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FINAL CASE STUDY REPORT NOVEMBER 2013

**RESEARCH ON CLIMATE CHANGE ADAPTATION
BY INDIGENOUS PEOPLE IN THE REPUBLIC OF CONGO**

**COMMUNITY OF NGONAKA, LÉKOUMOU DEPARTMENT &
COMMUNITY OF BOUCY BOUCY, LIKOUALA DEPARTMENT**



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EXECUTIVE SUMMARY

INTRODUCTION

As part of a regional study on indigenous peoples and climate change adaptation in Africa, The Rainforest Foundation UK (RFUK) coordinated desk and field research for the Republic of Congo, in collaboration with Congolese NGO *Forum pour la Gouvernance et les Droits de l'Homme* (FGDH) and local indigenous peoples' organisations. Field research was carried out between March and August 2012 in the villages of Ngonaka (Lékoumou Department, southwest Congo) and Boucy Boucy (Likouala Department, north Congo).

The research methodology included obtaining the free, prior and informed consent (FPIC) of communities, group exercises, transect walks in the forest, semi-structured interviews and individual questionnaires. 44 community members in Ngonaka and 37 community members in Boucy Boucy were surveyed in the individual questionnaire exercise.

According to the latest official figures from 2007, there are 43,378 indigenous people in the Republic of Congo, although the real figure is likely to be higher. Traditionally, indigenous peoples of the Republic of Congo lead a semi-nomadic lifestyle based on traditional hunting and gathering of forest products. Analysis of questionnaires from Ngonaka and Boucy Boucy shows that 100% of those interviewed rely on gathering of wild plants, 93% rely on wild meat, 89% on gathering wood for fuel and only 9% have salaried employment.

Indigenous peoples in the Republic of Congo are forest people and have unsurpassed knowledge of the forests, their resources and how they can be utilised, for example how to harvest water from trees and roots, digging water points to access clean water, using a wide range of barks and leaves as traditional medicines and hunting using traps. However, this rich cultural heritage is currently threatened along with their traditional way of life. Over the past 40 years, indigenous peoples have been brought more into the cultural world of settled agriculturalists, although at different speeds and to different extents depending on the region. Logging and mining activities have also impacted on their traditional way of life. In the past 20 years, the communities have abandoned some hunting techniques (such as hunting game with nets, bow and poisoned arrows) and taken on new hunting techniques (such as with guns). Similarly, they have begun to fish with a line and rod instead of a spear.

POLITICAL CONTEXT

In general, indigenous peoples live in a situation of economic poverty, with very little access to formal employment, social services (health centres, schools), clean drinking water and electricity. Basic needs as well as health care and housing are met by using forest products. Often, access to state services is hindered by lack of identity documents: over 50% of indigenous children have no birth certificate, compared to a national average of 19%, which can prevent them from attending schools or health clinics, for example.

TEMPERATURES HAVE INCREASED AND RAINFALL HAS DECREASED IN THE REPUBLIC OF CONGO IN THE SECOND HALF OF THE TWENTIETH CENTURY.

MODELS PREDICT THAT TEMPERATURES COULD RISE BY UP TO 1.1°C ON AVERAGE BY 2050

Indigenous peoples are systematically discriminated against in the Republic of Congo. The indigenous peoples of both and Ngonaka and Boucy Boucy (which are 'mixed' villages, having also Bantu farming inhabitants) were originally the indentured servants of Bantu "masters" in the village who had full authority over them. In a positive move, in February 2011, the Republic of Congo adopted a Law on Indigenous Peoples' Rights. This law is the first of its kind in Central Africa. Regulations (*décrets d'application*) for implementing this law are currently being developed, and it is important to ensure that this is done through an appropriate process of consultation with indigenous peoples. Similar to neighbouring countries, the customary land rights of indigenous peoples and local communities in the Congo are not formally recognised.

SCIENTIFIC DATA ON CLIMATE CHANGE AND COMMUNITY PERCEPTION OF CLIMATE CHANGE IMPACTS

Historical climate data shows that, on average, temperatures have increased and rainfall has decreased in the Republic of Congo in the second half of the twentieth century. Models predict that temperatures could rise by up to 1.1°C on average by 2050. Local perceptions of climatic changes largely correlate with the scientific data; research for this study showed that communities have observed increased temperature, changes in the length of seasons, drying up of rivers and water pollution – all of which can potentially be linked to climate change.

The primary social impact of climate change on communities studied relates to deteriorating human health. The prolonged dry season and reduced rainfall have led to streams in the forest flowing for shorter periods in the year, and when stagnant, tend to breed bacteria and become polluted leading to diarrhoea, vomiting and occasionally death. Stagnant ponds are also ideal breeding ground for malaria-carrying mosquitoes.

There is little knowledge and understanding of the theory of climate change outside the capital, Brazzaville, and local communities in the research site had no prior knowledge of the phenomenon. However, communities also observed environmental changes which might be linked to climate change such as: the increasing rarity of medicinal plants, less abundant resources available in the forest, and deforestation. Results of the individual questionnaires show that the gathering of wild meat and wild plants has declined severely, and communities believe that they will continue to reduce. Community members also reported that fish and agricultural production have declined, though not as sharply. It would require much more primary scientific research to establish a causal link to climate change. The observed and perceived changes may also be caused at least in part by other local, and more direct, environmental pressures.



TO WHAT EXTENT ARE INDIGENOUS PEOPLES VULNERABLE TO CLIMATE CHANGE? WHAT ADAPTATIONS HAVE THEY ALREADY STARTED TO MAKE?

Analysis of the results of the field work point to five broad factors that reduce indigenous peoples' ability to minimize the impacts of, and adapt to, climate change:

- High dependency of community on natural resources for sustenance and livelihoods – therefore, if these are threatened, the consequences are direct and severe
- Discrimination against indigenous people by Bantus – therefore weaker economic situation and access to information and state services or adaptation projects were they to reach the village
- Lack of understanding or respect of way of life and of indigenous peoples' specific rights under national legislation and by external actors – therefore denigrating traditional cultural values and knowledge of indigenous peoples and pushing them into new livelihoods which may not be suitable
- New pressures on forest resources (from logging and mining activities) – leading to loss of important trees species and increased competition for, and reduced access to, forest resources (although providing a little formal employment)
- Low level of literacy and access to information and limited capacities of indigenous organisations posing a challenge to awareness-raising

Two factors that support indigenous peoples' ability to respond to climate change:

- In-depth knowledge of the forest and its resources
- Traditional adaptation strategies such as mobility, allowing them to move easily between resources depending on their availability

Adaptation or coping strategies that indigenous communities have taken up in response to climatic and environmental changes include: gathering wood and leaves at greater distance from village; planting of medicinal plants; fishing with net and line (instead of spears/harpoon); digging of water points; use of wells. Some adaptations are clearly a more frequent use of traditional activities; others are genuinely "new" adaptations. It should be noted that these adaptations are also influenced by factors other than climate and environmental change such as the availability of new technology, service or the influence of neighbouring farmers.

RECOMMENDATIONS

The study points to three ways forward to enable indigenous peoples to better adapt to climate change in the Republic of Congo:

- 1. Training for decision-makers and government officials on indigenous peoples' way of life and rights, in order to build awareness and respect towards the community**
- 2. Support to indigenous peoples' organisations to increase their capacity to defend community rights and to promote the emergence of leadership and expertise on indigenous climate issues**
- 3. The full implementation of the Indigenous Peoples' Law of 2011 to enhance indigenous peoples' participation in climate change policy, as it requires full consultative processes**

There should be extensive consultation with indigenous peoples themselves on the best way in which to implement these.



PART 1: DESCRIPTION OF THE COMMUNITIES AND THE CONTEXT

1.1 STUDY BACKGROUND

In October 2011, Charapa Consult and partner organisations submitted a proposal to the World Bank Trust Fund for Environmentally and Socially Sustainable Development (TFESSD), to undertake research for the elaboration of case studies on indigenous peoples and climate change adaptation in the African region. On 16 December 2011, Charapa Consult, on behalf of the various partners, signed the contract with the World Bank for implementation of the research.

The partner organisations are:

- Rainforest Foundation, UK
- Legal Assistance Centre, Namibia
- Mainyoito Pastoralist Integrated Development Organization, Kenya

The overall objectives of the research are to:

- Analyse and document how indigenous peoples are affected by climate change;
- Identify indigenous peoples' local and traditional knowledge, practices and adaptation strategies that are critical to minimizing the adverse impacts of climate change
- Support the strengthening of the indigenous peoples' capacities for their engagement and direct participation in the formulation of national and international public policies regarding climate change.

This final report brings together data gathered from the two sites identified for field work in the Republic of Congo: the community of Ngonaka, Lékoumou Department, in the south-west, and the community of Boucy Boucy, Likouala Department, in the north of the country. Reasons for choosing these study areas include the fact that the Lékoumou and Likouala departments have the highest concentration of indigenous people in the Republic of Congo; they also have a variety of indigenous ethnic groups and different rainfall patterns.

The field research was conducted by the Congolese NGO *Forum pour la Gouvernance et les Droits de l'Homme* (FGDH), coordinator of the national platform of NGOs for the sustainable management of forests, and local indigenous peoples' organisations, in collaboration with the Rainforest Foundation UK. In **Ngonaka**, 24 households (44 people) of the indigenous community were surveyed. In **Boucy Boucy**, 37 members of the indigenous community were surveyed and many more participated in group exercises. The methodological approach of the case study included first obtaining the Free, Prior and Informed Consent of indigenous peoples.

A research team of four people spent ten days in Lékoumou Department for the **Ngonaka** research from late March to beginning April 2012. A research team of five people, including FGDH, the indigenous organisations *Association pour la défense des droits des peuples autochtones* (ADDPA) and *Association BaAka*, and a technical assistant from Rainforest Foundation UK, spent nine days in Likouala Department for the **Boucy Boucy** research from 17th to 25th July 2012. Further research was carried out by two researchers from *Forum pour la Gouvernance et les Droits de l'Homme* (FGDH) in **Ngonaka** from 31st July to 10th August 2012, and by the local organisation *Association BaAka* in **Boucy Boucy** to complete the first data.

The first research site **Ngonaka** is located in the south-west of the country in the district of Komono in Lékoumou Department at S 02°59.882 and E 13°12.013. The second, **Boucy Boucy**, is located in the north of the country in the district of Dongou in Likouala Department, at N 02°17.576 and E 018°00.286 (see Figures 1 and 2 below)

FIGURE 1:
Map of departments of the
Republic of Congo

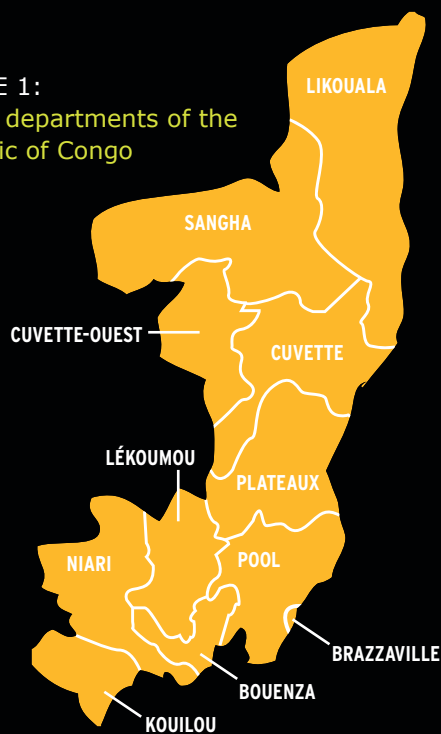


FIGURE 2:
Research sites of Boucy
Boucy and Ngonaka
marked with yellow pins



Sources:

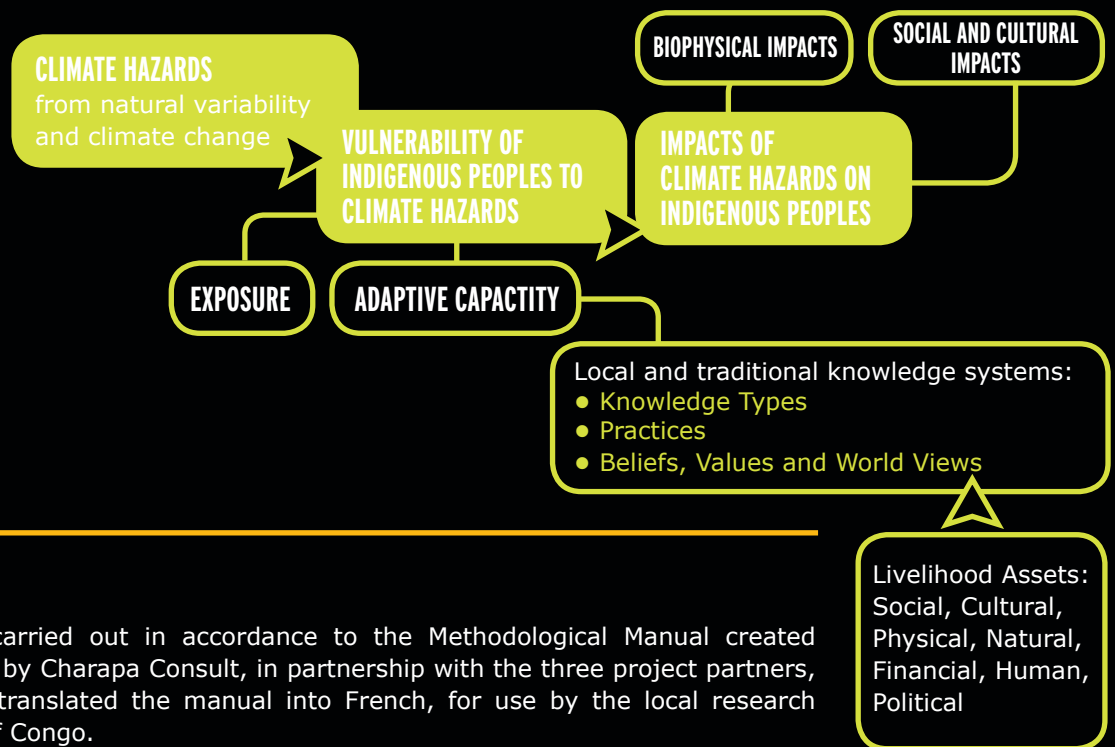
Fig 1: www.escudosybanderas.es

Fig 2: RFUK & FGDH data on Google Earth

1.2 CONCEPTUAL FRAMEWORK

The common point of departure is the conceptual framework illustrated below, which sees impact of climate hazards on indigenous peoples as a function of their vulnerability – which again is understood as a function of exposure and adaptive capacity:

FIGURE 3:
Vulnerability and Impacts
of Climate Hazards
on Indigenous Peoples



1.3 METHODOLOGY

The field research was carried out in accordance to the Methodological Manual created specifically for the project by Charapa Consult, in partnership with the three project partners, in February 2012. RFUK translated the manual into French, for use by the local research partners in the Republic of Congo.

The specific research activities undertaken as part of this work include:

- Meetings with government officials, researchers and NGOs in Brazzaville to gather information about national policies and projects related to climate change and expected climate impacts
- Preliminary meetings in provincial capitals – Sibiti in the case of **Ngonaka** and Impfondo in the case of **Boucy Boucy** - with local authorities and actors to gather statistical information and to assess the context
- Preliminary meeting with local Bantu traditional authorities
- Meetings to obtain the Free, Prior and Informed Consent (FPIC) from indigenous communities
- Field research according to the methodological manual including an individual questionnaire, one-to-one interviews and group exercises (mapping the village, trend lines¹, identifying livelihood strategies, drawing up a seasonal calendar², transect walks, listing relevant institutions, feeding back preliminary results).

Some exercises set out in the Methodological Manual, such as the well-being ranking exercise, were not fully adapted to the targeted population. Hence some exercises were adapted to be made simpler. The target communities had no prior knowledge or understanding of the concept of climate change. Therefore, exercises with communities focused on 'environmental changes' and these were later analysed to identify those that link to climate change (as explained in greater detail below).

¹ **Trend lines** will reveal community perceptions of change in the local climate, environmental and natural resources, economic, social and institutional patterns. It is a tool for looking at what is getting better and what is getting worse. A trend line is a simple graph depicting change over time.

PART 2: INDIGENOUS PEOPLES OF THE SUB-REGION

2.1 HISTORY

Indigenous peoples are found in almost all departments of the Republic of the Congo, totalling 43,378 indigenous people according to the most recent census data from 2007, although the real figure is likely to be higher. Traditionally, they are forest peoples who live in small egalitarian social groups and their way of life depends on hunting and gathering. They are considered by many as the original inhabitants of the Congo Basin rainforest. Given their long inhabitation of the region, the indigenous peoples developed relationships with Bantu farming communities first based on mutually profitable exchanges of forest products in return for agricultural products, European products, iron and salt.

The histories of the two research sites are as follows:

- The village of **Ngonaka** was created in the early 1970s by people of Miyoumi Village, located three kilometres from **Ngonaka**. **Ngonaka** territory is located in the logging concession leased by Asian company Taman. The indigenous “Pygmy” population in this area are Babongo. They were originally the indentured servants of Saya Mbani, a Bantu inhabitant of the village, who “gave them” to his son Maboukou Mbani. On the death of Maboukou in 1983, indigenous people were set “free” but they are still facing discrimination and marginalization in their daily lives and experience very poor social and economic conditions.
- According to the mayor of **Boucy Boucy**, the village was founded in 1930 by his grandfather, with the inhabitants of a village further upstream that was prone to frequent flooding. The name comes of the sound made when walking on the wet sand, described by inhabitants as “woucy woucy” and wrongly recorded by colonial administrators. According to the community, the first indigenous peoples, who are Bayaka or Baka, were brought to the village from a nearby village in the 1950s as indentured servants or slaves of Paul Belemene, a prominent Bantu inhabitant and founder of the school in the village. The population of indigenous people in the village grew in the 1970s due to migration south because of repression and human rights abuses further north.

FIGURE 4:
Map showing the location of
Indigenous Peoples’ groups in the
Republic of Congo

Source: OCDH/RFUK 2006



² In the seasonal **calendar** exercise, participants name the major events of the year as they perceive them. They then use simple symbols for the events and circumstances they are describing, and gradually draw up a chart or table placing their symbols at the appropriate stage of the year. This is important for measuring variables and making comparisons. As they work, participants can compare month by month which are the busiest periods

2.2 SOCIAL ORGANISATION

INSTITUTIONALISED DISCRIMINATION OF INDIGENOUS PEOPLES

Indigenous peoples in the Republic of Congo continue to be subject to systematic and structural discrimination that affects virtually all aspects of their individual and collective existence. This discrimination has deep roots in the country's history and culture. It is reinforced by a lack of application of any special mechanisms within legislation and government policies that would take account of the specific way of life and needs of these groups.

According to the report "Indigenous peoples of the Republic of Congo: discrimination and slavery" (« *Les peuples autochtones de la République du Congo: Discrimination et Esclavage* ») published in November 2011 by OCDH, discrimination and exploitation of the indigenous minority are still deep and troubling today. The report states that the "Relationship between Bantus and indigenous peoples has turned into a relationship of "master-slave" over the time, the most common practice being that of forced labour: the person is required to work against their will under threat of violence or any other form of punishment or coercion" (OCDH, 2011).

For example, the indigenous peoples of both **Ngonaka** and **Boucy Boucy** were originally the indentured servants of Bantu "masters" in the village who had full authority over them. In **Ngonaka**, the indigenous peoples usually worked in the field of the master, as well as undertaking all kinds of other productive tasks. They were reportedly often "punished" and beaten. As noted above, the indigenous peoples of **Ngonaka** have been "free" since 1983 but there are still facing discrimination and marginalization in their daily life; it was reported to us, for example, that members of the indigenous community were sometimes obliged to work in Bantus' fields or to hunt for Bantus to "reimburse a debt".

In **Boucy Boucy**, the indigenous peoples interviewed described systematic discrimination such as being paid half what a Bantu inhabitant of the village would be paid for completing a task or when selling forest products. They described "force" being used to make them accept the lower prices.

2.3 INTERNAL SOCIAL ORGANISATION OF INDIGENOUS PEOPLES

Social organisation of indigenous people in the Republic of Congo is based on the clan. The members of a clan are linked by a strong solidarity based on the common ancestors. The "camp" ("*campement*") is the equivalent of the "village". Camps are related to clans, and are typically named after them or an elder, or after the name of the Bantu village the camp is linked to. The camp is a unit of production and of dissemination of products collected in the forest. It also is a social/political unit, where decisions are discussed and made.

The family represents the fundamental unit in indigenous traditional societies. Economic organisation is based on distribution of specific tasks among the members of a family and a camp. Men usually hunt, while women gather forest products. Children play an important role and assist their parents in economic activities. Each person decides on a specific activity (hunting, checking hunting traps, gathering of honey, plants etc.) depending on daily needs. Improvisation is also common.

The authority of the patriarch is often limited to a family or a clan as the political life of these indigenous communities is highly egalitarian. The decisions that concern the whole community – a clan – are subject to numerous discussions and typically lead to a consensus.

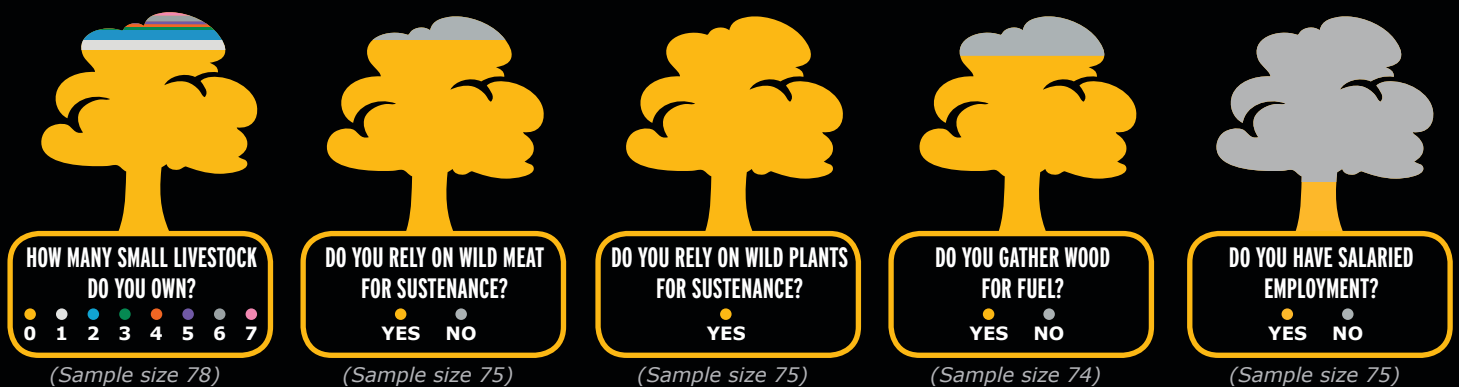
2.4 LIVELIHOODS

Traditionally, indigenous peoples of the Republic of Congo lead a semi-nomadic lifestyle based on traditional hunting and gathering of forest products. This way of life is characterised by mobility over a vast territory, as they move from one resource centre to another according to their needs. However, this way of life is changing as indigenous peoples have settled along roads and alongside Bantu villages since the 1960s, and are taking on a less mobile, agricultural way of life, often due to pressure of external agents. Very few indigenous people have formal employment.

The Ngonaka research shows that the indigenous population of the village settled alongside the Bantu village 40 years ago. However semi-nomadic traditions are still important. If the hunting and gathering areas are generally located at walking distances from the village (one day or less), the members of the community can still travel long distances in the forest and be away from the village for months at a time in order to exploit far-flung hunting areas and set-up camps in the forest.

In Ngonaka, almost all the people interviewed practice hunting (for example wild pig, antelopes, monkeys, rats) and gathering of forest products (such as asparagus, leaves, wild fruits, mushrooms, caterpillars, honey) as their main economic activity. The main source of income is the trade of forest products and agricultural products (mainly cassava, but also maize, peanut and yam). Indigenous populations are often subjected to difficult working conditions, when they do have the chance to access formal employment. Only 4 people out of Ngonaka – out of the 44 involved in the study – have had a formal job in the local logging company (see figure 5 below). Some of the targeted households own small livestock (chicken and goats), but many of them do not. According to the research, there is a clear trend showing that both animal and vegetable products were more abundant in the past and the belief that they will get scarcer in the future. This will be explored further in the sections below.

FIGURE 5:
Results of individual questionnaires from Boucy Boucy and Ngonaka
Source: Field research



The Boucy Boucy research shows that the indigenous population of the village was first present in the 1950s and became more numerous in the 1970s. Members of the community reported walking for up to four days to access remote hunting areas and gathering wild plants two hours walk from the village. The Bantu population reported that some members of the community spend months at a time away from the village in the forest. In the past two years, indigenous peoples of the village have begun to practice agriculture, although currently at a small scale.

Analysis of questionnaires from Ngonaka and Boucy Boucy show that only a tiny proportion of those interviewed have formal employment and hunting, gathering and fishing activities are the principal means of subsistence and generating revenue. According to the research, 85% of those interviewed own no small livestock, 93% rely on wild meat and 100% of those interviewed reported relying on the gathering of wild plants. 89% gather wood for fuel and only 9% have formal salaried employment (see Figure 5 above).

2.5 CULTURE AND TRADITIONAL KNOWLEDGE

Indigenous peoples in the Congo Basin have a rich cultural heritage, which is currently threatened along with their traditional way of life. Traditionally, indigenous communities evoke *Ndjengui*, the spirit of the forest, through dancing and other rituals which are linked to the forest. The penetration of churches into some indigenous communities has been encouraging the slow disappearance of their beliefs and ritual practices.

Linked with their traditional mobility, indigenous peoples in Congo do not amass material assets. Forests provide them with a wide range of goods and services that create opportunities for subsistence and well-being. These range from construction materials, foods, energy, medicines, water catchment protection, soil protection, shade, habitat for wildlife and honey-producing bees and grazing, as well as cultural values.

Indigenous peoples are forest peoples and have unsurpassed knowledge of the forests, their resources and how they can be utilised. In the example of **Boucy Boucy**, the community demonstrated in the transept walk exercise (see figure 6 below) their knowledge about harvesting water from trees and roots, digging water points to access clean water, setting traps for small mammals, using a wide range of barks and leaves as traditional medicines, harvesting wild fruits and roots and fishing. Research from the community shows that in the past 20 years the community have abandoned some hunting techniques (such as hunting game with nets and bow and poisoned arrow); similarly, they have begun to fish with a line and rod instead of a spear. Some of these changes are related to climate change impacts, although other factors play an important role, as will be discussed later.

FIGURE 6:
Route of transept walk, with notable points marked, Boucy Boucy

Source: GPS data from Google Earth



The different points on the route of the transept walk represent the location of: the village (13), medicinal plants - *kongo bololo* for malaria (14), medicinal plants - *koungou* for fever and sore throats (15), edible wild roots or *igname sauvage* (16), wild fruit - *bemba* (17), a sacred site (18), a vine from which water can be drunk (19), a medicinal plant (20), a trap for porcupines (21), track crossroads for path to Pokola (22), a medicinal plant for coughs (23), an indigenous community agricultural field (24), a gathering of wild manioc or *écoumé* (25), a vine from which water can be drunk (26), a medicinal plant - *nganda* (27), a fishing site (28) and a stagnant water point (29).

Over the past 40 years, indigenous peoples have been brought more into the cultural world of settled Bantu agriculturalists, although at different speeds and to different extents depending on the region. For example, the indigenous peoples of **Boucy Boucy** have only very recently – in the past two years – begun to farm crops for themselves, whereas in **Ngonaka** the community have been practicing small-scale agriculture for ten years or more. This assimilation of indigenous peoples by the Bantu leads to the gradual erosion of their forest knowledge and cultural values.

2.6 INSTITUTIONS

Over 50% of indigenous children have no birth certificate, compared to only 19% of children in the general population. The absence of this legal document, which in turn precludes the acquisition of a national identity card, denies them access to many social services, including schools and health clinics, etc. As indigenous people generally do not have identity documents, they may be unable to fully exercise their citizenship rights, such as having access to the justice system or the ability to obtain a passport. In addition, participatory studies conducted by civil society groups in the Congo Basin region have shown that indigenous people working in local industries and services are often discriminated against in terms of conditions of recruitment, working conditions, salaries, etc. The right to citizenship is related to the fundamental recognition of the legal existence of the person.

Villages in the Republic of Congo are governed by a mayor, officially called the PRECO (or President of the Village Committee) who is appointed by the *sous-préfet* (representative of the government at Departmental level). In mixed Bantu-indigenous villages, the mayor is almost without exception a Bantu. The PRECO has an important decision-making role at the village level – especially when the village is in a remote area far from other representatives of the state – which includes resolving conflicts, organising village events or works and distributing funds received by the village. Minor conflicts are dealt with within the family or within the community, while major conflicts are under the responsibility of village elders, the Bantu chief and local institutions of justice.

In the group exercises in Boucy Boucy the indigenous community recognised that the PRECO provides some protection for them against aggression from Bantus. However, in one-to-one discussions there were also complaints about local authorities only passing on funds given to the indigenous community (by politicians campaigning for election, for example) if the indigenous peoples carried out other tasks that had no relation to the funds, such as clearing grass from a certain area. During the field research, some representatives of local authorities described indigenous peoples as “complicated” and a “difficult people” and complained of them spending long periods in the forest away from the village.

Whilst indigenous communities are largely egalitarian, they recognize a moral authority that is often consulted at times of conflict. This authority is the family patriarch, who will typically possess a deep knowledge of customary and ritual practices, or otherwise a person chosen for their wisdom and advanced age. In the village of Boucy Boucy, René MBINDO, a member of the community was described as the “Chief of the indigenous peoples” although this position is not recognised by the state and he did not appear to have extensive powers.

The following table summarises the main institutions and impacts on indigenous peoples in Boucy Boucy:

Table 1: External institutions and their reported impact on indigenous peoples, Boucy Boucy.

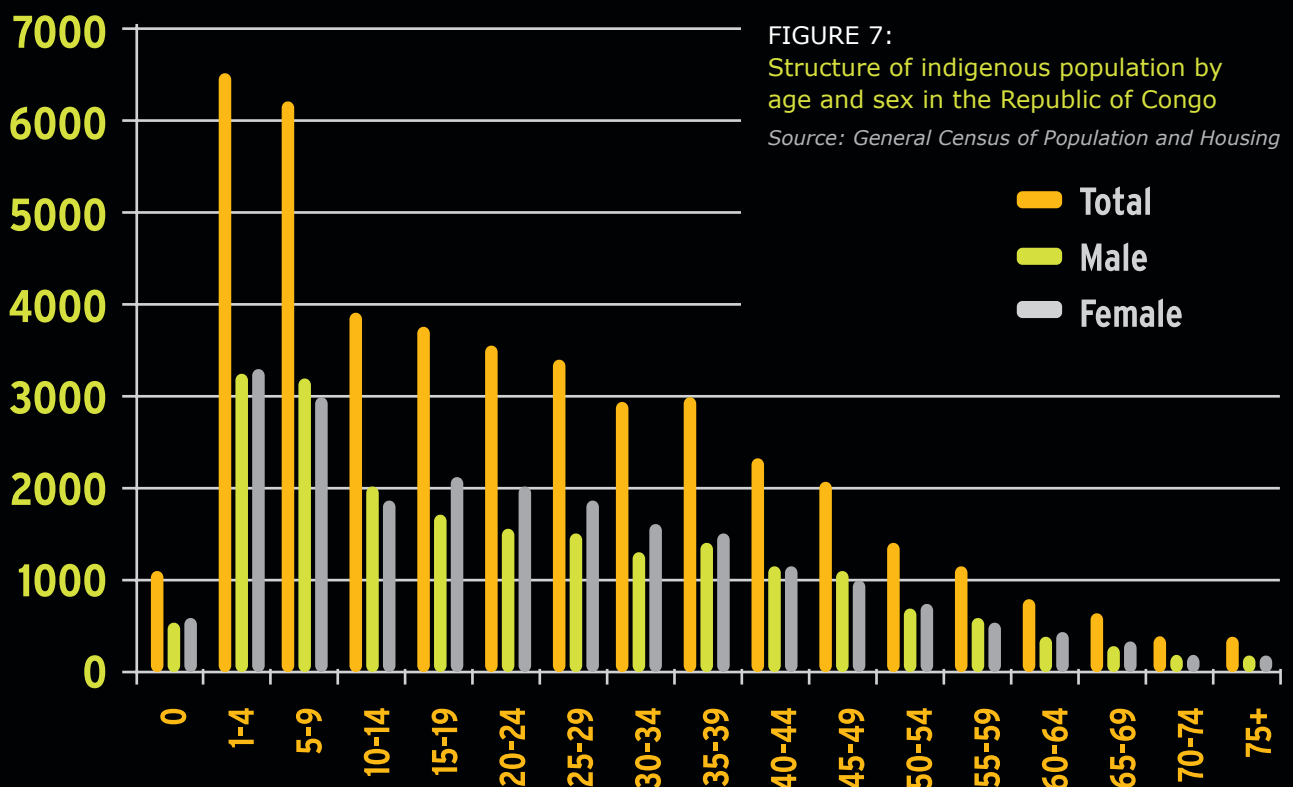
SECTOR	INSTITUTION(S)	IMPACT
EDUCATION	The village of Boucy Boucy has a primary school ("Ecole Primaire Paul Belemene de Boucy Boucy") which was founded in 1955, according to the mayor.	<p>Primary education in Republic of Congo is supposed to be free, but "volunteer" teachers work in the school and parents collect money to support them, effectively making schooling dependent on payment. Indigenous people reported their children being refused entry to school due to parents being unable to meet the fees.</p> <p>Indigenous people see school as a way to improve their children's lives but it also poses problems for their traditional way of life (as meals are not provided in schools and children often do not eat unless they go into the forest). Some Indigenous people question the usefulness of formal education "as there are no decent jobs to get at the end". Pupils wishing to continue with secondary education must travel to the district capital, Dongou, 30 km away.</p>
HEALTH	There is no health centre in Boucy Boucy, although there is a registered nurse in the village.	<p>The nurse prescribes medicines for a fee. Indigenous people reported that due to the increasing rarity of medicinal plants they increasingly use modern medicine, which leads them into debt.</p> <p>Free vaccinations against polio (amongst other diseases) and malaria nets have been given to indigenous peoples by state health services.</p>
AGRICULTURE	Occasional visits from state agricultural services	Indigenous people reported that the visiting technicians only work with Bantus despite requests from indigenous people for assistance.
REGISTERING OF BIRTHS	Registration and certification of births is also supposed to be free in Republic of Congo	Indigenous people reported that payment is demanded for these services.
RELIGION	Seven Christian churches in Boucy Boucy	No detailed research was done into the impact of these on indigenous peoples' livelihoods. (Although it is likely to impact the community's perception of climatic changes and extreme weather events; when asked to imagine the rains not coming and the river drying up completely individuals said, "It only rains because God wills it. God would not allow this to happen".)
POLICE / GENDARMERIE	Small presence in Boucy Boucy	Indigenous people reported that they help reduce conflict and bring security.
CONSERVATION ORGANISATIONS	Active a few days walk from the village	Indigenous people reported that eco-guards were a repressive force.
LOGGING COMPANIES	The forest near Boucy Boucy has been allocated to a logging company but extraction of timber has yet to begin	Indigenous people had temporary employment as 'prospectors' to assess the tree species present, but are unlikely to have permanent jobs if extraction begins, based on experience from other communities in the region.

Source: RFUK + partner field research

2.7 ETHNICITY AND DEMOGRAPHY

Accurate information about the main socio-demographic characteristics of indigenous people is still a major challenge for governments and NGOs operating in Congo. However, the General Census of Population and Housing carried out in 2007 gives some data on indigenous peoples' populations. According to this census, the total Congolese population is 3,697,490 inhabitants, of which 43,378 are indigenous, representing 1.2% of the total national population. The highest concentration of indigenous people is in the departments of Likouala (where Boucy Boucy is located) - with 13,476 individuals, and Lékoumou (where Ngonaka is located), with 11,456 individuals, and the Sangha with 7,885 individuals. For various reasons, these figures are likely to be underestimates of the true number of indigenous peoples in the Republic of Congo.

Taking the country as a whole, the indigenous population is young; those aged under 15 years account for nearly 41% of the total population of indigenous people. In contrast, those aged over 60 account for only about 5% of the total population. The population is 48.5% male and 51.5% female, with markedly higher female population between the ages of 15 and 39 (see Figure 7 below).



With regard to the field research sites, in Ngonaka the population is a mix of Bantu and indigenous peoples. Within the category of Bantu there are numerous ethnic groups, Téké people representing the majority. The indigenous peoples in Ngonaka, and more generally in the department of Lékoumou, are part of the Babongo peoples. According to the Bantu chief, the total population of Ngonaka is 603, with the indigenous population a small percentage of this.

For Boucy Boucy, the mayor reports that the population of the village is 1,229, which includes both Bantus and indigenous people. Again, no accurate figures were available for the total population of indigenous peoples in the village, but they were estimated at about 20% or just over 200 individuals. The village also has 123 (Bantu) migrants from DR Congo, not included in the total population, who fled from violence across the Oubangui River to the Republic of Congo in 1994 and 2002.

PART 3: VULNERABILITY AND OPPORTUNITY CONTEXT

3.1 CLIMATE HAZARDS AND IMPACTS

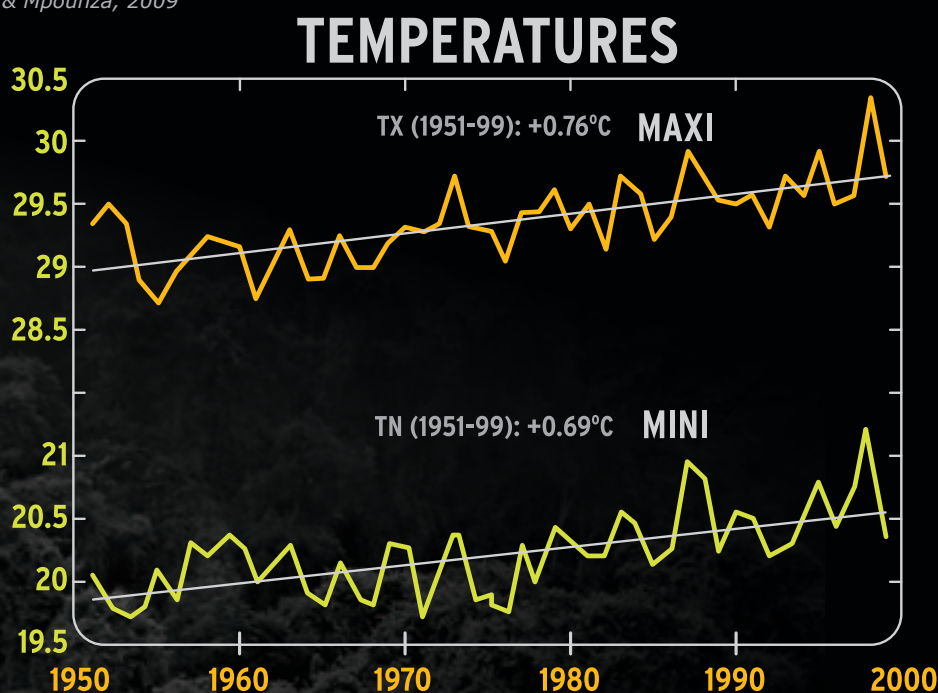
The research team met with Mr. Geoffrey Ebase, a climatologist at the Climate Research Centre (CRTH) of the Department of Geography at the University of Brazzaville. He stated that climatic data for the country goes back to 1932, but does not form a continual series, with breaks in the record and the loss of many monitoring stations due to lack of maintenance or conflict. He noted, however, a marked trend in the data which shows a "rupture" in the 1980s with decreased rainfall and increased temperature. These trends continue until 2005, when there is a small increase in rainfall although not up to the previous levels. In general, there is less rainfall and rivers are drying up.

Desk research carried out for this study shows that temperatures have increased and rainfall has decreased on average in the second half of the twentieth century (see figures 8 and 9 below). This correlates with the local perception of climatic changes, as described later. Bouka Biona and Mpounza (2009) provide us with a graph showing the increase in maximum and minimum temperatures in the Republic of Congo from 1950 to 2000.

FIGURE 8:

Temperature trends in Republic of Congo from 1950 to 2000

Source: Bouka Biona & Mpounza, 2009

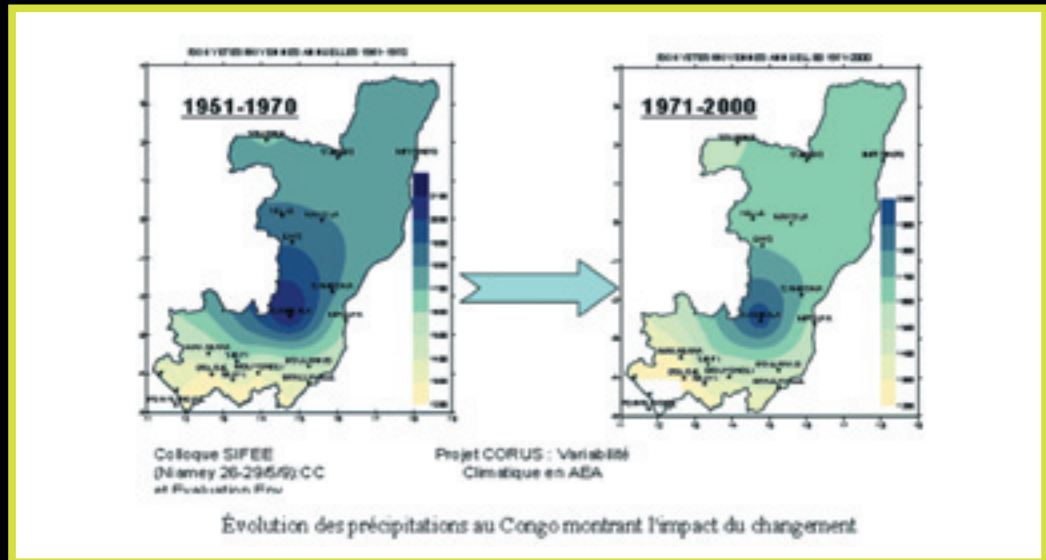


Colloque SIFEE (Niamey 26-29/5/9): CC et Evaluation Env.
Projet CORUS: Variabilité Climatique en AEA

The same source also provides isohyetal (rainfall) maps of the Republic of Congo for the period 1951-70 and 1971-2000, showing a decrease in rainfall in this period.

FIGURE 9:
Rainfall in Republic of Congo compared
between 1951-70 and 1971-2000

Source: Bouka Biona & Mpounza, 2009



This data is supported by other studies which show reduced rainfall in recent decades: "Overall, in the West Africa/north Congo tropical rainforest belt rainfall levels were 10% lower in the period 1968 to 1997 than in the period 1931 to 1960 (Nicholson et al., 2000)" (Somorin, 2010 p. 4). There is also some evidence that large rivers in Central Africa experienced reduced flow rates between 1990 and 1995 (Bouka Biona & Mpounza, 2009 citing Laraque et al. (2001)).

Mr. Georges Boudzanga, REDD Focal Point, Ministry of Forest Economy in Brazzaville, stated that climate change effects are evident and cited reducing production of the second cycle in the year of peanuts, which means that a new variety from West Africa is having to be introduced.

Regarding projections of future climate phenomena, according to climate change models, temperature is predicted to rise by up to 1.1°C on average by 2050. Much of the information available about predicted impacts of climate change in Republic of Congo comes from the country's 2001 National Communication to the UNFCCC. This study was based on the MAGICC/SCENGEN (General Circulation Model) built on data from 1961 to 1990 (République du Congo, 2001). Other studies, use a later version of the same model - MAGICC/SCENGEN 5.3 (Bouka Biona & Mpounza, 2009).

These future scenarios predict a general rise in temperatures across the entire country. If CO² levels double in the atmosphere, temperatures could increase by up to 0.6°C in the North and 1.1°C in coastal areas by 2050, with peaks of 2.1°C in some areas (*Plateau des Cataractes* and *la vallée du Niari*). Figures from Brazzaville's *Université Marien Ngouabi* suggest that temperature will increase across the country by 0.7°C by 2025, 1°C by 2050 and 3°C by 2100 (Bouka Biona & Mpounza, 2009, p. 7).

Knowledge and understanding of climate change phenomena is not widespread in the Republic of Congo. One NGO Director interviewed for this research explained that often local communities have not heard about climate change and that discussion of it is restricted mainly to "intellectuals" in Brazzaville, the capital. Local communities, whilst not using the terms climate change, identified many phenomena which may be related to this, as described below. No information was available at the departmental level about climate change data or studies for either Likouala or Lékoumou. However, staff at provincial authorities often cite anecdotal evidence of changing climatic conditions or perturbation of seasons (for example, "the rains have come late this year", "we no longer know when to plant crops").

3.2 GOVERNANCE

INDIGENOUS PEOPLES' RIGHTS

In February 2011, Congo adopted a Law on Indigenous Peoples' Rights (*Loi portant promotion et protection des droits des populations autochtones*). It guarantees civil and political rights, economic, social and cultural rights and the right to a healthy environment for indigenous peoples. This law is the first of its kind in Central Africa, and its adoption is a historic development for indigenous peoples in the Congo and on the continent. The law states that "the State ensures that indigenous peoples are consulted in a suitable manner" (see Article 3 on consultation of indigenous peoples) and presents legal developments to ensure civil and political rights, cultural rights, rights to education, to work and to lands and resources. Article 31 of the law states that indigenous peoples have individual and collective rights to own, possess, access and use lands and natural resources they traditionally use.

Regulations (*décrets d'application*) implementing this law that would guarantee the rights of indigenous peoples, including their rights to forest lands and resources, are currently being developed. It is important that indigenous peoples are appropriately consulted in this process. Many local actors are not informed about the existence of the law. Moreover the concepts and specificities of indigenous peoples' rights are virtually unknown at local level and major efforts should be made in terms of information and awareness-raising. Currently, representation and participation of indigenous peoples in state structures has been negligible, resulting in structural and systematic discrimination and exclusion. Given the lack of administrative recognition of indigenous villages and the weak capacities of representative structures, indigenous peoples are not able to participate adequately in decision-making, even at the most local levels.

LAND AND RESOURCE TENURE

In Congo, as in the neighbouring countries, there is cohabitation and a complex interaction between customary law, which is a body of rules sometimes dating back to the pre-colonial era, usually unwritten, and state law, or statutory written law, described as "modern" and dating from colonial times. At the local level, customary rules still play an important role in the access and management of lands and resources. The practice of land occupation takes place in a customary manner by the Bantu. The occupation and development of an unoccupied plot (for example, construction of houses, clearing land for agriculture) is then enough to convey transmission by succession to descendants.

Under the Forest Code adopted in 2000 by the Ministry of Forest Economy, the national forest estate includes the permanent domain and the non-permanent domain. The permanent domain includes the private domain of the State. The permanent domain occupies about 19 million hectares.

The 2000 Forest Code is based on the principle of 'sustainable management' of forest resources. Application texts for this law were adopted in 2002 followed by national guidelines for sustainable forest management, published in 2004. The legislative framework supports the development of management plans for logging concessions, although most of these are still in preparation. It also encourages the participation of local and indigenous communities in the management of forests but the mechanisms to allow this are unclear and field experiences show that communities often complain of not being involved in the management of resources.

Analysis of the texts reveals that people are banned from using certain wildlife resources, as well as mining and hydrocarbons. In the forests of the Private Domain of the State, the law recognizes certain customary use rights of indigenous and local communities, but these rights are limited to domestic consumption and do not extend to the marketing of forest products, which are a vital source of income for poor and excluded local and semi-nomadic populations.

According to the Congolese land tenure legislation, all forest lands are owned by the State. However, there is a category of land for which the law recognizes two types of access to property: the property by registration and ownership by recognition of customary land rights. The registration of a property results in an official certificate or land title recognized by the

state. It is recognizable to anyone who has delineated an area, applied for registration and respected the procedure that results in the issuance of a land title. This is a common property regime for urban and rural land, but rural people have trouble completing the lengthy and costly bureaucratic procedures. Specifically, these procedures are not adapted to the culture and way of life of the indigenous peoples.

The use of land and concepts of ownership and control are different for indigenous peoples. The forest is, in fact, considered by the indigenous peoples as 'their' land, which they administer through their own management systems. Often, they follow a semi-nomadic life, using a vast area for hunting and gathering. The idea of "development" thus differs between an indigenous person and a Bantu.

NATIONAL CLIMATE CHANGE POLICIES AND CONSULTATION

With regard to climate change policies, they have been mainstreamed into the *Plan National de Développement* (PND) which runs from 2012-2016. Both in regards to mitigation and adaption – in forest management and to help communities adapt to climate change. The PND is itself made up of a number of other documents such as the Poverty Reduction Strategy Paper (PRSP) – (*Document de Stratégie pour la Réduction de la Pauvreté - DSRP*) – and the REDD Readiness Preparation Proposal (R-PP). Political watchers interviewed for this research were sceptical as to how much government activities will follow the PND. With regard to consultation, for the PND there was no public consultation, for the PRSP NGOs in Brazzaville were consulted (but many admitted to not reading the entire 500 page document); for the R-PP there were public meetings held in the capital of each department which including indigenous peoples' participation after pressure from national NGOs and donors.

GENERAL POLITICAL CONTEXT OF CONGO

The Republic of Congo saw three armed conflicts between 1993 and 1999. These conflicts have caused population displacement and resulted in the disruption of the economy. Since the ceasefire in 2000 and adoption of a new Constitution in 2002, the Republic of Congo has been at peace. Decentralisation is provided for in the 2002 National Constitution that underpinned the country's return to democracy. However local councils still depend heavily on the central government for managing social and economic development. The Congolese economy has grown significantly since 2008. Real GDP is estimated to have expanded by 8.8 percent in 2010, and 7.5 percent in 2009, based on continued high growth in the oil-sector as well as accelerated growth in the non-oil sector. Petroleum extraction has supplanted forestry as the mainstay of the economy.

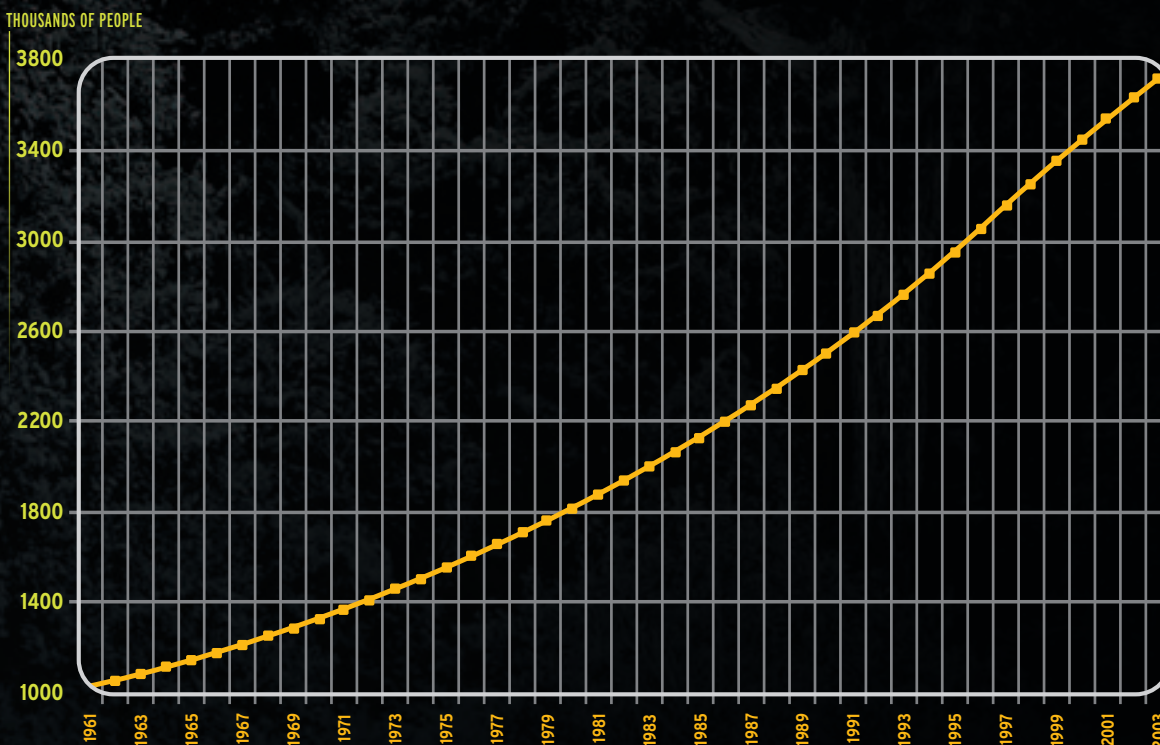
However, the country continues to face fundamental development challenges. Poverty remains significant, with about half the population living below the poverty line, and inequality remains high. Social indicators are still far below those of countries with comparable levels of Gross National Income per capita and meeting the Millenium Development Goals remains a challenge (World Bank, 2011).

Corruption remains one of the biggest challenges throughout the Congo Basin. Public services are unevenly provided and of poor quality. The institutions that are intended to provide checks and balances within the system are generally under-resourced and lack independence (Transparency International, 2011). The Republic of Congo is ranked 154th on Transparency International's Corruption Index for 2011.

3.3 SOCIAL AND ECONOMIC FACTORS

With an estimated 3.7 million inhabitants spread over an area of 342,000 km², the Republic of Congo has a low average population density of 10.8 inhabitants per km², and in reality 70% of the population is concentrated in the urban centres of Brazzaville and Pointe Noire. It is composed of different groups: Baya, Kongo, Kota, Mbere, Nzabi, Mbochi, Makasi, Punu, Sangha, Teke, and indigenous hunter-gatherers whose number is estimated at 43,378. There has been rapid population growth in Republic of Congo in recent decades.

FIGURE 10:
Population of Republic of Congo, 1961-2003 *Source: Data FAOSTAT, 2005*



Non-timber forest products (animals, fruits, seeds, flowers, etc.) represent important resources for forest communities. Studies have revealed around 800 different species that are used for food, construction, tools, heating, medicine and customary practices. However, RFUK's Congolese NGO partners have found that indigenous peoples in particular are living in situations of extreme poverty and marginalization without secure access to natural resources and lands on which they depend for their culture and survival.

The field research demonstrated that the indigenous populations of Ngonaka and Boucy Boucy have very limited access to formal jobs (some of the men from Ngonaka have been working for the local logging company to identify valued tree species) and have virtually no access to a pension. They get most of their income from selling products from cropping, hunting and gathering mushrooms, caterpillars, asparagus, leaves etc.

Access to modern health facilities, such as hospitals, is still low due to the financial cost involved. Access to basic education is low due to several factors, specifically the lack of financial resources to support school costs, intimidation by Bantu children and the non-adaptation of the curriculum and school calendar (in the indigenous culture, at some periods the children should be with their parents in the forest to participate in the gathering of forest products etc.).

3.4 ENVIRONMENT

Bordered to the north-west by Cameroon and the Central African Republic, to the south and east by the Democratic Republic of Congo and to the west by Gabon and the Atlantic Ocean, approximately 60% of the total land area of the Republic of Congo is covered by rainforest (between 20 and 22 million hectares) which is extremely rich in flora and fauna. For example, of the 10,000 species of plant identified in the Congo Basin, 1,200 are endemic to the Republic of Congo.

About 75% of the total forest area of the country, or around 15 million hectares, has been allocated to timber production, while protected areas account for some 3.7 million hectares, or nearly 11% of the country. The rainforests in the south and south-west of the country have faced decades of extensive deforestation while logging activities have intensified in the north. According to an industry survey conducted in 2007, logging generates 5% of GDP and 10% of non-oil GDP, creating more than 12,000 direct and indirect jobs and generating 110 billion CFA francs in turnover and 100 billion CFA francs in exports. However, very little of this appears to have supported the development of forest communities. The Republic of Congo has rich oil resources which provide the majority of the GDP.

Deforestation rates in the Congo Basin (0.17 percent / World Bank, 2011) are still low compared to large forest blocks in the Amazon or South-East Asia, but these rates are expected to increase rapidly in the coming decades, driven by a variety of forces such as industrial logging activities, road development, agricultural expansion (both for subsistence purposes and for commercial farming), as well as oil and mineral extraction.

Regarding the field research sites identified:

- Ngonaka is surrounded by two rivers, at the east and at the west of the village. Towards the north to Gnimi there are fields and forests where people practice fishing, gathering and hunting. There are four logging concessions around Ngonaka: Taman, Asia Congo, Sicofor and Afriwood. The territory of Ngonaka is located in the Taman Concession, which limits the access and use of forest resources. Ngonaka is located in the Massif of Chaillu Niari. Rainfall varies from 1,200 to 1,700 mm per year. It lies at about 438 metres above sea level. There is a long dry season lasting three to four months (June-September) bookended by two rainy seasons (October to December and February to May). There is another short dry season (January/February).
- Boucy Boucy is located on the banks of the Motaba River, which is the main access navigation channel and source of water for drinking and washing. There are currently no commercial logging operations in the area, although these are set to begin shortly. It lies at about 335 metres above sea level. The area is characterised by rainfall occurring all year (1800 mm/year) with only two periods of reduced rainfall from December to February and in July. There is an un-tarmacked road to Dongou, which is 28km away as the crow flies. As well as being the main means of transport, the River also provides fish for the village. Close by the village is primary forest which has never been logged industrially. This hosts plant and animal resources which constitute the main source of livelihoods for the inhabitants. Large mammals are found at several days walk from the village. There are numerous small streams and ponds in the forest. A small area outside the village is occupied by agricultural fields.

PART 4: IMPACT OF CLIMATE CHANGE AND VARIABILITY ON INDIGENOUS PEOPLES IN THE SUB-REGION

4.1 LOCAL PERCEPTIONS

The research with both communities was hindered by their lack of prior knowledge of the concept of climate change. Whilst they were able readily to identify environmental changes that have occurred in the past 20 years, they were not able to associate these with either global climate change or local environmental pressure. The research team in Boucy Boucy decided to focus on “environmental changes” in general, in exercises with the community, and later to analyse these findings and draw out links to potential climate change impacts. Table 2 below summarises the six main environmental changes identified by the indigenous community of Boucy Boucy in order of importance.

Table 2: List of environmental changes observed by Boucy Boucy indigenous peoples in order of importance

OVERALL RANKING ³	ENVIRONMENTAL CHANGE OBSERVED	LINK TO CLIMATE CHANGE
1	Water pollution	Indirect
2	Impoverished forest	Potential in part
=3	Temperature increase	Direct
=3	Deforestation	Potential in part
=3	Increasing rarity of medicinal plants	Potential
6	Drying up of rivers	Direct

The observed changes of increased temperature, drying up of rivers and water pollution can be linked to climate change. Discussion following the seasonal calendar exercise showed that communities clearly identified changes in the length of seasons, specifically that in the past the rainy season was longer and the dry season shorter, but now the dry season has got longer and is the same length as the rainy season. This reduction in rainfall was seen in the drying up of rivers and hence ‘water pollution’ (as ground water in the forest ‘runs’ for less time in the year and becomes stagnant and polluted). Both this reduced rainfall and increased temperature fits with available historical data for the Republic of Congo.

³ This combines the results of ranking exercises conducted separately with men and women within the community

FIGURE 13:
The seasonal calendar exercise, Boucy Boucy

Photo credits:
The Rainforest Foundation UK

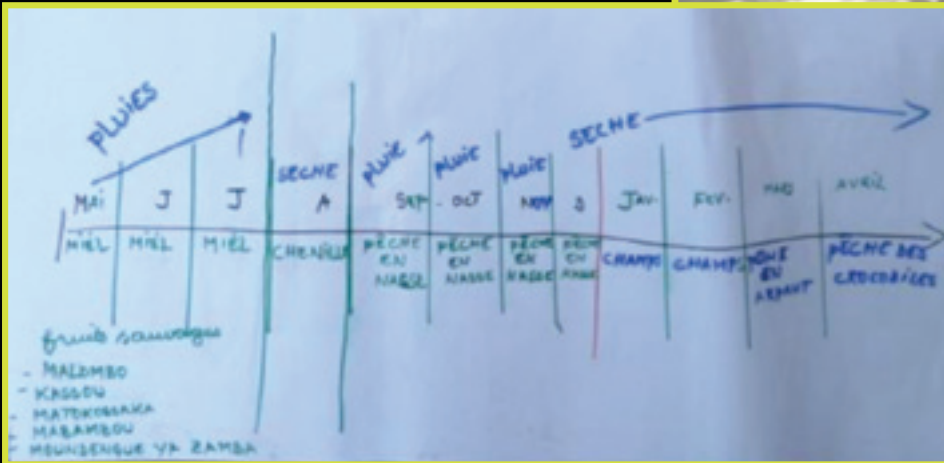


FIGURE 14:
Results of the seasonal calendar exercise, Boucy Boucy

The observed changes of the increasing rarity of medicinal plants, less abundant resources available in the forest and deforestation may potentially, at least in part, be linked to climate change. Climate change could provoke these changes if medicinal plants, animal and vegetable forest resources used by the communities and certain species of trees were not adapted to increased temperature and reduced rainfall conditions present and were hence disappearing. This would, however, require a primary scientific study to identify the species in question and their susceptibility to climate change. These changes may also be caused in part by local environmental pressures. Having said that, the research team observed that the manner in which medicinal plants were gathered was done in a way that did not harm the plant (for example, by cutting off a small section of bark or a few leaves from a tree).

Therefore, for the case of Boucy Boucy, it appears that the observed changes which can be linked to climate change are: increased temperature, changes in the length of seasons, drying up of rivers and water pollution. The following changes were observed and may in part be linked to climate change, but this would require further research: increasing rarity of medicinal plants, forest resources becoming less abundant and deforestation.

The research in Ngonaka showed that disruption of the seasons and the increased temperature are the main signs of climate change according to the community. The climate change impacts felt by the populations surveyed are, in order of priority, as follows:

- Disruption of the seasons;
- Increased warmth;
- Less frequent rains;
- Stronger winds and heavier rains.

The community reported disruption of the seasons resulting in unpredictable periods of rain and drought. In the past, communities had a clear timetable of activities that were linked to the rainy and dry seasons. But now, they consider that the seasons no longer obey any periodicity and rainy seasons have become rare. Moreover, these rains have become less frequent and more violent and are accompanied by strong winds that sometimes cause damage. The longer dry seasons are also characterized by higher temperatures.

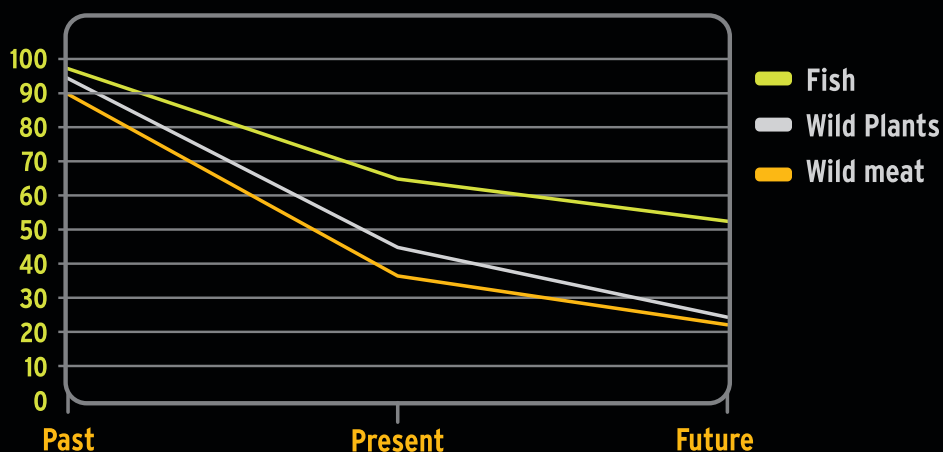
Results of the individual questionnaires are presented in figures 15 and 16 below. It was reported frequently in questionnaires from both research sites that to find bushmeat or wild plants, the indigenous community must travel further and further into the forest. In the past, hunting and gathering were carried out at sites "close to the village" ("about 30 minutes" for some resources, as stated by community members) while today hunting areas are located more than a day's walk away. However, there is no definitive link of these impacts to climate change.

The graphs show that whilst the gathering of wild meat and wild plants has declined more severely, and communities believe that they will continue to decline, fish and planted crops have also declined but not as sharply as traditional hunting and gathering products. Livestock has also declined rapidly (community members in Boucy Boucy mentioned a disease which had killed many of their chickens a few years previously) as has income.

FIGURE 15:
Community perception of abundance of fish, wild meat and wild plants over time

Source: Questionnaires from Boucy Boucy and Ngonaka, sample sizes: wild meat (77); wild plants (78); fish (33)

Community perception of change over time:
Wild meat, wild plants and fish - Boucy Boucy and Ngonaka



Community perception of change over time for:
Income, livestock and crops - Boucy Boucy and Ngonaka

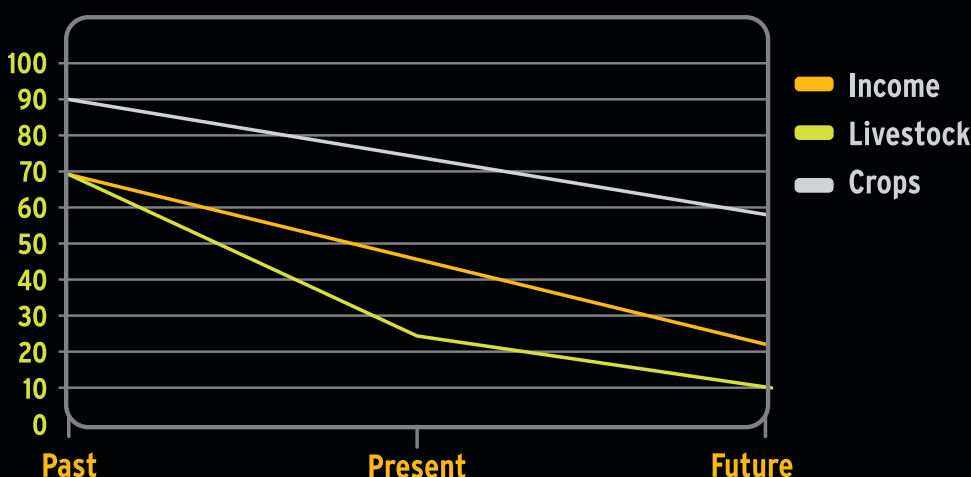


FIGURE 16:
Community perception of their income and abundance of livestock and crops over time

Source: Questionnaires from Boucy Boucy and Ngonaka, sample sizes: income (76); livestock (73); crops (32)

A short note on methodology: These graphs were created from data collected in individual questionnaires. Individuals were asked whether the harvesting of wild plants, for example, was "good", "medium" or "bad" at three points in time: "past" (approximately 20 years ago), "present" and "future". In order to transform into a graph, "good" was assigned 3 points, "medium" 2 points, and "bad" 1 point. Differences in the sample size were accounted for and adjusted so that 100 on the y-axis would mean all responses were "good" and 0 on the y-axis that all responses were "bad".

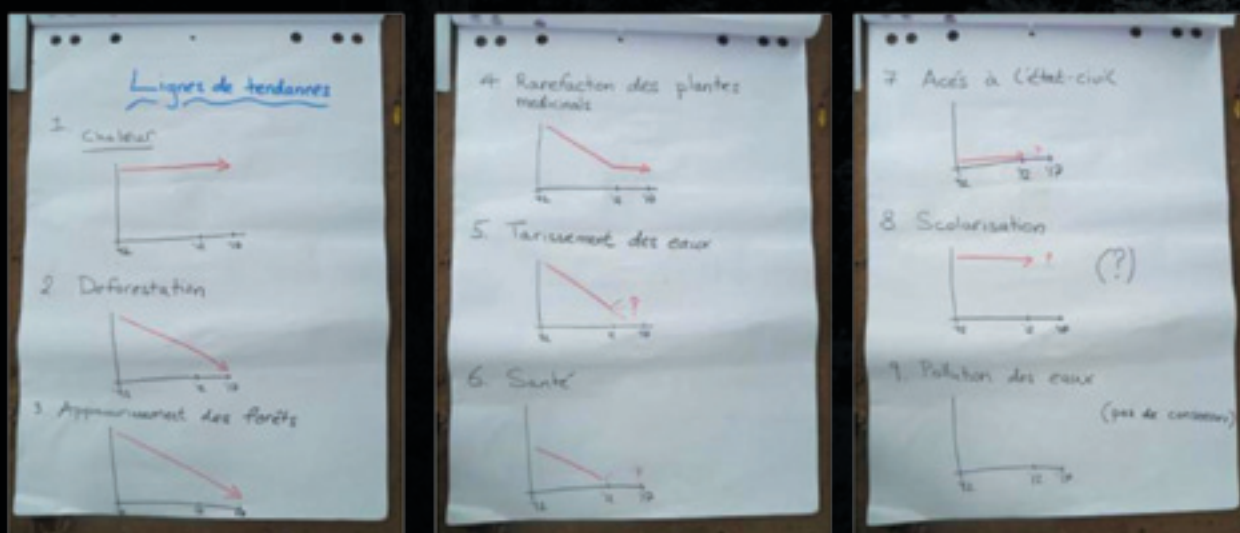
4.2 KEY IMPACTS

SOCIAL IMPACTS

The primary social impact of climate change on the communities studied relates to deteriorating health. The Boucy Boucy community perceived that the indigenous community's health declined from "medium" to "bad" in the period 1992 to 2012 in the trend lines exercise (see below). The prolonged dry season and reduced rainfall have led to streams in the forest flowing for shorter periods in the year, and when stagnant, tend to breed bacteria and become polluted leading to diarrhoea, vomiting and occasionally death. Stagnant ponds are also ideal breeding ground for malaria carrying mosquitoes. This also shows that there may be a direct link between 'health of the village' and climate change. Staff at the health centre in Ngonaka confirmed that water pollution has already caused an increase in skin and digestive diseases.

FIGURE 17:
Photographs of the results of the trends
lines exercise, Boucy Boucy

Photo credit: The Rainforest Foundation UK



(Key: 1- temperature; 2 – deforestation; 3 – impoverishment of forests; 4 – rarity of medicinal plants; 5 – drying up of rivers; 6 – health of community members; 7 – access to civil status services; 8 – school enrolment; 9 – water pollution).

Further scientific research would be needed to determine whether increased temperatures also play a role in decreasing health outcomes. This is suggested by research done for the technical report of this study, which states that one of the key impacts is: "Increased prevalence of disease / malaria due to rising temperatures." Temperatures are predicted to rise more in the south of Congo than the north, and by up to 1.1°C in coastal areas by 2050. Studies show that this is likely to heighten the conditions for transmissible diseases, particularly malaria: "the potential effect of climate change in areas of existing transmission is noticeable, with 28–42% of new person-months of exposure towards the end of the 21st century arising in areas presently suitable for the disease" (Tanser et al. 2003).

The increasing rarity of medicinal plants – such as 'Mbako', the bark of a tree which is used like quinine against malaria – has health implications, as too does the reduced availability of plant and animal resources from the forests. However, as discussed above it is not clear whether these changes are linked directly to climate change.



ECONOMIC IMPACTS

Indigenous people in both communities studied are reliant almost exclusively on income derived from hunting and gathering activities in the forest. In Ngonaka, only four people out of 44 interviewed reported being in salaried employment, the rest make a living exclusively from hunting, the sale of forest products, agriculture (mainly cassava) and fishing. Therefore, any climate or environmental changes are likely to have direct and major economic impacts on indigenous peoples in the Republic of Congo.

The indigenous peoples of Boucy Boucy reported that the drying-up of rivers can have positive or negative impacts on fishing activities depending on its scale. They report that when the water level diminishes to a certain level fishing yields tend to increase as fish are more exposed and easier to catch, but when the water level gets too low they are unable to fish at all. In Ngonaka, anecdotal evidence points to climate change negatively impacting agriculture: “the agricultural production is less abundant”, and “the heavy rains can destroy the crops” is reported by indigenous peoples. This is supported by research that suggests that rain-reliant agriculture (as practiced in most of sub-Saharan Africa), is particularly susceptible to climate change (Mendelsohn, 2000).

As noted before, communities strongly observe that forest resources have become scarce and more remote. For example, people note that caterpillars, which are a major source of animal protein for indigenous people, have disappeared in the area of Ngonaka, and that consequently people report that the quality of living has deteriorated. More energy and time is required for hunting and gathering activities for the same return. The scarcity and remoteness of resources have a negative impact on the amount of forest products that communities can collect and sell. However, more research would be needed to see whether there is a link between climate change and the disappearance of caterpillars or other animal and plant resources from the forest.

One other important impact of climate change on communities relates to the increasing rarity of medicinal plants. Faced with this, indigenous peoples from both communities reported that some diseases cannot be treated traditionally anymore, this has led to a greater dependence of the community on modern medicine, which is expensive. This often leaves community members indebted.

PHYSICAL AND NATURAL IMPACTS

The main physical and natural impacts of climate change have largely been mentioned above. These are the drying up of rivers, water pollution, and potentially increasing rarity of medicinal plants, which are linked to reduced rainfall, seasonal changes and increased temperature. According to the study, the drying up of rivers is directly related to the overall reduction in rainfall and high temperatures. This drying of rivers restricts access to water and water resources, such as fish or certain plants that grow on river banks.

The Ngonaka research has reported increased warmth and less frequent rains, which are heavier and accompanied with strong winds when they occur, as the main climate changes phenomena in the area. This suggests an annual reduction in rainfall with shorter periods of more intense rain. According to the targeted community, this has led to physical and natural impacts which are essentially the drying of rivers, erosion and occasional flooding. Access to water is hence problematic due to the drying up of many rivers and therefore less water collection points. This scarcity of access points to water causes many conflicts with local people who don't want to share water sources with indigenous people. These have had to opt for digging wells to access water.

4.3 CONTRIBUTING FACTORS

As noted above, indigenous peoples are economically, socially and politically marginalised in the Republic of Congo, a situation which increases their vulnerability to climate change impacts. This situation means that they are less likely to be able to earn a decent livelihood or have adequate financial means to pay for medical treatments.

Another general trend that may exacerbate the impacts of climate change is the increasing sedentarisation of indigenous peoples, as they increasingly adopt a more settled, agricultural way of life. As mentioned, in Boucy Boucy indigenous peoples have only begun to cultivate their own fields in the last two years, whereas in Ngonaka they have been practicing agriculture for ten to fifteen years. Many external institutions such as the state, local authorities and development projects push them towards a more settled life. This can be expected to lead to an erosion of traditional knowledge of the forest and a reduction in mobility, which might be considered a key adaptation strategy of the community to climate change.

In Ngonaka, the main additional factors which compound the effects of climate change are logging and mining. These two activities, but especially the former, include the movement of vehicles in the forest, construction of roads and the use of certain chemicals. These aggravate and precipitate environmental degradation, the loss of biodiversity and other impacts such as water pollution and the decline of certain wild plants used for economic activities and/or medicine by local communities. It is often the same trees that are prized for their medicinal qualities such as 'caterpillar trees' that are targeted by logging companies for their wood. In Boucy Boucy, the presence of eco-guards in hunting grounds several days walk from the village, acts as a restriction on the animal resources that indigenous peoples traditionally extract from the forest. There is currently no industrial logging in Boucy Boucy, but it is expected to begin in the near future, and this is likely to have a further negative impact on the local environmental situation.

The impact of population growth and migration cannot be known accurately. The population of the Likouala Department doubled, according to some estimates, in 2009 with migrants escaping conflict and crossing the Oubangui River from the Democratic Republic of Congo. This has anecdotally increased pressure on the forest.



PART 5: TRADITIONAL KNOWLEDGE AND ADAPTATION TO CLIMATE CHANGE AND VARIABILITY

5.1. INDIGENOUS PEOPLES' ADAPTIVE CAPACITY AND RESILIENCE

What key factors determine local Indigenous Peoples' ability to minimize the adverse impacts of, and adapt to, the key impacts of climate change?

Analysis of the results of the field work point to five broad factors that reduce indigenous peoples' ability to minimize the impacts of and adapt to climate change:

- High dependency of community on natural resources for sustenance and livelihoods – therefore if these are threatened the consequences are direct and severe
- Discrimination against indigenous people – therefore weaker economic situation and access to information and state services, or adaptation projects, were they to reach the village
- Lack of understanding or respect of way of life by external actors and indigenous peoples' specific rights under the national legislation – therefore denigrating traditional cultural values and knowledge of indigenous peoples and pushing them into new livelihoods which may not be suitable
- New pressures on forest resources (from logging and mining activities) – leading to loss of important tree species and increased competition for, and reduced access to, forest resources (although providing a little formal employment)
- Low level of literacy and access to information – therefore posing a challenge to awareness-raising and to limited capacities of indigenous organisations.

And two factors that support indigenous peoples' ability to respond to climate change:

- In-depth knowledge of the forest and its resources – the traditional knowledge of indigenous people about forest resources
- Traditional adaptation strategies such as mobility – allowing them to move easily between resources depending on their availability.

How do climate change policies and the general governance context in the case study countries impact Indigenous Peoples and their ability to adapt to climate change and variability?

Despite some positive advances regarding indigenous peoples' rights in the national legislation, there has so far been no implementation of the 2011 Indigenous Peoples Law. Likewise, as stated above, consultative processes on national policies related to climate change have been absent or when they have occurred, often due to pressure put in place by external donors, unsatisfactory. The indigenous communities studied in the field research had almost no information or awareness about national policies: in Boucy Boucy, only one person out of a group of 20 community members had heard of the existence of the Republic of Congo Indigenous Peoples Law. It should also be noted that the lack of representative indigenous peoples' organisations at the national level poses a problem for the formulation and implementation of national adaptation strategies.

At the level of local forest management, indigenous peoples are almost universally excluded from forest management processes. This means, for example, that indigenous peoples have limited legal rights to use forest resources in an area where a national park is developed, or a logging or mining title is allocated to a company. General forest governance system does not address sufficiently the specificities of indigenous peoples and their relations to the natural environment.

5.2. INDIGENOUS PEOPLES' ADAPTATION STRATEGIES

What are some of the specific coping and adaptation strategies that Indigenous Peoples have developed or are currently using to address the key impacts from climate change?

Table 3 summarises the results from the field research in Boucy Boucy on adaptation strategies.

Table 3: Coping and adaptation strategies developed by the indigenous community of Boucy Boucy

NO.	ENVIRONMENTAL / CLIMATE CHANGE IMPACT OBSERVED	COPING / ADAPTATION STRATEGY	TRADITIONAL KNOWLEDGE OR NEW ADAPTATION
1	Deforestation	Gathering wood and leaves at greater distance from village/camp (for example, koko leaves could be gathered from 1 minute away and are now a 2 hour walk away)	New
2	Increasing rarity of medicinal plants	Searching for plants at greater distance from village or camp	New
		Planting of some medicinal plants around camp	New
		Resorting to modern medicine unlike grandparents (which leaves them in debt)	New
3	Drying up of rivers	Carry out less fishing activities	New
		Fishing with net and line (instead of spears/harpoons)	New
4	Water pollution	Digging of water points	Traditional activity practiced more frequently
		Resorting to wells	New
		Gathering of water from plants / vines in the forest	Traditional activity practiced more frequently
5	Impoverished forest	Using far flung hunting grounds	More frequently
6	Increased temperature	Building of shelters made of leaves from the forest (called "essembé")	Traditional adaptation
		Building of shelters made of cut branches (called "epouta")	Traditional adaptation

The research from Ngonaka supports these results, as the following adaptations were noted:

- The digging of water points - according to populations, this practice of digging waterholes in the forest is recent and seems practical to get water quickly and at reduced cost
- Changes in agricultural practices such as the use of selected variety of plants - this has been mentioned by community members as a possible strategy, which is not implemented due to the lack of access to such plants.
- Changes in hunting and gathering practices - accessing hunting and gathering areas further away from the village



FIGURE 19:
Stagnant pool of water (left) and recently dug 'water point' (bottom middle/right)
Photo credit: The Rainforest Foundation UK

FIGURE 18:
Harvesting of medicinal bark to treat coughs
Photo credit: The Rainforest Foundation UK



As stated above, the lack of prior knowledge of communities about climate change hindered this research as it was not always possible for the community to identify the reason for the new adaptation or strategy. Some adaptations are clearly more frequent use of traditional knowledge, others are genuinely "new" adaptations. It should be noted that these adaptations are also influenced by factors other than climate and environmental change such as the availability of new technologies or services (for example, modern medicine); or the influence of Bantu neighbours and village life.

How does the traditional and local knowledge of Indigenous Peoples influence their adaptation strategies? How do these strategies complement new scientific information?

As can be seen in table 3 above, many of the adaptation strategies are based on traditional knowledge of indigenous peoples. Even when new technology is a factor in provoking a new adaptation – such as hunting by electric torches – this is combined with traditional knowledge of hunting practices and animals of the forest. Likewise, the ability to travel large distances on foot in the forest – and to spend extended periods of time there – allows adaptations such as accessing hunting and gathering areas further away from the village.

Further research would be required to assess how these strategies complement new scientific information.

What roles do formal and informal institutions play in the elaboration of local Indigenous Peoples' adaptation strategies?

Formal institutions play almost no role in the elaboration of indigenous peoples' adaptation strategies, especially because indigenous peoples do not participate in formal local decision processes. The adaptation strategies mentioned above have been formulated by the communities themselves without external help. Indeed, external institutions have hindered these adaptation strategies, at times, by restricting access to the forest. The only exceptions to this are the availability of water wells in the village and access to modern medicine. In the trend lines' exercise in Boucy Boucy, the community stated that the access to state services is "poor" and has not improved in the past twenty years, see Figure 17 above. More information about the impact of formal institutions is above, especially in Table 1.

With regards to informal institutions, traditional decision-making processes of the community involve the following elements:

- A decision which can be taken by the community as a whole might not be followed up by everyone. Every member of the community is free to decide their own priority. In that way adaptation strategies can be collective and/or individual.
- Daily decisions are taken according to the needs to be fulfilled (food, water etc.), there is hence a high level of flexibility related to adaptation strategies.
- Decisions are easily implemented within the household and small groups (camp).
- Decisions that concern the community as a whole are made collectively and not unilaterally.

This leads to a high level of autonomy and potential for new adaptive strategies to develop and spread within the community.

PART 6: LESSONS LEARNED AND RECOMMENDATIONS

6.1 LESSONS LEARNED ON LOCAL KNOWLEDGE AND ADAPTATION STRATEGIES

What lessons do Indigenous Peoples' adaptation strategies, local and traditional knowledge provide that may assist them and other local communities, as well as inform national strategies, on how to minimize the adverse impacts of climate change and adapt to a changing climate?

According to the study, adaptation strategies of the indigenous community of Ngonaka have the following characteristics that should be taken into consideration by national strategies:

- They are driven by their needs to fulfil basic needs (access to food and water).
- These strategies can be individual and/or collective, reflecting the social organization of the community and decision-making processes.
- They are flexible and highly based on indigenous traditional knowledge of the forest lands and resources.

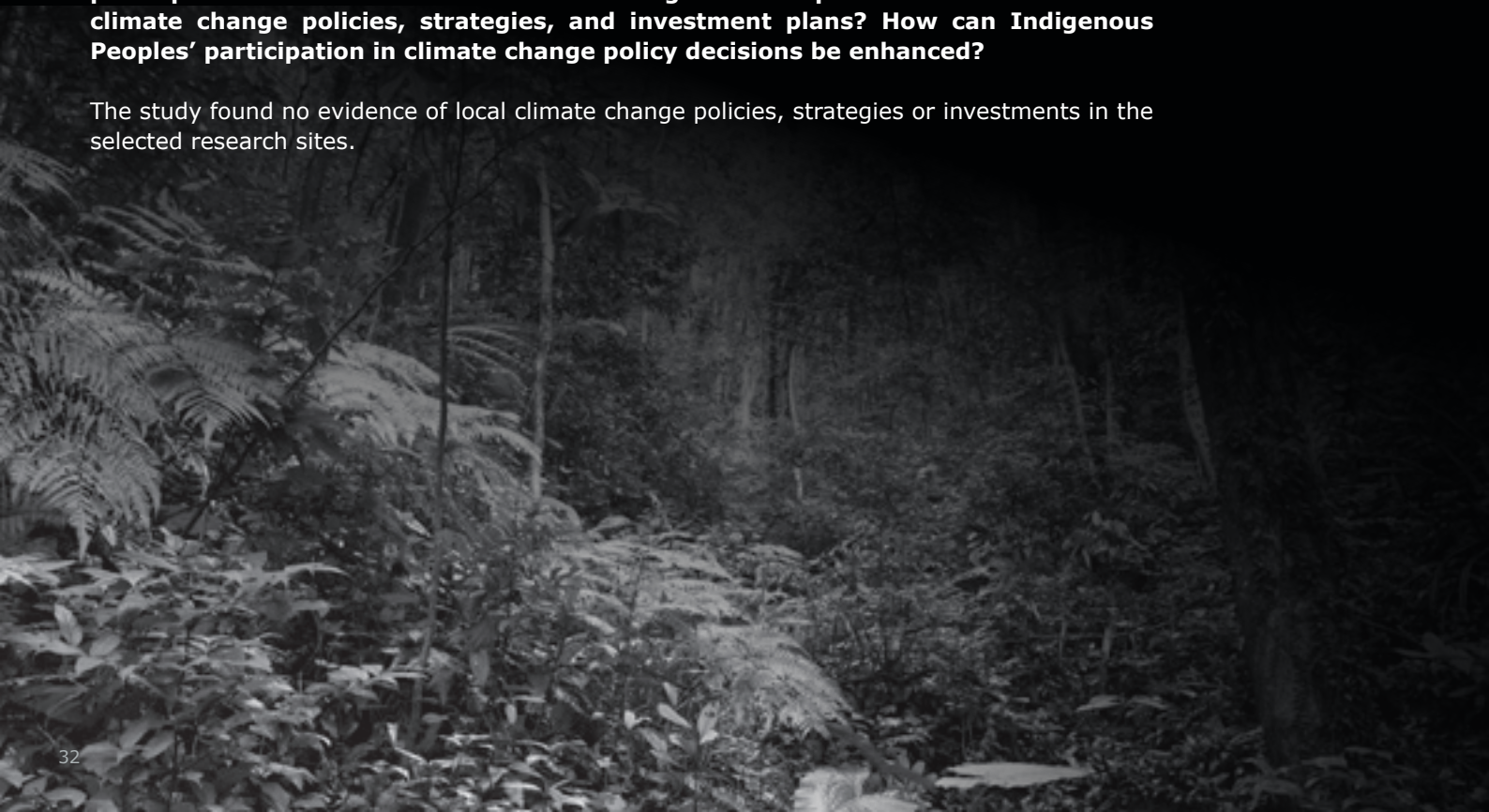
The vulnerability of indigenous population to climate changes is also due to the lack of national adaptation strategies, which are limited due to the lack of institutional, economic and financial capacity to support such actions.

It is also due to the limits of the current lands and resource management systems which don't fully consider indigenous ways of life, and particularly how they access and use forest resources.

6.2 RECOMMENDATIONS: ADAPTATION, MITIGATION, CAPACITY-BUILDING AT LOCAL LEVEL

How can local climate change policies, strategies and investments be better tailored to the circumstances of Indigenous Peoples? How can decision-makers ensure active participation and full consultation with Indigenous Peoples in the formulation of climate change policies, strategies, and investment plans? How can Indigenous Peoples' participation in climate change policy decisions be enhanced?

The study found no evidence of local climate change policies, strategies or investments in the selected research sites.



6.3 RECOMMENDATIONS: ADAPTATION, MITIGATION, CAPACITY-BUILDING AT NATIONAL LEVEL

How can national climate change policies, strategies and investments be better tailored to the circumstances of Indigenous Peoples? How can decision-makers ensure active participation and full consultation with Indigenous Peoples in the formulation of climate change policies, strategies, and investment plans? How can Indigenous Peoples' participation in climate change policy decisions be enhanced?

The main blockages that this study has identified regarding the full participation of indigenous peoples in climate change policies and strategies are:

- 1** Lack of understanding and respect of indigenous peoples' way of life and rights by decision-makers.
- 2** Lack of consultation and participation of indigenous peoples. Decisions affecting indigenous people are often taken without their free, prior and informed consent. They rarely participate in formal decision making processes at national and local levels.
- 3** Lack of leadership, capacities and expertise among indigenous peoples' organisations on climate change.
- 4** Lack of implementing regulations for progressive legislation such as the Indigenous Peoples Law of 2011.
- 5** Local actors (indigenous peoples, local authorities and NGOs) lack information on national legislation, the rights of indigenous peoples under the existing laws, and of the existing policy processes.

The study points to three ways forward to enable indigenous peoples to better adapt to climate change in the Republic of Congo:

- 1** Training for decision-makers and government officials on indigenous peoples' way of life and rights, in order to building awareness and respect towards the community
- 2** Support to indigenous peoples' organisations to build their capacity to defend the rights of communities; to promote the emergence of leadership and expertise on indigenous climate issues and to support them in advocacy and awareness raising activities, through community radios and short films.
- 3** The full implementation of the Indigenous Peoples' Law of 2011 to enhance indigenous peoples' participation in climate change policy, as it requires full consultative processes.

Policies, strategies and actions that may have a considerable impact on indigenous communities have to involve their consultation and participation at every stage.

The national policies and strategies on climate change would be more effective if adapted to the realities of indigenous people, as their participation in the implementation of these policies and strategies would be a guarantee of success.

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