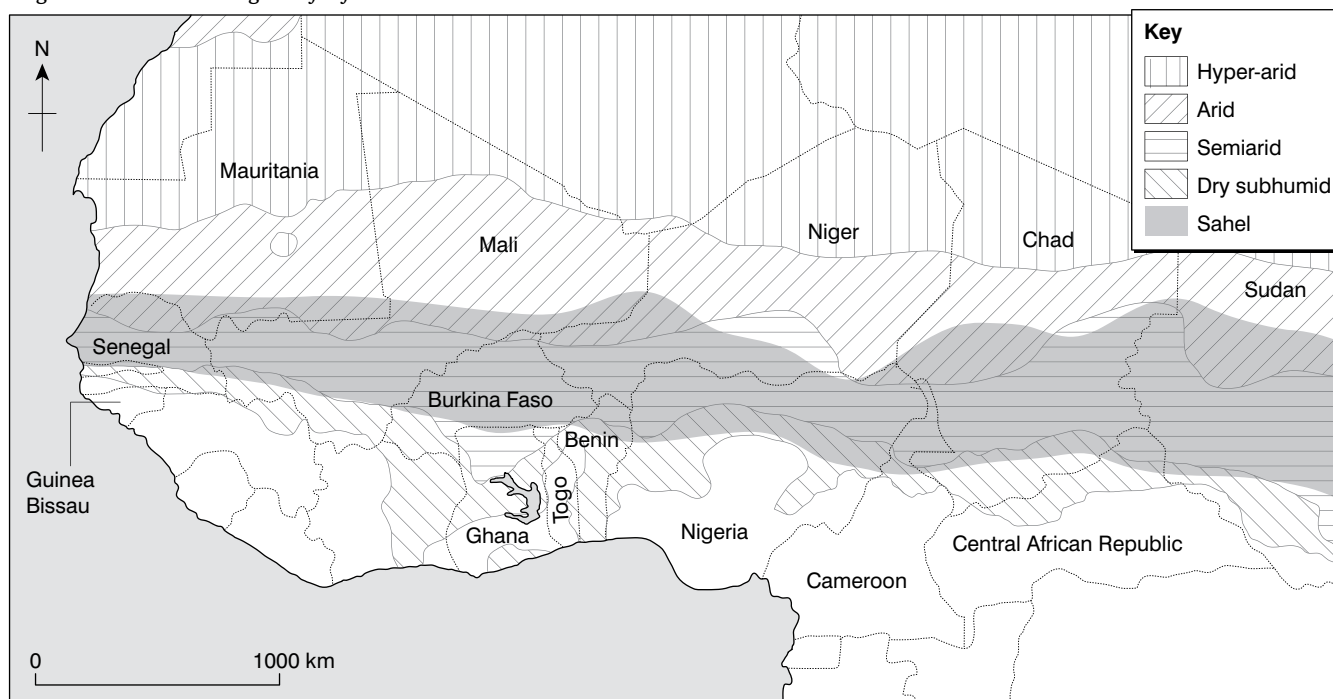


DESERTIFICATION: SUCCESSFUL MANAGEMENT IN THE SAHEL – FAMINE IN THE HORN OF AFRICA

Figure 1: The Sahel region of Africa



According to the Food and Agriculture Organisation, desertification can be defined as:

‘the degradation of land in arid, semi-arid, and dry sub-humid areas. It is caused primarily by human activities and climatic variations. Desertification does not refer to the expansion of existing deserts. It occurs because dry-land ecosystems, which cover over one-third of the world’s land area, are extremely vulnerable to over-exploitation and inappropriate land use.’

The definition refers to the fact that the process is not simply the natural expansion of a desert, but rather the degradation of land and soil in regions of the world that experience dry climates or dry seasons for much of the year. The exploitation of that land to feed growing populations in many LEDCs is a primary cause, largely due to over-grazing, poor irrigation techniques and political instability aggravating these problems.

In many regions that are experiencing desertification, the problem crosses international borders. The Sahel (Figure 1) is one such region. It is an expanse of land extending from

west to east Africa, marking the transitional change in vegetation and soil between desert and grassland in sub-Saharan Africa. The use of sustainable farming techniques in one country could be futile, if over-exploitation and other factors such as conflict are occurring in a neighbouring country.

In the western Sahel, Mauritania is desert-like due to the cold Canaries ocean current on its Atlantic coastline and its position between 5° and 30°N latitude. Its southern and western edges are semi arid and, where some vegetation occurs in greater abundance, it is now being used for permanent grazing land for nomadic people’s cattle. Similarly, in neighbouring Mali, nomads are settling down and populations in urban areas are growing, increasing the amount of farming and over-grazing taking place on semi-arid land. In areas such as these, the seasonal shift of the ITCZ to the southern hemisphere causes prolonged periods of drought.

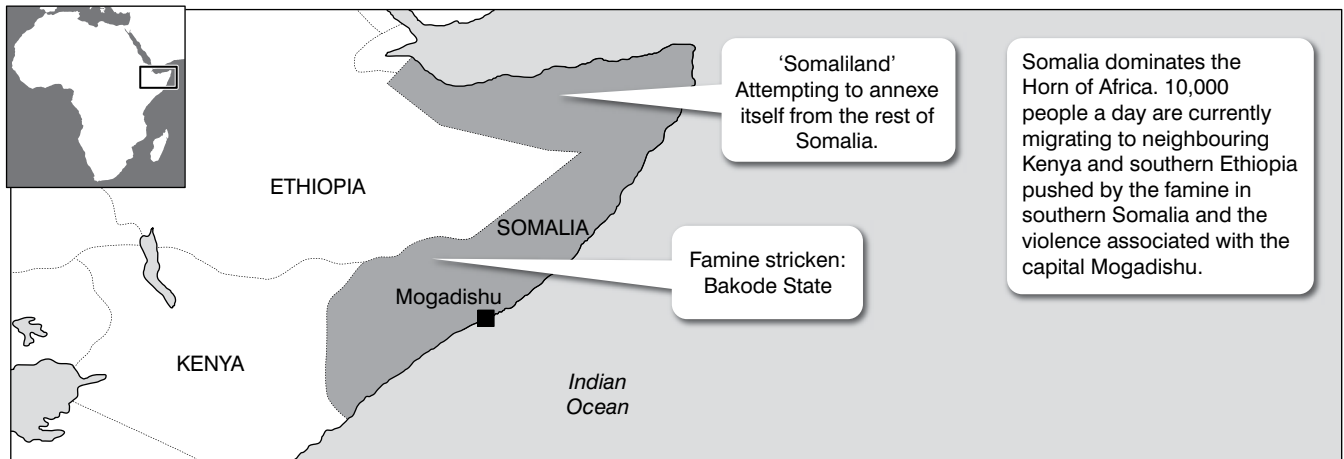
Furthermore, irrigation largely consists of rainfall during the wet

season, and water collected during that time simply poured onto crops or grazing land without further thought. These pressures cause the vegetation cover to recede rapidly. Cattle often graze down to the stem, killing most vegetation and thereby cause a two-fold problem: reduction in the amount of humus being created by decaying vegetation, and removal of the protective barrier that vegetation provides to thin desert soils. Strong trade winds blowing toward the low pressure at the equator cause erosion of these soils.

Following an appeal by French aid workers in Mali and Niger in 2007, a number of international organisations such as USAID and the Red Cross are currently funding projects to educate the people of these nations to farm sustainably and conserve water during wet seasons. They may have some success because of a period of relative peace in the western Sahel.

NGOs are trying to replicate the success of sustainable farming in Burkina Faso. Granted there is considerably more vegetation

Figure 2: The Horn of Africa



cover in Burkina Faso, as it is located further south toward the tropics. However, this country lies within the transitional zone of desert and grassland, receiving more rainfall than its northern neighbours, and as vegetation was in greater abundance here, people were more inclined to settle and farm intensively, leading to desertification during the 1990s.

In the 21st century, aid agencies such as the Eden Foundation (Oxfam) along with USAID intervened both to supply equipment needed for sustainable farming and to educate locals on sustainable techniques, many of which require understanding, rather than cost. Farmers were taught how to use drip irrigation techniques and set up rudimentary versions of the expensive industrial drip irrigations systems used on the American Prairies. Other techniques have been implemented in Burkina Faso, at little cost, funded fully by the Eden Project.

Firstly, large open containers have been sited at the foot of hundreds of rocky outcrops and hillsides. When precipitation is heavy during the wet season, rain saturates the ground, running off, causing soil erosion and flooding, as well as being difficult to collect. These huge open containers act as reservoirs and collect water running off the steeper ground. Attached to these containers are pipelines to villages to supply fresh water, and pipelines that supply a rudimentary drip irrigation system. This system draws water from the reservoir, dripping water slowly, consistently straight to where each seed is planted. This reduces the amount of

water lost to evaporation in normal farming techniques of irrigation whereby water is often spread in large quantities across the whole field.

Other techniques involved anchorage of thin arid soils by providing a permanent root system and providing protection of seedlings and soil from wind erosion. Again the techniques are simple and effective. Specifically, the Eden Project has invested charitable funds and the skills of volunteers in educating and building. Creating stone walls (bunds), between rows of crops, breaks up ground level wind speed and reduces soil erosion, allowing the seeds a better chance of taking root. Another technique is the planting of perennial shrubs, and in the more arid areas, desert scrub such as creosote bushes.

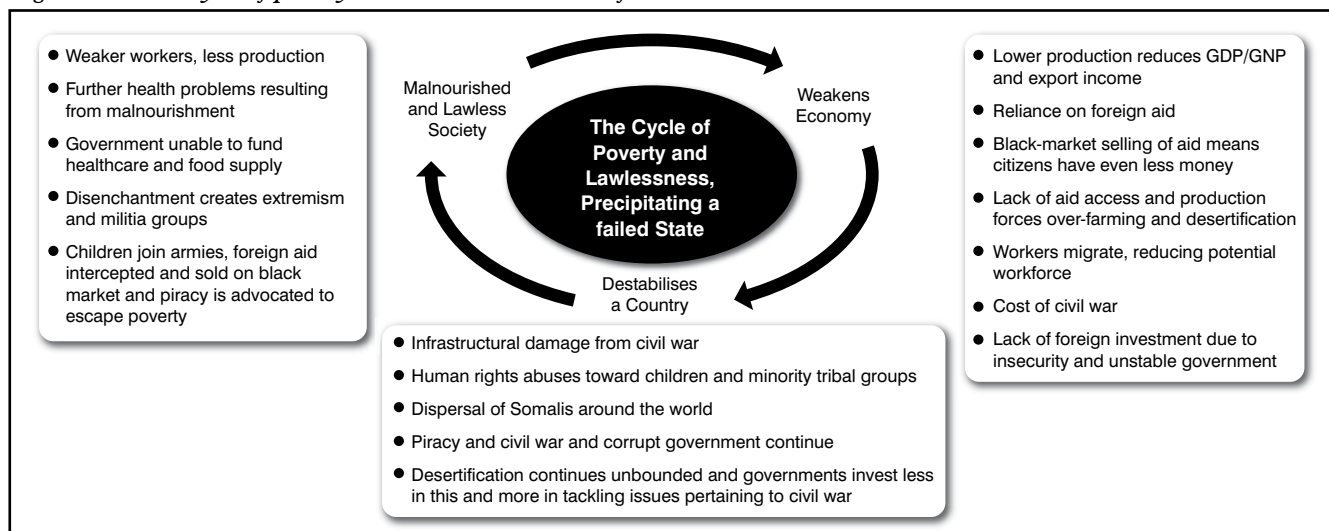
These plants survive year round in desert-like conditions and they contribute to reducing desertification in three main ways. They improve the thin soils by providing dead and decaying foliage to increase the depth and nutrient quality of the humus layer of soil. Secondly, their height provides some protection from wind erosion of the top soils and they also have extensive water-seeking root systems which helps anchor the soil and further reduce wind erosion, allowing the humus layer to gain depth. In the battle against desertification, education and funding provided by NGOs is important in helping growing populations in the Sahel to farm sustainably. However, there is relative peace across the western Sahel. The absence of peace is one

of the problems experienced in the Horn of Africa.

The Horn of Africa (Figure 2) lies on the north east coast of the continent. Here, NGOs are fully occupied feeding and distributing medical supplies amongst refugees in thousands of refugee camps across Sudan, Chad, Ethiopia and Somalia. These countries experience regular drought and famine. They experience desert conditions in their central regions and to the north, due to their high continentality, a cold ocean current travelling southwards on the east coast and their location between 15°N and 30°N, thus experiencing the warm dry high pressure in that region and the impact of the ITCZ's southward journey during long dry seasons. Farming techniques are unsustainable (over-grazing, over-farming of the same tracts of land, lack of irrigation systems or reliable water supplies) combining with drought to cause desertification in the southern and interior regions of these countries.

An additional factor is that this region has some of the fastest growing populations in the world. They are youthful and therefore continuing to grow. Growth is strictly confined to children between 0-5 years old. This is not matched by a growing adult population. Indeed, life expectancy in these countries hovers between 38 and 50 years old. As a result, there are fewer adults to care for this dependent youthful population. Many children die at a young age, the infant mortality rates for these countries being amongst the highest in the world, largely a result of malnutrition due to famine.

Figure 3: How a cycle of poverty and lawlessness creates a failed state



The effect of a growing population is that people attempt to farm more crops or use increasingly marginal grazing land for animals in order to provide sufficient food. Combined with a decreasing supply of clean water, and regular droughts, this causes desertification and crop failure, resulting in further malnutrition. The impact is that adults become malnourished, meaning that, even if these countries were able to improve their farming output or attract industrial investment from TNCs, the adult population is too low and malnourished for productivity to increase exports to encourage internal investment by governments. A vicious circle ensues. But why is desertification here less successfully managed than in the Sahel?

Case Study: Desertification and famine in Somalia

Somalia is in the north eastern region of Africa, known as 'the Horn' (Figure 2). The region has been subject to turmoil for centuries. Mogadishu, the capital, is the seat of a weak UN-backed government and is a city spiralling into violence and disrepair. Since the early 1990s, the drought, famine, lack of international investment, civil war, corruption and extremism, have all precipitated decline.

In May 2011, the UN declared a state of famine and emergency in a number of southern regions of Somalia, the worst being Bakode. Problems worsened throughout 2011:

- Somalia's worst drought in 60 years
- 10,000 people migrating to bordering countries each week
- 60% of livestock malnourished
- the majority of the youthful population malnourished
- continued action by extremist Islamic group Al-Shabab disrupted aid getting to people in need
- black-market trading of international aid
- limited supplies reaching the target groups.

Somalia is a failed state, whose government is ineffective, corrupt and has little control over its territory, incoming aid or policing of criminality. Famine and malnutrition are causing the population to become weak, prone to disease and ineffective at working. At a local level, people over-farm their crops and over-graze their livestock in an attempt to provide food for their families, resulting in soil loss to wind erosion and eventually causing desertification.

In Somalia, governments have failed to overcome the issues created by drought and desertification. From 1991 to 2006, weak UN-backed governments were at war with the Islamic militants, Al-Shabab. Al-Shabab briefly took over in 2006 before being ousted by Ethiopian soldiers, and now the country again has a weak, UN-backed democratic government.

Since 1991, Al-Shabab, and other militia have been involved in offshore piracy. They demand a ransom for the return of ships

and captives. They also intercept aid and sell this on the black-market in the capital Mogadishu, where desperate farmers from famine-stricken regions travel to buy supplies that should have reached them as foreign aid. This is a major source of money for the militia groups on land. It helps funding to buy arms and pay for food, water, medical supplies and western luxuries to maintain their following.

Some children are abducted to become child soldiers, others are tempted by the lure of food, water, clothes and western luxuries, bought with the money from piracy and black-market trade of foreign aid. With famine and malnutrition the only other option, this seems an attractive proposition to many children and their families. As a result, guerrilla war, piracy and interception of aid persist to fund civil war, whilst the poorest try to maintain farmland (precipitating desertification) in the face of drought.

In Somalia, drought has prompted people to try to farm more intensively. Where crops are sown and fields ploughed, soil is often exposed to high winds and occasional seasonal rainfall and so the thin humus layer resulting from a lack of initial vegetation cover and foliage decay is eroded. The lack of crop and natural vegetation growth and removal of vegetation by grazing means there are insufficient roots systems to anchor soil, further exposing thin top soils to wind and occasional surface run-off erosion.

Over the 50 years since colonial rule ended, governments have been slow to react and make any investment in creating a rural infrastructure and educating farmers in sustainable techniques. Famine and poverty have become so bad that people have been encouraged to take up arms against their governments and each other, and have even turned to offshore piracy and the interception of international aid to sell on the black-market. Desertification, when not addressed by government, causes famine and poverty.

Once law and order is lost, it is difficult to bring peace back to a country embroiled in multiple civil conflicts. As a result, desertification is overlooked and the problem continues to precipitate other problems – a vicious circle of armed struggle, extremism, and even piracy (Figure 3).

Social impacts of desertification in Somalia

Poverty means local communities are unable to fund even a rudimentary education or health care system. As a result many develop health issues such as HIV and malaria, whereas in other, more stable places a basic education might prevent the development of such diseases.

Uneducated children exposed to poverty will grow to become child soldiers or to resent their government further and be encouraged to take up arms. The battling clans and militia often subject citizens to terror, rape and child abduction.

Drought compounds these problems, forcing people into poverty, resentment and lawless acts. As a result Somalia is experiencing social issues as diverse as malnutrition, HIV, low literacy rates, human rights abuses, piracy, the stealing of aid and the withholding of aid from those who need it.

According to the UN, in 2011, Somalia had over two million malnourished citizens – 20% of the population. 678,000 have officially been accepted as refugees in foreign countries. Somalia is losing its potential working population, while the refugees face the issues of integration into foreign societies.

Economic impacts of desertification in Somalia

- Individual families are farming and producing less, due to a combination of drought and weakness brought on by malnutrition.
- The government is losing money each day in its battle to suppress Al-Shabab and other militia.
- Ultimately, the marginalisation of the country by the international community due to conflict has had the most draining economic impact.
- Somalia has endured military dictatorship, centuries of resource pillaging, and failure to achieve stability.
- TNCs are unlikely to invest in and help develop such an unstable nation.

Political factors contributing to desertification in Somalia

- Land mines and conflict destroy or make hazardous land that may be farmed, therefore forcing civilians to farm on increasingly smaller areas of land.
- The lack of production, cost of war and the interception of NGO aid and the kidnapping of aid workers means that the creation of stone bunds, planting of perennial shrubs and implantation of drip irrigation systems to improve farming techniques is non-existent. Farming continues to be unsustainable, contributing to further desertification.

The movement of people to neighbouring countries due to political unrest and drought puts pressure on farmland and production in other regions to provide food for additional mouths. Secondly, the lack of vegetation growth, decay, thinning

soils and wind erosion during prolonged dry periods will lay waste to much of the land that is left in the semi-abandoned interior of Somalia.

Summary

In the western Sahel countries, desertification is a process that occurs naturally due to the location and a combination of physical factors such as warm dry air, cold ocean currents, continentality, ITCZ movement and strong winds. We can also see that in the past the populations of this region have worsened that effect by settling, using unsustainable techniques to feed growing populations. However, it is also evident that countries such as Burkina Faso, with a little international aid, can implement sustainable farming techniques that can indeed override the effects of the physical environment and allow people to farm and be nourished in semi-arid regions.

It is also apparent in Somalia and its neighbouring countries that if desertification is not addressed it can become a reason for conflict, and that once conflict is ingrained in society it leads to the breakdown of law and order, the decline of a country and makes that nation ineffectual in dealing with desertification which then continues to grip regions such as the Horn of Africa.

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- Wright, L. (2007) *The Looming Tower*. Penguin.
- www.unhcr.org (reports on Somali refugees in Horn of Africa)
- www.irin.org/tv (video clip reports on desertification across the Sahel and Horn of Africa)

FOCUS QUESTIONS

- 1 Outline the physical geographical conditions that might cause desertification. (7)
- 2 Explain how NGOs have helped to reduce the effects of desertification in the Sahel. (8)
- 3 Discuss the statement that desertification is a natural process. (15)
- 4 Discuss the social and economic implications of desertification. (15)
5. Evaluate the success of human intervention to harvest water for agriculture in the Sahel region of Africa.