

Drylands Programme

ISSUES PAPER



The IUCN Sahel Programme

Sahel Information Kit

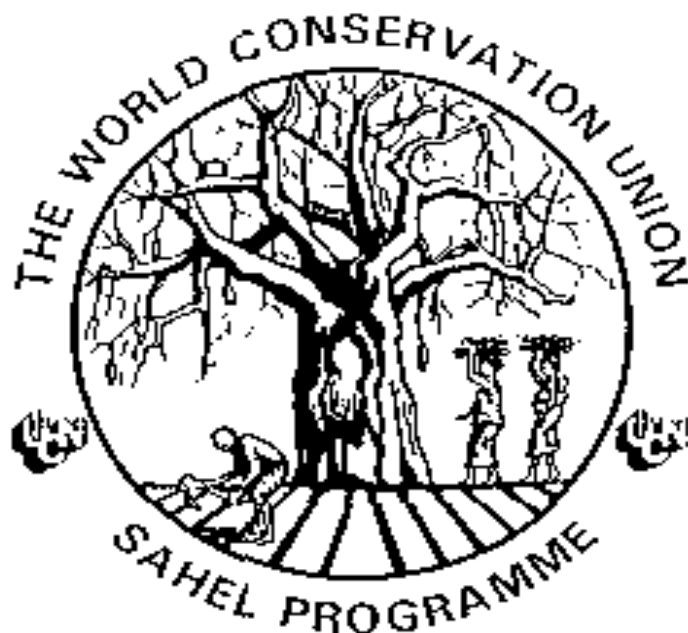
IIED

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The IUCN - the World Conservation Union - has published the IUCN Sahel Studies 1989, as part of its Sahel Programme. Running to 152 pages, the Sahel Studies includes sections on Rainfall, Population, Food and agricultural production, Conservation areas, Agricultural prices and natural resource management, Sustainable development, Supply and provision of firewood, and Pastoral land tenure. The report provides reviews of recent research on sustainable development issues by leading experts in the various fields.

Under an agreement between IUCN and IIED, Haramata is publishing four edited papers from the Sahel Studies in the Issues Envelope series - two in each of the September and December 1989 editions. In this Issues Envelope are included papers on Food and Agricultural Production and on Sahelian Rainfall. The original version of the Agriculture and Food paper was written by Dr. M. Norton-Griffiths formerly of IUCN, Nairobi and that on rainfall by Dr. G. Farmer of the Climatic Research Unit, University of East Anglia, UK. Haramata has been responsible for the editing of the original text.

Copies of the full IUCN Sahel Studies 1989 are available in English and French and can be obtained from the IUCN Publications Unit, 219c Huntingdon Road, Cambridge CB3 0DL, UK (price UKstg.12.50 or US\$25).



Some questions and answers about

RAINFALL

How bad is the rainfall shortage in the Sahel?

For the last 20 years the Western and Central regions of the Sahel have received below-average rainfall, and have experienced several severe droughts. In the entire western half of the Sahel, every seasonal rainfall since 1968 has been below normal.

Neither the droughts nor the years with rainfall deficits are peculiar in themselves. What is distinctive is the unbroken run of deficit years, which is quite unique in the records.

What is "normal" for the Sahel?

That depends on the standard used. It has often been assumed that the relatively high average rainfall measured during the period from 1930 to 1960 is "normal", and that the more recent, drier period is unusual. This may not be the case. When all the data are in for the entire 1963-1990 period, they will form the basis for a new international meteorological standard, and the 1931-1960 period will seem to have been abnormally wet. It's really a matter of definition.

Where have recent rainfall deficits been the greatest?

The western countries have been most affected by lack of rain (Senegal, Mauritania, Mali and Niger). Deficits are less pronounced in the Central region (Burkina Faso, Chad and Sudan). In the Eastern region (Ethiopia, Somalia and Djibouti) rainfall remains highly variable, with no long-term identifiable trends.

What is causing the rainfall deficits?

Many models have been postulated for these changes in rainfall distribution, ranging from man-induced effects to the effects of purely physical perturbations in the global circulation. None are very satisfactory.

One hypothesis links rainfall to the reflectivity of the land, or *albedo*. According to this, factors such as overgrazing and spreading cultivation degrade the vegetative cover, increase the albedo, and decrease rainfall; this can set up a positive feedback system leading to ever-increasing dryness. There is not much evidence from the Sahel to support this model, however.

Another model suggests that sea surface temperature (SST) anomalies might influence Sahelian rainfall by altering the temperature differential between the Sahara and the Atlantic, thereby lessening the winds associated with rainfall events. Such a relationship is supported by statistical evidence, although climatologists have no clear idea as to how the effect would actually be achieved. The same holds with another hypothesis which tries to link El Niño/southern oscillation (ENSO) events to Sahelian rainfall: although there is some evidence of a statistical link, no mechanism has been proposed.

Other ideas, such as climatic cycles and global warming effects, have to be shelved until a time when statistical analysis becomes possible.

When will rainfall averages return to their previous, higher values?

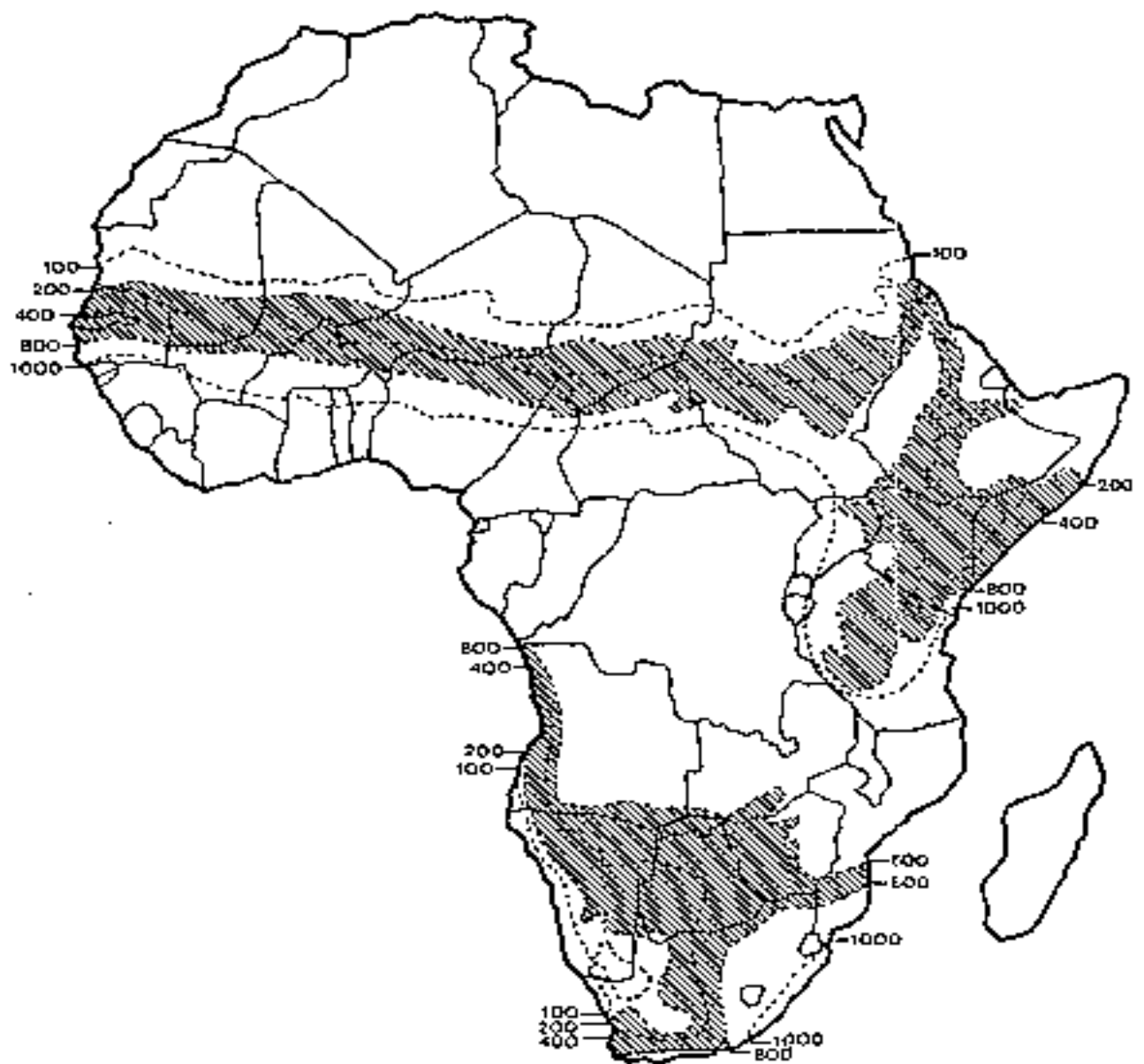
No one knows when, or if, they will. The report recommends that we assume the current pattern (rainfall deficits in the Western and Central regions) will continue: "It is probably best to err on the side of prudence and use the experience of the last twenty years in planning for the future."

What about recent media reports that 1988 was a very wet year for the Sahel?

This is another misconception. Although there has been more rain relative to recent years, seasonal totals do not approach those of pre-deficit years. There has also been a



Map of Africa



A map of the African continent, showing areas that receive between 200mm and 800mm per year of rainfall (90 per cent isohyet probability). Adapted from *Atlas for Africa*, Editions Jeune Afrique, 1973.)

In *The UNCTAD Sahel Studies, 1989* the ten countries of the Sahel Programme are generally grouped into three regions on the basis of their climate patterns:

Western region: Senegal, Mauritania, Mali, Niger;

Central region: Burkina Faso, Chad, Sudan;

Eastern region: Ethiopia, Somalia, Djibouti.



tendency for the media to interpret extreme local events as evidence of larger-scale patterns and trends.

So many questions about the Sahel climate remain unanswered. When will we know more?

Climate monitoring in the region is making great strides through use of remote sensing by satellite, a technique especially important for less populated areas. The African Centre for Meteorological Applications and Development is now being established in Niamey, Niger. National meteorological agencies enjoy improved data banking and analysis as computing facilities become increasingly available: these range from micro-computers to mainframes both in and outside the region.

As new data emerge, are analysed and exchanged, a much clearer picture of the future climate of the Sahel should emerge.



Some questions and answers about

LAND DEGRADATION AND AGRICULTURE

Do concentrations of livestock and people around water boreholes spread land degradation?

A study in the North Ferké region of Senegal by the *Centre de Suivi Ecologique* determined that there is no statistically significant increase in the standing crop of herbaceous biomass at the end of the growing season with distance from a borehole. Since there was no evidence of degradation in the vicinity of the boreholes, the report suggests that this factor can be considered irrelevant to land management in the Sahel.

Is the Sahel overgrazed?

The popular image of Sahel rangelands as verging on collapse from drought and overgrazing is not borne out by the data, which show that livestock populations have increased in all regions over the last 26 years (by 100% in the Central region, 22% in the Western region and 20% in the Eastern region).

Are the changes in vegetation which have occurred during the 20 dry years irreversible?

Possibly so. And they may be natural, having little to do with human activity. The long run of years with below average rainfall may well have caused quite natural changes in the vegetation, especially woody types. There is evidence of this in the extensive and severe mortality observed in the kinds of woody vegetation which now provide much of the Sahel's fuelwood.

How can we tell?

We can compare the changes that take place in protected areas with those where people farm, gather wood and graze their animals. This kind of research "is especially needed in the Sahel, where the effects of regional ecological changes and more localised environmental degradation caused by man's activities are often difficult to distinguish."

If the vegetation cannot be restored to its previous state, what adjustments will people have to make?

Traditional farming practices may no longer be appropriate in the affected regions. In fact, what many people have interpreted as misuse of agricultural and grazing land may simply be failed attempts of farmers to readjust to the new conditions.

Has agricultural production greatly declined over the last 20 years?

No. It has steadily increased.

How can this be?

A likely explanation is that the annual rainfall deficits can largely be accounted for by losses in August, when growing crops are past their period of greatest sensitivity to dry conditions. This means that the lack of rain in recent years did not have the impact on production it might have had. Also, there were relatively good rains in 1988, leading to excellent harvests.

In any case, the study has found no evidence that climatic conditions in the Sahel are limiting to agricultural production, even if they do have an effect.

So what has produced the famines?

The region's recent famines have a number of causes, including problems with food transport to deficit areas, poverty, wars, and high population growth.

Have production increases been equal in all regions?

The Central region has fared best; in the 26 years from 1961 to 1987, it showed a 79% increase in the gross value of its agricultural production (GVP), a 70% increase in cereal production, and a 100% increase in livestock numbers. The other regions did less well, but still showed substantial gains in spite of the years of drought.



Has there been a qualitative change in the Sahel's agricultural production during this period?

Not very much. Livestock has been replaced somewhat by crops, but for the most part the increase in the GVP index is due to increased production of the same commodity mix.

Has the amount of land under cultivation increased during this time?

In the Western Sahel the area under cultivation has increased 33%, which may account for the 37% increase in its GVP. At the same time, the productivity of each agricultural worker has declined.

In the Central region, there has only been a 26% increase in cultivated area, and a 79% increase in GVP. This is apparently due to improved farming techniques and increased production per labourer.

In the Eastern region, cultivated lands have increased by 16% and GVP by 39% over the same period. Per capita output has increased dramatically since 1975.

How does agricultural pricing affect agricultural production in the Sahel?

The effect appears to be minimal: one study found that in response to a 1% general price increase, the agricultural output of Senegal grew by 0.54% and of Burkina Faso by 0.24%.

This low response was thought to result from the difficulty of mobilising additional resources: land, labour, fertilizer, etc.

Who does most of the farming?

Rural women bear most of the responsibility for raising crops and livestock, partly because so many of the men migrate elsewhere in search of jobs and higher pay.

Given the Sahel's rapidly-growing population, is there enough land to go around?

The average number of people per square kilometre is very low: less than 10 in six of nine countries covered in this report. This leads many to think that the growing population has only to move into the unimproved areas. This statistic is misleading however, since much of the land is not favourable for human habitation, much less cultivation.

When you look at the population density of arable and irrigated land, only two countries have less than 100 people per square kilometre. The report concludes that "...the 'enough space' argument has to be interpreted with caution."

When common grazing areas are used by many people, are they destined to be over-exploited?

There is no evidence that this concept, which Garrett Hardin in 1968 called the "tragedy of the commons," applies to the Sahel. Indeed, there seems to be a system of checks and balances in pastoral and other societies that resists such destructive practices. The exception has been when governments have become involved, interfering with traditional rules governing pasture use.

This is an example of a conventional wisdom that has distorted rational discussions of pastoral development in the Sahel and elsewhere.

Are fuelwood supplies sufficient in the Sahel?

There are no data on the subject, and we simply don't know.

There has been a lot of controversy recently over the use of the word "desertification". Why is this?

First of all, the term desertification has never been critically defined. The word has been used in so many different ways that it has become meaningless.

Second, and more important, the very concept of desertification has come into question. How much of what is happening in the Sahel is the result of natural changes? How much is caused by human misuse of resources? What is reversible, what is not? Until such questions are answered, we will not be able to define the problem, much less address it. It is recognized, however, that the misuse of resources arises from a complicated interaction of political, economic, socio-economic and environmental factors. Therefore, the problem we sometimes call "desertification" must be tackled in a multi-sectoral manner as part of integrated development planning.



Some questions and answers about

FOOD SUPPLY

Is there enough food produced in the Sahel?

No, because although there have been major increases in production in the last 20 years, this has still not been enough to keep up with the increase in population.

The Central region is the only one where growth in agricultural production has been greater than population growth. In the Western and Eastern regions, per capita production has fallen.

Can any of the regions be considered self-sufficient in food?

Today, no region is self-sufficient, although all of them were in the recent past. The Central and Eastern regions were more or less self-sufficient up to 1975, but today are only about 90% so.

In the Western region, self-sufficiency declined from 115% in 1961 to 82% in 1987. Here imports now account for about 20% of the total food supply (production plus imports), up from 9% in the early 1960s.

All three regions are now net food importers; in the 1960s they were all net food exporters.

Is self-sufficiency something the Sahel countries should pursue?

The report points out that 'food self-sufficiency probably cannot be achieved by most countries... A country may well be more secure producing a mixture of cash-crops and food crops: the cash-crops will provide income to purchase food imports as the needs arise.'

However, some countries, such as Burkina Faso, Senegal and Sudan, could probably become minimally self-sufficient with improved agricultural technology and soil conservation measures. Production could also be raised considerably in Chad and Ethiopia.

Do the Sahelian countries still export agricultural produce?

Yes, even in the worst drought years. Major exports are palm products, cotton, coffee, groundnuts, animals, meat, bananas, pears, onions, peas, lentils, sorghum, millet, sesame seeds, sugar, rubber, dates, wheat flour and potatoes.

Although exports grew steadily up to the late 1970s, after that they declined sharply; at the same time imports accelerated. The report concludes that 'in terms of the agricultural trade balance, the surpluses of the '60s and '70s have been replaced by deficits in the '80s.'

How much of the Sahel's total exports are agricultural exports?

In the Central and Eastern regions, agriculture accounts for about 90% of all exports, 30% of which is food.

However, the Western region has experienced substantial growth in other sectors, especially minerals, and is much less dependent on agriculture today (30% of all exports) than it was in the 1960s (50% of all exports).

Are the Sahel countries importing more food?

Imports of agricultural products in general and food in particular are growing in all regions. However, in the Eastern region, these make up an increasing proportion of total imports - up to 30% today from around 10% in the 1960s. In the Western region during this period, the proportion has declined (from 37% to 28% for agricultural imports/total imports, and from 30% to 23% for food imports/total imports). In the Central region the proportions of imports made up by agricultural products and food have remained stable for 26 years.



How does food aid figure in the imports?

In the Central and Western regions, food aid accounts for nearly 90% of all food imports, and 12% of the total food supply. In the Eastern region, a much smaller proportion - about a third - of food imports come as aid, and these make up 7% of the food supply.

Does an increase in prices of exported cash crops lead to reduced food crop production and increased risk of famine?

The argument was heard during the Ethiopian famine when melons were exported as Ethiopians starved. However, a careful study of famine has revealed that "a general shortage of food is hardly ever the cause of famines. Rather, famines are caused by the poverty of its victims: they are unable to purchase the food that is available."

Are Sahelian peoples eating less today than in the past?

Per capita food consumption, measured as dietary energy supply, has remained constant in all three regions. Even though *per capita* production has been falling in the Western and Eastern regions as a result of population growth, food imports have made up the difference.

The report concludes that the fact that growth in food production is lagging behind population growth "is a cause for grave concern, but it should not be interpreted as a catastrophic collapse of agricultural production systems in the Sahel...."



Some questions and answers about

POPULATION GROWTH AND MOVEMENTS

What is the population of the Sahelian countries?

Between 1950 and 1980, the population of the ten countries covered in this report rose from 47 million to 91 million.

How fast is the population growing?

The annual rate of increase is currently around 2.8%, which means the population is doubling every 25 years. The rate is itself increasing and is expected to peak in the early 1990s.

Therefore, the population of the Sahel is expected to reach 159 million by the year 2000, and 263 million by 2020.

How does this compare with other less-developed countries (LDCs)?

The rates of increase throughout all of sub-Saharan Africa are the highest in the world, and "the Sahelian pattern is similar to, though less extreme than, the rest of sub-Saharan Africa." Both the Sahel and sub-Saharan Africa as a whole are expected to peak at rates higher than ever experienced in the LDCs. Moreover, the rate for all LDCs combined began falling in the 1980s, following world trends.

Why this difference?

Birth rates have remained high and steady since the 1950s, while vaccination programmes, antibiotics, rehydration therapy and anti-malarial drugs have all contributed to a rapid decline in infant and child mortality. The changes brought about by modern medicine are thought to have occurred too fast in the Sahel to be reflected in altered reproductive behaviour and fertility rates.

How does this pattern compare with that of industrialised countries?

Mortality rates decreased more slowly in industrialised countries, mainly as a result of improved sanitation, nutrition, and housing rather than modern medicine. Sweden, a country for which we have reliable statistics, took 100 years to reduce death rates by a proportion that took only 30 years in the Sahel. The governments of the Sahel have simply not had time to adjust in terms of creating more wealth, jobs, etc.

Social attitudes toward fertility have had three generations to evolve in the industrialised societies, many of which now have negative growth rates as a result of family planning practices. In the Sahel, there has not yet been sufficient time for social attitudes towards fertility to change.

If family planning measures were adopted extensively, how soon would population growth stabilise?

Even if fertility rates were to immediately drop to replacement levels, the population would continue to increase well into the next century. This stems from the fact that 45% of the population is under the age of 15. These people are now reaching reproductive age in increasing numbers, which is why the rate of increase is still increasing. This is known as 'demographic momentum'.

How does demographic momentum relate to Sahel economies?

In many countries, the demands of young people for food, clothing, shelter, health care, education and employment is outpacing the abilities of governments to generate the wealth needed to pay for them. The under-15s are not economically active, so the rest of the populace has to try to provide for them. When they do enter the labour market, they



face intense competition from the large numbers of people of their age who are doing the same.

What population policies have been adopted by the Sahel governments?

Most of their efforts are aimed at reducing mortality rates; very few are aimed at reducing fertility in spite of increasing awareness that unrestrained population growth greatly inhibits their economic development.

Although Senegal is the only country in the Sahel to have an official National Population Policy, in other countries family planning is provided in the context of maternal and child health care programmes or through non-governmental health centres.

Many Sahelian countries have adopted a forward-looking approach to women's issues. In Senegal, for example, "...a Plan of Action for Women has been drawn up to ensure women's liberation in all areas: economic, social and cultural. One of the main effects of this plan will be to help control fertility."

Where is the Sahel's population growth concentrated?

Throughout the region, cities are growing faster than rural areas, especially capital cities. In some cases, more than half of a country's city-dwellers live in the capital.

What role does migration play in this pattern?

An important one, although not as great as most people seem to think. In the Sahel, most of the increase in urban populations results from childbirth rather than immigration. Also, since urban populations have better access to public health care, their death rates have declined faster. The result: higher fertility rates and greater demographic momentum in the cities.

Do large-scale migrations still take place in the Sahel?

Yes, and there are four major patterns:

1. International migration. This primarily involves migrants from the Eastern Sahel to Arab countries of the Persian Gulf. International movements used to be important elsewhere in the Sahel until new immigration restrictions were introduced.
2. Seasonal migrations to cities or to agricultural areas in need of workers. Examples are found in Senegal during the groundnut growing and processing season, and in Sudan where the attraction is modern agriculture techniques.
3. Rural-rural migrations, involving pastoralists and farmers moving to areas with better rains. This category also includes government-sponsored resettlement.
4. Rural-urban migrations, mentioned above. Many people still move permanently to cities, perhaps because their farms are increasingly unproductive or because of real or imagined job opportunities.

Do migrations cause any special problems?

They often mean that people must learn an entirely new way of life - new farming methods, new skills, new habits. Since migrations are carried out principally by men, many of the women are left to cultivate the land on their own. In some cases, up to 50% of the men in a particular population have moved away. The report points out that "...population censuses confirm these distorted sex ratios. There are usually more men than women in the urban areas and more women than men in the rural areas."

Migrating farmers in search of farmland with adequate rainfall will sometimes concentrate in suitable areas, putting a strain on local resources and land. This was seen in Mali, where displaced farmers have gathered along the 800mm isohyet. (An isohyet is a line on a map connecting points of equal rainfall. See map, page 6). The report speculates that "the 800mm isohyet represents some kind of threshold beyond which migrants do not move."

Another problem arises when educated young people from rural areas settle permanently in the cities, when their minds and skills are needed back home. Senegal is attempting to slow migration to cities by launching a rural economic recovery programme that reduces income disparities between rural and urban areas.



Some questions and answers about

ENVIRONMENTAL PROTECTION AND SUSTAINABLE DEVELOPMENT

How much of the Sahel is protected?

There are 127,000 sq km under total protection and another 327,000 under partial protection. This amounts to 5% of the total land area of the Sahel.

How many protected areas are there?

There are 180 protected areas spread across the Sahel. There are three types, as defined in the 1968 African Convention on the Conservation of Nature and Natural Resources: strict nature reserve (total protection), national park (conservation of all wildlife for the benefit of the public), and special reserve (conservation of characteristic wildlife, with some human activities permitted).

What is their purpose?

According to the report, "the aim is to conserve the resources for future generations, whilst deriving the greatest sustainable benefits for present generations."

Are protected areas distributed evenly throughout the Sahel?

No, there are large discrepancies among the Sahel countries in the percentage of land area which they have placed under protection. These range from a high of 20.6% in Senegal to lows of 0.4% in Somalia and 2% in Ethiopia.

The United Nations Environment Programme has recommended that around 10% should be protected if the area's species are to be preserved. Besides Senegal, only Burkina Faso and Chad have met this target.

What is the legal basis for conservation in the Sahel?

All Sahel States are Parties to the 1968 Convention, mentioned above, although four (Chad, Ethiopia, Mauritania and Somalia) have yet to ratify it.

Otherwise, there are three international instruments which can confer national and international status on sites nominated by the individual countries: the Convention Concerning the Protection of the World Cultural and Natural Heritage, 1972 (the World Heritage Convention), the Unesco Man and the Biosphere Programme, and the Convention on Wetlands of International Importance especially as Waterfowl Habitat, 1971 (the Ramsar Convention).

What do ecologists consider special about the Sahel, and worthy of protection?

The Sahel's vegetation, although largely sparse and impoverished, nevertheless features 35% of Africa's 80 "vegetation types". The most predominant are woodland (1.3 million sq km), wooded grassland/deciduous brushland (1 million sq km), grassland/shrubland (1.6 million sq km), and edaphic grassland - grassland determined primarily by soil factors (370,000 sq km). Somalia, Ethiopia and Sudan also contain 850,000 sq km of Somalia-Masai bushland.

Most of the vegetation categories are represented in the protected areas, except for edaphic grasslands. The highly specialised Saharomontane vegetation types, 61% of which occur in the Sahel, are also virtually unprotected.

The Sahel contains several areas with distinctive floras of shared origin, known technically as "phytochoria" and less technically as "cradles of evolution." The Afrotropical phytocorion, such as that found in the Simen Mountains National Park of Ethiopia (now abandoned for security reasons), features 4,000 plant species, of which 75% are endemic (i.e., occurring nowhere else).



Somalia hosts 20 genera of endemic plants, and the northern part is known for its distinctive drought-resistant succulents.

There are many such pools of genetic and biological diversity in the Sahel which are currently unprotected.

What about animals?

Faunal diversity and endemism are relatively low in the Sahel, except for Ethiopia and Somalia. The most important areas for conservation of endemic animal species are the National Parks of Ethiopia's Bale Mountains and Simen Mountains. There are also important protected areas in Burkina Faso/Niger, Chad, Mali and Senegal.

Are any protected areas threatened by development?

Some of the most serious effects of development will be felt by the Sahel's wetlands. There are major projects for dams on the Senegal River system and a 360 km canal in the Sudd swamps in western Ethiopia. Both these will have severe impacts on human communities and livestock as well as wildlife.

What are some of the benefits associated with protected areas in the Sahel?

There are a number of direct economic benefits of these areas. For example, tourism revenue brings in substantial foreign exchange to some countries. Protected areas also provide renewable resources which are harvested for food, medicine and a huge variety of household purposes: firewood, construction materials, tools, oils, resins and waxes. Their rivers can provide hydroelectricity.

There are a number of wetlands in the Sahel which are important as sources of water for people, livestock and wildlife. There are flourishing fisheries in the Lake Chad basin (115,000 tonnes were caught in 1980) and the inner delta of the Niger in Mali (100,000 tonnes in 1980).

What are some of the indirect benefits of protected areas?

They protect topsoils, they stabilise water runoff and recharge aquifers. The Simen Mountains National Park of Ethiopia supplies water for several human communities. Ethiopia's President has said that "if we look to some of the regions of our country that are affected by drought repeatedly, the cause is directly related to the deterioration of our forest, soil and water resources."

Protected areas also preserve genetic resources and biological diversity. These can be exploited in many ways; for example, to produce new crop varieties for the Sahel that are tolerant to drought, heat or salt.

Protected areas offer many scientific and educational opportunities. They can also serve as controls against which to measure the effects of human activities on ecosystems.

Is there widespread support for conservation in the Sahel?

The importance of the Sahel's protected areas to the individual countries, the region and the world is increasingly recognised. It helps that a new approach to development is evolving which allows planners to put an economic value on the environment - a "new science" which combines economic and an ecological approaches to development and natural resource use.

As the report states, "the view of protected areas as a luxury, irrelevant to development, is fading fast, yet the pressure to exploit protected areas to meet urgent short-term needs is increasing. IUCN aims to help the region to review and revitalise its protected area network as one part of its effort to secure sustainable long-term development."



The IUCN Sahel Programme

In 1984 the IUCN General Assembly adopted a Resolution expressing deep alarm at the effects of the drought in the Sahel and the Horn of Africa. In response, the Secretariat set up a task force which in 1986 published a plan for the Sahelian countries affected by the drought and environmental degradation entitled 'The IUCN Sahel Report - A Long-Term Strategy for Environmental Rehabilitation.'

During the second half of 1987, a Sahel Coordination Unit had been established at IUCN Headquarters in Gland, Switzerland, with the support of Denmark, Finland, Norway and Sweden. The IUCN Sahel Programme became operational early in 1988, with publication of a Policy and Programme Declaration defining its objectives: to develop ways to manage living natural resources that better correspond to prevailing climatic conditions and which permit sustainable development; to help preserve the biological diversity of the Sahel, and to monitor the changes taking place in the region.

Initial support from the Nordic countries is about 3,3 million Swiss francs per year over a three year period. Other contributions have come from IUCN projects previously under way which have been incorporated into the Sahel Programme.

With an annual budget of around 7 million Swiss francs, the Sahel Programme is now the largest of IUCN's field programmes.

The Sahel Programme's headquarters in Gland has a staff of four headed by Sahel Programme Coordinator Per Rydén. Address: World Conservation Centre, Avenue du Mont-Blanc, 1196 Gland, Switzerland. Telephone: (4122)647181 (after 15 June 1989: 649114). Telex: 419 605 iucn ch. Fax: (4122)642926.

The IUCN Regional Office for Western Africa in Dakar, Senegal, works on Sahel problems in Francophone Africa. Its staff includes the IUCN Regional Representative, Gérard Sourris, and the Deputy Regional Representative, Camille Pomerleau. Address: B.P. 3215, Dakar, Senegal. Telephone: 328521. Telex: 3103. Fax: 329246.

The IUCN National Office for Mali, headed by Jean-Michel Bourreau, coordinates programme activities in that country. Address: B.P. 275/DNEF, Bamako, Mali. Telephone: 227572.

The Sahel Programme is also assisted by the Joint WWF/IUCN Representative in Niger, John Newby. Address: B.P. 10903, Niamey, Niger. Telephone: 733338.

The IUCN Regional Office for Eastern Africa is located in Nairobi, Kenya, and headed by Regional Representative, Dr Robert Malpas. Its staff of 14 includes the Eastern Sahel Unit, headed by Nicholas Winer, which coordinates the programme activities of Anglophone countries of the Sahel. Address: P.O. Box 68200, Nairobi, Kenya. Telephone: 2/502650. Telex: 25190. Fax: 2/503511.