 69).

Negotiating mining deals

France relies on Nigerien uranium to meet one-third of its total energy needs and the French corporation Areva has been the main player in the sector (Volberding & Warner, 2018, p. 295). The Nigerien government have taken steps to improve their bargaining position vis-à-vis Areva, including strengthening the Mining Law in 2006 to better institutionalise the relationship between the Nigerien state and foreign mining companies (Volberding & Warner, 2018, p. 296). However, Niger still granted Areva significant financial and regulatory exemptions when it renegotiated its contracts in 2006 (Volberding and Warner, 2018, p. 296).

After 2007, the export value of Niger's uranium grew as there was a surge in international market prices and increasing competition amongst foreign investors (Larsen & Mamosso, 2014, p. 66). Niger has negotiated deals with new buyers for their portions of the mined uranium including with the US-based Excelon Corporation in 2010 and buyers from South Korea (Volberding & Warner, 2018, p. 300).

In 2013, Niger and Areva renegotiated their terms in a contentious process (Volberding and Warner, 2018, p. 296). Negotiations stalled as Niger attempted to decrease French tax breaks and increase Nigerien royalties (Volberding and Warner, 2018, p. 296). In an apparent protest, Areva temporarily shut down of both the COMINAK and SOMAIR mines between December 2013 and February 2014. At the end of the 2013 renegotiations, Niger was able to extract some concessions, getting an additional payment of 35 million euros over three years (Volberding and Warner, 2018, p. 296).

The 2013 renegotiation took place against the backdrop of a campaign by Oxfam and ROTAB (Réseau des Organisations pour la Transparence et l'Analyse Budgétaire / Publish What You Pay Niger). This campaign called for greater transparency around mining contracts and revenues and for fairer revenues to be paid by Areva to the Nigerien government (Alliot, Corthin, Kurkjian, Lemaitre, Ly, & Parrinello, 2017, p. 26).

In 2016, AREVA, due to new European reporting requirements disclosed the amounts it pays the Nigerien government. Alliot et al. (2017) argue that AREVA pays less than its fair share (p. 26). They argue the uranium AREVA exports is under-priced, representing significant potential losses for the Nigerien government (Alliot et al., 2017, p. 32).

Social and environmental concerns

The uranium industry operates in the face of severe grievances from affected local populations and transhumant pastoral people (Larsen & Mamosso, 2014, p. 68). Civil society claims against Areva include: soil and water contamination, radioactivity exceeding the mandated exposure levels, health impacts including babies born with birth defects, and a lack of compensation for work related illness and insufficient compliance with norms on health surveillance (Larsen &

Mamosso, 2014, p. 68). Mining corporations have rejected civil society claims (Larsen & Mamosso, 2014, p. 69).

Mining activities are carried out in the Zone Pastorale and the livestock corridors, for example, Agadez is home to 15% of Niger's 5 million bovines and 14% of the national total of camels (Larsen & Mamosso, 2014, p. 68). Pastoral organisations have described widespread evictions, disturbance of livestock herds through the use of heavy vehicles and military escorts, military personnel hunting in protected areas, waste bins and toxic dumps on pastoral land, mining vehicles frequently killing children and animals and corporations blocking livestock migration routes (Larsen & Mamosso, 2014, p. 68). These impacts are pushing herders further north where there are scarce water resources and less forage (Larsen & Mamosso, 2014, p. 68).

Niger's placer mining

The mineral-rich Liptako region in southwest Niger⁶ is home to a booming placer mining (panning alluvial deposits of sand and gravel) industry (Yonlihinza, 2017). The government of Niger originally promoted placer mining in the 1980s to stem the tide of rural migration following bad harvests (Yonlihinza, 2017). As a result, the population of Tera, a department in the southwest has doubled every 15 years and 61% of people are under the age of 20 (Yonlihinza, 2017). Komabangu village, close to the largest placer mine site in the region saw its population increase from 200 people in 1999 to 25,000 in 2004, including both internal migrants and migrants from Burkina Faso, Mali and other countries (Yonlihinza, 2017).

The increase in placer mining has had a number of social and environmental impacts, including localised land conflict (Yonlihinza, 2017). For example, the villages and ethnic communities of Sonray and Gurmantche are fighting for control of a site called Chaka, located on the border of both villages (Yonlihinza, 2017). Environmental impacts include increased water use affecting the local water table, localised deforestation and harmful chemicals used in gold mining contaminating the soil (Yonlihinza, 2017). The government has done little to address rural poverty, migration or mitigate the environmental impacts of unplanned demographic shifts that are altering life in this region (Yonlihinza, 2017).

Chad

Chad's oil revenue peaked in 2011 at USD 2 billion or 76% of government revenue (IMF, 2016). Oil is extremely important to the Chadian economy: in 2016, oil accounted for nearly 50% of Chad's exports and nearly 9% of GDP (Moore Stephens LLP, 2018). In 2015, Chad earned USD 538 million from its extractive industry tax: 99.6% of these revenues were from hydrocarbons, including oil transport and refining (Moore Stephens LLP, 2018)⁷. However, oil revenues have

⁶ The Liptako region also encompasses parts of Burkina Faso, Benin and Mali and is rich in bedrock formations. There has been convincing evidence since the 1970s that communities in the region are sitting on considerable mineral wealth (Yonlihinza, 2017).

⁷ Chad also exports cement, gold and uranium: in 2016, the export value of its gold was USD 167 million (Moore Stephens LLP, 2018). However, no figures could be obtained by EITI on the volumes and value of this production (Moore Stephens LLP, 2018).

decreased since their 2011 peak: in 2016, they were USD 263 million (Moore Stephens LLP, 2018).

The IMF (2016) has linked decreases in revenues to falling oil prices. However, Moore Stephens LLP who produced the 2018 EITI report on Chad suggest that it is more complicated than this as the decrease in revenues is linked to decreases in the gross receipts of the sales of the State's share of the oil (Moore Stephens LLP, 2018). This was due to both decreases in the quantities marketed by the SHT and a decrease in the average price (Moore Stephens LLP, 2018). Oil production fell in 2016 by 11% against 2015 (Moore Stephens LLP, 2018). State oil shares, including taxes recovered in kind, amounted to 11.3 million barrels or 24.1% of total production (Moore Stephens LLP, 2018).

Social conflicts and public debates have focused on the management of oil revenues (including the oil-backed loans granted by Glencore in 2013 and 2014), environmental impacts and poverty alleviation impacts⁸.

Legal and governance framework

The EITI outline Chad's legal and governance framework for extractive industries as follows: oil and gas licenses are awarded either through competitive bidding or direct negotiations; mining licenses are awarded on a first come, first served basis. Companies operating in the oil and gas sector must pay corporate income tax, royalties on production and a levy on crude oil exports. In the mining sector, extraction tax applies. The public Treasury is responsible for collecting and managing taxes paid to the central government. Subnational governments from oil producing regions are entitled to 5% of oil revenues from the Treasury. In 2018, the government of Chad committed to drafting legislation ensuring the publication of all existing contracts and licenses in the oil sector within 90 days of their approval and to make the documents easily accessible online.

However, the IMF (2016) report on Chad's oil sector suggests governance is more complicated than this as the government has steadily increased its participation in the sector, which contains both benefits and risks. The 2007 Hydrocarbon Law introduced a second fiscal regime (IMF, 2016). The Doba Consortium and the China National Petroleum Company International (CNPCI) continue to operate under the original fiscal regime as concessions and pay royalties and corporate income tax, whereas new licenses are issued under a production sharing contract regime (IMF, 2016). Under a production sharing contract, the government is entitled to a share of production instead of income tax (IMF, 2016). In 2010, Chad introduced a model Production Sharing Contract, to standardise key fiscal parameters: the IMF (2016) argues that this facilitates accountability in the sector.

In 2008, the Doba Consortium, as requested by the government, began paying quarterly income tax advances based on a concurrent estimate of what would be due as opposed to on the past year's declaration (IMF, 2016). This has created uncertainty about how much will be received each quarter (IMF, 2016).

In 2012, the government began switching to revenues in kind, with companies paying royalties and taxes in physical barrels of oil, which SHT would then be responsible for marketing (IMF,

⁸ <https://eiti.org/chad>

2016). In 2015, two-thirds of oil revenues were revenues in kind: this is a major challenge and risk (IMF, 2016). The introduction of revenues in kind resulted in the government entering into oil-collateralised borrowing in the form of prepayment agreements (IMF, 2016).

In 2013, the Government borrowed USD 600 million for budget financing and in 2014, SHT borrowed USD 1.45 billion to purchase a 25% share in the Doba Consortium (IMF, 2016). By 2016, in addition to owning 25% of the Doba Consortium, the SHT also owned 25% of the CNPCI's three not-yet producing oilfields, 40% of the N'Djamena Refinery Company, and a 15% stake in Glencore's operations in Chad (IMF, 2016).

In 2014, a new PRMS was introduced and its key features include:

- The oil revenue oversight body, *College de Contrôle et de Surveillance des Recettes Pétrolières*, which produces annual reports on the use of direct oil revenues (royalties and dividends) for priority spending and detailed information of production, exports, shipments and prices;
- An offshore account with Citibank in London: this is the only bank account into which companies can make royalty payments, and the account that the proceeds of sales of revenues in kind are paid into: it can only be accessed by the Treasury. Indirect revenues (taxes and custom duties) are paid into Treasury accounts;
- Ongoing participation in the Extractive Industries Transparency Initiative (IMF, 2016).

The Ministry of Petroleum is responsible for negotiating contracts, monitoring activities and promoting the sector (IMF, 2016). The Ministry of Finance is responsible for revenue streams derived from taxation, debts contracted or guaranteed by the government, and forecasting and reporting on oil revenues (IMF, 2016).

Glencore's prepayment loan to SHT

SHT's purchase of the 25% stake in the Doba Consortium was funded through a USD 1.45 billion prepayment loan from Glencore (IMF, 2016). This loan was guaranteed by the government and scheduled to be paid back over four years from the proceeds of oil cargoes sold by SHT to Glencore at a discount against Brent price (IMF, 2016). Projections based on a high 2014 oil price for the Doba oil showed that it was possible for SHT to pay the loan back over four years and make USD 500 million in profit (IMF, 2016). However, oil prices dropped in 2014 and 2015 and the net proceeds from the project no longer covered debt service (IMF, 2016).

In 2015, Chad and Glencore renegotiated both the prepayment for the Doba Consortium share and the 2013, prepayment for budget financing, including a lower interest rate and an extension on the repayment period to 2022 (IMF, 2016). Despite restructuring the debt, it continued to absorb nearly all of Chad's oil profits (Payne, 2018). The IMF characterised the debt as unsustainable and labelled the process of allocating payments to service the debt as opaque (Payne, 2018). The IMF's release of funds to Chad in 2017 was conditional on a second restructure of the debt (Payne, 2018). This restructure included extending the repayment period to 2030, a two-year grace period on principal payments and a lower interest rate (Payne, 2018).

Recommendations to improve transparency in Chad's oil sector

The IMF (2016) recommends a number of ways to improve transparency and accountability including:

- Modelling oil contracts: this would help civil society to understand the contracts and also help the government manage popular expectations as it would show what type of revenues will accrue at what stage of the project;
- Improving the flow of information about the oil sector, not only to the public, but within the government itself. In 2015, the Inter-Ministerial Committee in Charge of Monitoring Petroleum Revenues was established to consolidate and convey all information relating to oil revenues. However, progress has been slow and is also hampered by limitations in the flow of information from the oil companies to the government;
- Improving government auditing of oil companies including SHT and of the revenue administration system (IMF, 2016).

The Extractives Industries Transparency Initiative

The Extractives Industries Transparency Initiative (EITI), launched in 2002, is the global standard to promote the open and accountable management of oil, gas and mineral resources. The EITI Standard requires countries to publish timely and accurate information on key aspects of their natural resources management, including how licenses are allocated, how much tax and social contributions companies pay and where they money ends up in the government at the national and regional level (EITI, 2018). Published data is two years old. For example, 2018 report on Chad contains data from 2016.

Table 1: EITI Status

Country	Status
Burkina Faso	Meaningful progress
Chad	Yet to be assessed against the 2016 Standard
Mali	Meaningful progress
Mauritania	Meaningful progress
Niger	Other

Source: Author (date, p. page)

In October 2017, the EITI's board suspended Niger on the basis of inadequate progress against the requirement for civil society engagement: following this Niger announced its withdrawal from the EITI⁹. Meaningful progress means that a country has implemented significant aspects of each requirement and the broader objectives of the requirement are being fulfilled¹⁰.

⁹ <https://eiti.org/niger>

¹⁰ <https://eiti.org/about/how-we-work#upholding-the-standard-internationally-validation>

5. Intervention strategies

Donor intervention in the Sahel has focused on a number of areas including food insecurity, improving agriculture, combatting/preparing for climate change, pastoralism and improving water access and management. In terms of extractives, the World Bank and the IMF have both focused on management initiatives (e.g. the World Bank supported the development of Chad's PRMS).

Donors active in the Sahel include France who launched the Integrated and Sustainable Livestock Farming and Pastoralism in West Africa Project (PEPISAO¹¹) in April 2018. This project aims to promote more effective regulation of pastoralism and reduce farmer-herder tensions. The EU, through its Emergency Trust Fund for Africa, launched a project in conjunction with France in 2016 to support agriculture in the Tahoua and Agadez regions of Niger¹². Regional donor initiatives include:

- The Sahel Alliance¹³ launched in 2018 by the EU, the World Bank, the African Development Bank, France and Germany, with support from Italy, Spain and the UK. Priority areas include rural development and food security and there will be projects focused on Lake Chad.
- The UN Support Plan for the Sahel (which includes ten countries) identifies building resilience to climate change and improving management of natural resources as key priorities (UN, 2018, p. 14). Priority activities include preventing and managing farmer-herder conflicts by improving land and water management and governance; and, protecting marine and coastal ecosystems (UN, 2018, p. 15).

As opposed to undertaking a donor mapping for the countries of the Sahel, this section focuses on evidence of successful intervention strategies for agriculture, including land and water management.

USAID

The RISE (Resilience in the Sahel Enhanced) programme is currently entering its second phase, implemented by USAID's Sahel regional office, in conjunction with Sahel country offices and the USAID's Food for Peace Programme. RISE focuses on building resilience in the Maradi and Zinder zones of Niger and parts of the Central Nord region, Burkina Faso. Developed in response to the severe drought of 2011-12, RISE argues that communities in the Sahel are unable to manage the ongoing stressors of limited and erratic rainfall, low soil fertility and population growth (USAID, 2018, p. 3). USAID (2018) identifies conflict over diminishing resources as an important issue. One of the key objectives of the second phase of the programme is to improve water security (both by improving access to potable water and enhancing water resources management) and enhance sustainable productive land use (e.g.

¹¹ <https://www.afd.fr/en/west-africa-rethinking-pastoralism-cultivate-peace>

¹² C:\Users\cooperrv\Zotero\storage\48XP3HGE\projet-dappui-aux-filieres-agricoles-dans-les-regions-de-tahoua-et_en.html

¹³ <https://www.afd.fr/en/sahel-alliance-launched-eur-6bn-and-500-projects-development>

secure access to land, improved management of natural resource conflicts, and enhancing climate smart agriculture) (USAID, 2018, p. 14).

In Burkina Faso, USAID (2018) argues that the government's support for agro-pastoralists (e.g. by supporting professional producers groups with seeds, fertilisers and agricultural equipment) is insufficient and lacks the sustainability of a market solution (p. 7). USAID's focus on water is complementary to the Nigerien government's HC3N initiative, Nigeriens Nourishing Nigeriens, which identifies water as the greatest constraint to macroeconomic growth and the rural population's most pressing daily need (its second priority is reclaiming degraded lands) (2018, p. 8). However, a large part of Niger's budget is directed towards security (USAID, 2018, p. 8).

The World Food Programme (WFP)

In addition to its emergency food security work, the WFP implements **Food Assistance for Assets** in Chad, Niger and Mali¹⁴. For example, in Mali, the Food Assistance for Assets programme has built 3,966 community assets including dams, ponds and canals (WFP, 2017b).

In the Batha and Bahr el Gazel regions of Chad, more than 3,000 people are engaged in working on schemes where they receive a cash transfer equivalent to USD 3 a day in exchange for working on assets that will increase the community's ability to handle future shocks such as drought. For example, construction of dykes and ponds retains water and increases the cultivation of off-season crops (grown after the rainy season as the water recedes) that are used for either family subsistence or to sell.

In Niger, the WFP has paid villagers with cash or food to build dams and dykes, dig zai and implement other projects that maximize water resources (Peyton, 2017). According to Benoit Thiry, WFP Niger country director, over 600,000 hectares of dry farmland have restored in the past three years (Peyton, 2017). In Niger, the World Food Programme is scaling up resilience initiatives in Maradi, Tahoua and Zinder regions and aiming to reach 350,000 people. Over the past 5 years, WFP's resilience activities have focused on environmental rehabilitation, asset creation and lean season support (WFP, 2018a).

The World Bank

Regional Sahel Pastoralism Support Project¹⁵: running from 2015 to 2021 the project aims to improve access to essential productive assets, services and markets for pastoralists and agro-pastoralists in selected trans-border areas and transhumance axes of Mali, Burkina Faso, Senegal, Chad, Mauritania and Niger. The implementing partner for the project is the Interstate Committee for Drought Control in the Sahel (CILSS). The project aims to strengthen countries' capacities to respond promptly and effectively to pastoral crises or emergencies. Drought is a key trigger for crises in pastoral regions (World Bank, 2014). Part of the project focuses on enhancing sustainable natural resources management including rangeland management and sustainable management of water access infrastructure.

¹⁴ <https://insight.wfp.org/work-food-cash-the-path-towards-self-reliance-my-journey-to-chads-sahel-belt-part-1-4cdb7169b822>

¹⁵ <http://projects.worldbank.org/P147674?lang=en>

The World Bank argues that a regional approach is appropriate because of the nature of pastoralism in the Sahel (World Bank, 2014). Past projects have demonstrated that national approaches to pastoralism, characterized by its cross-border mobility, are not sufficient to address issues that have regional and cross-border dimensions (World Bank, 2014).

In March 2018, the project was rated as moderately satisfactory in its overall implementation progress¹⁶. To date it has achieved the following:

- Sustainable land management practices adopted on 21,244 hectares against a completion target of 2450000 hectares;
- The average distance between functional water points accessible to pastoralists and agro-pastoralists in targeted zones was 47km in December 2017, against a completion target of 27km.

Sahel Irrigation Initiative Support Project 2018-2024¹⁷: It covers the six countries outlined above with regional implementation and coordination support from the CILSS. The project aims to reach nearly 60,000 direct beneficiaries (increasing their capacity to develop and manage irrigation) and, increase irrigated areas by 23,230 hectares. This includes new small-scale irrigation and potential medium and large-scale schemes and rehabilitating/improving existing schemes.

Evidence based and recommended techniques for the agricultural sector

A number of these techniques are already practised in the Sahel but farmers need support to implement them and training to make them more effective and successful approaches need to be scaled-up to a regional or national level (Peyton, 2017).

Techniques that increase crops yields: In Niger, USAID, through the RISE programme has supported conservation-farming techniques as well as irrigations systems (Peyton, 2017). Successful techniques include zai and stone-bunds (low stone walls that slow water run-off). Zai involves planting seeds in pits filled with compost and manure at the start of the rainy season. The pits boost productivity by concentrating scarce water and nutrients around the plants (Peyton, 2017).

Rainfall forecasts via radio: In Senegal, the Climate Change, Agriculture and Food Security (CCAFS) programme in partnership with Senegal's meteorological agency, provides detailed rainfall forecasts to farmers via radio (Peyton, 2017). This made a significant difference during a 2014 drought as the service notified farmers before planting time that the season would be dry and advised them to substitute their regular crops with varieties that required less water. The programme has now expanded to 7 million people in rural Senegal and there are similar projects underway in Burkina Faso, Mali and Niger (Peyton, 2017).

¹⁶ <http://projects.worldbank.org/P147674/?lang=en&tab=ratings>

¹⁷ <http://documents.worldbank.org/curated/en/299631537652703220/pdf/Disclosable-Version-of-the-ISR-Sahel-Irrigation-Initiative-Support-Project-P154482-Sequence-No-02.pdf>

Rehabilitation of degraded lands: The World Food Programme, FAO and IFAD have collaborated to rehabilitate and develop the productivity of degraded lands in Dargue, Niger (WFP, 2017a). Land degradation is one of the biggest challenges facing agricultural production in Dargue (WFP, 2017a). This collaboration rehabilitated and developed 1,500 ha of land and increased yields to 1 tonne per hectare; produced fodder crops for livestock; reducing flooding; and created income generation activities for women, which contributed to women being able to purchase between 1 to 2 animals themselves (WFP, 2017a). The WFP (2017a) argues that the intervention was successful for a number of reasons including: coordination between the three agencies (e.g. a common framework of operational planning and the development of a joint operational plan), and participatory planning at the commune and area level ensured the project understood the local context.

In addition to a local management committee to implement the activities, local ownership was increased by beneficiaries establishing their own local group to fight land degradation (WFP, 2017a). The agricultural techniques acquired by the beneficiaries (zai and stone bunds) have been replicated by community members in other sites external to the project area on about 100 hectares between 2014 and 2015 (WFP, 2017a).

Watershed approach: In their land rehabilitation work, the WFP, the FAO and IFAD are piloting an integrated watershed approach based on a comprehensive understanding of the characteristics of the territory (plateau, slopes and lowland) and how these interact with each other (WFP, 2016). Diverse soil and water conservation measures are implemented in each territory. The watershed approach helps slow down rainwater runoff, increase water infiltration and reduce erosion (WFP, 2016). In conjunction with USAID's Food for Peace programme, water infrastructure is constructed increasing access to irrigation, drinking water and fisheries development (WFP, 2016).

Agro-forestry: the deliberate use of trees in association with crops and pastureland to reduce soil erosion and increase water infiltration (Doso Jnr, 2014, p. 71). This could help to increase yields (Doso Jnr, 2014, p. 71). Recent studies of Sahelian agro-forestry parklands have demonstrated that they can reduce wind speed, increase soil fertility and air humidity and reduce diseases including fungal attacks (Binam, Place, Djalal, & Kalinganire, 2017). Agro-forestry products also contribute to food security and provide cash income (Binam et al., 2017). As markets for agro-forestry products develop, there is more incentives for farmers to maintain trees on their farms (Binam et al., 2017).

Farmer managed natural regeneration (FMNR): this is a type of agro-forestry actively practised in Niger, Mali and Burkina Faso and involves the regeneration of trees on farms (Binam et al., 2017). Institutional factors, including the governance framework and grazing management, can promote or limit the potential for FMNR (Binam et al., 2017). For example, re-greening in Niger accelerated after enforcement of the country's Forest Code was relaxed (Binam et al., 2017). Binam et al. (2017) argue that the importance of FMNR will increase as agricultural land expands into woodland and bushlands. FMNR is important as opportunities for planting new trees in the Sahel are limited (Binam et al., 2017). Binam et al. (2017) recommend capacity building for farmers including field demonstrations and information dissemination.

Re-greening in Niger has resulted in more than 200 million new trees, particularly Goa trees, over the last 30 years (McLean, 2018). Farmers have cultivated the new trees, which have grown naturally, on approximately 5 million hectares of farmland (McLean, 2018). Farmers are motivated by the impacts trees have on crop yields: in some cases goa trees have doubled crop

yields in conjunction with mineral fertilisers (McLean, 2018). Gao-nourished soil retains water, which ensures a better crop in drought years (McLean, 2018). Re-greening in Niger is largely taking place in areas with high population density: with less space to expand into, farmers are using trees to regenerate degraded land (McLean, 2018). Local ownership has been essential: prior to the 1980s trees were considered state property, once this changed, farmers began to cultivate the trees that belonged to them (McLean, 2018). In some areas communities organised patrols to protect the trees from passing farmers and neighbouring villagers foraging for firewood; in others farmers with more than 50 goa trees were paid a small amount for each tree (McLean, 2018). There are concerns that the goa trees of Zinder could be vulnerable to a tree pest that has been killing trees near Niamey (McLean, 2018).

Extractive Industries

Intervention strategies within the extractive resource sector have largely fallen under the purview of the IMF and the World Bank. Programmes and projects have focused on improving transparency and revenue management and compliance with EITI has featured strongly.

The IMF's Managing Natural Resource Wealth Trust Fund

The aim of the fund is to build economic policy and administrative capacities in resource-rich, low-income countries to help them derive the maximum benefit from their extractive resources, boosting economic development and alleviating poverty (IMF, 2016b). IMF provided technical assistance to Mauritania in 2013-2015 to

- Introduce a withholding tax of 15% in order to limit profit sharing through subsidiaries: the revenue raised from this tax in 2013 was 0.33% of GDP;
- Revise the Mining Code, incorporating a standard VAT charge on mining firms and eliminate VAT exemptions;
- Introduce rules on the arms' length principle, thin capitalisation rule and taxation of capital gains from indirect transfers of mining licenses;
- Forecasting model for resource revenue provided to the authorities (IMF, 2016b).

The IMF also completed a diagnostic assessment of the mining and petroleum taxation system in Mali in 2014 and made a number of recommendations to increase transparency and management of the sector (IMF, 2015). These included publishing the tax agreements and feasibility studies of companies holding mining rights online; guaranteeing funding for the rehabilitation of mining and oil sites; and strengthening coordination among the customs and tax administrations and the directorates responsible for the mines (IMF, 2014). Measures suggested to achieve these recommendations include creating a special fund at the Central Bank financed by grants for the rehabilitation of extraction sites and creating an inter-ministerial unit responsible for mining and petroleum taxation (IMF, 2015).

The World Bank's *Recovery and Governance Reform Support Operations for Mali*

Ranked moderately successful, the project was implemented between 2014 and 2016 and partly focused on the extractives sector (World Bank, 2017). The project achieved its objectives of auditing all mining conventions for compliance with the Mining Code and compliance with the EITI standard (World Bank, 2017). The project supported the government's decision to publish all ongoing mining exploration contracts within the EITI framework (World Bank, 2017). The purpose

of this was to promote the development of extractive industries whilst reducing opportunities for corruption (World Bank, 2017). The project also supported the adoption of the 2014 Budget Law and financed EITI activities (World Bank, 2017).

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