Towards an environmental strategy for Sudanese refugee hosting areas in Upper Nile and Unity States, South Sudan

Environmental inception mission 4 – 22 June 2013

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List of abbreviations

ACTED	Agency for Technical Cooperation and Development
CFM	Community Forest Management
DRC	Democratic Republic of the Congo
DRC	Danish Refugee Council
ETF	Environmental Task Force
FAO	Food and Agriculture Organization
GIS	Geographic Information System
HCT	Humanitarian Country Team
IDP	Internally Displaced People
IOM	International Organization of Migration
IP	Implementing Partner (UNHCR)
MAFCRD	Ministry of Agriculture, Forestry, Cooperatives and Rural Development
NGO	Non-Governmental Organisation
NRM	Natural Resource Management
OCHA	Office for the Coordination of Humanitarian Affairs
RS	Remote Sensing
RSS	Republic of South Sudan
SAFE	Safe Access to Firewood and alternative Energy
SDC	Swiss Agency for Development and Cooperation
SHA	Swiss Humanitarian Aid Unit
SLPA-N	Sudan People's Liberation Army-North
UNEP	United Nations Environment Programme
UNHCR	United Nations High Commissioner for Refugees
UNOSAT	UNITAR Operational Satellite Applications Program
UNITAR	United Nations Institute for Training and Research
VSF	Vétérinaires sans Frontières
WFP	World Food Programme

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Executive summary

Fighting in Blue Nile and South Kordofan States in Sudan led to the flight of about 190,000 people to Maban County in Upper Nile and Pariang County in Unity State. The refugee-hosting areas in Sudan are localised in a savanna landscape mostly sparsely populated.

This report summarises the findings and recommendations of this first inception mission carried out from 4 – 22 June 2013 by a team composed of Dr. Urs Bloesch (SDC/HA, team leader), Annemarie Schneider (SDC/HA) and Charles Jalan Taban Lino (UNHCR Environmental Focal Point in South Sudan).

The overall expected outcome of this mission is to draft an environmental action plan which will guide design, implementation, monitoring and evaluation of environmental protection and mitigation projects in the Sudanese refugee hosting areas in Upper Nile and Unity States. An environmental strategy should be elaborated jointly with all key stakeholders in view of a peaceful cohabitation between locals and refugees based on a commonly agreed natural resource management. Existing reports, studies, data collections and assessments from various stakeholders have been reviewed in view of defining the main areas of environmental concern in the Sudanese refugee-hosting areas.

The needs of the refugees for building materials for shelter and latrines (wooden poles and sticks, grasses for roofing) and for their daily domestic energy needs (cooking, heating and lighting) are permanent and high in both refugee hosting Counties leading to rapid progression of deforestation around the refugee camps. Tree cutting is greatly accelerated by illegal cutting of poles and in particular by charcoal making.

The savanna vegetation of the refugee-hosting areas has a high resilience to disturbances. Their natural regeneration capacity is very high owing to their distinct vegetative reproduction capacities (coppice shoots and root suckers) and their rapid sexual reproduction by seeds due to a rich soil seed bank.

The additional needs of the Sudanese refugees for natural resources including water, firewood and construction poles/sticks, pasture and agricultural land put an additional burden on the local ecosystems with an inherent risk of overstressing their carrying capacity. Host communities see their natural resources increasingly depleted in the surroundings of the refugee camps without having a benefit. The local communities and the representatives of line ministries have not been involved systematically by UNHCR and its implementing partners in the design and implementation of activities related to natural resource management.

The ongoing deforestation around the Sudanese refugee camps/settlement in Upper Nile and Unity States is reversible if managed appropriately but its impact on the livelihoods of the host communities is immediate. Both, the large demand for wooden poles mainly for shelter construction and the rapidly increasing and mostly illegal charcoal making entails an increasing conflict potential between refugee and host communities.

A draft environmental action plan has been elaborated which should be discussed and agreed upon during a workshop in October 2013 involving all key actors. During this workshop, priority, timing and budget of each activity and role of each actor should be defined. An Environmental Task Force will be set up in Maban and Pariang counties to support the implementation and monitoring of the environmental action plan.

In view of a sustainable supply of wood for refugees (and host communities) it is absolutely necessary to carry out a forest inventory in both Counties in order to know the standing volume and the productivity of the tree stands as base for a sustainable community-based forest management and important pillar of the environmental action plan. The forest inventory will be based on a forest mapping elaborated together with UNOSAT. The shelter strategy for 2014 should be reviewed considering the promotion of locally available building materials for the construction of shelter (and latrines) considering a community-based supply of the natural resources. A community-based forest management will facilitate the organisation and control of the wood harvesting (selective cutting, appropriate cutting techniques, designed areas for collecting dry wood) and facilitate the protection of natural regeneration and tree plantation from uncontrolled fire and free roaming cattle (mainly goats).

Domestic energy saving techniques and practices are insignificant for mitigating the increasing ecosystem degradation around the camps/settlement. Agencies promoting new cooking technologies and claiming substantial fuel-saving should in future be obliged to yield objective data based on prolonged field trials. They should also provide credible evidence of user acceptability that demonstrates suitability for the culture, traditions and diet of the intended recipients.

Tree plantations should be supported only if the beneficiaries are committed and are willing to ensure its maintenance (watering, protection from uncontrolled fires and free roaming goats).

Conflicts about access to grazing land and water points for the herds are complex and need a conflict-sensitive approach. We suggest carrying out a rangeland assessment to better understand the abundance and quality of rangeland, the availability of water sources, the seasonal migratory routes and the different pastoral stakeholders.

Sufficient capacity building, including staffing, budget and training at all levels is a prerequisite to successfully implement the environmental action plan. A comprehensive environmental database should be elaborated to facilitate the information access for the UNHCR management and their implementing partners. GIS and remote sensing should be used systematically for the analysis of environmental data.

1. Introduction

Fighting, combined with destruction of crops and livelihoods in South Kordofan and Blue Nile State in Sudan led to the flight of some 200,000 people to Pariang County in Unity State and Maban County in Upper Nile State of South Sudan (see Fig. 1). The Sudanese refugees are by far outnumbering the local host communities.

UNHCR's emergency response for the Sudanese refugees started in September 2011. Both, the complex character of this emergency and the remoteness of the area with limited access (by air only for several months) pose a great challenge to the humanitarian actors operating in the Sudanese refugee hosting areas. Since refugees are using the same local natural resources as the locals, the risk of overexploitation of the increasingly scarce natural resources is imminent leading to conflicts between host communities and refugees. UNHCR, UNEP, the Joint UNEP/OCHA Environment Unit and national forestry representatives carried out from 16-22 November 2012 a joint rapid environmental assessment in the Sudanese refugee camps of Maban County, Upper Nile State only (UNHCR, UNEP, OCHA & RSS 2012).

Following UNHCR's request, SDC/HA accepted to deploy two environmental experts to support UNHCR's operation in South Sudan in the elaboration of a common agreed environmental strategy with all relevant stakeholders. The overall expected outcome of this first inception mission is to draft an environmental action plan which will guide design, implementation, monitoring and evaluation of environmental protection and rehabilitation projects in the Sudanese refugee hosting areas in Upper Nile and Unity States (see ToR in Annexe A). The focus will be on forestry, animal husbandry (and agriculture). It is foreseen between SDC and UNHCR that another SDC/HA secondee will support UNHCR's environmental operation for 6 months, starting in October 2013. SDC and UNHCR have recently intensified their partnership in the field of environment by organising a training workshop for their experts on domestic energy in the humanitarian context.

The inception mission has been carried out from 4 – 22 June 2013 (see mission programme in Annexe B and list of organisations and persons met in Annexe C) by a team composed of Dr. Urs Bloesch (SDC/HA, team leader), Annemarie Schneider (SDC/HA) and Charles Jalan Taban Lino (UNHCR Environmental Focal Point in South Sudan).

After completing the field mission, the RSS has announced that all Sudanese refugees in Pariang County will be relocated to Mapel in Lakes States. However, a detailed planning of the relocation has not yet been defined with UNHCR.

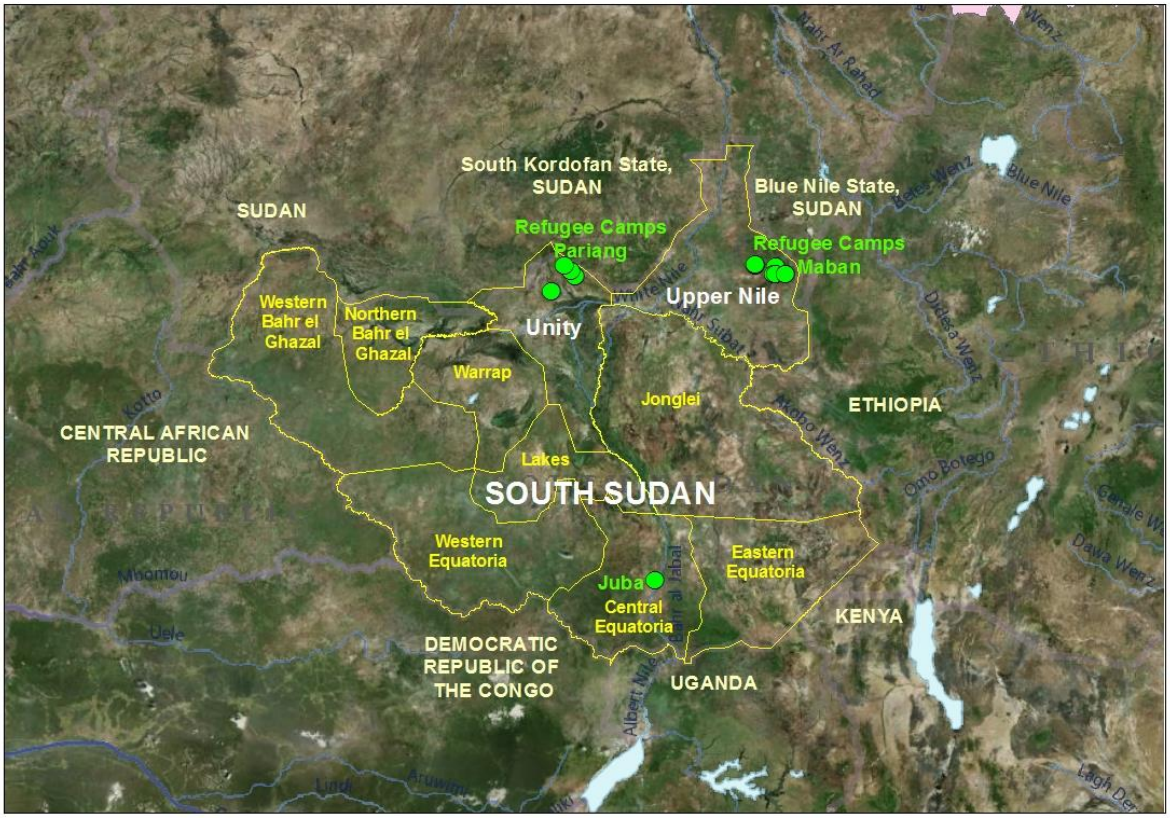

Fig. 1. Sudanese refugee-hosting areas in Upper Nile and Unity States in South Sudan

2. Socio-political context

Peace in South Sudan, the world's newest state, is still very fragile. On 9 July 2011, the people of South Sudan voted for independence from Sudan in a largely peaceful referendum. Although much has been accomplished, the humanitarian situation remains extremely fragile. Conflict and violence affects hundreds of thousands of people, and up to five million will need food and livelihoods support this year.

While the Comprehensive Peace Agreement in 2005 brought an end to decades of civil war and led to the creation of an independent country, the security situation in the new nation remains volatile. An estimated 1,5 million people perished during the war, due to armed violence, malnutrition and the destruction of health services. The conflict uprooted millions more.

South Sudan is host to one of the world's largest humanitarian responses, bringing together national and international humanitarian actors in an operation worth $ 1.05 billion in 2013 (reviewed consolidated appeal). However, emergency response should not lose sight of mid- and longer-development needs thereby addressing the underlying causes that undermine sustainable livelihoods, such as deficient agricultural production and lacking economic growth (Lanzer 2013). More than 1.9 million returnees have been registered in South Sudan since 2007 according to IOM (extracted from IOM Tracking and Monitoring Database on 1/7/2013). According to UNHCR (2013) about 224,000 refugees have been registered in South Sudan including from Sudan (198,000), DRC (18,000), Ethiopia (6,000) and Central

African Republic (2,000). In addition, the planning figures for IDPs amount to 125,000 according to OCHA (2013).

Therefore, resilience building of households and local communities should be an integrated part of emergency programmes. However, logistical constraints are enormous: Up to 60% of the country is cut off during the rainy season, meaning that road access in key locations of humanitarian response is minimal or impossible (Bennett 2013).

Over 50% of the population lives below the poverty line and life expectancy is 42 years. Maternal mortality rates are amongst the highest in the world, with 2,054 deaths for every 100,000 births. Notwithstanding improving education figures, only 10% of children actually finish primary school, and fewer than 2% are enrolled in secondary education (Lanzer 2013). Out of a population of 12 million, more than 4.6m are food insecure, many of them recent returnees (see also FEWS NET 2013). On the other hand, South Sudan's agricultural potential is enormous, and encompasses crops, horticulture, fish, livestock and forests and, in theory, there should be no food shortages (Lanzer 2013). With an estimated cattle population of 12.2m and an asset value of $2.4bn, South Sudan has the sixth-largest cattle economy in Africa and the largest per capita. However, extremely high livestock mortality means that South Sudanese are losing millions of animals each year, reducing the proportion of herds suitable for commercial trade (Lanzer 2013).

The people's already fragile livelihoods have been further aggravated by the government's decision to stop oil production in January 2012. With oil revenues accounting for 98% of government revenue and over 80% of its gross domestic product, the shutdown has prompted deep cuts in public spending. Oil production has resumed in April 2013 and is likely to improve the economic situation of the country. These problems are exacerbated by seasonal flooding, displacement, loss of assets, high food prices and the closure of the border with Sudan cutting off major trade routes between Sudan and South Sudan (Lanzer 2013). The closing of the border and increased tensions in the border area had adverse impacts on the transhumance migration of Sudanese pastoralist depending on dry season pastures in South Sudan (DDG 2013).

Ongoing tensions between Sudan and South Sudan, as well as communal violence within the country, displace hundreds of thousands of people each year (Bennett 2013). OCHA (2013) expects the arrival of up to 150,000 additional people from South Kordofan and Blue Nile states in 2013, bringing the total Sudanese refugee population to 350,000.

3. Biogeography of the Sudanese refugee hosting areas

South Sudan has seven agro-ecological zones, namely: The Green Belt, the Central Hills, the Ironstone Plateau, the Mountain Slopes, the Nile-Sobat Corridor, the South East Plains, and the Flood Plains. Both refugee hosting areas in Upper Nile and Unity State are part of the Flood Plains draining their water to the White Nile. The altitude in the Sudanese refugee hosting areas ranges from 420 to 450m and from 400m to 425m asl (potential site of Gumriak lies at 435m a.s.l.) a.s.l. for Maban and Pariang County, respectively.

A single rainy season lasts from May to October, peaking in July till September. Mean annual rainfall is not precisely known but is estimated to be around 900mm per year (slightly higher in the green belt along the Sudan border in Pariang County). Rainfall is remarkably irregular in time and space and therefore quite unreliable. Extensive inundation in the rainy season is

a normal phenomenon on the flat flood plains. Several seasonal rivers and streams exist during the rainy season, some of which are located near to the camps.

Temperatures are hot in the dry season, often exceeding 45°C in February and March, with extremely low humidity levels. Soils are predominately clays (Black cotton soils) with moderately productive loams in the areas where villages tend to be located (FEG/Solidarités International 2013b). Laterite soils are sparse and used for extracting Marram (gravel) for road constructions.

Both refugee-hosting areas are part of the Sudan savannas (phytogeographical zone). The savanna landscape comprises savanna woodlands (vegetation cover 30-60%, see Fig. 2), tree savannas (<30%), grasslands, seasonally waterlogged marshlands and few narrow pockets of gallery forests mainly along the permanent Yabus River in Maban County. The savannas may be broadly divided into fine-leaved savannas dominated by Acacia (mainly *A. seyal*) and broad-leaved savannas dominated by *Combretum* spp. (local name Guok). Many grasslands are man-made as a result of extensive tree clearing of savannas for crop production and pasture lands; typically only a few protected *Balanites aegyptiacus* remain.

Fig. 2. Savanna woodland at Gumriak (potential refugee site)

The dominating tree species include, *Acacia senegal* (Gum arabic tree), *A. seyal* (Red acacia), A. *nilotica*, *A. sieberiana*, *Adansonia digitata* (Baobab), *Anogeissus leiocarpus* (Ameth), *Balanites aegyptiacus* (Heglig, Lalob or Thou), *Hyphaene thebaica* (Doum palm, only Maban County), *Borassus aethiopum* (only Pariang County), *Combretum* spp. (Guok),

Prosopis africana (Gier, only Pariang County), *Sclerocarya birrea*, *Tamarindus indica* (Tamarind, mainly Pariang County), *Terminalia* sp. (Piok, mainly Pariang County), *Ziziphus abyssinica* and *Z*. *mauritiana* (see all recorded trees and shrubs in Annexe D).

Large parts of the refugee-hosting areas are annually burnt (see Fig. 3). We estimate that more than 50% of the savanna landscape surrounding the refugee camps has been burnt during the last dry season (estimation from aerial view). The combustion of large amounts of biomass released large amounts of greenhouse gases. Late dry season fires may also kill the trees and shrubs thereby opening the savannas.

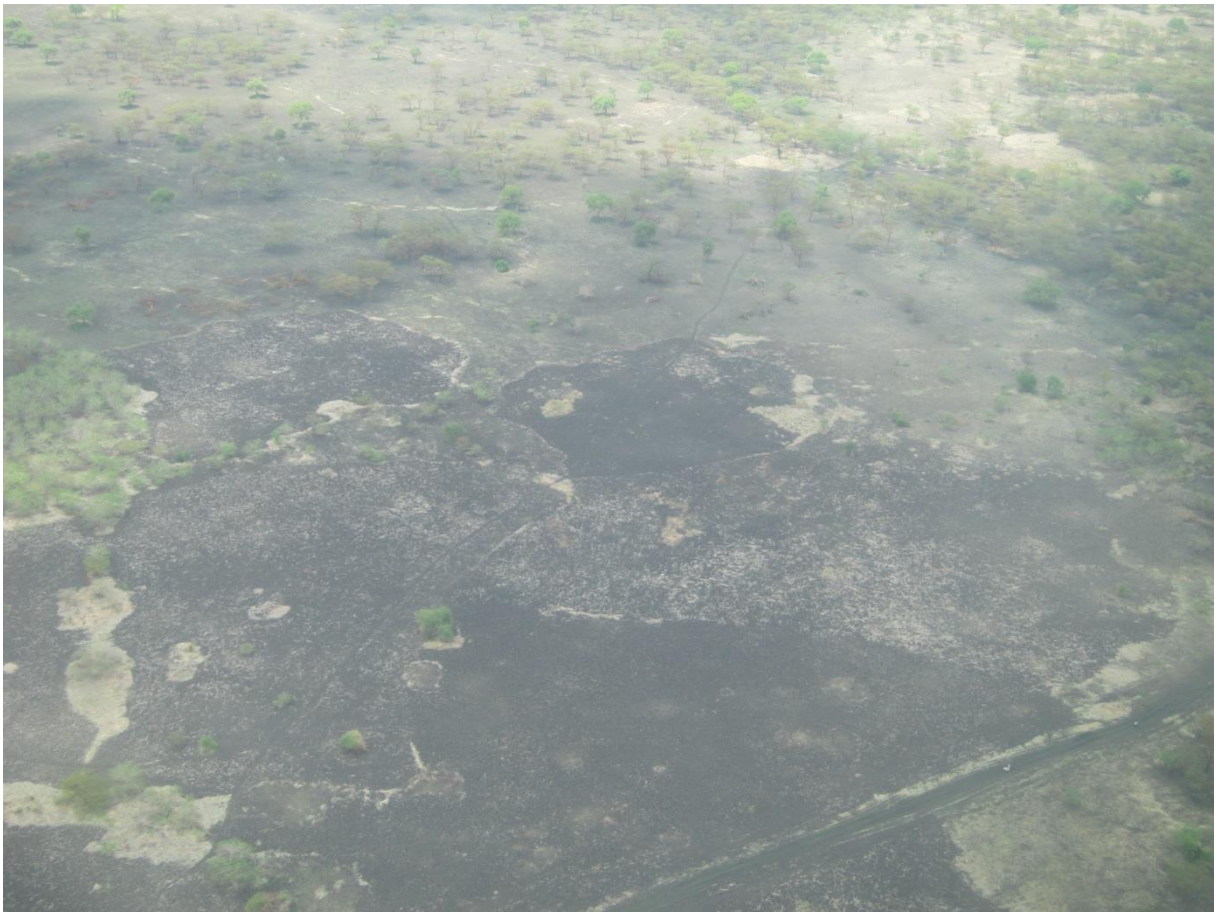

Fig. 3. Annual large-scale uncontrolled fires (Pariang County)

The host communities in Pariang and Maban County have an intimate relationship with their environment. The rural communities are heavily reliant for their livelihoods on a multitude of forest products including shelter (wooden poles, grasses for thatching), handicrafts, energy (firewood, charcoal making), food (tubers, nuts, seeds, fruits and leaves available at various times throughout the year), wild honey, medicine and a number of invaluable environmental and spiritual services. Non-timber forest products (NTFP) are of great importance for the livelihoods of the locals. It is important to note that consumption of wild foods is a normal component of the diet and is not an indicator of livelihood stress, although increase of wild food consumption, is the first strategy used by all household types in response to livelihood stress (FEG/Solidarités International 2013b).

People do not cut trees which they classify of being of high value. The most prominent tree is *Balanites aegyptiacus* having a wide range of uses including edible fruits, thorny branches

and twigs for fencing, looping for fodder and young twigs and leaves serving as food in case of famine and as medicinal plants having a wide variety of applications. Protected trees are listed in Table 1.

Table 1. Locally protected trees in the Sudanese refugee hosting areas

Latin name	Common name	Local name
Acacia nilotica		Sunt Giarad
Acacia senegal	Gum arabic tree	Sunt Hashab
Anogeissus leiocarpus		Ameth
Balanites aegyptiacus	Desert date tree	Heglig, Lalob, Thou
Borassus aethiopum		Deleib
Celtis integrifolia		Tutal
Dalbergia melanoxylon	African blackwood	Babanus
Prosopis africana		Gier
Tamarindus indica	Tamarind	Chuei
***Terminalia* sp.**		Piok
Ziziphus abyssinica	Jujube	Man-Lang, Nabak
Ziziphus mauritiana	Jujube	Man-Lang, Nabak

Both counties are practically void of game and virtually all mammals left the area due to recurrent fighting and poaching by soldiers and militias. On the other hand, big birds such as Black crowned-crane (*Balearica pavonina*), Marabou (*Leptoptilos crumeniferus*), Sacred ibis (*Threskiornis aethiopicus*), African open-billed stork (*Anastomus lamelligerus*), and to a lesser degree Saddle-billed stork (*Ephippiorhynchus senegalensis*) and Helmeted guinea fowl (*Numida meleagris*) are very abundant on the wide open flood plains, especially in Pariang County (guinea fowl in tree savannas and savanna woodlands).

3.1 Maban County

3.1.1 Host community

Maban County is divided into five administrative payams which are being subdivided into several bomas (villages). The County is very sparsely populated, with about 36,000 inhabitants (Tiller & Healy 2013). Most people live in remote bomas with a maximum of 200 to 300 families each. The bomas are mostly far away from the main road that runs east-west, linking the county capital, Bunj, to the state capital, Malakal. The predominant ethnic group in the county are the Mabanese with besides minor groups of other ethnicities (FEG/Solidarités International 2013b). The people of Maban County have been displaced several times during the second civil war.

The predominant livelihood system in Maban is sedentary agropastoralism with limited agricultural capacities due to repeated displacements, with the main focus being in subsistence farming, in addition to non-migratory, livestock rearing. All crops are rainfed. Fields are prepared by burning prior to the rains. Productivity is moderate since mechanical machinery, ox-drawn ploughs, fertilisers, pesticides, improved seed or other inputs are lacking. The most important crops cultivated include long-cycle (6 months) sorghum as the primary staple, maize, beans, cowpeas, groundnuts, sesame and okra. The cultivation of

sorghum and maize is a risk reduction strategy: both crops respond differently to rain conditions, and are harvested at different times around four months apart, meaning that food availability is spread more evenly throughout the year (FEG/Solidarités International 2013b).

Cattle are the main livestock of cultural and financial value in the county followed by goats (few sheep), pigs, chickens, and few donkeys. Cattle and goats are grazed in the vicinity of the village and are returned for tethering next to homes every evening. Pigs roam freely to forage (FEG/Solidarités International 2013b).

Gathering of wild foods is an important supplement to the agropastoralism practiced by all Maban households, including fishing for those villages in the south of the county. Cash-based trade of commodities is very limited in Maban. Most villages are self-sufficient in terms of production of cereals, other food crops and livestock, with significant amounts of exchange of food and labour between households within the village (FEG/Solidarités International 2013b).

Many villages in Maban suffer extreme water stress in the dry season. Aquifer are deep (>50m) and difficult to access in some villages. Women and children have to walk several kilometres for fetching water. *Hafirs* (man-made rain catchment reservoirs) are also used for human water consumption in some locations due to lack of an alternative source (FEG/Solidarités International 2013b).

There is a traditional annual migration into the county by the nomadic Falata pastoralists. They arrive into Maban in November with an estimated 200,000 head of livestock seeking dry season grazing areas. Their herds are considered to be well vaccinated, strictly controlled for the most part. They have a very long history of coming to Maban and pay taxes upon entry. Both communities live in harmony together. The exact population size of Falata that migrates in and out of Maban is not known, however it is estimated at not more than a few thousand families. They remain in Maban until May/June when they return to Sudan from where they originate (FEG/Solidarités International 2013b).

3.1.2 Refugee community

In November 2011, fighting in Blue Nile State in Sudan led to the flight of some 25,000 people to Maban County, in Upper Nile State having a similar ecosystem than that of their home place. They were initially settled in two refugee camps, first at Doro and then, from December onwards, at Jamam. More people continued to arrive during the subsequent months. Six months later, in May 2012, a second wave of 35,000 refugees arrived. They were in very bad condition, many dying due to dehydration. After an initial period in transit camps en route, most of the people of this second wave were moved to Jamam camp. New camps were established at Yusuf Batil (in May) and Gendrassa (in July) for the new arrivals and in order to reduce the number of people in the Jamam camp (Tiller & Healy 2013). Due to the extensive flooding in Jamam during the rainy season, the camp was decommissioned and the refugees were relocated in May/June 2013 to the new camp of Kaya. Jamam camp is now officially closed.

All refugee camps in Maban are situated along the main road. Families in the camps are organised according to the village of origin, with the same *sheikh* (chiefs) and *omda* (paramount chiefs) structure acting as the political line of authority. The refugees are mainly of the Ingassana and Uduk tribe. The number of new arrivals dropped considerable during the last weeks. The current refugee numbers are shown below in Table 2.

The main physical capital brought by refugees was livestock; cattle, goats, sheep, donkeys and camels (rare). However, there were massive livestock losses along the way, from disrupted grazing, disease as well as theft and raiding (FEG/Solidarités International 2013a).

All households are reliant in near totality for their water, food, and other basics on external relief agencies although some remain better off than others. A few households have started to cultivate small plots of land to grow vegetables with inputs provided by NGOs. Some refugees are more advanced in agricultural cropping techniques than the hosts. All camps have grinding mills which have been set up either by private enterprise or with the support of NGOs/UN. These operate on a payment basis, either in cash (ranging from 1 to 2 SSP per 3kg) or a part of the grain that is brought for grinding (FEG/Solidarités International 2013a).

Table 2. Sudanese refugees in Maban County (UNHCR 2013)

Camp	Coordinates	Refugee number (30 June 2013)	Households
Doro	9°58'26.79"N / 33°45'06.88"E	45,441	12,143
Yusuf Batil	9°59'01.11"N / 33°35'03.41"E	37,917	9,410
Gendrassa	9°59'04.44"N / 33°36'48.86"E	16,505	4,172
Kaya	10°05'30.67"N / 33°35'54.52"E	17,596	4,405
Jamam (closed)	10°07'53.44"N / 33°15'43.24"E	0	0
Total		**117,459**	30,130

3.2 Pariang County

3.2.1 Host community

Pariang County is divided into nine administrative payams which are being subdivided into several bomas. The host community is almost entirely Dinka or Nuer (Concordis International 2012) and their traditional livelihood system is agropastoralism with the focus on cattle rearing. Sorghum, maize, sesame and groundnuts are the main crops of the subsistence farmers. Gathering of wild foods is an important supplement, including fishing for those villages in the south of the county. The plain represents good grazing land and, subject to improved drainage. Also, the potential for large-scale mechanised agriculture is high (Concordis International 2012) and drilling of water is not difficult.

At the onset of the 2011-2012 dry season, food insecurity increased in Pariang County: Host food reserves have been severely stretched due to a) refugee influxes, b) impassable roads in the rainy season exacerbating low grain supplies, and c) trade restrictions preventing profitable livestock sales to, and access to goods from Sudan. Fighting in the border area led to massive displacement of farmers from their homesteads.

Pariang County (82,443 inhabitants) historically host seasonal transhumance from South Kordofan, predominantly Fallaita, Fellata and, more recently, Shenabla Arabs. Large-scale conflicts between seasonal pastoralists and host communities began in the 1960s. Pastoralists formed armed protection units in response. The civil war and development of oil production in Unity State has caused significant displacement of populations living in Pariang. Traditional authorities and officials from Pariang claim that no migration agreements had been brokered in their territories since the 1970s (Concordis International 2012).

3.2.2 Refugee community

In July 2011, fleeing fighting and bombing in the Nuba Mountains, South Kordofan, a first wave of refugees crossed the border and settled in Yida, a small Dinka village in Pariang County. From April 2012, following increased violence and food shortages in the Nuba Mountains and the approach of the rainy season, the rate of new arrivals grew dramatically (up to 1,000 per day). By July 2012 Yida's population had quadrupled, reaching 64,000; currently there are more than 71,000 refugees in Yida settlement (see Table 3). While enough food was available, water and sanitation conditions were poor, leading to increased diarrhoeal diseases, which in turn contributed to severe acute malnutrition among children (Tiller & Healy 2013). Yida is a spontaneous settlement in the insecure border area where UNHCR is only supporting life-saving activities to encourage voluntary relocation formerly to Nyeel (flood-prone site) and currently to Adjuong Thok. The refugees are reluctant to leave Yida for several reasons including the fact that during the dry season, the close proximity allows for keeping the contact with family members left in South Kordofan and the soil and climate is more similar to that of their places of origin; the flood plains of the surrounding areas are foreign and less conducive to the Nubian agricultural practices (ACTED 2012). The current refugee numbers are shown below in Table 3.

Families in the camps are organised according to the village of origin, with the same *sheikh* (chiefs) and *omda* (paramount chiefs) structure acting as the political line of authority. The refugees are mainly Nubians including different sub-tribes from the Nuba Mountains. The refugee society is very structured and under the control of SPLA-N.

Table 3. Sudanese refugees in Pariang County (UNHCR 2013)

Camp	Coordinates	Refugee number (30 June 2013)	Households
Yida	10°06'13.12"N / 30°05'02.12"E	70,384	16,822
Adjuong Thok	9°57'09.76"N / 30°16'18.99"E	2,077	871
Gumriak (potential site)	10°01'43.21"N / 30°12'13.14"E	0	0
Nyeel	9°41'10.90"N / 29°52'45.94"E	1,019	272
Total		**73,480**	17,965

4. Methodology

Existing reports, studies, data collections and assessments from various stakeholders have been reviewed in view of defining the main areas of environmental concern in the Sudanese refugee hosting areas. The information gathering was supported by extensive internet search.

The subsequent field assessment have been jointly carried out with representatives from the line ministries (see programme Annexe B). All refugee camps have been visited and the environmental impact briefly assessed. All relevant key stakeholders were involved in the assessment. Focussed group discussions were held with the local authorities and the host communities with their traditional leaders to get their perception of the environmental challenges and possible mitigation measures. This is of paramount importance since most

environmental impacts are long-lasting and have an impact on the natural resources and thereby on the livelihoods of the locals.

The vegetation of the Sudanese refugee-hosting areas has been described. Therefore, mainly tree and shrub species have been recorded following an opportunistic sampling focusing on dominant species. The nomenclature follows that of the Missouri Botanical Garden (2013).

The preliminary findings and the holistic approach for an environmental strategy for the Sudanese refugee-hosting areas were then shared in Juba with the Ministry of Agriculture, Forestry, Cooperative and Rural Development, the HCT, and with the senior management of UNHCR and SDC.

5. Findings

Environmental issues are often overlooked in the emergency phase since the focus is on lifesaving activities. Therefore, the challenge remains high to address appropriately and in a timely manner environmental issues in humanitarian crisis. Many decisions made in camp and settlement management during the emergency phase have an environmental component which may lead to long lasting impacts on the ecosystems of the site and its surroundings and thereby on the livelihoods of the host community (UNEP 2006). In this context, appropriate site selection for hosting refugees/IDPs considering environmental issues is of paramount importance in order to sustain the available natural resources and thus livelihood. UNHCR and the implementing partners often lack the awareness and the technical knowledge for natural resource management. The later environmental mitigations measures are implemented in camp and settlement management, the later the costs for the rehabilitation of the degraded ecosystems will increase.

In view of the manifold and complex environmental dimensions of humanitarian crisis, environmental issues have to be addressed timely and comprehensively in order to avoid long-lasting impacts on the ecosystems and the livelihoods of the host communities. The following key environmental issues will be addressed:

5.1 Needs for building materials and domestic energy

The needs of the refugees for building materials for shelter and latrines (wooden poles and sticks, grasses for roofing) and for their daily domestic energy needs (cooking, heating and lighting) are permanent and high in both refugee-hosting Counties.

5.1.1 Refugee shelter in Maban County

UNHCR procured material for 29,643 households, to be distributed in the four Camps of Doro, Gendrassa, Yusuf Batil and Kaya. The shelter strategy, as a result from several shelter assessment missions, foresees to meet the long-term displacement needs through the provision of durable, phased shelter. In phase 1, Emergency Shelter kits will be distributed (currently ongoing). Phase 2 consists of extension kits for larger families immediately upon completion of phase 1. In a third phase, distribution of materials for ensuring longer term durability of the shelters has still to be confirmed.

The shelter design was originally planned by the regional UNHCR Shelter Advisor and should ensure equitable shelter for refugees as seen at host communities using local materials in order to minimize the environmental impact. Shelter projects were planned to be developed in direct consultation with refugees, Government coordinating body, host community, partners and other relevant stakeholders, ensuring equitable and transparent participatory engagement.

Fig. 4. Selling of poles in Doro refugee camp

Unfortunately, these guiding principles could not be met. The purchase and procurement of local construction materials, especially wood, was heavily controlled by the local authorities. The former District Commissioner set the price for wooden poles only to be procured through three local licensed suppliers ("middlemen") having serious implications. Firstly, the prices exceeded the costs for importing timber. Secondly, transportation and supply capacities of the suppliers would have been insufficient. Thirdly, since the operation is not managed in a transparent way, conflicts between the middlemen and local communities could raise. Procurement of grass bundles was also very expensive with a non-transparent supply chain.

These constraints and the approaching rainy season forced UNHCR to make a very inconvenient shelter decision with importing timber from Kenya and bamboo (*Oxytenanthera abyssinica*) from Central Equatoria (see front page). This decision implies a) high ecological footprint due to the long-distance transport (and high logistical constraints), b) uncertainty about the local impact of the tree cutting in Kenya (Kenya has a high annual deforestation

rate), c) low durability of the procured softwood which is not termite-resistant, and d) finally very high costs (US$ 1,000 per shelter).

5.1.2 Refugee shelter in Pariang County

Yida is considered as a spontaneous settlement and only lifesaving activities have been provided by UNHCR. Therefore, the refugees received only plastic sheets and cut themselves wood poles for their shelter. Some refugee households built their shelter using

Fig. 5. Use of mud bricks for shelter construction in Yida settlement

mud bricks (not fired, see Fig. 5). In Nyeel, there is no official shelter prototype, but shelter kits are provided to each household including 20 poles, 20 grass bundles, 20 pieces of bamboo, rope and plastic sheets.

In Adjuong Thok, DRC developed during the dry season 2012/13 a shelter model with local building material similar to the local Tukul house. DRC was able to sign a Memorandum of Understanding with the local authorities regarding the supply of wood to a reasonable price for the poles. In spring 2013, UNHCR decided to introduce a new shelter model similar to the one of Maban County, but using metal sheets for the roofing because of recurring heavy storms. As a consequence, DRC adapted its shelter model based on local materials. A specific problem in Adjuong Thok is the high demand for wooden poles and sticks for the construction of the traditional fencing around the houses (see Fig. 6).

Fig. 6. Highs needs for poles and sticks for fencing in Adjuong Thok

In both refugee-hosting areas, Sudanese refugees do not feel comfortable neither in tents nor under iron sheets due to the very hot climate. If they can afford, they build an additional traditional shelter (Tukul, see Fig. 7) using wooden poles, which are often harvested illegally and sold on informal markets in the camps (see Fig. 4). This further contributes to increased conflicts between refugees and hosts.

A voucher system could be used for the supply of building materials (poles and grass bundles at a fix price) for the refugee shelter based on contracts with the surrounding local communities (see chapter 5.6). Each refugee family would receive a voucher to be exchanged against the building material.

Fig. 7. Traditional shelter (Tukul) at Doro refugee camp

5.1.3 Domestic energy

Tree cutting is greatly accelerated by illegal cutting of poles and in particular by charcoal making (see Fig. 8). The construction of all-weather roads, especially those to Yida and Adjoung Thok, has opened the formerly inaccessible northern savanna woodlands (green belt) of Pariang County to business. Especially charcoal making is becoming very lucrative because of the easy access to the markets at Pariang or Bentiu. This may become the biggest environmental problem in the near future if not controlled appropriately. Northern Maban County was used as a source of charcoal prior to independence leaving some areas deforested (FEG/Solidarités International 2013b). Deforestation is highly accelerated by converting wood into charcoal using traditional earth kilns since about 70-80% of the original energy content is lost in this process. Humanitarian actors should pay more attention to energy issues for refugees and their own needs. For example, the camp manager of Nyeel, Intersos, supplies one bag of charcoal per month for each household (70-80 SSP per bag). In Yida, 11% and 26% of all refugee and local community households, respectively, are using charcoal for cooking (ACTED 2012).

Fig. 8. Charcoal making just outside Yida refugee settlement

Selling of firewood, which requires a licence with a once-off fee, is widespread in the camps/settlement (to a lower degree also charcoal) and is an important source of income especially for poorer households. Many individuals (refugees and locals) involved in tree cutting and charcoal making, however, have no licence. Furthermore, there is no tax collection for wooden poles and charcoal sold in the camp/settlement markets. A licence for charcoal making is valid for one month (no quantity limit). The forest service is understaffed and has not enough transport means to stop this illegal business.

5.2 Impact of wood harvest

The impact of tree cutting on the local ecosystems is locally very high in the surroundings of the camps/settlement. The radius of deforestation around the camps/settlement is steadily increasing while the cutting rate decreases with increasing distance from the camps/settlement. Exhaustive tree cutting has occurred mainly around Yida settlement and the former camp of Jamam. In Yida, the deliberate cutting of trees in the vicinity of the camp is truly alarming and deforestation is progressing at a very high pace not only to satisfy the high demand of wood for more than 70,000 refugees but also for business making. Within the settlement and within a radius of about 2 km most of the trees are chopped down at a height of about 60 – 80 cm. Although this cutting technique does not prevent the stumps to resprout this technique disfavours regrowth of a straight single stem suitable for poles (see Fig. 9 and chapter 5.4). Acacias do only resprout from the base.

Fig. 9. Resprouting stumps (mainly *Combretum* sp., Guok) outside Yida settlement

The wood harvest is controlled neither by the forest service nor by the local communities. Within a distance of 4-5 km from Yida settlement dry wood is still very abundant. However, refugees prefer to cut remaining trees in the vicinity of the settlement rather than to collect dry wood more distant from the settlement.

Grass cutting for roofing and fencing has little impact on the ecosystem since most of the grass layer is anyhow annually burnt.

5.3 Sustainable supply and use of wood

Sustainable use of wood requires that the consumption of wood will come into a balance with the annual wood increment. Sustainable use of wood resources requires reliable information on both, the amount of wood being used and the amount of wood being produced in the surrounding areas of the refugee camps/settlement:

- The use of wooden poles and sticks for shelter and latrine construction by refugee and host communities (including the own important needs of the humanitarian actors);
- The use of firewood and charcoal by refugee and host communities (including the own needs of the humanitarian actors);

- The wood harvesting patterns of refugee and host communities, including harvesting radius, preferred species, cutting methods, transport modalities and commercial considerations;
- The sustainable wood yield of the refugee-hosting areas, including standing stocks, dominant species and annual wood increment.

Accurate information on the availability (forest inventory) of wood in the surrounding areas of the refugee camps/settlement does not exist. In this context it would be also interesting to assess the status of the forest prior to the first refugee influx in 2011 in comparison with the current situation. The vegetation trend around the refugee camps/settlement could be established using remote sensing either by using a vegetation index (e.g. Normalised Differenced Vegetation Index, NDVI) or radar images. A forest mapping and inventory has been recommended by the joint rapid environmental assessment UNHCR, UNEP, OCHA & RSS (2012).

In addition, no reliable information is available regarding the consumption of firewood and charcoal by refugee and host community. There is a quite high uncertainty regarding the average consumption of firewood by refugees and locals (see UNHCR, UNEP, OCHA & RSS 2012). A recent and comprehensive energy survey in in Chad found domestic firewood consumption in eight Sudanese refugee camps ranges from 0.61 to 0.79 kg per person per day (p.p.p.d.) and averages 0.69 kg p.p.p.d. Fuel use in the two sampled host communities was higher at 0.97 and 1.02 kg p.p.p.d. of firewood equivalent, including up to 25% charcoal (Owen & Caveng 2013).

ACTED and DRC have started to disseminate clay stoves (Banco) in the Sudanese refugee camps of Maban. Selected women are paid to produce the clay stoves which they are distributing for free. This approach does not require a certain commitment of the beneficiaries. Furthermore, the model propagated is a copy of a model used elsewhere and it seems that many women are not using this stove since it is not adapted to their cooking practises.

WFP is planning to disseminate 2,500 metallic fuel efficient stoves from Kenya (Jikopoa) to the Sudanese refugees (2,000) and the local communities (500). The training of trainers for the dissemination will be done by an Asian expert. It is very important to have a common agreed domestic energy strategy amongst WFP and UNHCR and its implementing partners to avoid confusion and loss of confidence in the future proposed technologies. Only locally-appropriate fuel efficient stoves which consider local cooking culture and practices and which have proven lower fuelwood[1] consumption and emit less greenhouse gases and soot than traditional stoves (proven by field test) should be promoted.

5.4 Resilience of affected ecosystems and natural regeneration

The impact of deforestation depends on the ecosystem. The vulnerability of ecosystems is highly varying depending mainly on topography, climate and former use of the natural resources in the area by the local communities. Arid ecosystems are particularly sensitive to disturbances and environmental impacts will be long-lasting and very difficult to reverse at high costs (Bloesch 2001).

On the other hand, savannas like those of the refugee-hosting areas have a high resilience as a result of frequent disturbances such as fire or browsing by large mammals. Their

[1] Firewood and charcoal

regeneration capacity is very high owing to their distinct vegetative reproduction capacities (coppice shoots and root suckers) and their rapid sexual reproduction by seeds due to a rich soil seed bank. The high natural regeneration capacity of savannas is demonstrated by the former Rwandan refugee camp of Benaco in northwestern Tanzania with a population of over 450,000 people. Their enormous wood requirements led to the complete depletion of the wood resources in the surrounding savannas covering an area of about 500 km^2 at the time when the refugees left the camps after two and a half years. Five to ten years later, however, the tree and shrub layer recovered naturally (Bloesch 2001).

Yet, as for plantations, the natural regeneration has to be protected from uncontrolled fires and free roaming of cattle, especially from goats (see chapter 5.5). A community-based and appropriate management of the deforested areas is crucial to allow the regrowth of the cut trees and shrubs. Therefore, the ongoing deforestation around the refugee camps/settlement is reversible if managed appropriately (see Fig. 9) but its impact on the livelihoods of the host communities is immediate with an increasing conflict potential between refugee and hosts.

5.5 Afforestation

Little effort has been undertaken so far with reforestation. Late in the last rainy season ACTED has started to produce plants and finally about 2,600 trees have been planted as a gift for the host community in private and public areas by the refugees in Pariang County.

Tree plantations on public land have failed and it seems that also on private land only few plants have survived (no exact figures available due to lack of monitoring). ACTED and DRC are planning small-scale plantations for this planting season.

Long-term experiences with tree plantation in the humanitarian context revealed that the survival of the tree planted is very challenging. Many plantations have perished mainly due to insufficient community-based approach (selection of sites and species) and not fully considering landownership and user rights what often resulted in deficient maintenance of the seedlings. Watering of seedlings in the first year and in particular protection from free roaming livestock, mainly goats (see Fig. 10) and uncontrolled bushfires are vital for the survival of the trees. Experiences from Chad have shown that individual planting of multipurpose trees in Sudanese refugee camps were very successful contrary to the planting of seedlings on communal land where most trees perished due to lacking maintenance (Bloesch 2011).

It is noteworthy to recognise the relatively high costs of tree plantations (establishment and running of tree nurseries) in comparison to an afforestation approach based on natural regeneration. Regenerating native trees and shrubs are usually also preferred by the beneficiaries since such wood usually has a higher calorific value than exotic trees and is better suited for construction poles (often termite-resistant). Therefore, the focus should be on managing natural regeneration rather than to consider large-scale plantations. Certainly, tree planting at a household level (agroforestry) or in schools is more promising than communal planting. A cash approach could be used for promoting tree planting/ agroforestry activities.

Fig. 10. Free roaming livestock (sheep) outside Yida settlement

5.6 Community Forest Management

A strong participative approach is a prerequisite for successfully managing natural resources in the mid and long run. It is widely agreed that the primary users – those who directly depend upon the natural resource for their livelihood – should have the greatest entitlement (UNEP 2013). There are many examples of community forest management across Africa. For example, Tanzania has successfully introduced community forest management following the general devolution process.

A new forest act is currently under elaboration based on the new forest policy (RSS 2012). More than 90% of the forest in South Sudan belongs to the local communities. The forest policy of South Sudan promotes collaborative forest management by supporting the capacity building for local communities to manage their own forest. Community forest management offers additional revenue to the local communities by selling forest products but requires an appropriate social organisation of the local community to ensure equitable benefit sharing amongst all members. The local communities will be responsible to set up appropriate structures and organise the operational management in close collaboration with the local authorities. The forest service should technically support the local communities in the elaboration and implementation of a community forest management plan.

The introduction of a community-based forest management in the Sudanese refugee-hosting areas could also serve as a demonstration project at national level. We believe that the

introduction of community forest management is favourable considering the intimate relationship and understanding of the local communities with their environment. A prerequisite for the introduction of community forest management is to know the forest resources and their productivity.

5.7 Livestock

The humanitarian needs of pastoralists are often invisible to humanitarian organisations until the loss of their herds is so acute that it leads to drop-out and destitution (Young & Cormack 2013). In case of mass population displacement of refugees with large herds of cattle, the needs of both, refugees and livestock, have to be considered and veterinary services should be provided at the entry point to avoid the transmission of diseases.

Refugees from Blue Nile State arriving in Maban County brought large numbers of livestock with them (65 % of the refugee households keep livestock). When the refugees arrived, the livestock was diseased and almost famished and the international community was not at all prepared for the influx of refugees keeping huge numbers of livestock. The refugees lost part of its source of income / livelihoods. ACTED together with VSF and FAO started with destocking initiatives: through the programme, weak animals were bought and slaughtered thus reducing the livestock density and consequently the pressure on pastures. Hundreds of sick animals were bought and then the carcasses, if not eatable anymore, burned. In addition, FAO came up with a vaccination programme to reduce the high mortality.

Host communities, are mainly small-scale farmers. Their agricultural fields close to the refugee camps are exposed to browsing livestock (goats and sheep) leading to conflicts which are not related to overgrazing and pasture degradation. During the dry season, conflicts erupted over sparse water sources.

Maban County authorities, in an effort to avoid tension and disputes, helped to set up a negotiated agreement between three parties: Maban host authorities, representatives of the Falata, and the head *omdas* of the refugees. It is widely considered that the Falata and Ingassana are historically antagonistic towards each other. The documented and signed agreement covers several crucial areas, most importantly grazing and water access as well as dispute resolution mechanisms (FEG/Solidarités International 2013b). The Falata received grazing areas in the southern part of Maban County. The refugees obtained dry season pasture north of the refugee camps while during the rainy season livestock were kept closer to the camps as pastures, browse and water were available in close proximity. Extensive grazing opportunities exist in the areas around the camps, with man-made *hafir* (rain catchment reservoirs) as the main water source for livestock. Vulnerable local population could be involved in the construction of additional water catchments on their land following a cash for work approach.

Fig. 11. Livestock of refugees and locals competing for the same pastures and water points

FAO estimates, that there are still around 80,000 remaining cattle in the refugee hosting area in Maban County (the Ministry of Animal Resources and Fisheries estimated the number of cattle owned by refugees at the end of 2012 at only 20,000!). ACTED undertook some first mapping of routes and availability of pastures with a participatory approach. But without remote sensing and systematic mapping of the exact routes, it is difficult to get an overview of the availability of pastures and on the grazing pattern. A systematic approach to servicing livestock owned by camp residents is the most effective way to facilitate maintaining and slowly rebuilding herd sizes. Services should be paid for, as most households who have such herds, have the cash to make the payments. It might be worth considering using a voucher system for poor and middle households who have small numbers of goats (1 to 3), whereby they can get their animals vaccinated or attended to by a veterinary technician.

In Pariang County, similar conflicts are uprising since available pastures are limited due to flooding in rainy season, lack of fodder during the dry season or due to distribution and governance factors. But in general, the Nubian refugees are agro-pastoralists with only little livestock.

5.8 Conflict over natural resources

Mass population displacements put additional stress on the ecosystems especially in the case of large refugee or IDP camps. The fact that displaced people often competing for the same dwindling natural resources (mainly water, pasture, arable land and firewood) as the local communities carries the risk of new conflicts as happened in Chad, Ethiopia, Kenya, Nepal, Rwanda and Sudan (Lyytinen 2009; UNEP 2009). The additional needs of the Sudanese refugees for natural resources including water, firewood and construction poles/sticks, pasture and agricultural land put an additional burden on the local ecosystems with an inherent risk of overstressing their carrying capacity.

Host communities see their natural resources increasingly depleted in the surroundings of the refugee camps without having a benefit. The local communities and the representatives of line ministries have not been involved systematically by UNHCR and its implementing partners in the design and implementation of activities related to natural resource management. For example, for the water pipeline for the new Kaya camp coming from a borehole near Kaya village, it seems that no water tap was foreseen initially for the local community. Host communities often feel that the refugee communities are better off and locals are neglected by the international community. This feeling of discrimination has certainly been accentuated by the fact, that refugees are by far outnumbering the local communities and the camps came into existence in a very short period of time. For example, in January 2012, Yusuf Batil was a normal little village. Within six months there were almost 40,000 people living in the once “empty” land adjacent to the village. The most striking example certainly is the Yida settlement with more than 70,000 refugees where only about 700 locals live in the surroundings of the settlement.

Increasing scarcity of the natural resources and weak environmental governance have raised tensions and conflicts about the use of natural resources are increasing. Peace Committees including refugee and local community leaders have been set up in several camps to address and ease the tensions.

5.9 Site selection at Gumriak

The selection of the potential site of Gumriak about 12 km north of Adjoung Thok lies in a rich stand of trees of high value for the local communities (see Fig. 2). Conflicts with the local communities are very likely to happen once the refugees will be relocated to this site and will start to cut trees.

Other environmental issues such as latrines or solid waste will be dealt once the environmental strategy will be operational.

6. Data management

The South Sudan refugee crisis has suffered from substantial information gaps, largely stemming from a lack of coordinated approaches to data collection and inadequate resources to operationalize such a data collection effort. In particular, shortcomings in the availability and reliability of data about patterns of refugee flows over the border, settlement area characteristics and overall social organisation have limited the speed and effectiveness

of the humanitarian response. Geographic information systems are appropriate tools for analysing spatial information for monitoring and evaluating livelihood and natural resource projects (indicators of change such as deforestation rate). The use of remote sensing to detect vegetation change such as the monitoring of tree plantation or natural regeneration is of particular interest for the environmental strategy.

Geographical Information Systems are currently used by many UNHCR implementing partners for reporting of activities such as mapping of drilling holes, water tabs, shelter, sanitation etc. With regards to information management and analysis, UNHCR has been funding the REACH[2] initiative. UNITAR/UNOSAT has been supporting some remote sensing activities with regards to vegetation and flood risk mapping.

Within UNHCR, data and information management is mainly dealt with at Juba level. There is an Information Management Officer supported by a team of three staff members. There is no capacity regarding GIS in the sub-offices. ACTED seems to be the only implementing partner having GIS experts in the field, though they do not have the means and the capacity to build up a long-term monitoring system for all UNHCR funded activities in the field of natural resource management.

7. Environmental strategy

Overall aim

Peaceful cohabitation between locals and refugees based on a commonly agreed natural resource management.

Specific objectives

A) Explore options and needs for making better use of available (biomass) resources in view of bringing wood consumption more closely into balance with the annual wood increment.

B) Organise environmental governance in ways that natural resources can be managed and accessed by different users peacefully, equitably and sustainably.

C) Environmental concerns should be considered systematically in all sectors of the humanitarian response (environmental mainstreaming).

The approach and the principles of the environmental strategy are described in the environmental action plan below.

[2] A joint initiative of IMPACT Initiatives and ACTED and the United Nations Operational Satellite Applications Programme (UNOSAT). REACH produced maps of the refugee camps and created a geo-referenced database of households in the refugee camps. This database on household level is correlated with the UNHCR registration database, enabling humanitarian aid actors to conduct rich demographic analysis of the population or to track food and NFI distributions, health metrics, etc.

8. Environmental action plan

In view of using the natural resources peacefully, equitably and sustainably, the needs of both, displaced people and local communities have to be considered systematically. Both communities have to be closely involved from the very beginning in the elaboration of an environmental action plan and its implementation. The local communities and in particular the poorest highly depend on intact natural resources. They are therefore very vulnerable to ecosystem degradation as a result of the massive refugee influx. Their involvement and commitment in a community-based management of natural resources is a prerequisite for a sustainable use of natural resources in the long run what is necessary to ensure their livelihoods. The sustainable use of local building materials should be promoted whenever possible since they a) are usually more environmentally friendly than imported goods and b) offer additional revenue to the local communities (community forest management). All activities should be planned considering the site-specific cultural, socio-economic and environmental context.

The local technical services are very familiar with the local context and should be systematically involved in the design of projects and their implementation by UNHCR and its implementing partners. Their technical advice and their role in the enforcement of the legal framework are crucial.

Capacity building of all actors is crucial for the success of the environmental action plan. In this context, regular vocational training of the environmental staff of UNHCR, the implementing partners and the line ministries is a prerequisite. Appropriate planning and monitoring of the activities require comprehensive data management and systematic use of GIS.

The environmental action plan should be based on a common agreed vision (environmental strategy) of all key stakeholders following a holistic approach. The suggested draft of an environmental action plan (see below) resumes all activities related to the recommendations. The detailed description of the activities is outlined in chapter 10 (Key recommendations.) The numbering of the activities follows the order of the recommendations. The timing of the activities is tentative. The forest inventory should be carried out as soon as possible as a basis for the planning of sustainable use of natural resource (biomass) by refugee and host communities.

The environmental action plan and the recommendations should be discussed and agreed upon during a workshop in October 2013 including all key actors (Activity 2). For the long-term management of natural resources and the viability of the environmental action plan it is highly requested, that development actors (donors) are participating in the workshop and in the implementation of the environmental action plan. During the workshop, priority, timing and budget of each activity and role of each actor should be defined. UNHCR's Environmental Focal Point, supported by a senior environmental expert seconded by SDC, will ensure the coordination and supervision of the implementation of the environmental action plan.

The environmental action plan is a living document and has to be continuously adapted to an evolving context (e.g. additional refugee influx or new knowledge). A rapid changing situation requires high preparedness and flexibility of all actors. The Environmental Task Forces will support the monitoring of the environmental action plan and makes suggestions for necessary adaptations.

Please note that a new environmental action plan has to be elaborated once the Sudanese refugees from Pariang have been relocated to Mapel in Lakes States following the recent announcement of the RSS.

Draft Environmental Action Plan 2013/14

N°	Activities/ milestones	2013						2014 (quartals)				Leading Agency/ Responsibility
		7	8	9	10	11	12	I	II	III	IV	
Technical Level												
1	Forest inventory/vegetation mapping											UNHCR / SDC, FS
	a) Mandating UNOSAT for vegetation mapping											UNHCR
	b) Ground truthing											UNHCR / SDC, FS
	c) Data analysis (forest inventory/mapping)											UNHCR / SDC, FS
2	Workshop about environmental action plan											UNHCR, IPs, LM, other actors
3	Elaboration of 2 CFM pilot projects											UNHCR, FS, IP
4	Define shelter programme 2014											UNHCR
5	Examine a shelter cash or voucher system											UNHCR
6	Organised collection of dry wood											UNHCR, IPs
7	Stop illegal tree cutting and charcoal making											FS, UNHCR, IPs
8	Plantations/agroforestry											IPs, FS
9	Tree nurseries at school level											IPs, FS
10	Implement a SAFE programme											WFP, UNHCR
11	Assessment firewood/charcoal consumption											UNHCR, IP, FS
12	Assessment other renewable energy sources											UNHCR, IP, FS
13	Rangeland assessment											UNHCR, IP
14	Construct systematically landfills											UNHCR, IP
15	Set up systematically Peace Committees											UNHCR, IP
16	Dislocate the potential refugee site at Gumriak											Local authorities, UNHCR
Capacity Building												
1	Environmental positions in both UNHCR SO											UNHCR
2	SDC senior environment expert (secondee)											SDC
3	LM: staffing and transport means											LM, UNHCR
4	Employment senior environment/NRM expert											IPs
5	Joint training identified by ETF											UNHCR, IP, FS
Coordination and management												
1	Set up Environmental Task Force											UNHCR, FS
2	Follow systematically participative approach											UNHCR, IPs, local authorities
3	Comprehensive data base											UNHCR, IPs
4	Enhance GIS and RS capacities											UNHCR, IPs

FS = Forest Service; LM = Line Ministries; SO = Sub-office (UNHCR)

9. Conclusions

The needs of both, displaced people and local communities (and if relevant of nomadic or semi-nomadic herders) have to be considered systematically in mass population displacements in view of using the natural resources peacefully, equitably and sustainably. Failing to take into account the environmental impact of a humanitarian response can undermine the relief process, leading to additional loss of life, increased vulnerability and long-term dependency on aid.

The needs of the refugees for building materials for shelter and latrines (wooden poles and sticks, grasses for roofing) and for their daily domestic energy needs (cooking, heating and lighting) are permanent and high in both refugee-hosting Counties. Domestic energy saving techniques and practices are insignificant for mitigating the increasing ecosystem degradation. However, the resilience of the savanna vegetation of the refugee-hosting areas is high thanks to their high natural regeneration capacity. Therefore, the ongoing deforestation around the Sudanese refugee camps/settlement in Upper Nile and Unity States is reversible if managed appropriately i.e. protecting the natural regeneration from fire and free roaming animals.

On the other hand, the forest degradation has direct impact on the livelihoods of the host communities depending on intact natural resources. Both, the large demand for wooden poles mainly for shelter construction and the rapidly increasing and mostly illegal charcoal making entails an increasing conflict potential between refugee and host communities. A proper understanding of the impact of the refugee livestock on the rangeland is necessary due to the high conflict potential.

A strong participative approach is a prerequisite for successfully managing natural resources in the mid and long run. In view of a sustainable supply of wood for refugees (and host communities) it is absolutely necessary to carry out a forest inventory in Maban and Pariang counties in order to know the standing volume and the productivity of the tree stands as base for a sustainable community-based forest management and important pillar of the environmental action plan. Community forest management would also facilitate the sustainable use of building materials.

10. Key recommendations

The recommendations are integrated as activities in the environmental action plan.

10.1 Technical level

1) In view of a sustainable supply of wood for refugees (and host communities) it is absolutely necessary to carry out a forest inventory in both Counties in order to know the standing volume and the productivity of the tree stands. This information will also serve as basis to define the shelter programme 2014 and should be carried out ideally before finalising the UNHCR budgeting for 2014 this autumn. The forest inventory will be based on a forest mapping elaborated together with UNOSAT (remote sensing) who should be mandated by UNHCR. The ground truthing should be carried out by a team composed of foresters from the line ministry supported by an international expert in tropical forestry. In

addition, the mapping could also include the mapping of pastures serving for future rangeland management considering also flood risk which hinders access.

2) UNHCR should organise a workshop with all relevant actors to discuss the draft environmental action plan and to come up with a commonly agreed plan.

3) Elaboration of one pilot project in one refugee camp in each County to promote community forest management in line with the new forest policy (RSS 2012). A community-based management of forest resources is a prerequisite to organise and control wood harvesting (selective cutting, appropriate cutting techniques, designed areas for collecting dry wood) and to protect the natural regeneration and tree plantation from free roaming cattle (mainly goats).

4) The shelter strategy for 2014 should be reviewed considering the promotion of locally available building materials for the construction of shelter (and latrines) considering a community-based supply of the natural resources.

5) The introduction of a cash or voucher system for the shelter programme and the forest and pasture management should be investigated, what could also help to improve the relationship between refugee and host communities.

6) Organise the collection of dry wood in the vicinity supervised by the local communities to avoid widespread clear-cutting in the vicinity of the camp.

7) A concerted effort between local communities, local authorities, forest service and UNHCR and its implementing partners is needed to stop illegal tree cutting and charcoal making.

8) Tree plantations should be supported only if the beneficiaries are committed and are willing to ensure its maintenance (watering, protection from uncontrolled fires and free roaming goats). Tree planting activities should be carried out together with the forest service with a focus on agroforestry.

9) Tree nurseries at school level (locals and refugees) should be promoted to raise environmental awareness of the pupils.

10) We support the initiative of WFP to implement a SAFE Programme in South Sudan (Safe Access to Firewood and alternative Energy) to deal with domestic energy in a comprehensive and multi-sectorial based on a concerted approach with UNHCR and its implementing partners. Agencies promoting new cooking technologies and claiming substantial fuel-saving should in future be obliged to yield objective data based on prolonged field trials. They should also provide credible evidence of user acceptability that demonstrates suitability for the culture, traditions and diet of the intended recipients.

11) A simple, objective energy survey should be carried out to assess the firewood and charcoal consumption of the refugees and the locals (see Owen & Caveng 2013).

12) Other possible renewable energy sources such as solar (e.g. for solar water pumps for boreholes such as in Nyeel) or the use of grass as burning material to substitute part of fuelwood used in the Sudanese refugee camps (Caveng 2000) should be assessed.

13) A rangeland assessment should be carried out in both Counties including a rough livestock inventory for refugee and host communities, the mapping of the pasture (see 2. recommendation), water sources, the seasonal migratory routes and the understanding of the different pastoral stakeholders.

14) Landfills should be systematically constructed in the refugee-hosting areas serving both communities.

15) Peace Committees should be set up systematically in all camps/settlement to address and ease tensions about the common use of natural resources.

16) The potential refugee site at Gumriak should be dislocated 2-3 kilometres westward to a monospecific Acacia stand (*Acacia seyal*) where the ecological and socio-economic impact of the tree cutting would be less negative.

10.2 Capacity building

Sufficient capacity building, including staffing, budget and training (at all levels) is a prerequisite to successfully implement the environmental action plan:

1) UNHCR: In addition to the Environmental Focal Point at Juba level (Charles Lino) an environmental position should be created in both sub-offices of Maban and Pariang. In return, UNHCR should consider increasing its environmental budget.

2) It is foreseen that SDC will deploy a senior environmental expert for 6 months mainly to support the implementation of the environmental action plan (as Environmental Coordinator?).

3) Line ministries (For each county):
Staffing: Two professional foresters, (10? inspectors), 1 for professional agronomist, and 1 professional veterinary;
Transport means: 1 4x4 car and 4 motorbikes;

4) Implementing partner (environment): 1 Senior environmental expert in their team.

5) Organise joint trainings for different environmental topics for all actors (identified by the Environmental Task Force).

10.3 Coordination and management

1) Set up an Environmental Task Force in each county:
Co-chair by representative of forest department and UNHCR Environmental Associate;
Members: Representatives of line ministries, implementing partners (environmental experts);
Tasks:
   - Exchange of expertise, common data management and monitoring of the environmental action plan;
   - Joint technical trainings;
   - Elaboration of approaches/technical guidelines;
   - Dissemination of information to traditional leaders and local authorities...

2) UNHCR and its implementing partners should follow more systematically a participative approach with host communities and representative of line ministries.

3) Install a comprehensive database at UNHCR's level including all environmentally relevant data with open access for the implementing partners. This database will facilitate the information access of UNHCR and its implementing and will enhance their monitoring systems.

4) GIS and remote sensing should be used more systematically for the analysis of environmental data and UNHCR and its implementing partners should enhance their analytical capacity using GIS.

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Annexe A: Terms of reference

Terms of Reference for Environmental Specialist – Inception Phase

The overall expected outcome of the inception phase by the environmental specialist, will be the identification of viable project and initiate the formulation of a concrete action plan which will guide the design, implementation, monitoring and evaluation of environmental protection and rehabilitation projects in refugee hosting areas in Upper Nile and Unity States.

Under the overall supervision of the UNHCR Assistant Representative (Operations), and in close coordination with the Senior Reintegration Officer and collaboration with relevant NGOs and Government Departments, the environmental specialist will perform the following duties and functions during the Inception Phase:

1. Undertake an in depth review of existing assessment reports and data collected by various stakeholders and define main areas of concern with regard to use of natural resource such as deforestation, rangeland degradation, soil erosion, water conservation, and land use by both the host community and refugees.

2. Undertake a supplementary assessment in the field with the active involvement of both refugees and host communities to determine critical and viable areas of priority.

3. Identify specific and viable projects in the major priority areas identified during the inception phase.

4. Identify appropriate agencies and local institutions that have the expertise and capacity to implement the proposed projects, and advise on designing, implementing, monitoring and evaluation arrangements, while ensuring that the environment projects are harmonized and coordinated with the work of those agencies dealing with environmental projects.

5. Identify training needs and conduct on the job training to build capacity on environmental protection and management of the UNHCR focal person.

6. Provide technical guidance and support to initiate the elaboration of a draft environmental action plan covering the identified critical priority areas and underscore implementing, monitoring and evaluation methods.

UNHCR Juba
SDC Juba and HQ
27 May 2013

Annexe B: Mission programme

Dates :	**3.-23.6.2013**
Participants:	Dr. Urs **Bloesch** (SDC)
	Mr. Charles **Lino** (UNHCR Juba, Environnemental Focal Point)
	Ms. Annemarie **Schneider** (SDC)
Participants Upper Nile State only	Mr. Walla Mango **Liwe** (Forestry Department in Bunj, Director)
	Ms. Muram Haron **Abdalla** (Forestry Dep. Bunj, Deputy Director)
	Mr. Mohammed Ahmed **Ibrahim** (Forestry Ranger)
Participants Unity State only	Mr. **Mustafa** Kur Lueth (Assistant Commissioner for Agriculture, Forestry, Cooperation and Rural Development)
	Mr. Juoi Teat **Choung** (UNHCR Bentiu, Programme Associate)
	Mr. Abraham Mijok Ayuel **Dau** (UNHCR Yida, Field Associate)

Date	Meeting	Organization / location	Topics / Remarks
Monday June 3rd	*9:20 Flight Zurich – Nairobi, arrival time 18:00* *Staying overnight in Nairobi (Hotel Ole Sereni)*		
Tuesday June 4th	*Travelling* *7:30 Flight Nairobi – Juba, arrival time 9:30*		
	Briefing with UNHCR ResRep	UNHCR Juba	General Briefing
	Briefing with Senior Reintegration Officer	UNHCR Juba	Senior resp. for environment
	Administration: IT, registration, security etc.	UNHCR Juba	
	Briefing with SDC Country Director	SDC Juba	
	Briefing with Assistant Representative Operations, Head of Field Office Maban, Head of Field Office Yida	UNHCR Juba	Briefing regarding the UNHCR operations in Maban and Yida
	Staying overnight in Juba (Hotel Juba Grand)		
Wednesd. June 5th	Security Briefing	UNHCR Juba	
	Preparatory Work for meetings		
	Joint Meeting with Partners	MoE, UNEP, DRC, WFP	Environmental Briefing, discussing the main challenges
	Information Management / GIS	UNHCR Juba	Collecting Data / Maps
	Staying overnight in Juba (Hotel Juba Grand)		
Thursday	Briefing on RSS environmental policy at	UNEP Juba	New environmental

June 6th	national level		legislation/bill; forest policy; community based environmental management
	Meeting with ACTED	ACTED Juba	Camp Management, livelihood activities, REACH initiative
	Staying overnight in Juba (Hotel Juba Grand)		
Friday June 7th	Meetings: UNHCR Programmes officers, information management, IT etc.	UNHCR Juba	
	11:00 Flight to Bunj, Maban County (arrival time 16:00)		
	Briefing with acting Head of Mission Maban	UNHCR Maban	Key conflict issues: Deforestation, access to water
	Staying overnight in Maban (UNHCR Suboffice / Camp)		
Saturday 8th	Meeting with Director of Forestry Department in Bunj	RSS, Forestry Department in Maban County	RSS, County level
	Visiting Kaya Camp, meeting with ACTEDsite planner, shelter, livelihood responsible persons, refugees	ACTED Kaya / Gendrassa	Issues discussed: Shelter, deforestation, peace/joint meetings, community forestry
	Meeting with host community	Village close to Kaya	Involvement of host community in NRM
	Vegetation mapping Kaya	Field	
	Staying overnight in Maban (UNHCR Suboffice / Camp)		
Sunday June 9th	Visiting Jammam Camp, meeting with UNHCR, ACTED, Oxfam	ACTED, OXFAM,	Field Visit
	Vegetation Mapping Jamam	Field	Field Visit
	Meeting with ACTED / REACH Initiative	ACTED Gendrassa	Information Management and GIS activities
	Staying overnight in Maban (UNHCR Suboffice / Camp)		
Monday June 10th	Meeting with DRC Camp Manager for Doro and Batil	DRC Bunj	Discussion on environmental aspects / NRM
	Visiting Batil Camp	DRC Batil	Field Visit
	Meeting with WASH Team in Gendrassa,	Solidarité International Gendrassa	Discussion on environmental aspects / NRM
	Meeting with ACTED livestock programme manager	ACTED Gendrassa	Discussion on environmental aspects / NRM
	Meeting with livestock programme manager	FAO Bunj	Destocking, Vaccination
	Staying overnight in Maban (UNHCR Suboffice / Camp)		
Tuesday June 11th	Meeting with UNHCR Shelter &site planner, WASH programme officer	UNHCR Maban	Shelter Strategy, WASH-environment, GIS and information management in UNHCR Maban Operation

	Debriefing / meeting with partners: CAFOD, ACTED, DRC, Forestry and Agricultural Departement	UNHCR Maban	Environmental coordination, community involvement, technical key environmental issues
	12:00 Flight to Juba (arrival time 16:30)		
	Staying overnight in Juba (Hotel Quality)		
Wednesd. June 12th	*7:00 Flight to Yida via Malakal (arrival time 15:00)*		
	Briefing with acting Head of Mission in Yida / Pariang	UNHCR Yida	Discussion on environmental aspects / NRM, logistics, security
	Meeting with ACTED Pariang	UNHCR Pariang	Deforestation; Afforestation project
	Briefing with Head of Office Pariang	UNHCR Pariang	Discussion on environmental aspects / NRM
	Staying overnight in Pariang (UNHCR Suboffice)		
Thursday June 13th	Meeting with DRC Siteplanner AjuongThok, DRC	Ajuong Thok Refugee Camp	Field visit; site selection, deforestation, shelter, fuel efficiency
	Vegetation mapping AjuongThok	Field	Field visit
	Meeting with Executive Director of JanjangPayam	Office Janjang	Discussion on environmental aspects / NRM / upcoming illegal business (wood, charcoal)
	Staying overnight in Pariang (UNHCR Suboffice)		
Friday June 14th	Visiting "Concord Agriculture Company"	Close by Nyeel Refugee Camp	Field visit
	Visiting Solar Water Pumps, Nyeel Camp with CARE International	Nyeel Refugee Camp	Discussion on environmental aspects / NRM
	Visiting Nyeel Camp, local authorities and refugees	Intersos	Discussion on environmental aspects / NRM
	Vegetation Mapping Nyeel		Field Visit
	Meeting Assistant Commissionar for Agriculture, Forestry, Coop. and Rural Development	Pariang	Discussion on environmental aspects / NRM
	Staying overnight in Pariang (UNHCR Suboffice)		
Saturday June 15th	Visiting Yida Camp, UNHCR Protection Officer, Refugee Representative meeting	Yida Camp	Field visit, Discussion on environmental aspects / NRM
	Meeting with Executive Director of YidaPayam	Yida	Discussion on environmental aspects / NRM
	Meeting with WASH officer Samaritan's Purse	Yida Camp	Discussion on environmental aspects / NRM
	Vegetation Mapping Yida	Yida	Field visit
	Staying overnight in Pariang (UNHCR Suboffice)		

Sunday June 16th	Visiting Gumriak Site, meeting with host community	Gumriak	Field visit
	Vegetation mapping Gumriak	Gumriak	Field visit
	Staying overnight in Pariang (UNHCR Suboffice)		
Monday June 17th	Meeting with Director General of Forestry Department, Unity State	Bentiu	Discussion on environmental aspects / NRM
	Meeting with Director General of Animal Resources and Fishery Department, Unity State	Bentiu	Discussion on environmental aspects / NRM
	Meeting with Director General of Physical Infrastructure, Unity State	Bentiu	Discussion on environmental aspects / NRM
	Staying overnight in Pariang (UNHCR Suboffice)		
Tuesday June 18th	Meeting with the commissioner of Pariang County, Unity State	Pariang	Discussion on environmental aspects / NRM
	Meeting with Non Violent Peace Force	Yida Refugee Camp	Protection, Conflict Prevention & Mitigation and natural resources
	Meeting with ACTED REACH / Information Management Officer	Yida Refugee Camp	REACH and basic cattle grazing map
	Meeting with Solidarité International	Yida Refugee Camp	WASH and Waste Management
	Staying overnight in Pariang (UNHCR Suboffice)		
Wednesd. June 19th	Short Meetings / Debriefings with different partners in Yida (UNHCR, NVPF, MSF-F)	Yida Refugee Camp	Discussion on environmental aspects / NRM
	11:00 Flight to Juba via Bentiu (arrival time 17:00)		
	Staying overnight in Juba (Hotel Quality)		
Thursday June 20th	Preparation of Meeting with the Ministries and Debriefing with the Humanitarian Country Team and the UNHCR Senior Staff	UNHCR Juba	Preparatory work for HCT meeting and debriefing
	Staying overnight in Juba (Hotel Juba Grand)		
Friday June 21st	Meeting with Director General, Ministry of Agriculture and Forestry	MoAF, RSS, Juba	Results of the Assessment, discussion on community based forestry, agroforestry, domestic energy and energy efficient stoves; new focal point from the GoSS/MoAF for UNHCR appointed
	Humanitarian Country Team meeting	OCHA Juba	Debriefing / presenting of the preliminarily findings
	UNHCR Senior Management	UNHCR Juba	Mission Debriefing with the senior management
	Staying overnight in Juba (Hotel Juba Grand)		

Saturday June 22nd	Report	UNHCR Juba	Report writing
	Debriefing with SDC senior management	SDC Juba	Mission Debriefing with the senior management, next steps
	Staying overnight in Juba (Hotel Juba Grand)		
Sunday June 23rd	17:00 Flight to Zurich via Nairobi 7:00 Arrival in Zurich Airport, End of Mission		

Annexe C: List of organisations and persons met

Organization	Name
ACTED	Poisson Emilie, Country Director South Sudan
	Addonizio Emily, Programme Manager Livelihood, Jamam
	Beadle Emily, Head of Programming, Maban
	Cavier Clemantine, Camp Manager, Maban
	Counterman Miriam, REACH Officer, Maban
	Hamda Yonas, Livestock Expert, Maban
	Harvey Ellen, Project Development Officer, Juba
	Hopfensperger Mike, GIS Specialist Gendrassa, Maban
	Kevlin Nadia, REACH Officer, Yida
	Larose Thibault, Unity Area Coordinator
CAFOD	Tichaona Mashodo, Programme Officer
DRC	Young Chris, Head of Programme, Juba
	Onenchan Victor, Livelihood Advisor, Bunj
	Abraham Mijok Ayuel, Field Associate, Ajoung Thok
	Deng Lang Akok, Project Officer, Ajoung Thok
	Kondal Rao, Camp Manager, Yusuf Batil
	Rasmussen Peter, Camp Operation Officer, Ajoung Thok
	Rusu Sorana, Camp Manager, Ajuong Thok
	Simon Makuei Agau, Field Associate, Ajoung Thok
FAO	Hillary Taban, Livestock Officer, Maban
Intersos	Lam Samuel Paul, Protection Officer, Nyeel
Local Government Maban County	Walla Mango Liwe, Forestry Department in Bunj, Director
	Muram Haron Abdalla, Forestry Dep. Bunj, Deputy Director
	Mohammed Ahmed Ibrahim, Forestry Ranger
	Bella John John, Agronomiste
Local Government Pariang County	Mustafa Kur Lueth, Assistant Commissioner of MAFCRD
	John Miabil Miakuei, Veterinary Director
	Elijah Wal Chol, Local Community Leader, Nyeel
	Peter Kon Minyiel, Local Community Leader, Nyeel
	Yokpiny Lual Deng, Local Community Leader, Nyeel
	Mijok Simon, Executive Director Jamjang Payam
	Simon Miabek Kuel, Executive Director Yida Payam
MAFCRD, Juba	Timothy Thwol Onak, Director General of Forestry
Medair	Knight John, Wash Expert, Maban
Ministry MAFCRD, Unity State	Eihsa Muktar, Director General
Ministry of Animal Resources & Fisheries, Unity State	Botino Malual Kok, Director General
Ministry of Environment and Sustainable Development, Juba	Biong Martha
Non Violent Peace Force	Guderian Marika, Team Leader, Yida
	Wolfer, T., Protection Officer, Yida
OXFAM	M^{c} Ardle D., Programme Manager, Maban
	Deniel Karine, Wash Specialist, Maban
Samaritan's Purse	Conor Lucas-Roberts, Yida Area Coordinator
	Mulatu Kassa, Wash Programme Manager, Yida
SDC	Rainer Baudendistel, Head of Cooperation Office
	Valeria Gamboni, Deputy Head of Cooperation Office
	Christian Scherer, Program Officer
Solidarité International	Chour Jack, Officer in Gendrassa, Maban County
UNEP	Khan Arshad Samad, Officer in Charge
	Tshering Chado, Programme Officer
UNHCR Juba	Chanda Cosmas, Representative

	Balke Gregory, Assistant Representative – Protection
	Wondimu Girmai, Assistant Representative – Operations
	Aksakalova Marina, Senior Programme Officer
	Khuri Sulayman, Senior Regional Safety Advisor
	Makanga Kate, Senior Reintegration Officer
	Tornieri Giorgia, Information Management Officer
	Negasha Bekele, Programme Officer
	Lullo Ganyipira Stephen, Senior IT Assistant (Database)
UNHCR Upper State	Le Couster Gwenolenn, acting Head of Suboffice
	Frederic Cussigh, former Head of Field Office, Maban
	Kassim Nur Issak, Field Officer
	Kanani John, Wash Coordinator
	Kaweh Hagi Negad, Field Officer, Jamam
	Mariano Efren, Physical Planner/Shelter Coordinator
	Njoya Varonique Nadine, Community Services Officer
	Michael Kimbo, LadoField Associate
UNHCR Unity State	Telo Alessandro Registration Officer Yida, Officer in Charge
	Velusamy Ravindran, Field Officer - Protection
	Jagadishwar Barun, Associate Wash Officer
	Cummings Ernest Ariyo, Bentiu, Physical Site Planner
	Umar Yakhayaev, Protection Officer, Yida
	Obomba Jimmy, Programme Officer, Pariang/Yida
	Elsie Bertha, Community Services Officer, Pariang/Yida
UNOSAT	Bromley Lars, Principal Analyst, Geneva
VSF	Duop Pal Andrew, Logistics Officer, Maban
WFP	Mukami Lucy, Head of Field Office, Maban

Annexe D: Trees and shrubs recorded in Maban and Pariang Counties

Latin name	Common name	Local name	County M=Maban P=Pariang
Acacia nilotica		Sunt Giarad	M
Acacia polyacantha			M, P
Acacia senegal	Gum arabic tree	Sunt Hashab	M, P
Acacia seyal		Silak	M, P
Acacia sieberiana			M, P
Adansonia digitata	Baobab	Tebelia	M, P
Anogeissus leiocarpus		Ameth	M, P
Balanites aegyptiacus	Desert date tree	Heglig, Lalob, Thou	M, P
Borassus aethiopum		Deleib	P
Boscia senegalensis		Rejdena	P
Bridelia micrantha			P
Cadaba farinosa			P
Calotropis procera			M, P
Crataeva adansonii			M
Celtis integrifolia		Tutal	M
Combretum sp.			M
Combretum collinum		Guok	P
Combretum glutinosum		Guok	P
Commiphora africana			M
Dalbergia melanoxylon	African blackwood	Babanus	P
Detarium microcarpum			P
Dichrostachys cinerea		Umkadat	M, P
Gardenia ternifolia		Dong	P
Grewia sp.			M, P
Guiera senegalensis			P
Hymenocardia acida		Akumoro	P
Hyphaene thebaica	Doum palm		
Kigelia africana		Abosodo	M
Lannea fruticosa			P
Lannea microcarpa			M
Lannea velutina		Biel	P
Lonchocarpus laxiflorus		Guokkoba	M, P
Piliostigma reticulatum			M, P
Prosopis africana	Akumoro	Gier	P
Sclerocarya birrea		Himed	M, P
Strychnos spinosa			P
Tamarindus indica	Tamarind	Chuei	M, P
Terminalia sp. 1		Piok	P
Terminalia sp. 2		Habil	M
Ziziphus abyssinica	Jujube	Man-Lang, Nabak	M, P
Ziziphus mauritiana	Jujube	Man-Lang, Nabak	M, P