

Roundtable on Sustainable Palm Oil

New Planting Procedure

Summary Report

High Conservation Values and Environmental and Social Impact Assessment

APRIL 2015

Kalyan AgroVet Investments Ltd – Togo – Region des Plateaux

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List of Acronyms and abbreviations

ANGE:	Agence Nationale de Gestion Environnementale - National Agency for Environment Management
CVD	Comité de Développement Villageois – Village Development Committee
DSID	Direction des Statistiques Agricoles de l'Informatique et de la Documentation – Direction of Agricultural Statistics, IT and Documentation
ESIA:	Environmental and Social Impact Assessment
FED:	Fond Européen de Développement – European Development Fund
FEPH	Fédération des Exploitants de Palmiers à Huile – Oil Palm Operators Federation
FPIC	Free Prior and Informed Consent
IBA	Important Bird Area
IPA	Important Plant Area
KBA	Key Biodiversity Area
LUC	Land Use Change
HCV:	High Conservation Value
JVE:	Jeunes Volontaires pour l'Environnement – Youth Voluntary for Environment (NGO)
MAEP:	Ministère de l'Agriculture, de l'Élevage et de la Pêche – Ministry of Agriculture, Livestock farming and Fisheries
MCDAT	Ministère de la Coopération, du Développement et de l'Aménagement du Territoire – Ministry of Cooperation, Development and Territory Planification
MERF	Ministère de l'Environnement et des Ressources Forestières - Ministry of Environment and Forest Resources
PGES:	Plan de Gestion Environnemental et Social - Socio-Environmental Management Plan
SONAPH:	Société Nationale de développement des Palmeraies et Huileries - National Society for oil palm plantations and mills development
IUCN	International Union for Conservation of Nature

I Executive summary

This report presents the executive summary of the final results of the Social and Environmental Impact Assessment and High Conservation values of Kalyan's oil palm plantation in the Plateaux Region of Togo. Kalyan AgroVet Investments Limited (hereafter referred as "**Kalyan**"), a company with Indian capitals, has started negotiations with the Government of Togo in 2014 to acquire a 7,263 ha concession in the South of the country. A Memorandum of Understanding (MoU) has been signed the 13th of November between the two parties. The objective of this MoU is to develop an industrial oil palm plantation which will supply a CPO mill.

The concession is located in the Plateaux Region, district of Agou, in the ecological zone known as the "middle plains zone" or zone III. It is mainly located on fallows, croplands and patches of former palm oil plantations. The proposed concession has a long history of oil palm industry starting back in the 19th century, during German colonization.

It is anticipated that 6,000 ha will be planted out of the 7,263 ha of the concession. There are 14 communities living in and around the boundaries of the proposed concession.

As part of its commitment to environmental sustainability and in line with its own environmental policy, Kalyan intends to undertake this plantation development in compliance with all relevant local Togolese legal requirements and those of the Roundtable on Sustainable Palm Oil (RSPO) certification.

Essential requirement of RSPO certification prior to land conversion (as part of its New Planting Procedure - NPP) is impact assessments including identification and management of HCVs (High Conservation Values) and Environmental and Social Impact Assessments (ESIA). Oil palm plantation developers are then expected to develop appropriate strategies to mitigate any potential social and environmental impacts as well as manage areas identified to contain HCVs to ensure those values are maintained or enhanced. Kalyan intends to achieve RSPO certification, thus making it crucial for the company to meet HCV and ESIA requirements under RSPO certification.

Responding to the legal requirements in Togo, Kalyan has commissioned a local company (JAT Consulting Ltd) to undertake the ESIA for the project. *JAT Consulting* is a consulting company accredited by the Togolese Ministry of Environment to undertake ESIA.

In order to ensure efficiency and cost-effectiveness of the impact assessments, Kalyan has requested Mr DUVAL (who has a provisional license to undertake HCV assessment as Team Leader) and JAT to jointly undertake the HCV and social impact assessments.

This reports details the assessment that has been undertaken from December 2014 to April 2015, the High Conservations Values (HCV) and the social and environmental impacts identified, as well as the management and monitoring recommendations for their protection in the proposed concession allocated to Kalyan.

I.1 Primary forests

There are no primary forests in the assessment area. Togo, as well as Benin and part of Eastern Ghana, belongs to the so called “Dahomey gap”, which consist of a savanna corridor interrupting the zonal West African rain forest between the Upper and Lower Guinean forests. Paleo records suggest that this situation is due to a dryer climate that established between c. 4 500 - 3 500 cal. yr BP and after c. 1 100 cal. yr BP. These dryer environmental conditions resulted in the establishment of an open savannah with a mosaic of dry semi-deciduous forests with a high number of pioneer tree taxa including the oil palm *Elaeis guineensis* (Salzmann and Hoelzmann, 2005).

Patches of Eastern Guinean forests, themselves part of the Guinean Moist Forests “super” eco-region (Olson and al., 2002) used to be present in the area of Mount Togo in the center west of the country. It corresponds to the ecoregion IV that will be described in chapter V.3 (*Mounts Togo southern zone*). Despite the fact that some blocks of the concession overlap with the most southern limit of this ecoregion (on the map – see Figure 7), in the field, forests have disappeared since a long time due to human pressure.

In fact, most of the area proposed for oil palm plantation used to be planted with the same specie from the end of the 19th century to 2003. The rest of the area is made of small-scale agriculture, fallows, savannas and degraded woodlands.

A **Land Use Change (LUC)** analysis presented in **Annex IX**, shows that no primary forests have been present and therefore destructed since 2000.

I.2 Peat or fragile soils

No peat or fragile soils have been identified in the area assessed. The area proposed for oil palm development is flat (slope inferiors to 5%) and the degradation rating done by Brabant and al. (1996) goes from “Zero or very slight” to “slight, locally moderate”.

I.3 Lands of local communities

Land-uses in the area are mostly small-scale agricultural lands, plantations and fallows, followed by urban area and infrastructures, rivers and waterpoints and finally woodlands and secondary forests.

Order of du 06/02/1974 recognize both legal and customary land-use regimes in Togo. Access to land is generally done through inheritance, but can also be done by gift or legally acted selling. Use rights can be given to migrants temporarily whether it is for free or against annuity (for example for the villages of Adina kope, Seva and Develebe). This use right never become a property right whatever is the length of the use (even on several generations).

Out of the 14 communities identified as concerned by the project, only two (Develebe and Negle kope) have all their territories included in the project area. For the 12 others community, only a fraction of the community land will be impacted by the project.

During the community consultation, all communities have emphasized that, in the current situation they will need lands to continue their agricultural activities.

Except for Negble kope and Develebe, community have also admitted that not all their territories fall within the limits of the project area, and therefore, that it would be possible to develop both agro-industrial and traditional activities on the territories they are using, in exchange of employment. Even for Negble kope and Develebe, communities have agreed that some portion of their territories could be used for oil palm plantation if that could generate employment for the community.

The FPIC process initiated during this assessment have allowed to identify lands for which community will accept the development of Kalyan’s project in exchange of compensation in the form of permanent and seasonal employment and support to development of local infrastructures.

It is also important to note that after the transition from a public to a private status, the area knew a conflict for land use between representatives of lineages (or *Collectivités*) originated from the locality of Gadzagan (close to Fligbo and Votrome blocks) and the state. After several trials, the case has been arbitrated before Togo Supreme Court in 2006. The representatives of the *Collectivités* Agli and Awuya, represented by Ms Acouetey, won the case and have been their land retroceded following justice decision (*Arrêt*) n°11 of 16th February 2006. The assessment team could not be provided with a map of the areas retroceded by any of the public institutions consulted neither by the advocate of the *Collectivités* nor the *Collectivités* representatives themselves. Those collectivities have agreed to rent their land to the state in the context of this project.

I.4 High Conservation Values

The High Conservation Values have been identified using the *Common Guidance for the Identification of the High Conservation Values* (Brown and al, 2013).

HCV	ABSENT	POTENTIALLY PRESENT	PRESENT
HCV1: Species diversity			
HCV2: Lanscape-level ecosystems and mosaics			
HCV3: Ecosystems and habitats			
HCV4: Ecosystem services			
HCV5: Community needs			
HCV6: Cultural values			

High conservation values have been identified for different categories. For HCV1, *Osteolamus tetraspis*, a crocodylidae classified as Vulnerable (IUCN) is potentially present in the waters of river Zio and its presence should be further confirmed. This river being

protected under HCV 4, we will not develop here the protection measures for this specie. Two tree species were also classified as HCV1, *Vitellaria paradoxa* (VU – IUCN, Nationally Protected) and *Parkia biglobosa* (Nationally protected).

HCV4 has been assigned to all rivers (permanent and temporary) in the area, due to their importance for most populations that use rivers and streams for water consumption. There is also a potential impact on lake Togo downstream that justifies this classification.

The FPIC process, the socio-economic study and the participatory mapping exercise also showed that more than 80% of the population of local communities relies directly on agriculture for its subsistence. Therefore, all areas listed by local populations as of primary importance for food production were classified as HCV5.

Finally, all areas of cultural importance as described by local populations have been classified as HCV 6 (cemeteries, sacred forest and educational sites).

II Scope of the ESIA and HCV assessments

II.1 Identification of organization

Name of the company	Kalyan AgroVet Investments Limited 3rd Floor, 355 NexTeracom Tower, Cybercity, Ebene, Mauritius +971 567 747395
National registration number	125616
Contact person	Senthil C. R. (Vice-president) senthil@kalyanresources.com General e-mail: ashok@kalyanresources.com
Location of assessment	Togo, Province des Plateaux, Prefecture d'Agou
Date of assessment	12/2014 to 04/2015
Size of assessment area	7,263 ha
Current and planned land uses(s) for assessment area	Past: oil palm plantations and small farming Current: small farming, fallows, plantations Planned: oil palm plantations

II.2 Reference documents

II.2.1 List of reports

- HCV assessment for Kalyan's Agou plantation – Togo, Province des Plateaux – April 2015. Rémi Duval (provisional license n° ALS14002RD).
- Etude d'Impact Environnemental et Social du projet de palmeraie dans la prefecture d'Agou – April 2015. JAT Consulting. (*Socio-Environmental Impact Assessment of the Oil Palm Plantation Project in Agou Prefecture*).
- Analyse de la vegetation et de la flore sur l'ancien site de la palmeraie d'Avetonou – March 2015. Wouyo Atakpama. University of Lomé. (*Vegetation and Flora Assessment on the site of Avetonou Plantation*).
- Rapport social – Projet de plantation de palmiers dans la prefecture d'Agou pour la production d'huile de palme - March 2015. JAT Consulting. (*Social Report – Oil Palm plantation project in AGou Prefecture for palm oil production*).
- Rapport d'étude du contexte faunique pour l'herpétologie, l'ornithologie, et l'ichtyologie dans les zones écologiques correspondant aux anciennes plantations de SONAPH qui part d' Avetonou vers le Zio à Wonougba – January 2015. G. Segniabeto, D. Okangny, A. Delagnon. University of Lomé (*Assessment of fauna context – including reptiles and amphibians, birds and fishes – in the ecological zones*

corresponding to former SONAPH plantations from Avetonou city to Zio river in Wonougba).

II.2.2 List of legal documents

- Togolese Constitution of 14 October 1992
- Law n°2008-005 of 30 May 2008 relative to outline-law on environment in Togo
- Law n°2008-009 of 19 June 2008 relative to Forest Code
- Law N°2007-011 of 13 March 2007 relative to decentralization and local liberties
- Law N°2009-007 of 15 May 2009 relative to the Code Public Health in Togo
- Law n°2010-004 of 14 June 2010 relative to Water Code
- Law N° 2006-010 of 13 December 2006 relative to Work Code in Togo
- Law n° 99-001 of 28 December 1999 relative to Tender organization in Togo
- Law n° 2011-006 relative to Social Security Code in Togo
- Order n°12 of 6 February 1974 relative to agronomical land-use reform
- Decree n°2006-058/PR of 05 July 2006 and its text of application (decree n° 013/MERF of 1st September 2006 and decree n°018/MERF of 09 October 2006) relative to ESIA.

II.2.3 List of property documents

Private owners proof of ownership, purchase and sale.

Justice decision n°11 of 16th February 2006, concerning the land retroceded to *collectivités* Agli and Awuya.

II.2.4 List of partnership documents contracts

Memorandum of Understanding (MoU), 13th November 2014, signed between Kalyan AgroVet Investments Ltd and the Government of Togo.

Extension of MoU, 26th July 2016, signed between Kalyan AgroVet Investments Ltd and the Government of Togo

Partnership contract between local communities and Kalyan for the use of lands for oil palm development following the FPIC process.

As per the local practice, there is no separate permit issued by the local authorities to allow 'Use the Land'. The land lease agreement between the government and the Kalyan will be the document which will allow the use of land which will spell out the actual area which can be used for the plantation. A consent to use the land has been taken from the communities wherever initial development will take place as an interim measure, as part of the FPIC process. The agreements are in its final stages is expected to be done by mid 2016. The plantation development will start as soon as the agreement is done.

III Location and region description

The concession allocated to KALYAN is made of 7 blocks of sizes going from 48 to 6 280 ha, for a total of 7 263 ha. From an administrative point of view, the concession is mostly located in the *Plateaux* region, with a small patch of the south-east part of the main block pertaining to the Maritime region. In Plateau region, the concession is on the Agou *préfecture* (sub-division of the regions, equivalent to a canton) and in the *Maritime* province, on the *Zio préfecture* (see Figure 1 and Figure 2).

Table 1 - Administrative location of the concession

Block name (ex-SONAPH)	Size (ha)	Region	Préfecture
Agou iboe	204	Plateaux	Agou
Avetonou 1, 2, 3, 4	6 280	Plateaux	Agou
Wonougba 71, 72		Maritime	Zio
Avetonou 5	324	Plateaux	Agou
Fligbo	203	Plateaux	Agou
Tavié 1	62,5	Plateaux	Agou
Tavié 2	48	Plateaux	Agou
Votrome	141	Plateaux	Agou

III.1.1 Site history

In Togo, oil palm has always been cultivated for its fruits and sap. The country has a long history of natural oil palm plantations, with activities of production and exportation of oil since pre-colonial times. In 1844, Great-Britain was already importing 21 060 tons of palm oil from countries of the Gulf of Guinea (Daget, 1980; Northrup, 1976).

In 1906, the German had already created a mill in Agou. In 1968, to answer the increasing demand in palm oil, the government has created the SONAPH (Société Nationale pour le Développement de la Palmeraie et des Huileries – National Society for development of oil palm plantation and transformation mills) by decree N°168 of 04 September 1968. In 1979, a mill with a capacity of 20 tons of FFB/hr is constructed to replace the older one in Agou (annual capacity of 50,000 tons). A project of industrial plantation has also been developed in parallel with the support of the FED (Fond Européen de Développement – European Fund for Development). From 1968 to 1975, around 5,500 ha of oil palm are planted in the area.

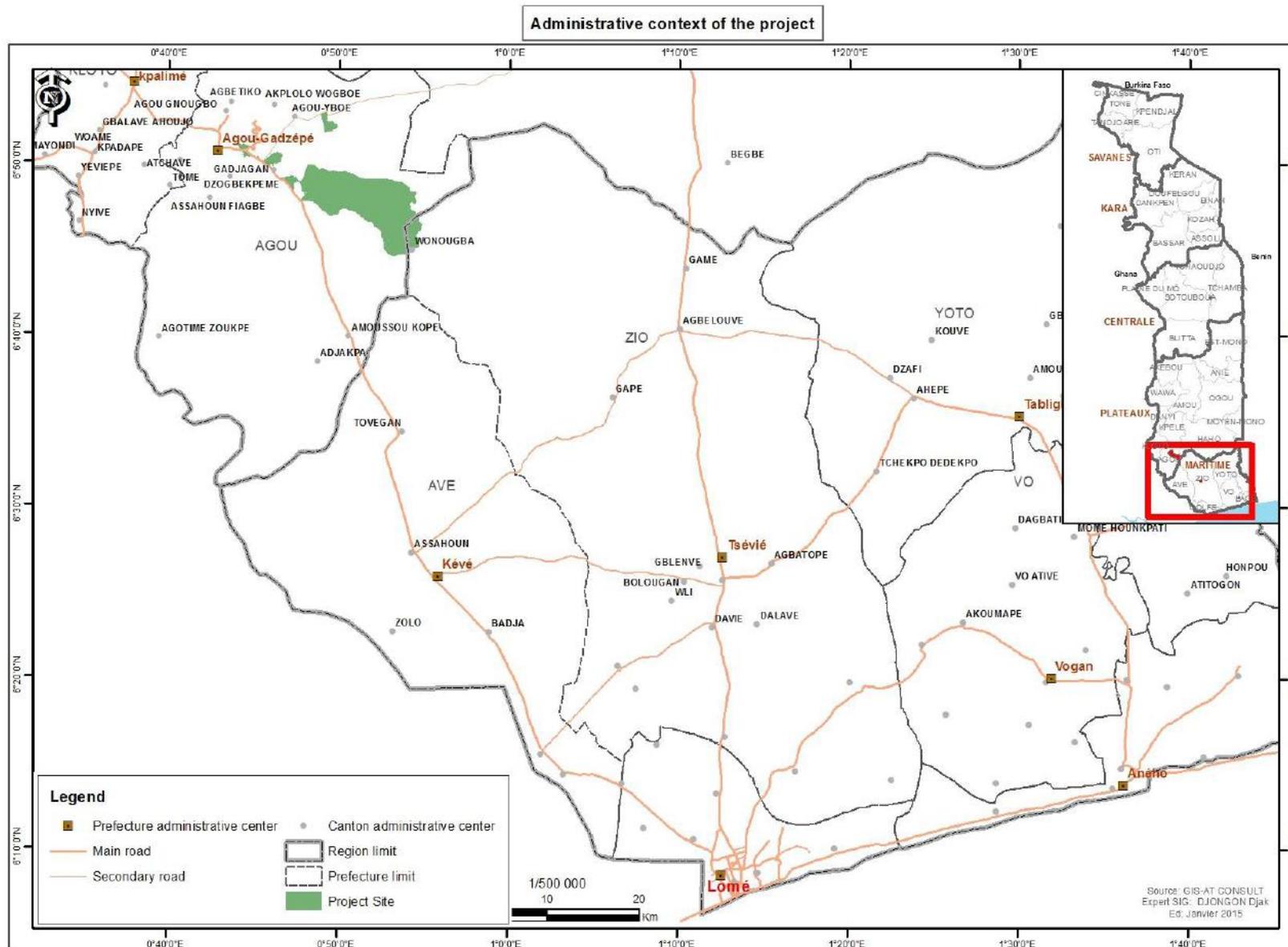


Figure 1 - Administrative background of the project - Final Version

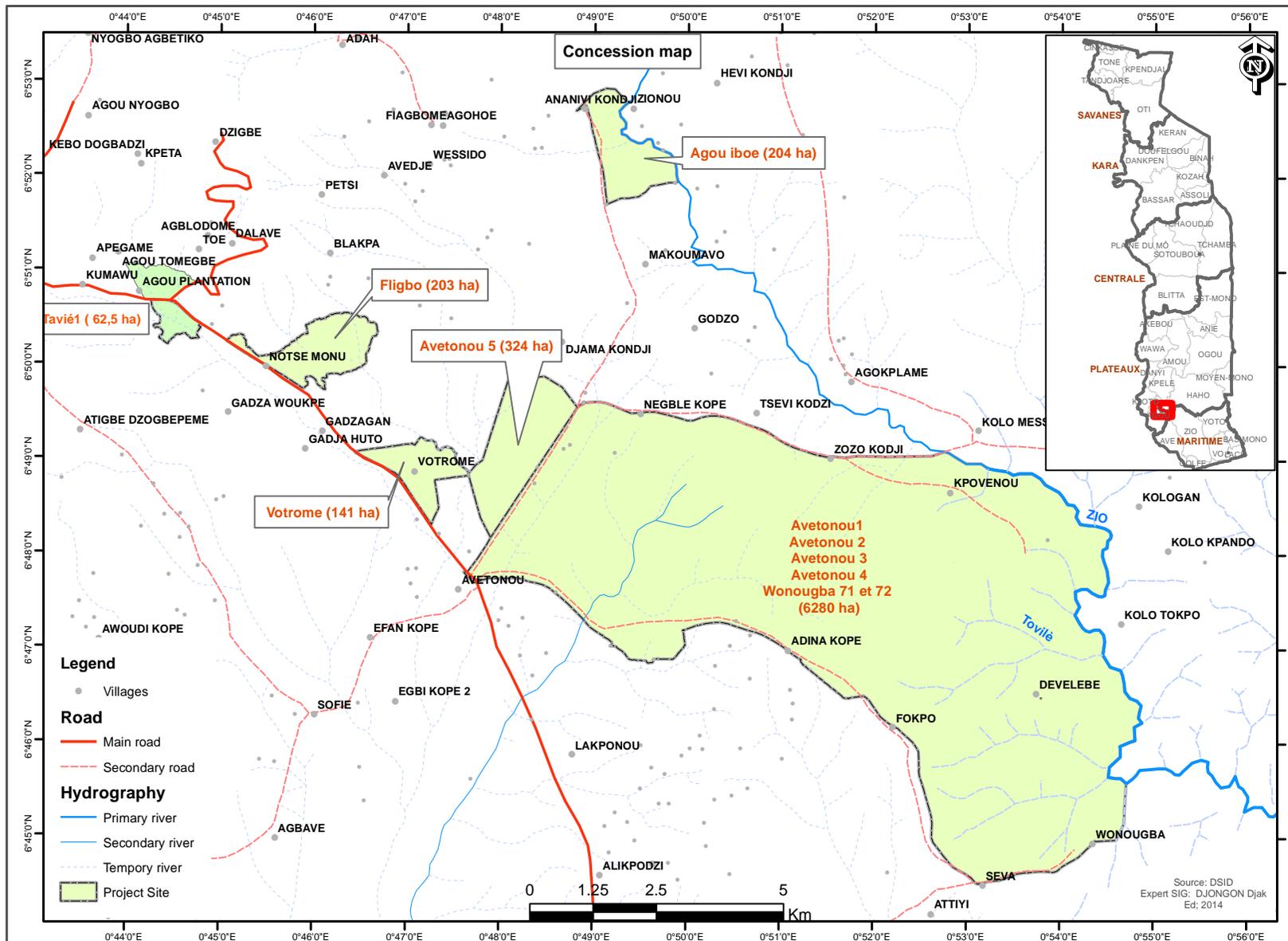


Figure 2 - Agou Concession- Final Version

After 1985, the falling down of the international palm oil market to the benefit of South-East Asia producers has impacted strongly the industrial production in Togo. These difficulties explain why plantations were not maintained, with less and less supply reaching the mills, leading to the dissolution of SONAPH in 1997.

Table 2 - Year of planting and areas planted by SONAPH

Block name	Year of planting	Planted area (ha)
Tavié	1970 and 1971	81
Fligbo	1970	163
Votromé	1970	213
Avétonou I	1974	201
Avétonou II	1974	206
Avétonou III	1974	298
Avétonou IV	1974	725
Avétonou V	1975	275
Wonougba 71	1971	591
Wonougba 72	1972	190
Agou Iboe	1971 to 1973	202
TOTAL		3205

After its dissolution in 1997, the state named a liquidator in order to sell its belonging. SONAPH has been dismantled between the mill (which has been sold to a company named Banamba) and several *Groupements*: those entities are equivalent of cooperatives of ex-SONAPH workers. The *Groupements* have bought the palm trees and were supplying the mill with the Fresh Fruit Bunches (FFB) collected.

After this transition from a public to a private status, the area knew a conflict for land use between representatives of lineages or *Collectivités* originated from the locality of Gadzagan (close to Fligbo and Votrome blocks) and the state. After several trials, the case has been arbitrated before Togo Supreme Court in 2006. The representatives of the *Collectivités* Agli and Awuya, represented by Ms Acouetey, won the case and have been their land retroceded following justice decision (*Arrêt*) n°11 of 16th February 2006.

This decision caused more conflicts in the town of Gadzagan and other villages as the justice decision never defined clearly neither who was included in the *Collectivités* nor the land concerned by the *Arrêt* of 2006. In this regard, the assessment team could not be provided with a map of the areas retroceded by any of the public institutions consulted neither by the advocate of the *Collectivités* nor the *Collectivités* representatives themselves.

After the trial, *Collectivités* proceeded to the sales of the oil palms and land parcels in the ex-SONAPH concession, resulting in a massive rush to cut the trees and produce palm wine by most of the villagers in the area, between 2006 and 2014 (*pers. co. of all the stakeholders interviewed*). Nowadays, only few oil palm trees remains in the assessment area.

III.2 Land-use and zoning

Land-uses in the area are mostly agricultural lands, plantations and fallows, followed by urban area and infrastructures, rivers and waterpoints and finally woodlands and secondary forests. A Land Use Change (LUC) analysis has been performed using LANDSAT images and its results are presented in **Annex IX**.

III.3 Areas of planting and time zoning

The project promoter plans to develop 6 000 ha of oil palm industrial plantations. The project will be developed in several phases, starting with the nursery in June 2015. Then, the promoter plan to clear around 1 000 ha of land each years, while the land title are secured with local communities, *Collectivités* and the government, respecting the FPIC process.

The mill will then be operational in 2019, starting with a capacity of 10 Mt/hour. The capacity will then be increased to 50 Mt/hour by 2022-2023. The mill will produce CPO, CPKO and Palm Kernel Cake. CPO will mainly be sold in Togo to answer the high demand for oil that is nowadays satisfied by external offer since SONAPH production has stopped.

Palm Kernel Cake will be used in poultry farm that are developed by the promoter in the North of the country. Shell and fiber will be burned in a boiler that will generate energy for the mill. Palm Oil Mill Effluent (POME) will be treated and the promoter will study the feasibility of using treated water for irrigation.

The seeds material used in the plantation will be CIRAD® PalmElit *E. guineensis* Deli x La Mé seeds, which provide high resistance to both vascular wilt and water stress.

IV Assessment process and procedures

IV.1 ESIA and HCV assessors and their credentials

The preliminary desk-based study together with the scoping study had showed that the main concern for this assessment would be on the social aspects (HCV 4 to 6). Indeed, the past and current land use of the area designated for the assessment (respectively oil palm plantation and small scale agriculture) suggested that there was a low probability to find HCV 1 and 3 and no chance to have HCV 2, as they are not present in Togo. Therefore, the team has been designed to take those parameters into account, and focus on the social expertise.

Table 3 - HCV assessment team

Name	ALS License	Institution	Role	Expertise
Rémi DUVAL	Provisional	Forests and People	HCV assessment Team Leader	HCV general, Forest ecology and management, Community mapping and Participatory Rural Appraisal, Biodiversity conservation
Joël AGBEMELO	N/A	JAT Consulting	ESIA Team Leader	ESIA, Environmental law, Social sciences, Threat assessment
Martin SEMEGLO	N/A	JAT Consulting	Expert sociologist	Social science, Community mapping
Kofi SEMEGNON	N/A	JAT Consulting	Sociologist assistant	Social science, Community mapping, Community awareness
Wouyo ATAKPAMA	N/A	JAT Consulting University of Lomé	Expert botanist	Tropical ecology and botany, Ecosystem modeling, Ethnobotany
Dabitora KOUMANDINGA	N/A	JAT Consulting University of Lomé	Botanist assistant	Tropical ecology and botany
Dr Gabriel SEGNIAGBETO	N/A	University of Lomé	Herpetologist / mammal expert	Herpetology / Mammals, Biodiversity conservation
Dédé OKAGNY	N/A	University of Lomé	Ichthyologist expert	Ichthyology
Delagnon ASSOU	N/A	University of Lomé	Ornithologist expert	Ornithology
Kokou DJONGON	N/A	GIS AT Consult	GIS expert	Mapping, Remote sensing and spatial analysis, Land-use planning

IV.2 Methodology used

The pre-assessment phase of this process was completed in December 2014 and January 2015. Data collected during this phase enabled identification of stakeholders and assessment area, identification of expertise required for field survey, expert training on the HCV approach and agreement on methods for primary data collection in the assessment phase.

In particular, the scoping visit done by JAT consulting in December 2014 allowed to identify the key stakeholders in the assessment area, contact local communities leaders and organize public consultations, identify key ecosystem features and confirm vegetation stratification based on satellite images.

The methods applied for the assessment phase are described hereafter.

Table 4 - Assessment timeline

2014			
JUNE	13 th NOV	1 st DEC	DEC
Beginning of site identification process	Signing MoU with Togolese government	Beginning of HCV assessment Beginning of ESIA	Desk based study Team selection Methodology development
2015			
17 th -20 th DEC	1 st -16 th JAN	5 th -16 th JAN	14 th JAN
Scoping visit	Fauna desk-based study by Lomé university specialists	Public announcement of community consultation	Beginning of in-country HCV assessment
2015			
14 th -27 th JAN	18 th JAN – 05 th FEB	18 th JAN – 27 th MAR	MAR - APR
Stakeholder consultation	Community consultations Botanical Inventory	JAT collect legal title of private owners in the assessment area	Report drafting
2015			
11 th APR – 17 th APR	APR	APR	MAY
Independent Peer-review HCV Resource Network Quality review	SGS NPP review	ESIA Togo Public consultation	RSPO Public consultation

IV.2.1 Socio-economical survey and FPIC process

The methodology of the socio-economical assessment has been thought from the inception to respect the FPIC process. More specifically, the social assessment aimed to (RSPO, 2008):

- **Engage with representative organizations:** a wide range of stakeholder has been consulted, and to avoid misunderstandings and/or entering in future agreements that do not secure the consensus of the communities and thus result in conflict, first meeting happened in an open way to better identify who the community choose to represent them in negotiations;
- **Providing information to allow fair participation and informed consent:** the provision of adequate information to interested parties is a core aspect of FPIC. The presentation that has been made to all concerned communities (of course in local language – a dialect of Ewé) included i) detailed presentation of the project (project

proponent, timeline, extent and boundaries, employment, impacts...), ii) potential benefits, gains and losses, iii) “no-project” option, iv) description of RSPO, HCV assessment and ESIA;

- **Identify customary lands and existing conflicts:** one of the best ways of clarifying the extent of customary right is through participatory mapping. For this purpose, we have used a combination of high-resolution aerial photography (during the community consultation) and ground-truthing of the extent of the customary lands and potential areas for planting oil palm. All data collected have been geo-referenced with GPS. This method also allows verifying very simply if there are inter-communities conflicts regarding the lands they are claiming.

The expected outputs of this approach are the following:

- Communities likely to be impacted understand the project and its consequences;
- Land-use is clarified and approved by all stakeholders involved in the project;
- Maps produced will serve both for impact assessment and further negotiated agreements;
- If the project is approved by communities, prepare the next steps of negotiations to ensure there is a prior and freely given consent;
- Understand which institutions should be involved in conflict resolutions and propose a base for conflict resolution.

IV.2.1.a Scoping visit

A scoping visit has been organized in December 2014 (see Table 4) with the objective of i) informing local authorities, ii) identifying communities with lands impacted by the project, iii) identifying traditional heads of communities and representatives of other local NGOs and organizations, iii) listing people with private title in the proposed project area.

All these information collected has served for the preparation of the community consultations.

IV.2.1.b Community consultation and participatory mapping

A combination of Focus Group Discussions (FGD) and individual-based interviews was used to collect data on social and cultural aspects of villages consulted. This approach is an effective way to collect information on social and cultural dimensions of village life in a comfortable setting that permits discussion and exchange of ideas between group members. As explained before, this approach was preceded by a detailed description of the project, the RSPO, ESIA and HCV processes. The focus group discussions targeted Chiefs/elders, women and youth interest groups, community elites/opinion leaders, farmers, hunters and resource user groups as key informants

Head of villages have been contacted minimum a week before the consultation took place in order to have the time to inform the community. Communities have then been informed by *Gong*, a traditional way of communication with a town crier using a local bell.

A participatory mapping exercise has been organized for each community. First, a general map of the project was presented to the assembly to allow peoples to understand the extent of the project. In a second time, very high-detail aerial photos in large format (A2) were presented to the assembly (see **Annex II**). The photos disclosed the North, the limits of the proposed concession and peoples were



Figure 3 - Participatory mapping with Develebe community

explained the different features of the photos. Once the land they are using for agriculture had been identified on the map, representatives where designated by the community to take GPS reference points to identify the limits of the territory they used and the areas they though were possible for planting oil palm.

Table 5 - Communities consulted

Village	Date	People present		
		Total	Women	Men
Tavié	19/01	129	46	83
Agou Iboé	19/01	108	9	99
Gadzagan	20/01	165	19	146
Avetonou	20/01	120	23	97
Djama Kondji	21/01	41	1	40
Negble Kope	21/01	39	16	23
Tsevi Kondji	21/01	119	27	92
Zozo Kondji	23/01	43	8	35
Kpovenou	23/01	49	20	29
Fokpo	24/01	97	41	56
Develebe	24/01	118	45	73
Adina Kope	04/02	24	9	15
Wonougba	05/02	190	60	130
Seva	05/02	27	10	17
TOTAL	-	1,269	334	935

During these consultations, all private owners were invited to present their legal titles to have a better understanding of the land-use patterns in the assessment area.

IV.2.2 Stakeholder consultation

A number of stakeholder consultation meetings involving wide range of stakeholders were carried out during this assessment including the pre-assessment stage, the data collection stage and finalization of the report. Each stage of the consultation process aimed at collecting specific information and data relevant for the assessment. The objective was to

inform them of the project and to elicit their inputs into the assessment methodology and the process. It also aimed at collecting vital information and baseline data as well as soliciting their comments and inputs into the recommendations for Kalyan to adopt and implement.

IV.2.3 Botanical inventory

The scoping visit made in December allowed to identify 4 vegetation formations (confirming the stratification): cultivated areas and fallows; degraded savannas; plantations; woodlands and relics of secondarized forests. Inventory methodology is based on common best practices used for Togo and West Africa.

A stratified systematic sampling has been undertaken following a 500 x 500 m grid. Size and shape of sampling plots is varying from 50 x 50 m in cultivated areas and fallows, 30 x 30 m in savannas (Atakpama and al., 2014), 20 x 20 m in woodlands and 50 x 10 m in gallery and riparian forests (Dourma and al., 2012; Folega and al., 2014).

In total, 209 plots have been inventoried. Maps of the plots location and their GPS references are presented in **Annex VI**. All trees with a DBH > 10 cm will be identified and measured (diameter and height).

Inventory has been completed by interview with local populations to better understand the local use of plants and their socio-economical importance.

IV.2.4 Fauna assessment

For fauna assessment, secondary data on species potentially present in the assessment area were extracted from literature by Scientifics from Lomé University. These data were augmented by consulting online data sources and outside expertise as deemed necessary. In particular, the expertise and network of Dr. Segniagbeto (member of IUCN specialist group for Africa) has been of great help for the fauna assessment.

Considering the outputs of the pre-assessment and scoping visit, it has been considered that survey of mammals and other vertebrates of concern could be conducted using a rapid assessment technique, combining i) structured interviews with hunters and local communities, (ii) assessment of habitat quality and forest condition, and (iii) direct (visual) and indirect (prints, calls, scat) sightings whilst undertaking habitat assessments.

V Summary of assessment finding

V.1 Geology and pedology

Geology

The concession is located on five main different geological stratum (see Figure 4), which are, by order of importance:

- Gneiss with biotite muscovite (and garnet), on Avetonou 5 and the West side of the main Avetonou block;
- Migmatite with biotite and muscovite, on the East part of the main Avetonou block ;
- Quartzites crossing the center of the main Avetonou block ;
- Orthogneis-Amphibolitic series with garnet and intertwining of overburden, on Tavié, Fligbo, Votrome and Agou-Iboué blocks ;
- Orthoamphibolites locally with garnet, on Tavié and Agou-Iboué blocks.

Pedology

Soils of the area (see Figure 5) are mostly typical tropical ferruginous/ferralitic soils, with exception of “marbled” soils on varied alluviums bordering the Zio river and rich brown eutrophic soils in the areas closed to Mt Agou (Lamouroux, 1966). The soils in the area are very rich and appropriate to various crops, whether it is food-producing or cash crops (MCDAT, 2009).

Risk of soil erosion and soil degradation have been estimated by Brabant and al. (1996) for Togo and have been classified as “zero or very slight” (7%), “very slight” (30%), “slight, locally very slight” (40%), “slight, locally moderate” (20%) and “moderate” (3%). For the assessment area, no soils are classified as “moderate” (see [Annex I](#)).

In conclusion, the soils of the assessment area are considered adapted for the oil palm culture, with exception of the locals’ outcrop of rocks and hard crust. There is no risk of erosion and there are no peat soils.

V.2 Water and topography

Topography

Except for the Mount Agou that culminates at 986 m (highest point of Togo), the assessment area is established on flat plains, with an altitude difference of less than 80 m for 25 km of length (see Figure 6). Slopes are in all cases inferior to 5%.

Hydrography

River Zio is the main river of the assessment area, oriented North-South, with a length of 176 km and a catchment area of around 2 800 km². It is a permanent river that borders the eastern part of the Agou Iboué and main Avetonou blocks (see Figure 6). It ends in the lake Togo that is an important area for manatees and also for fishes populations that spawn their eggs in its waters. Most of the streams of the area ends up in this river except for a two streams in the west part of the main block and another one starting in Tavié 2 block, that

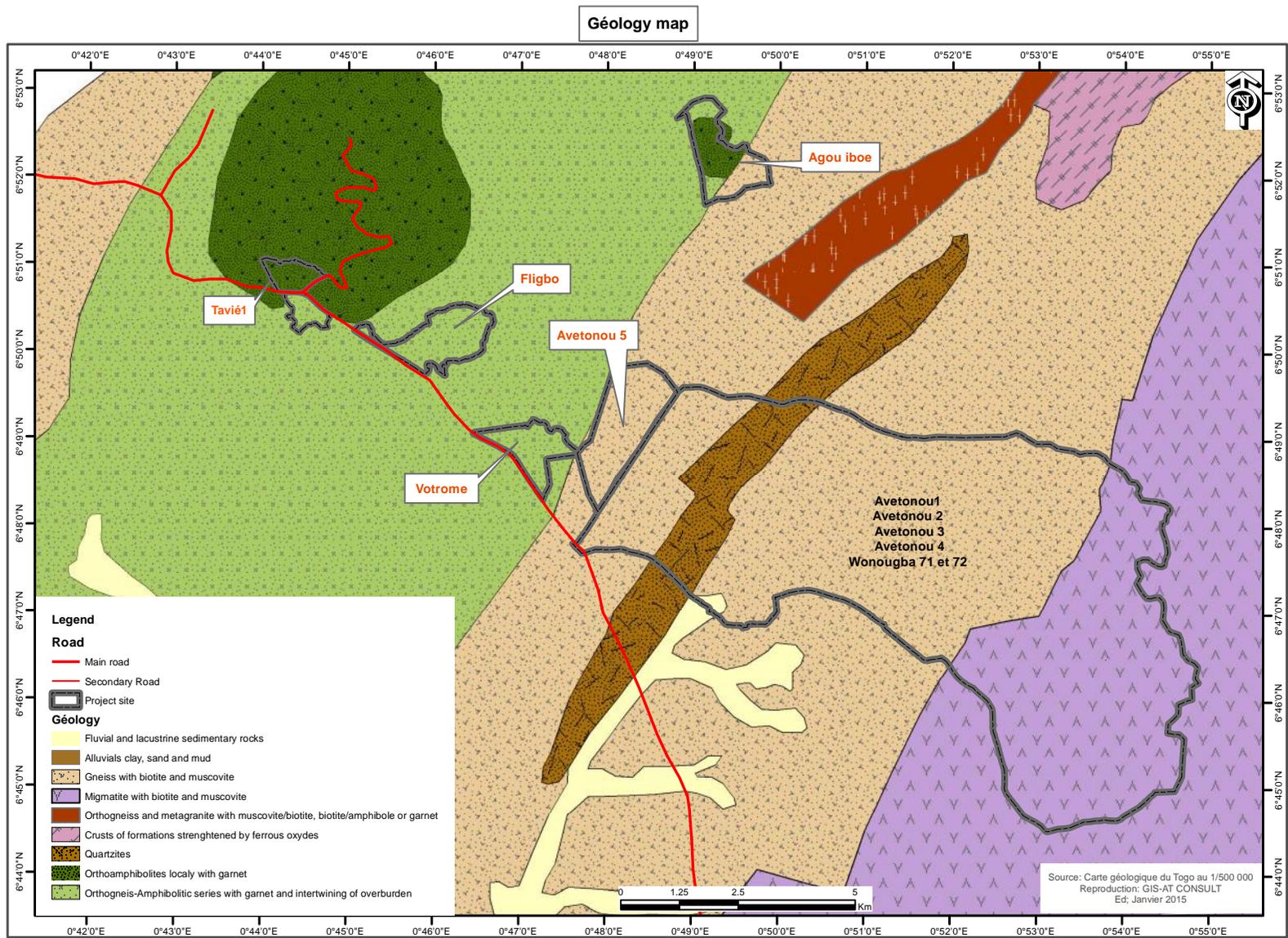


Figure 4 – Géology – Final Version

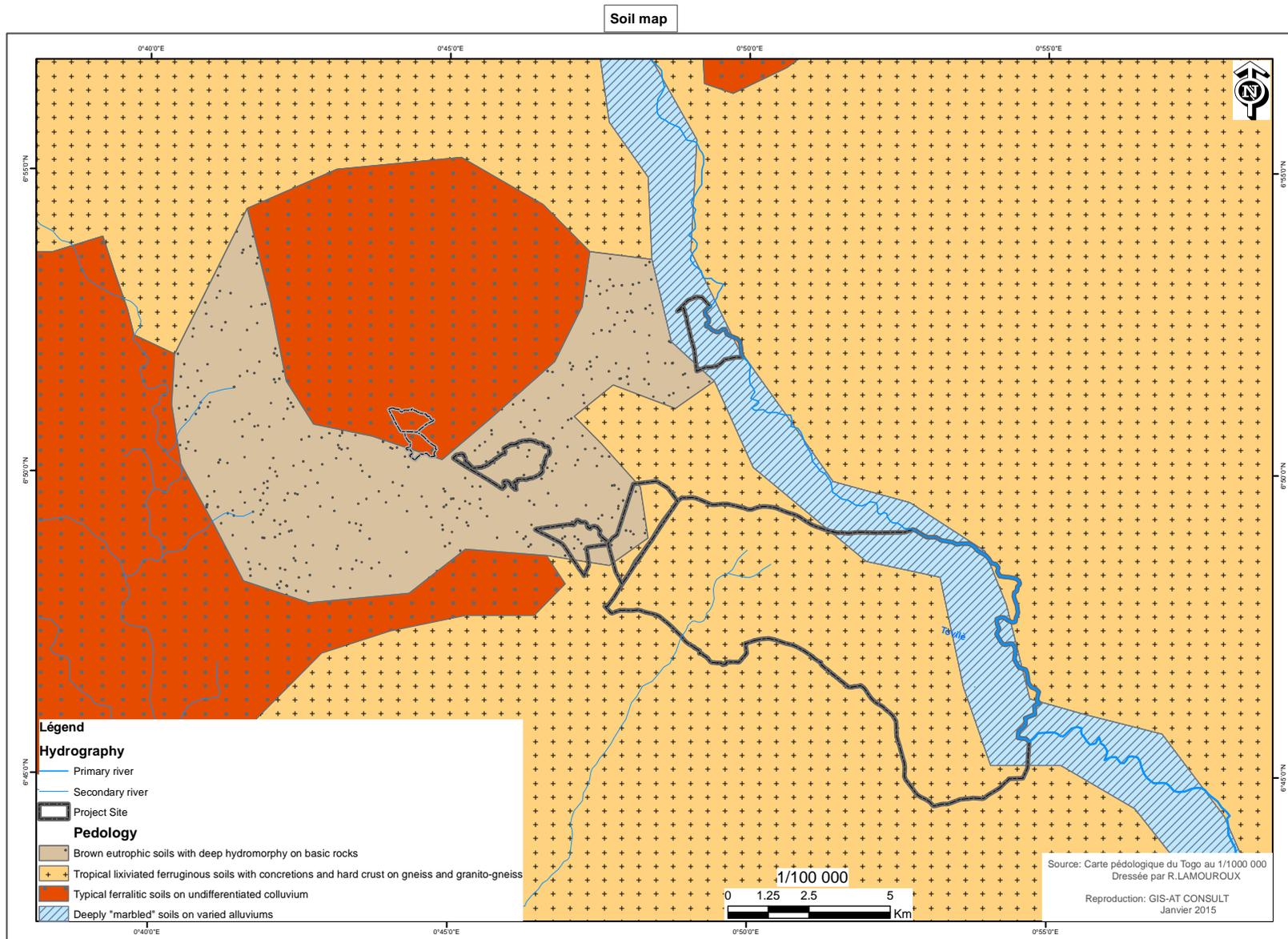


Figure 5 - Pedology - Final Version

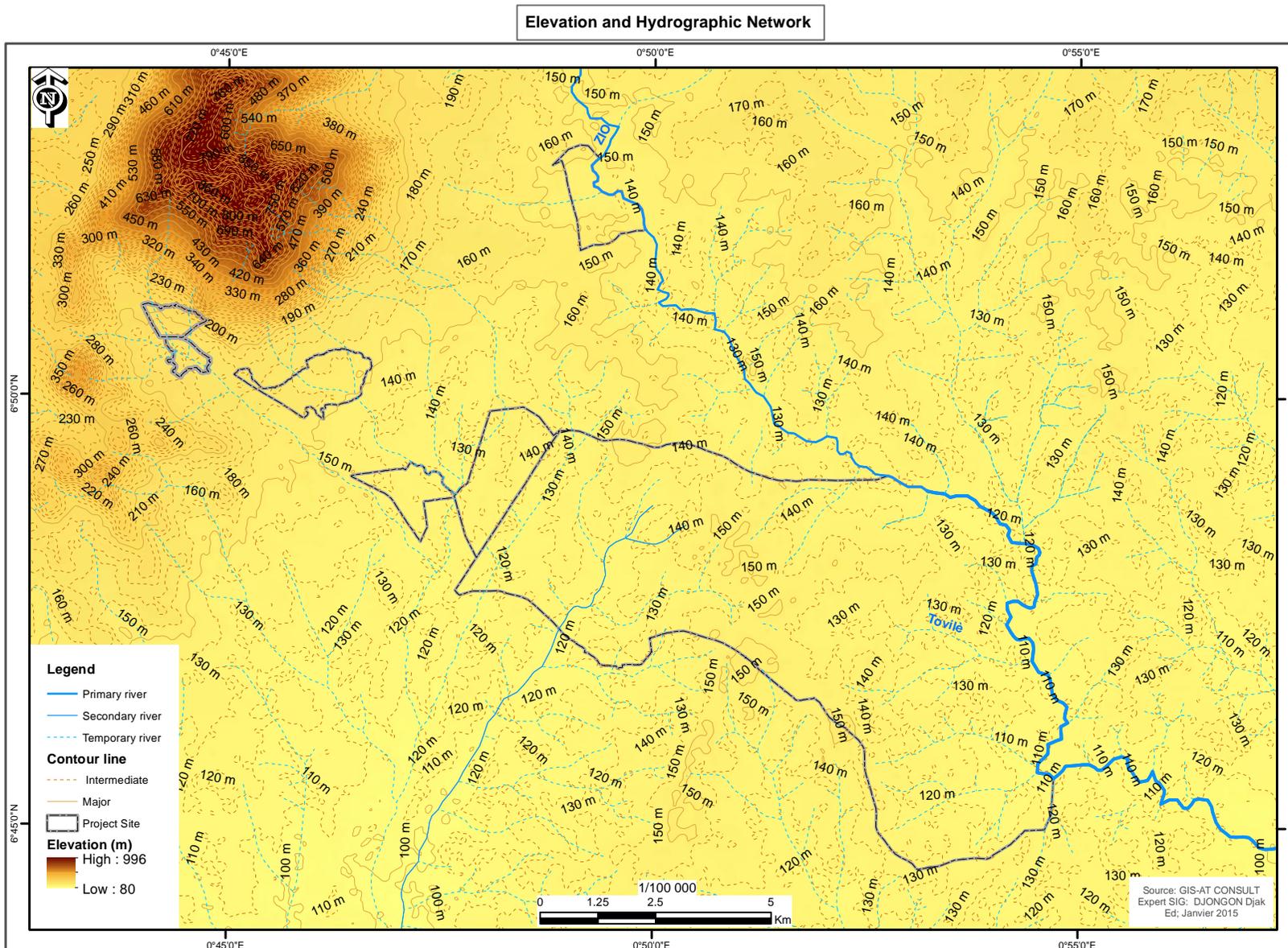


Figure 6 - Topography and Hydrography - Final Version

end up in the river Waya which is located in Ghana. Those streams are either secondary streams or temporary streams.

For this assessment, considering the importance of Lake Togo and the fact that it is not actually protected, we will take into account the potential impacts of the project through river Zio in the management and monitoring section of this report.

V.3 Vegetation

V.3.1 Vegetation stratification and Major ecosystems

Vegetation of the area has been stratified using Landsat 8 (2013 and 2014) images. The results are presented in Figure 7, with false colors to emphasize the different ecosystems.

Results from Landsat images have been confirmed with high details Google Earth images of the zone (see [Annex II](#)) together with ground verification during the scoping visit and the botanical survey.

The stratification study concluded that the assessment area is nearly totally formed of highly degraded and anthropized ecosystems, which are the following:

- **Cultivated areas:** main crops cultivated in the area are cassava, plantain, cereals such as millet, sorgho, corn, rice, and various tubers;
- **Plantations:** mostly teak and oil palm plantations, whether they are remnant of SONAPH plantation or planted by the local communities;
- **Fallows:** these formations are characterized by totally anthropized ecosystems. Fallows host species such as *Elaeis guineensis*, *Piliostigma thonningii*, *Imperata cylindrica*, *Daniellia oliveri*, *Andropogon gayanus*, *Vitellaria paradoxa*, *Ficus sur*, *Lonchocarpus sericeus* et *Chromolaena odorata*;
- **Degraded savannas:** these are forest formations which under-storey is occupied by a continuous grass stratum, consumed every year by bush-fire of human origin. These ecosystems are characterized by populations of *Isobertia doka* and/or *I. tomentosa*, *Anogeissus leiolepis*, *Uapaca togoensis*, *Daniellia oliveri*, *Terminalia macroptera*, *Combretum* spp, *Pterocarpus erinaceus*, *Parkia biglobosa*, *Vitellaria paradoxa*. Grass cover is dominated by *Hypparhenia* spp., *Andropogon* spp..
- **Highly secondarized woodlands and forests (semi-deciduous, gallery and riparian forests):** they are localized in ecological zone IV, southern part of Mounts Togo. In the assessment area, it is mostly *Terminalia superba* and *Celtis* forests. The under-storey of these forests is nearly exclusively occupied by crops. In the relic islets, the under-storey is dominated by *Piper umbellatum*, *Dicranolepis grandiflora*, *Lea guineensis*, *Rothmania longiflora*, *Phaulopsis* spp., *Pteris togoensis* etc. The area is also crossed by gallery and riverine forests, which are forested formation which presence, floristic compositions and dynamics are closely related to the presence of

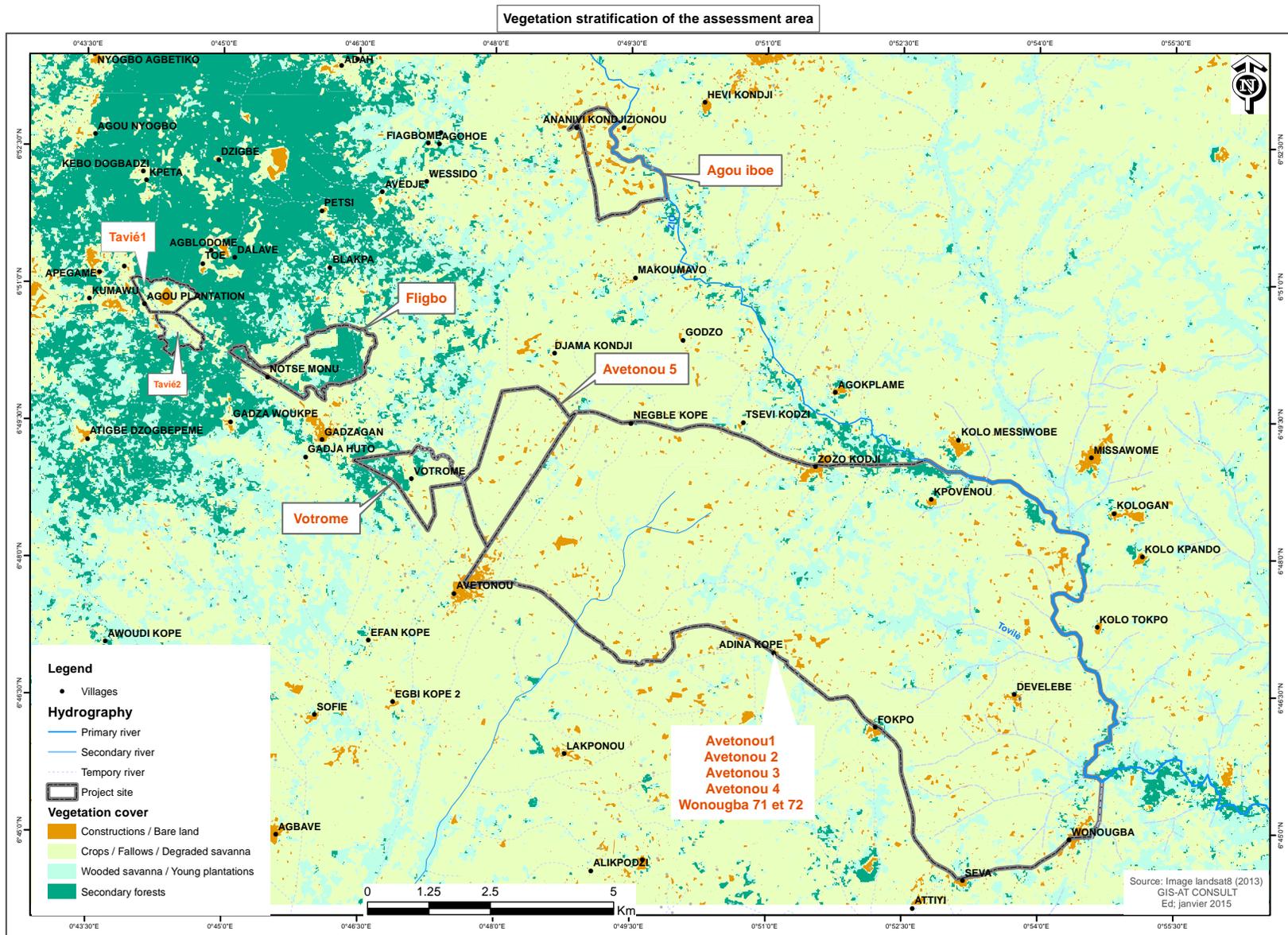


Figure 7 - Vegetation stratification - Final Version

watercourses. Typical species of these forests include *Berlinia grandiflora*, *Uapaca spp.*, *Pentadesma butyracea*, *Erythrophleum suaveolens*, *Cannarium scheinfurthii*, etc.



Figure 8 - Degraded woodland with burnt understory (Avetonou main block)

Table 6 - Superficies of each stratum identified

Stratum	Superficies (ha)	%
Constructions and bare lands	274.4	3.8
Cultivated areas / Fallows / Savannas	5925.8	81.7
Woodlands and plantations	799.3	11.0
Secondarized forests	252.8	3.5
TOTAL	7252.3*	100

*: There are some discrepancies in this table for the total area (7 252.3 ha instead of 7 263 ha in the legal acts) that are due to the different software used.

NOTE

There is no presence of rare or endangered ecosystem in the assessment area, such as significant wetlands or forests of national, regional or local importance.

V.3.1.a Flora

Endangered species and species with a specific conservation status

Ten tree species are listed as « Vulnerable » on the IUCN redlist. All those species are threatened in Togo due to destruction of natural habitat, collection of firewood and charcoal, slash-and-burn agriculture and annual burn-beating. **The list of endangered flora species is presented in Annex IV.**

Two species are protected in Togo, those are the shea-butter tree (*Vitellaria paradoxa*) and the Néré (*Parkia biglobosa*). The habitat of those species are dry savannas and woodlands. They are mainly present in the North of the country as they are typical of the transition between soudano and sahelian eco-zones, but their repartition area can extend up to zone

III and IV, in area degraded by human activities. They are mostly threatened in the North of the country, as they are valued by the local populations of the North for charcoal and firewood (Atakpama, 2015).

Endemic species

Up to date, only one species is signaled as endemic for the Togolese flora. It is *Phyllanthus rouxii*, of the Euphorbiaceae family, a small shrub which growth on the ferruginous hills of Northern Bassar. It is not present in the assessment area.

V.4 Fauna

The following literature review has been done by Gabriel Segniagbeto and his colleagues from Lomé University. It is based on general documentation, amongst other Cheke & Walsh (1996), Paugy et al. (2004), Rödel (2000), Schiøtz (1999), Oates (1996 and 2011), Chippaux (2006), Trape et Mané (2006). It has been completed by the use of recent guides on mammals and birds of West Africa (respectively Borrow & Denny, 2012; Kingdon, 2010), personal communication with specialists of Birdlife International and Ichthyology laboratory of Abomey-Calavi University (Bénin) and personal publications (Segniagbeto and al., 2007, 2011, 2013, 2014; Segniagbeto, 2009). **The list of endangered fauna species is presented in Annex IV.**

Endangered species and species with a specific conservation status

For this evaluation we have considered all vertebrates listed in the IUCN redlist¹. In the case of Togo, considering the high level of pressure on natural resources and wildlife, even species classified as “Least Concerned” or “Near Threatened” could be, in certain cases, of importance in the national or local context.

- **Mammals:** 12 species listed are potentially present in the region. *Manis tricuspis* (tree pangolin) is considered as “Vulnerable”. The Straw-coloured fruit bat (*Eidolon helvum*) is classified as “Near Threatened” but there is no concern for its protection in Togo. All other species (classified as “Least Concerned”) are either forests dependent species that are highly hunted (with very little chance to happen in the assessment area) or species that are not threatened at the national/local level;
- **Birds:** 7 bird species listed are potentially present in the region. *Picathartes gymnocephalus* and *Ceratogymna elata* are “Vulnerable” but totally forest dependent (dependent of undisturbed forest in the case of the first one). *Necrosyrtes monachus* (Hooded vulture) is classified as “Endangered” but there is no concern for its population in the assessment area. The other species, listed as “Least concerned”, do not occur in the degraded ecosystems of the assessment area;

¹ Categories as defined in the IUCN Redlist are, by decreasing order of extinction risk: Threatened categories -Critically Endangered (CR), Endangered (EN), Vulnerable (VU) – Not Threatened categories – Near Threatened (NT), Least Concern (LC).

- **Reptiles:** 34 reptile species are listed in the IUCN Redlist. *Kinixys homeana* (CR) and *Kinixys erosa* (EN) as well as 5 species classified as “Vulnerable” are all forests dependent species. *Trionyx triunguis* and *Osteolepis tetraspis* (VU) are dependent of rivers and water points and could potentially be present in the area. The populations of the other species (listed as “Least Concerned”) can be threatened by the actual human pressure (hunting, commercial captures, burn-beating practices), but are generally well represented on the regional/national territory;
- **Amphibians:** 12 amphibian species listed are potentially present in the region. *Conraua derooi* (CR) and *Hyperolius torrentis* (EN) are highly dependent of forests ecosystems, thus not present in the assessment area. All the others 10 “Least Concerned” species are also forest dependents.

Endemic species

Four species are considered endemic for Togo: one invertebrate, a giant snail (*Achatina togoensis*) which is present in the Mounts Adélé, more than one hundred kilometer North from the assessment area; and three species of amphibians. *Conraua derooi* in the semi-deciduous forests of Kloto (Plateaux region), *Aubria subsubgillata* in Kovié (Maritime Region) and *Bufo togoensis* in the Mounts Adélé (Région Centrale).

No endemic species is therefore present in the assessment area.

Migrating species

The assessment area is not located on known migration corridor such as RAMSAR zone (for water birds). Most of the palearctic birds migrate in the North of the country, and there is no known significant populations of migratory birds in the region.

V.5 Socio-economic context

All data presented in this section of the report are issued from MCDAT reports (2009, 2011) and DSID/MAEP census of Togolese agricultural sector (2013). For the analysis of the social dynamics, the only data available were the ones for Agou *prefecture*. We have therefore not used in this report data for Zio *prefecture*, which does not seem problematic as they only concern 2 villages and a small part of the concessions. The analysis and conclusions made for Agou is transposable for the populations of the villages of Wonougba and Seva, in Zio *prefecture*.

V.5.1 Demography

Agou *prefecture* population has been estimated to 84 890 habitants in 2011. More precisely, the population of Gadza *canton* (on which is located most of the concession) has been estimated to 19 400 habitants at the same date. The population growth rate in the area is 2,58%, increasing significantly on the last years. The density of population is 81 habitants / km², with 94,7% of the population living in rural areas. The population is very young, with

50% less than 15 years, and 45% between 15 and 45 years old. There is a mean of 6,2 peoples per household.

There are actually few migratory flows in the area, because of the lack of economical project.

V.5.2 Sociological aspects

Agou *prefecture* is mostly populated by the Ewé ethnical group (69,8%), followed by the Kabyé (16,8%) and the Tem (2,1%). Other groups represent 11,3% of the population (Lossos, Lamba...). The Ewé's group is historically originating from this area, the other groups having moved during the past century.

All villages in the assessment area are historically populated by "local ethnies", except Adina kope, Seva and Develebe, which are populated with people originating from the littoral region. This principally means that they are allowed to cultivate the lands on which they are established but do not own them, and that they are burying their death (adults) in the village from where they originate.

The religious groups are mostly catholics (37,4%), animists (37.4%), protestant (18,9%), muslims (9.9%).

V.5.3 Land uses and Economic activities

As seen in chapter V.3.1 land-uses in the area are mostly agricultural lands, plantations and fallows, followed by urban area and infrastructures, rivers and waterpoints and finally woodlands and secondary forests.

Order of du 06/02/1974 recognize both legal and customary land-use regimes in Togo. Access to land is generally done through inheritance, but can also be done by gift or legally acted selling. Use rights can be given to migrants temporarily whether it is for free or against annuity (for example for the villages of Adina kope, Seva and Develebe). This use right never become a property right whatever is the length of the use (even on several generations).

Active population represents nearly 45% of the canton and concerns mostly the 15-45 age group. Employment is typically informal whether it is for agriculture, handcrafting, small stores and transports.

In the canton of Gadza, it has been estimated that around 80% of the population makes a living of cultivation. The average size of the cultivated plot for one household is generally around 1 ha. Hunting and gathering are only marginal activities, as food-producing crops or plantations occupy most of the lands, and hunting pressure is very high. List of crops used in the assessment areas is presented in **Annex III**.

V.5.4 Authority and conflict management

The highest administrative level is the *Prefecture* which is subdivided into *Canton*. Each *canton* regroups villages (managed by chiefs), that can themselves be divided into districts (*quartiers*). 14 villages are included in Gadza *canton*.

Traditional chiefs are organized in Togo at the national, *prefecture* and *canton* levels. At the lower level, the cantonal chief is assisted by a council and two representatives of the *allogènes* (people of ethnic origin outside the area). The council used to be in charge of the conflicts related to land-use, heritage and ethnic/community disagreements. Nowadays, while most of the conflicts are solved following legal right (tribunal), it seems that people are more and more returning to traditional authorities for judging the local conflicts as public authorities are considered corrupted and ignorant of local realities.

Each village also disposes of its *Comité de Développement Villageois* (Village Development Committee – CVD) which is competent to plan, organize and coordinate the development activities of the locality.

V.5.5 Infrastructures

A very low level of general infrastructures characterizes the area.

Water and Electricity networks

Drinkable water supply is a general problem for the populations of the *canton*. The majority of Gadza *canton* population is collecting water in rivers and water points because of the deficiency or malfunction of drillings. Most of the drillings dry up between January to April (dry season). Only Avetonou and Agou iboé have functional drillings.

Electricity is only available in the villages of Gadzagan and Avetonou.

Health and Education

Both public services are very weak and poorly functional.

There are only two small hospitals for the *canton*, and nearly 1/3 of the other health centers (infirmary, “health-hut”) are not functional due to the lack of staff or material.

All villages have primary schools except Djama kondji. There are only three secondary schools (Gadzagan, Avetonou and Zozo kondji) and one high school in Avetonou.

Transports and Commerce

Road network in Agou *prefecture* count 50 km of paved road and 53 km of suitable trails. The railway is not anymore in function.

Population sells its production mainly in the markets of Gadzépé, Avetonou and Wonougba Seva. A small part of the production is exported to Kpalimé (Regional capital) and Lomé.

V.6 Summary of social and environmental impacts

All the negatives impacts evaluated as significant have been the object of a mitigation measure and/or compensation in the Environmental and Social Management Plan (ESMP). A Risk Management Plan (RMP) has also been proposed. Measure proposed in the ESMP and RMP will be implemented by the promoter under ANGE control.

Table 7 - impact matrix for the development phase

Impact sources Elements impacted	Impact sources			
	Land-clearing	Windrowing	Material transport	Road network construction
Air	X	X	X	X
Water	X	X		
Soil	X	X		
Flora and Ecosystems	X	X		
Fauna	X	X		
Landscape	X			
Employees	X	X	X	X
Local communities	X		X	X
Land-use, Agriculture and Food security	X			
Cultural values				
Housing				
Local economy	X	X		
Road traffic	X	X	X	X

Table 8 - impact matrix for the construction phase

Impact sources Elements impacted	Impact sources			
	Buildings	Fuel storage	Nursery	Material transport
Air	X			X
Water	X	X	X	
Soil		X	X	
Flora and Ecosystems		X	X	
Fauna		X	X	
Employees	X	X	X	X
Local communities		X	X	X
Local economy	X	X	X	X
Road traffic				X

Table 9 - impact matrix for the management phase

Impact sources Elements impacted	Administrative tasks	Road maintenance	Chemical storage and handling	Plantation management	FFB harvesting
Air		X			
Water		X	X	X	
Soil		X	X	X	
Flora and Ecosystems			X	X	
Fauna			X	X	
Employees	X	X	X	X	X
Local communities		X	X	X	
Local economy	X			X	
Road traffic					X

Table 10 - impact matrix for the end of project phase

Impact sources Elements impacted	Material transport	Chemical recycling and handling	Site management
Air		X	
Water		X	X
Soil		X	
Employees	X	X	X
Local communities		X	X
Road traffic	X	X	

V.7 Areas of High Conservation Values

V.7.1 HCV1: Species diversity

HCV 1	STATUS	JUSTIFICATION
Species diversity	Potentially present	Precautionary principle: possible presence of <i>Osteolaemus tetraspis</i> (VU) in Zio river.
	Present	Mature specimens (above 10 cm DBH) of <i>Vitellaria paradoxa</i> (VU), <i>Parkia biglobosa</i> (nationally protected)

Fauna

The pre-assessment has shown that there are no endemic species in the project area and that nearly all vertebrates that could justify a classification as HCV 1 are forest dependent species (Segnigabeto and al., 2007; 2009; 2013; 2015). Systematic interviews with hunters from each local communities consulted and farmers met during field visit showed that fauna was very scarce and only medium to small size mammals were present in the area. Most of the catches described by the local hunters are rodents. The different teams did no direct (visual) and indirect (prints, calls, scat) sightings whilst undertaking habitat assessments.

These matching testimonies from all hunters interviewed, together with the fact that ecosystems are totally anthropized and regularly burned, allowed the team to conclude that the creation of an industrial oil palm plantation would not constitute a threat to populations of rare, threatened or endemic species whether it is at a local or national level.

Regarding rivers and wetland ecosystems, the only species mentioned by local hunters is *Osteolaemus tetraspis*, a Crocodylidae listed as “Vulnerable” (UICN redlist). While it was not possible to confirm that this species is present, local hunters and fishers mentioned that crocodiles could be caught in Zio river. As this ecosystem is still viable, the precautionary principle recommends assuming that *Osteolaemus* is present in the Zio.

There is no specific map for this HCV as Zio river is well represented on all maps of this report as well as the full HCV assessment.

Flora

Vegetal formations identified during the botanical survey correspond to the stratification, e.g cultivated area and fallows, savannas, woodlands and secondary forests.

The structural characteristics of the vegetation are typical of degraded areas: tree density, mean diameter and height are very low. The mean basal area for the whole assessment area

is 1,51 m²/ha, ranging from 0,32 m²/ha in fallows and cultivated areas to 26,77 m²/ha in the remnant patches of secondary forest.

Vitellaria paradoxa, or shea-butter tree, a specie classified as “Vulnerable” by ICUN has been identified during the survey. This species is also protected at the national level as « subsistence species » together with the Néré (*Parkia biglobosa*) [Eyog-Matig and al., 2002], despite the fact they are not traditionally used by the population of the south of the country (Hall and al., 1996).

Mature specimens of *Vitellaria paradoxa* and *Parkia biglobosa* will be considered as HCV because their populations are also endangered by over-use for charcoal production (they are one of the preferred species for this production). All specimens above 10 cm DBH will be considered as mature and of interest for conservation purpose. Those trees are present in low densities, as the project zone is in the southern part of their area of repartition.

There is no specific map for this HCV as specimens of these trees are punctually present on various part of the concession.

V.7.2 HCV2: Landscape-level ecosystems and mosaics

HCV 2	STATUS	JUSTIFICATION
Landscape-level ecosystems and mosaics	Absent	All ecosystems in and around assessment area are anthropized and/or heavily disturbed

There is no forest formally designated as Intact Forest Landscape (IFL) by the World Resource Institute in Togo as there is no specific priority landscape in the assessment area. All ecosystems have been deeply perturbed by man and even the smaller areas of perturbed ecosystems cannot be considered to have a role in maintaining viable populations of the great majority of species.

V.7.3 HCV3: Ecosystems and habitats

HCV 3	STATUS	JUSTIFICATION
Ecosystems and habitats	Absent	No patches of intact forests or significant extent of intact wetlands

In the actual context of high human pressure on ecosystems, even small patches of the following primary/intact forest ecosystems would be considered as HCV3:

- **Dry forests** with pure and dense populations of *Anogeissus leiocarpus* or *Monotes kerstingii*;
- **Semi-deciduous forests** with *Terminalia superba* and *Celtis* species, or;

- **Gallery and riparian forests** with significant presence of *Berlinia grandiflora*, *Uapaca spp.*, *Pentadesma butyracea*, *Erythrophleum suaveolens*, *Cannarium scheinfurthii*.

Those ecosystems have not been found during the botanical survey (Atakpama, 2015). Areas which have been thought to be possible patches of intact forests during the vegetation stratification, were redefined after ground verification as oil palm plantations (Tavié 2 block), oil palm and teak plantations (Fligbo and Votrome blocks) and highly degraded remnants of riparian forests with under-storey occupied by crops (East part of main block, near Zio river and Kpovenou village). All vegetation formations assessed in this study have shown indicators of high levels of degradation and do not justify classification as HCV3.

Patches of vegetation will be protected under management recommendations for HCV4.

V.7.4 HCV4: Ecosystems services

HCV 4	STATUS	JUSTIFICATION
Ecosystem services	Present	All river and streams, even temporary, are HCV4. Most populations use rivers and streams for water consumption. Common water scarcity during dry season. Potential impact on lake Togo downstream

The socio-economic study has identified that populations of the project areas rely deeply on the water they can collect in all rivers and water points of their environment. Despite the fact that the quality of the waters collected is not sufficient (especially during dry season), the project could significantly impact water flows and physic-chemical quality.

Therefore, all rivers and streams, even temporary, shall be considered as HCV 4.

Furthermore, most of the streams of the area end up in the Zio river which ends in the lake Togo that is an important area for manatees and fishes populations that spawn their eggs in its waters. Therefore, it is of primary importance to ensure that the conversion to oil palm plantation and the daily operations in the plantation (especially in case of pesticides and fertilizer application) do not impact on water quality and flow.

All primary, secondary and temporary rivers present in the concession and which constitute HCVs 4 are presented in Figure 9. There are no areas of steep slopes or vegetation with an important role in fire control in the project area.

V.7.5 HCV5: Community needs

HCV 5	STATUS	JUSTIFICATION
Community needs	Present	<p>All areas listed by local populations as of primary importance for food production.</p> <p>More than 80% of the population relies directly on agriculture for its subsistence.</p>

During the community consultation, all communities have emphasized that, in the current situation they will need lands to continue their agricultural activities and that significant portion of the project area is of utter importance for meeting their basic needs, whether it is for food or for generating cash to buy essentials including medicine, clothes, etc.

All communities, except Zozo kondji, Kpovenou and Wonougba, have expressed their attachment to the project. All communities have shown during these consultations that they know the kind of works that are proposed by the project proponent, as most of the “elders” have been employed by SONAPH back in the 90’s. The three communities less attached to the project also stated that their opposition was due to the fact that no participation of the local populations has been sought in the past, and that they had not benefited from employment neither.

Except for Negble kope and Develebe, community have also admitted that not all their territories fall within the limits of the project area, and therefore, that it would be possible to develop both agro-industrial and traditional activities on the territories they are using, in exchange of employment. Even for Negble kope and Develebe, communities have agreed that some portions of their territories could be used for oil palm plantation if that could generate employment for the community.

Finally, several communities have mentioned two local development projects that could improve their standard of living together with helping freeing lands for the oil palm projects, if they were replicated:

- **ZAP or Zone d’Agriculture Planifié – Planned Agriculture Zone** (Beneficiaries: Gadzagan, Zozo Kondji, Dzama kondji, Avetonou): this area of around 150 ha has benefited from enhanced agricultural practices such as selected seeds, use of fertilizers, irrigation and mechanical preparation of lands. It has allowed to significantly increase agriculture yields and benefits for more than 100 families;
- **Community forest** (Beneficiaries: Fokpo): this project aims to protect and naturally regenerate forests.

Taking all these parameters into account, the assessment team has decided to classify as HCV 5 all lands designated by the local communities (during the participatory mapping exercise) as necessary for subsistence agriculture. Those areas are designated in pale orange on Figure 9 hereafter. This map is still a “Draft version” because HCV 5 delineation has been

done roughly in the field, and shall be précised during the FPIC process recommended in the “HCV Management and Monitoring” section of this report. The areas designated as HCV 5 in this report are not “carved in stone”: they could be renegotiated with local communities if improvement of agricultural practices (such as what has been experimented in Votrome ZAP) increase yields and allow communities to better fulfill their basic needs, assuming that the renegotiation follows the FPIC process.

The areas represented in green on Figure 9 represent the sum of all areas designated as possible for the oil palm project by the communities.

V.7.1 HCV6: Cultural values

HCV 6	STATUS	JUSTIFICATION
Cultural values	Present	All areas of cultural importance as described by local populations

HCV 6 areas are important for the maintenance of traditional cultural identity of local communities. All sites identified during the participatory mapping are listed in the table below.

Table 11 - Description and location of HCV 6

Indication on Fig.8	Description	GPS Coordinates (UTM)	
		X	Y
A	<i>Tavié cemetery</i>	250228,4	757563,6
B	<i>Notsue monu cemeterey</i>	252587,8	756106,3
C	<i>Gadzagan cemetery</i>	253230,4	755670,6
D	<i>Avetonou college</i>	256649,3	752792,1
E	<i>Djama kondji cemetery</i>	258084,5	754417,8
F	<i>Negble kope cemetery</i>	259590,3	754748,5
G	<i>Avetonou “sacred forest”</i>	259672,1	751830,7
H	<i>Dongo kope cemetery</i>	259042,0	750489,7
I	<i>Dongo kope school</i>	259813,5	750674,9
J	<i>Tsevi kondji cemetery</i>	261803,0	754632,2
K	<i>Zozo kondji high school</i>	262347,3	754304,8
L	<i>Adina kope cemetery</i>	262474,7	750301,4
M	<i>Fokpo cemetery</i>	264813,5	748637,3
N	<i>Develebe</i>	267655,6	749141,8
O	<i>Seva cemetery</i>	266301,0	745725,2

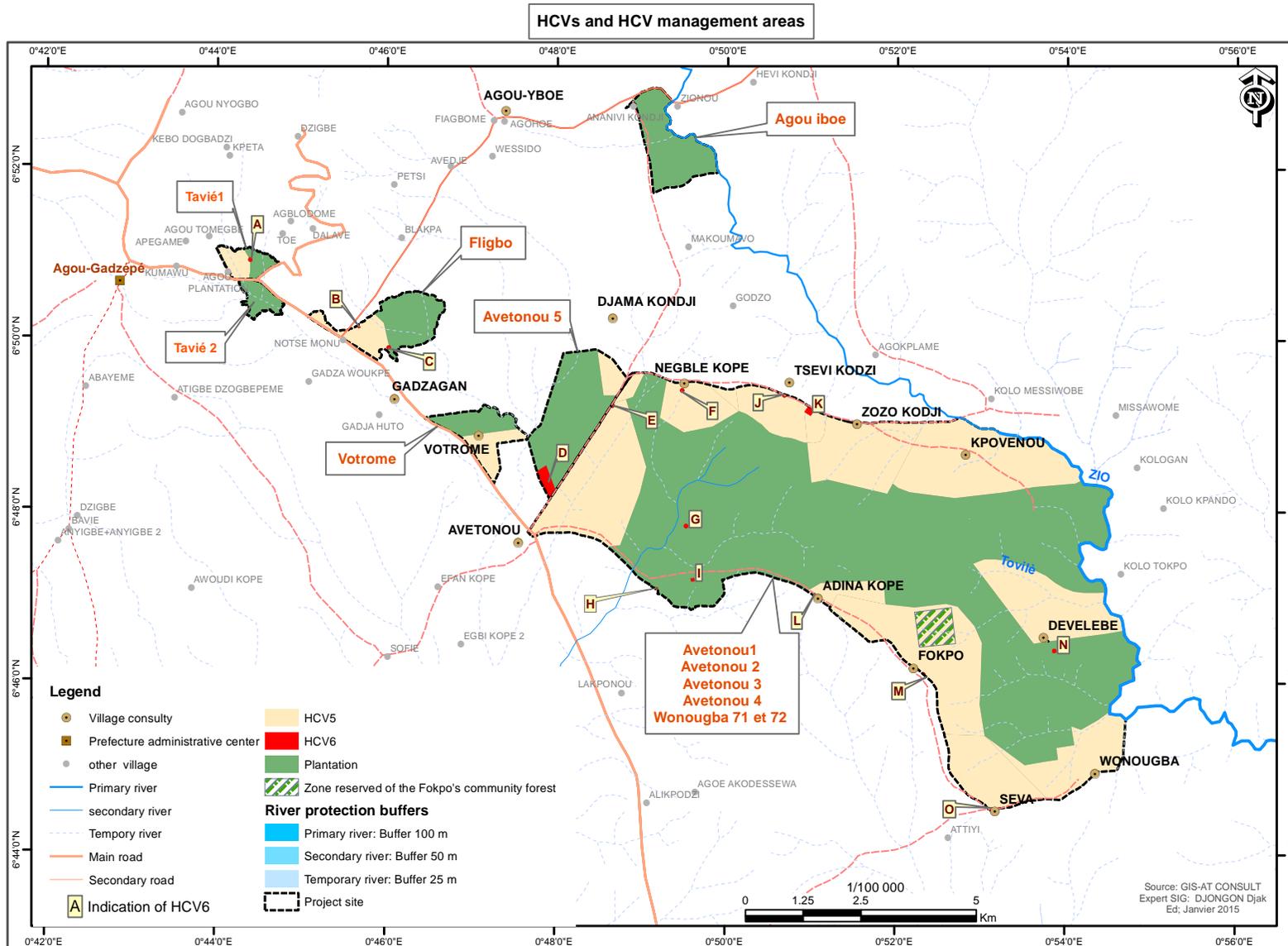
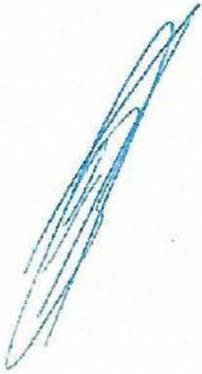


Figure 9 - HCV 4, 5 and 6 - Draft Version

VI Internal responsibility

Signed-off by HCV assessor	Signed-off by SEIA assessor	Acknowledgment of internal responsibilities by Kalyan Agrovet Investments Ltd
Date: 26 July 2016		
	 <p data-bbox="702 896 1069 1064"> JAT CONSULTING SARL ENVIRONNEMENT & DROIT 23 36 18 81 12BP335 LOME-TOGO </p>	<p data-bbox="981 683 1300 840">I understood and, being the representative of this company, I agree with this report</p> 
Rémi DUVAL www.Forests-and-People.net	Joel AGBEMELO JAT Consulting	Ashok GUPTA Director

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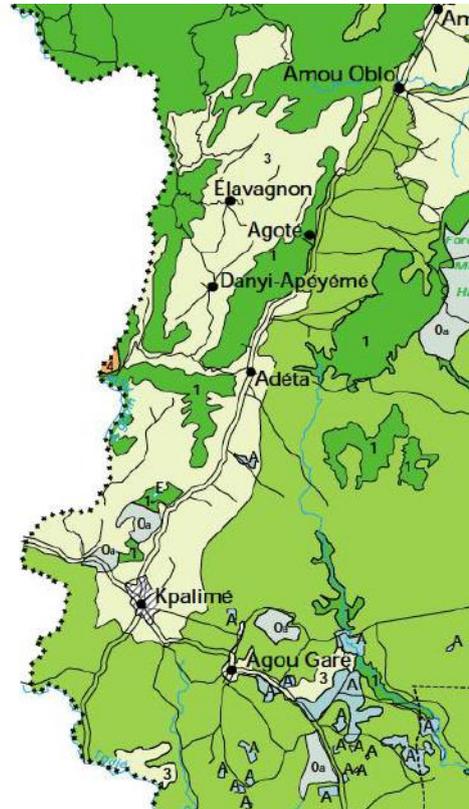
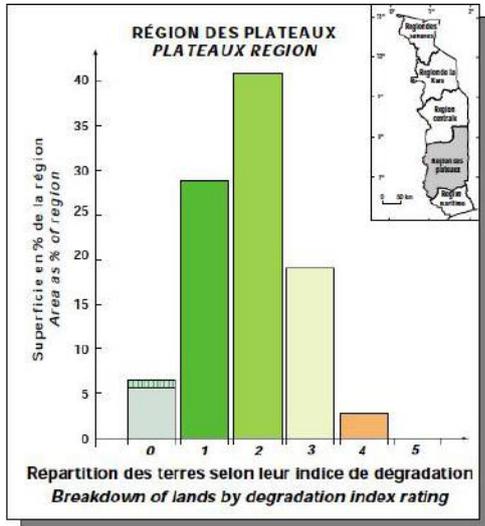
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Annex I - Risk of soil erosion and soil degradation

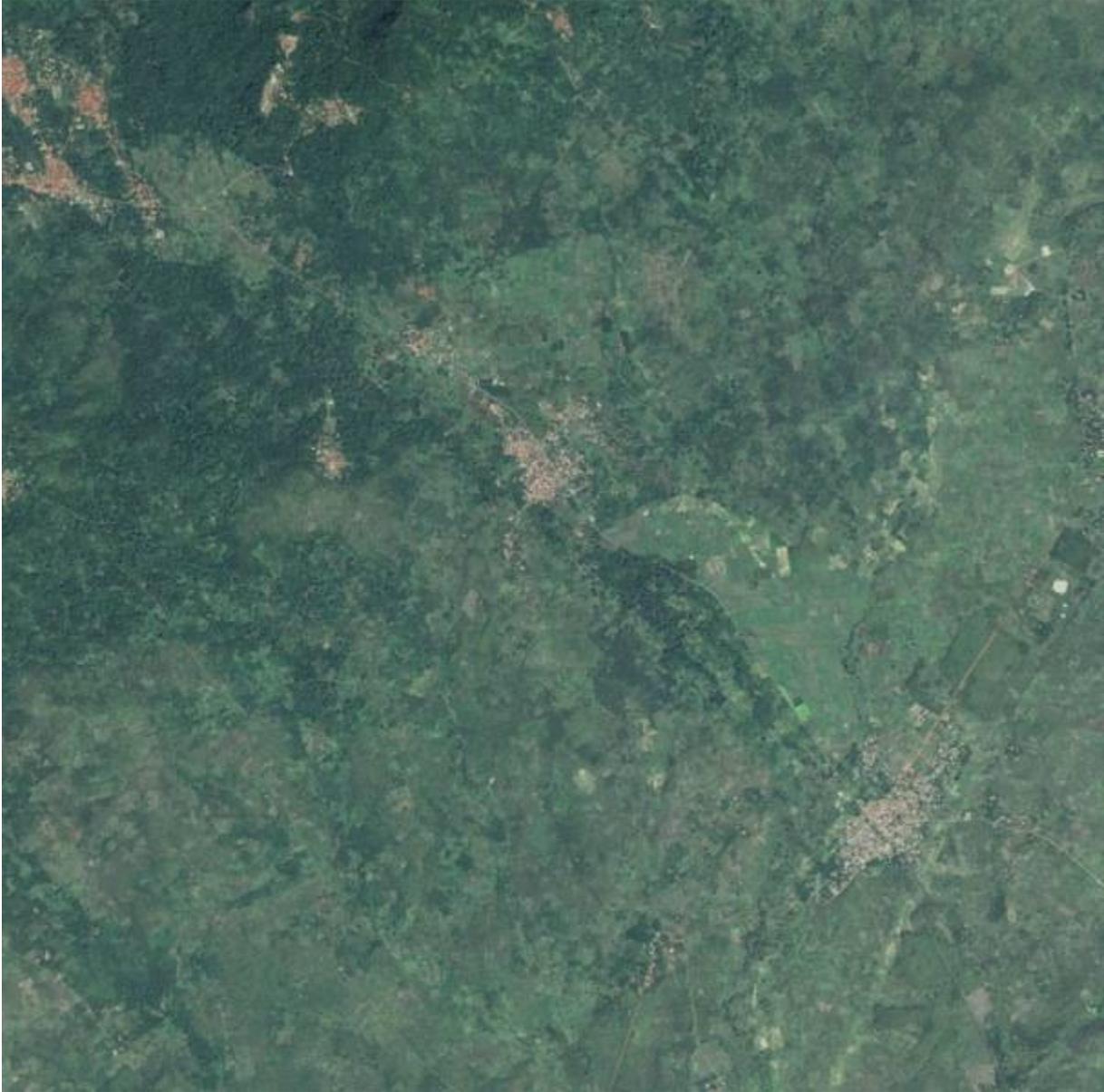
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LÉGENDE/KEY

Indice de dégradation Degradation rating	Degradation Degradation
0a, 0b	Nulle ou très faible Zero or very slight <small>a = Parcelles sans et réserves b = Parcelles sans et réserves</small>
1	Très faible Very slight
2	Faible, localement très faible Slight, locally very slight
3	Faible, localement moyenne Slight, locally moderate
4	Moyenne Moderate
5	Forte Severe

Annex II – High details Google Earth aerial images of the assessment area



Annex III – Crops cultivated in Agou prefecture

Latin name	Common name	Type of culture
<i>Abelmoschus esculentus</i>	Okra	Annual
<i>Cajanus cajan</i>	Cajan peas	Annual
<i>Capsicum frutescens</i>	Chili pepper	Annual
<i>Carica papaya</i>	Papaya	Annual
<i>Corchoris olitorius</i>	Corète	Annual
<i>Dioscorea sp</i>	Yam	Annual
<i>Gossypium hirsutum</i>	Cotton	Annual
<i>Hibiscus sabdariffa</i>	Hibiscus	Annual
<i>Manihot esculenta</i>	Cassava	Annual
<i>Oryza sativa</i>	Rice	Annual
<i>Xanthosoma mafaffa</i>	Arrowleaf	Annual
<i>Zea mays</i>	Maiz	Annual
<i>Ananas comosus</i>	Pineapple	Perennial
<i>Artocarpus altilis</i>	Breadfruit	Perennial
<i>Bambusa vulgaris</i>	Bamboo	Perennial
<i>Blighia sapida</i>	Ackee	Perennial
<i>Cocos nucifera</i>	Coconut	Perennial
<i>Eucalyptus citriodora</i>	Eucalyptus	Perennial
<i>Gliricidia sepium</i>	Gliricidia	Perennial
<i>Gmelina arborea</i>	White teak	Perennial
<i>Jatropha curcas</i>	Jatropha	Perennial
<i>Manguifera indica</i>	Mango	Perennial
<i>Musa sapientum</i>	Banana	Perennial
<i>Persea americana</i>	Avocado	Perennial
<i>Psidium guajava</i>	Guava	Perennial
<i>Tectona grandis</i>	Teak	Perennial
<i>Theobroma cacao</i>	Cocoa	Perennial

Annex IV – List of endangered species

Flora (Segniagbeto, 2015; Atakpama, 2015)

Latin name	Common name	IUCN Status	Habitat
<i>Albizia ferruginea</i>	Albizia	VU	Semi-deciduous forests, woodlands
<i>Coffea togoensis</i>	-	VU	Dry forests
<i>Encephalartos barteri</i>	Bread palm	VU	Forests between 400 and 1 400 m a.s.l
<i>Entandrophragma cylindricum</i>	Sapele	VU	Semi-deciduous forests
<i>Khaya grandifolia, K. senegalensis</i>	African Mahogany	VU	Semi-deciduous forests, woodlands
<i>Millettia warneckeii</i>	-	VU	Dry forests
<i>Pavetta lasioclada</i>	-	VU	Upland evergreen forests
<i>Pierreodendron kerstingii</i>	-	VU	Semi-deciduous forests
<i>Vitellaria paradoxa</i>	Shea butter tree	VU	Dry savannas and woodland

Mammals (Segniagbeto, 2015)

Family	Latin name	Habitat	IUCN Status
Bovidae	<i>Tragelaphus scriptus</i>	Forests, gallery forests, wooded savannas	LC
Bovidae	<i>Sylvicapra grimmia</i>	Forests, gallery forests, wooded savannas	LC
Bovidae	<i>Cephalophus rufilatus</i>	Savannas and woodland	LC
Bovidae	<i>Cephalophus maxwelli</i>	Forests and savannas	LC
Suidae	<i>Potamochoerus porcus</i>	Forests	LC
Mustelidae	<i>Aonyx capensis</i>	Forests, gallery forests, wooded savannas	LC
Manidae	<i>Manis tricuspis</i>	Forests and savannas	VU
Cercopithecidae	<i>Cercopithecus petaurista</i>	Undisturbed forests	LC
Galagonidae	<i>Galago senegalensis</i>	Woodlands, wooded savannas	LC
Galagonidae	<i>Galagoides demidoff</i>	Forests	LC
Anomaluridae	<i>Anomalurus beecrofti</i>	Forests and palm plantations	LC
Pteropodidae	<i>Eidolon helvum</i>	Forests, gallery forests, woodlands, savannas, fallows	NT

Birds (Segniagbeto, 2015)

Family	Latin name	Habitat	IUCN Status
Pycnonotidae	<i>Andropadus montanus</i>	Mountain forests	NT
Bucerotidae	<i>Ceratogymna elata</i>	Forests	VU
Accipitridae	<i>Circus macrourus</i>	Forests, savannas	NT

Coraciidae	<i>Coracias garrulus</i>	Forests, savannas	NT
Glareolidae	<i>Glareola nordmanni</i>	Forests, savannas	NT
Accipitridae	<i>Necrosyrtes monachus</i>	Forests, savannas	EN
Timaliidae	<i>Picathartes gymnocephalus</i>	Undisturbed forests	VU

Reptiles (Segniagbeto, 2015)

Family	Latin name	Habitat	UICN Status	CITES Category
Testudinidae	<i>Kinixys belliana nogoeyi</i>	Forests	VU	II
Testudinidae	<i>Kinixys erosa</i>	Forests	EN	II
Testudinidae	<i>Kinixys homeana</i>	Forests	CR	II
Trionychidae	<i>Trionyx triunguis</i>	Rivers and waterpoints	VU	III
Crocodylidae	<i>Osteolaemus tetraspis</i>	Rivers and waterpoints	VU	I
Crocodylidae	<i>Crocodylus niloticus</i>	Rivers and waterpoints	LC	I
Calabariidae	<i>Calabaria reinhardtii</i>	Forests	VU	II
Viperidae	<i>Bitis gabonica</i>	Forests	VU	N
Viperidae	<i>Bitis nasicornis</i>	Forests	VU	N
Chamaeleonidae	<i>Chamaeleo necasi</i>	Forests	VU	N
Pelomedusidae	<i>Pelomedusa subrufa olivacea</i>	Rivers and waterpoints	LC	N
Pelomedusidae	<i>Pelusios castaneus</i>	Rivers and waterpoints	LC	N
Crocodylidae	<i>Crocodylus niloticus</i>	Rivers and waterpoints	LC	N
Pythonidae	<i>Python regius</i>	Various habitats	LC	N
Pythonidae	<i>Python sebae</i>	Various habitats	LC	N
Elapidae	<i>Dendroaspis jamesoni</i>	Rivers and waterpoints	LC	N
Elapidae	<i>Dendroaspis viridis</i>	Various habitats	LC	N
Elapidae	<i>Naja melanoleuca</i>	Various habitats	LC	N
Elapidae	<i>Naja nigricollis</i>	Various habitats	LC	N
Chamaeleonidae	<i>Chamaeleo gracilis</i>	Various habitats	LC	II
Chamaeleonidae	<i>Chamaeleo senegalensis</i>	Savannas	LC	II
Scincidae	<i>Mochlus fernandi</i>	Forests	LC	II
Varanidae	<i>Varanus exanthematicus</i>	Various habitats	LC	II
Varanidae	<i>Varanus niloticus</i>	Various habitats	LC	II
Varanidae	<i>Varanus ornatus</i>	Various habitats	LC	II
Atractaspididae	<i>Amblyodipsas unicolor</i>	Various habitats	LC	N
Colubridae	<i>Hapsidophrys lineatus</i>	Forests	LC	N
Colubridae	<i>Philothamnus nitidus</i>	Forests	LC	N
Colubridae	<i>Thrasops occidentalis</i>	Forests	LC	N
Lacertidae	<i>Gastropholis echinata</i>	Forests	LC	N
Lacertidae	<i>Holaspis guntheri</i>	Forests	LC	N
Scincidae	<i>Cophoscincopus simulans</i>	Forests	LC	N
Scincidae	<i>Mochlus guineensis</i>	Forests	LC	N
Scincidae	<i>Trachylepis polytropis</i>	Forests	LC	N

Amphibians (Segniabeto, 2015)

Family	Latin name	Habitat	UICN Status
Brevicipitidae	<i>Hyperolius baumanni</i>	Forests	LC
Brevicipitidae	<i>Hyperolius guttulatus</i>	Forests	LC
Brevicipitidae	<i>Hyperolius sylvaticus</i>	Forests	LC
Brevicipitidae	<i>Hyperolius torrentis</i>	Forests	EN
Brevicipitidae	<i>Leptopelis viridis</i>	Various habitats	LC
Brevicipitidae	<i>Leptopelis spiritusnoctis</i>	Various habitats	LC
Pipidae	<i>Silurana tropicalis</i>	Various habitats	LC
Ranidae	<i>Aubria subsigillata</i>	Forests	LC
Ranidae	<i>Conraua derooi</i>	Forests	CR
Ranidae	<i>Phrynobatrachus calcaratus</i>	Forests	LC
Ranidae	<i>Phrynobatrachus gutturosus</i>	Forests	LC
Ranidae	<i>Phrynobatrachus plicatus</i>	Forests	LC
Ranidae	<i>Amnirana albolabris</i>	Forests	LC
Ranidae	<i>Ptychadena arnei</i>	Various habitats	LC
Ranidae	<i>Ptychadena aequiplicata</i>	Forests	LC
Caeciliidae	<i>Geotrypetes seraphini</i>	Forests	LC

Annex V – Team expertise and Curriculum

Team Leaders

Rémi DUVAL (Forests & People) – HCV assessment Team Leader: Rémi Duval has a background in quality and environmental management and has specialized in sustainable management of natural resources with more than 8 years of experience in this sector. In particular, he delivers consultancy services in the field of ESIA and HCV assessments with expertise in West and Central Africa, for timber, oil palm and agricultural sectors. He is accredited as HCV Team Leader by the RSPO since 2010. He holds a MSc in Tropical forestry and a MSc in Quality Management.

Joël AGBEMÉLO (JAT Consulting) – ESIA Coordinator: Mr. Agbemolo is an expert in the environment field. He created JAT Consulting in 2008, where he is CEO. He supervises the environmental studies and ensures the management of JAT Staff. He is the main interlocutor of ANGE (*Agence nationale de Gestion Environnementale*) with which he works in close cooperation. He gained a broad experience in Togo, in various sectors such as mining, agriculture, oil, forest. JAT Consulting is accredited by ANGE to undertake Environmental and Social Impact Assessments in Togo. He holds a MSc in Environment Law and Politics.

Social Experts

Martin SEMEGLO (JAT Consulting) – Expert Sociologist: Martin Semeglo is a sociologist specialized in Environmental and Social Impact Assessments. He is working with JAT since 2009, for which he has coordinated several ESIA in all regions of Togo, which gives him a very solid knowledge of the social and anthropological questions in the country. For this study, he will be in charge of developing the methodology, leading the participatory workshop with the local communities. He will draft the social part of the report, identify the impacts on the local communities and propose mitigation and management measures. He holds a MSc in Sociology and Environmental Impact Assessment.

Kofi SEMEGNON (JAT Consulting) – Sociologist assistant: Mr Semegnon is a sociologist specialized in community capacity building and participatory rural appraisal. He will assist the expert sociologist for the FPIC process and the data collection. He has participated to several ESIA with JAT. Mr Semegnon holds a MSc in Sociology.

Biodiversity/Ecology experts

Wouyo ATAKPAMA (JAT Consulting) – Expert Botanist: Wouyo Atakpama is consultant for JAT and also teach in Lomé university. His competencies cover preparing botanical inventories, analysis and interpretation of vegetation structure and dynamic. He also has robust expertise in social sensitization for vegetation conservation and sustainable management, ecological monitoring, GIS and cartography, ecological modeling.

For this assessment, he will coordinate the field inventory team in charge of identifying the botanical species present in the project area, enlightening rare, endemic and threatened species as well as those with etho-botanical or pharmaceutical interest for local

communities. Mr Atakpama holds a MSc in Vegetal Biology and prepare a PhD in the same area of expertise.

Dabitora KOUMANDIGA (JAT Consulting) – Botanist assistant:

Mr Koumandinga is consultant for JAT. His competencies cover preparing botanical inventories, analysis and interpretation of vegetation structure and dynamic. He holds a MSc in Vegetal Biology and prepare a PhD in the same area of expertise.

For this assessment, he will assist the Expert for identifying the botanical species present in the project area.

Dr Gabriel SEGNIAGBETO (University of Lomé) – Herpetologist: Dr Segniagbeto has wide experience in fauna studies. His domain expertise ranges from herpetology to mammals and also ichthyology and ornithology. In particular, he is a member of the group of herpetology specialists for IUCN in Africa and a recognized specialist of Protected Areas management for Togo and West Africa. He holds a PhD in Zoology from the Museum of Natural History of Paris.

For this assessment, he will lead the fauna team and proceed to an evaluation of the potential environmental HCVs in the proposed assessment areas.

Dédé OKAGNY (University of Lomé) – Ichthyologist: Dédé Okagny is a biologist specialist of Ichthyology for Togo. He has a wide experience in halieutic resources and fisheries management and is specialized in conservation of tropical wetlands. He holds an MSc in Natural Resources and Biodiversity Management.

He will assist Dr Segniagbeto for all the questions related to his domain of expertise.

Delagnon ASSOU (University of Lomé) – Ornithologist: Mr Assou is a biologist specialist of Ornithology for Togo. He holds an MSc in Natural Resources and Biodiversity Management and in Natural Science.

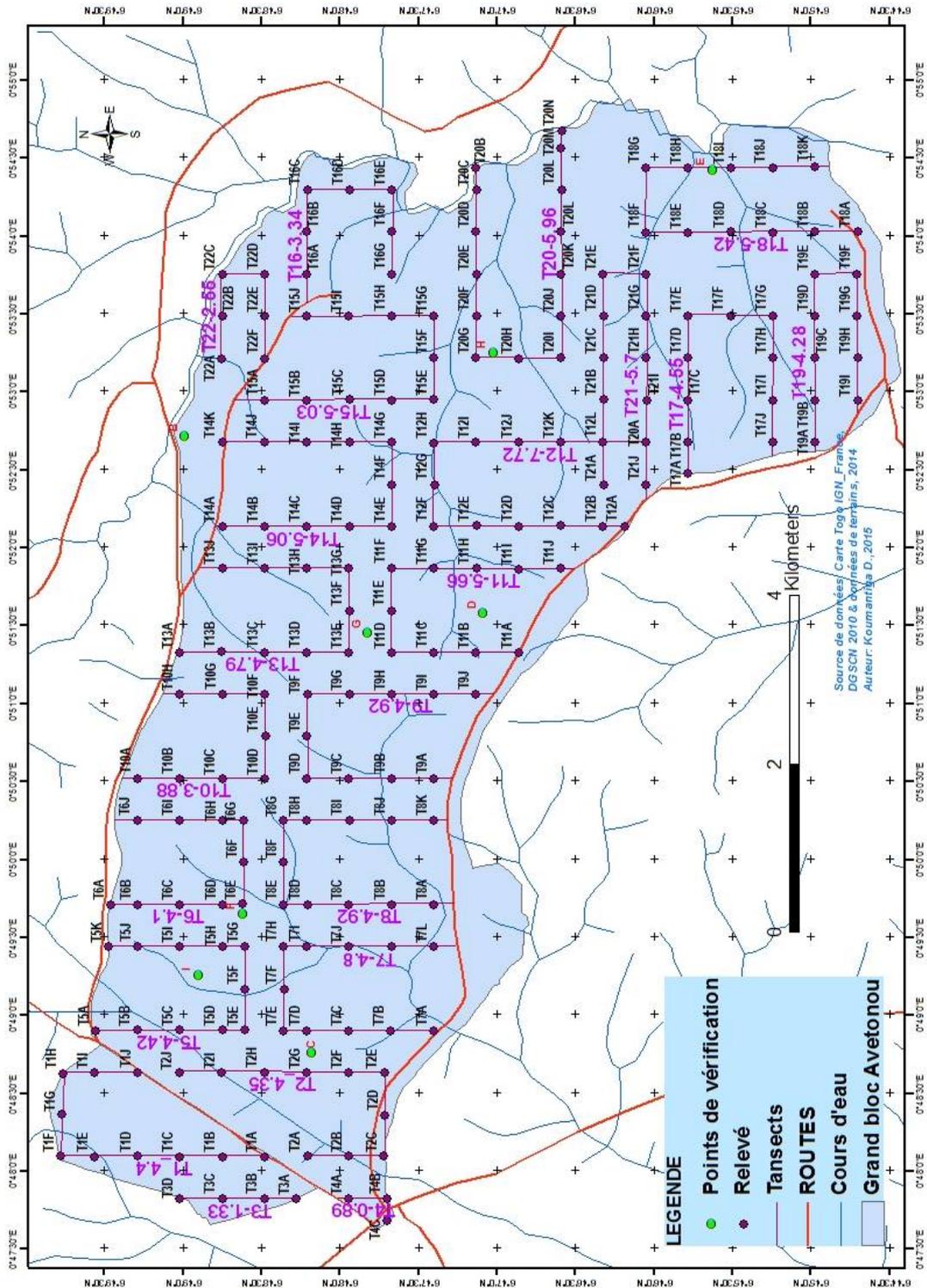
He will assist Dr Segniagbeto for all the questions related to his domain of expertise.

GIS Expert

Kokou DJONGON (GIS AT CONSULT) – Gis expert: Mr Djongon has a Master Degree in Environment, Land Planning, GIS and Remote sensing analysis. He has in-depth expertise in West Africa and Maghreb where his expertise has been used successfully on projects in the mining and oil, forestry, agriculture, hydrology and urban development sectors. Additionally, MR Djongon teach GIS and Geography at Lomé University.

Annex VI – Botanical inventory references

Botanical inventory: sampling plan



Botanical inventory: plot's GPS coordinates

ID	Latitude	Longitude	ID	Latitude	Longitude	ID	Latitude	Longitude
T1A	6,80798864	0,80152681	T9A	6,78994793	0,84195764	T16A	6,80346484	0,89589447
T1B	6,81243614	0,80152681	T9B	6,79443903	0,84193583	T16B	6,80346484	0,90049458
T1C	6,81694904	0,80152681	T9C	6,79899554	0,84193583	T16C	6,80339943	0,90498568
T1D	6,82144015	0,80154862	T9D	6,80344304	0,84197944	T16D	6,79890833	0,90496388
T1E	6,82597485	0,80152681	T9E	6,80346484	0,84649234	T16E	6,79439543	0,90496388
T1F	6,8295939	0,80157042	T9F	6,80339943	0,85102705	T16F	6,79443903	0,90045097
T1G	6,82944129	0,80599611	T9G	6,79895193	0,85096164	T16G	6,79443903	0,89591627
T1H	6,82931048	0,81044361	T9H	6,79446083	0,85093984	T17A	6,76302312	0,87457263
T1I	6,82595305	0,81048722	T9I	6,78994793	0,85098344	T17B	6,76295771	0,87799546
T1J	6,82144015	0,81053082	T9J	6,78550043	0,85096164	T17C	6,76300131	0,88244296
T2A	6,80341033	0,80154862	T10A	6,82140744	0,84197944	T17D	6,76295771	0,88695586
T2B	6,79902824	0,80154862	T10B	6,81695995	0,84197944	T17E	6,76295771	0,89146877
T2C	6,79532199	0,80154862	T10C	6,81242524	0,84193583	T17F	6,75848841	0,89146877
T2D	6,79514758	0,80597431	T10D	6,80789054	0,84189223	T17G	6,75397551	0,89144697
T2E	6,79521298	0,81046542	T10E	6,80786873	0,84649234	T17H	6,7539319	0,88697767
T2F	6,79896283	0,81050902	T10F	6,80793414	0,85098344	T17I	6,75397551	0,88244296
T2G	6,80345394	0,81048722	T10G	6,81240344	0,85100524	T17J	6,75397551	0,87797366
T2H	6,80797774	0,81054172	T10H	6,81691634	0,85098344	T18A	6,7449933	0,90047277
T2I	6,81245794	0,81050902	T11A	6,78096572	0,85545274	T18B	6,74950621	0,90047277
T2J	6,81700355	0,81049812	T11B	6,78547863	0,85543094	T18C	6,75397551	0,90040737
T3A	6,80460941	0,79699211	T11C	6,78996973	0,85549635	T18D	6,75844481	0,90045097
T3B	6,80796684	0,79701391	T11D	6,79441723	0,85545274	T18E	6,76295771	0,90040737
T3C	6,81243614	0,79701391	T11E	6,79448263	0,85992204	T18F	6,76747061	0,90040737
T3D	6,81690544	0,79703571	T11F	6,79441723	0,86447855	T18G	6,76740521	0,90729663
T4A	6,7989741	0,79700473	T11G	6,78996973	0,86443495	T18H	6,76297951	0,90725303
T4B	6,7949521	0,79701985	T11H	6,78545683	0,86443495	T18I	6,75842301	0,90727483
T4C	6,79493698	0,79466109	T11I	6,78094392	0,86439135	T18J	6,75399731	0,90734024
T5A	6,82585494	0,81498922	T11J	6,77647462	0,86441315	T18K	6,7494844	0,90747104
T5B	6,82145105	0,81503282	T12A	6,76973797	0,86894785	T19A	6,7494626	0,87793006
T5C	6,81693814	0,81505462	T12B	6,77198352	0,86894785	T19B	6,74950621	0,88246476
T5D	6,81244704	0,81503282	T12C	6,77645282	0,86899145	T19C	6,74950621	0,88693406
T5E	6,81002708	0,81505462	T12D	6,78096572	0,86894785	T19D	6,7494844	0,89146877
T5F	6,81000528	0,81948032	T12E	6,78543502	0,86899145	T19E	6,7494626	0,89593807
T5G	6,81004888	0,82399323	T12F	6,78994793	0,86892605	T19F	6,7450151	0,89595987
T5H	6,81240344	0,82399323	T12G	6,78990432	0,87341715	T19G	6,7450151	0,89140336
T5I	6,81693814	0,82399323	T12H	6,78996973	0,87788645	T19H	6,7449933	0,88695586
T5J	6,82140744	0,82403683	T12I	6,78547863	0,87793006	T19I	6,7449933	0,88244296
T5K	6,82452505	0,82397142	T12J	6,78094392	0,87793006	T20A	6,76744881	0,87793006
T6A	6,82426344	0,82848433	T12K	6,77645282	0,87795186	T20B	6,78547863	0,90723123
T6B	6,82140744	0,82846253	T12L	6,77200532	0,87797366	T20C	6,78545683	0,90494207
T6C	6,81695995	0,82850613	T13A	6,81695995	0,85545274	T20D	6,78550043	0,90045097
T6D	6,81240344	0,82850613	T13B	6,81246884	0,85553995	T20E	6,78543502	0,89593807
T6E	6,81022329	0,82852793	T13C	6,80791234	0,85549635	T20F	6,78545683	0,89142516
T6F	6,81017969	0,83301903	T13D	6,80346484	0,85549635	T20G	6,78550043	0,88693406

ID	Latitude	Longitude	ID	Latitude	Longitude	ID	Latitude	Longitude
T6G	6,81020149	0,83746653	T13E	6,79897373	0,85547454	T20H	6,78096572	0,88691226
T6H	6,81240344	0,83746653	T13F	6,79893013	0,85994385	T20I	6,77645282	0,88693406
T6I	6,81695995	0,83751014	T13G	6,79897373	0,86447855	T20J	6,77645282	0,89142516
T6J	6,82145105	0,83748833	T13H	6,80346484	0,86450035	T20K	6,77647462	0,89593807
T7A	6,78999153	0,81496742	T13I	6,80791234	0,86450035	T20L	6,77647462	0,90047277
T7B	6,79450443	0,81496742	T13J	6,81242524	0,86443495	T20M	6,77640922	0,90496388
T7C	6,79901734	0,81496742	T14A	6,81242524	0,86888245	T20N	6,77647462	0,90941138
T7D	6,80348664	0,81496742	T14B	6,80793414	0,86892605	T20O	6,77643102	0,9113081
T7E	6,8059284	0,81501102	T14C	6,80344304	0,86894785	T21A	6,77196172	0,87339535
T7F	6,8058848	0,81948032	T14D	6,79895193	0,86892605	T21B	6,77193992	0,88250836
T7H	6,8059284	0,82401503	T14E	6,79441723	0,86892605	T21C	6,77193992	0,88697767
T7I	6,80348664	0,82403683	T14F	6,79443903	0,87341715	T21D	6,77193992	0,89146877
T7J	6,79897373	0,82397142	T14G	6,79446083	0,87793006	T21E	6,77198352	0,89591627
T7K	6,79446083	0,82399323	T14H	6,79895193	0,87797366	T21F	6,76747061	0,89591627
T7L	6,78996973	0,82401503	T14I	6,80346484	0,87793006	T21G	6,76742701	0,89146877
T8A	6,78999153	0,82846253	T14J	6,80795594	0,87795186	T21H	6,76740521	0,88695586
T8B	6,79441723	0,82850613	T14K	6,81242524	0,87795186	T21I	6,76738341	0,88246476
T8C	6,79897373	0,82850613	T15A	6,80793414	0,88244296	T21J	6,76747061	0,87343895
T8D	6,80339943	0,82850613	T15B	6,80348664	0,88242116	T22A	6,8124614	0,88692512
T8E	6,80597201	0,82850613	T15C	6,79890833	0,88250836	T22B	6,81244628	0,89144609
T8F	6,8059502	0,83299723	T15D	6,79441723	0,88244296	T22C	6,81241604	0,89590657
T8G	6,8059284	0,83748833	T15E	6,78996973	0,88250836	T22D	6,80792531	0,89593682
T8H	6,80344304	0,83746653	T15F	6,78992613	0,88693406	T22E	6,80792531	0,89144609
T8I	6,79895193	0,83751014	T15G	6,78999153	0,89140336	T22F	6,80794043	0,88691
T8J	6,79443903	0,83748833	T15H	6,79441723	0,89149057			
T8K	6,78996973	0,83748833	T15I	6,79897373	0,89144697			
			T15J	6,80342123	0,89142516			

Annex VII – Botanical species inventoried

Atakpama, 2015

Latin name	Family	Latin name	Family
<i>Abelmoschus esculentus</i>	Malvaceae	<i>Jartropha curcas</i>	Euphorbiaceae
<i>Abutilon mauritianum</i>	Malvaceae	<i>Jartropha gossipifolia</i>	Euphorbiaceae
<i>Acacia ataxacantha</i>	Mimosaceae	<i>Kigelia africana</i>	Bignoniaceae
<i>Acacia auriculiformis</i>	Mimosaceae	<i>Lannea acida</i>	Acanacardiaceae
<i>Acacia dudgeoni</i>	Mimosaceae	<i>Lannea barteri</i>	Acanacardiaceae
<i>Acacia polyacantha</i>	Mimosaceae	<i>Lannea microcarpa</i>	Acanacardiaceae
<i>Acanthospermum hispidum</i>	Zingiberaceae	<i>Launaea taraxacifolia</i>	Asteraceae
<i>Achyranthes aspera</i>	Amaranthaceae	<i>Leersia hexandra</i>	Poaceae
<i>Adansonia digitata</i>	Bombacaceae	<i>Leptadenia hastata</i>	Apocynaceae
<i>Azalia africana</i>	Fabaceae	<i>Leucaena leucocephala</i>	
<i>Ageratum Conizoides</i>	Asteraceae	<i>Lippia multiflora</i>	Verbenaceae
<i>Albizia lebbeck</i>	Fabaceae	<i>Lonchocarpus sericeus</i>	Fabaceae
<i>Allophylus cobe</i>	Sapindaceae	<i>Ludwigia erecta</i>	Onagraceae
<i>Allophylus africanus</i>	Sapindaceae	<i>Macrosphyra longistyla</i>	Rubiaceae
<i>Alstonia boonei</i>	Apocynaceae	<i>Mallotus oppositifolius</i>	Lythaceae
<i>Ananas comosus</i>	Bromeliaceae	<i>Manguifera indica</i>	Anacardiaceae
<i>Anchomanes dalzielii</i>	Araceae	<i>Manihot esculenta</i>	Euphorbiaceae
<i>Andropogon gayanus</i>	Poaceae	<i>Maranthes polyandra</i>	Chrysobalanaceae
<i>Andropogon tectorum</i>	Poaceae	<i>Mariscus alternifolius</i>	
<i>Annona senegalensis</i>	Annonaceae	<i>Maytenus senegalensis</i>	Celastraceae
<i>Anogeissus leiocarpa</i>	Combretaceae	<i>Mezoneuron benthiom</i>	
<i>Anthocleista djalonensis</i>	Gentianaceae	<i>Milicia exelsa</i>	Moraceae
<i>Antiaris africana</i>	Moraceae	<i>Milletia thonningii</i>	Fabaceae
<i>Artocarpus altilis</i>	Moraceae	<i>Mimosa invisa</i>	Mimosaceae
<i>Asparagus africanus</i>	Asparagaceae	<i>Mnesithea granularis</i>	Mimosaceae
<i>Aspilia africana</i>	Asteraceae	<i>Momordica charantia</i>	Cucurbitaceae
<i>Azadirachta indica</i>	Meliaceae	<i>Monotes kerstingii</i>	Dipterocarpaceae
<i>Bambusa vulgaris</i>	Poaceae	<i>Morinda lucida</i>	Rubiaceae
<i>Bidens pilosa</i>	Asteraceae	<i>Mucuna poggei</i>	Fabaceae
<i>Blighia sapida</i>	Sapindaceae	<i>Musa sapientum</i>	Orchidaceae
<i>Asystasia gangetica</i>		<i>Nephrolepis undulata</i>	Davalliaceae
<i>Blumea viscosa</i>	Asteraceae	<i>Newbouldia laevis</i>	Bignoniaceae
<i>Boerhavia erecta</i>	Nyctagynaceae	<i>Ochna schweinfurthiana</i>	Ochnaceae
<i>Bombax costatum</i>	Bombacaceae	<i>Ocimum canum</i>	Ochnaceae
<i>Borassus aethiopicum</i>	Arecaceae	<i>Oryza sativa</i>	Poaceae
<i>Bridelia ferruginea</i>	Euphorbiaceae	<i>Oxythenanthera abyssinica</i>	Poaceae
<i>Cajanus cajan</i>	Fabaceae	<i>Palisota hirsuta</i>	Commelinaceae
<i>Calopogonium mucunoides</i>	Caesalpiniaceae	<i>Panicum maximum</i>	Poaceae
<i>Capsicum frutescens</i>		<i>Parinari curatelifolia</i>	Chrysobalanaceae
<i>Carica papaya</i>	Capparaceae	<i>Parkia biglobosa</i>	Mimosaceae

<i>Cassia alata</i>	Caesalpiaceae	<i>Paspalum scrobiculatum</i>	Poaceae
<i>Cassia momosoides</i>	Caesalpiaceae	<i>Paullinia pinnata</i>	Sapindaceae
<i>Cassia occidentalis</i>	Caesalpiaceae	<i>Pennisetum polystachion</i>	Poaceae
<i>Ceiba pentadra</i>	Bombacaceae	<i>Pennisetum pedicellatum</i>	Poaceae
<i>Chassalia kolly</i>	Rubiaceae	<i>Pennisetum purpureum</i>	Poaceae
<i>Chromolaena odorata</i>	Asteraceae	<i>Pericopsis laxiflora</i>	Fabaceae
<i>Cissampelos mucronata</i>	Menispermaceae	<i>Persea americana</i>	Lauraceae
<i>Cleome ruidospera</i>	Chrysobalanaceae	<i>Phoenix reclinata</i>	Arecaceae
<i>Cochlospermum planchoni</i>	Cochlospermaceae	<i>Phyllanthus amarius</i>	Euphorbiaceae
<i>Cocos nucifera</i>	Arecaceae	<i>Physalis amarius</i>	Solanaceae
<i>Cola gigantea</i>	Sterculiaceae	<i>Physalis angulata</i>	Solanaceae
<i>Combretum acutum</i>	Combretaceae	<i>Piliostigma thonningii</i>	Caesalpiaceae
<i>Combretum colinum</i>	Combretaceae	<i>Piper lapocea</i>	Piperaceae
<i>Combretum glutinosum</i>	Combretaceae	<i>Pouteria alnifolia</i>	Sapotaceae
<i>Commelina benghalensis</i>	Commelinaceae	<i>Premna quadrifolia</i>	Lamiaceae
<i>Commelina erecta</i>	Commelinaceae	<i>Pseudocedrela kotschy</i>	Meliaceae
<i>Corchoris olitorius</i>	Convolvulaceae	<i>Psidium guajava</i>	Myrtaceae
<i>Crescentia cujete</i>	Crassulaceae	<i>Pteleopsis suberosa</i>	Combretaceae
<i>Crossopterix februfuga</i>	Rubiaceae	<i>Pterocarpus erinaceus</i>	Fabaceae
<i>Crotalaria retusa</i>	Fabaceae	<i>Pterocarpus santalinoides</i>	Fabaceae
<i>Croton lobatus</i>	Euphorbiaceae	<i>Pycreus lanceolatus</i>	Poaceae
<i>Cursonia arborea</i>	Araliaceae	<i>Rauvolfia vomitoria</i>	Apocynaceae
<i>Cymbopogon schoenanthus</i>	Cycadaceae	<i>Ritchiea reflexa</i>	Caricaceae
<i>Cyperus rotundus</i>	Cyperaceae	<i>Rottboellia Cochinchinensis</i>	Poaceae
<i>Cyperus sp</i>	Cyperaceae	<i>Rourea coccinea</i>	Connaraceae
<i>Cyperus tenuiculmis</i>	Cyperaceae	<i>Rynchelitrum repens</i>	
<i>Daniellia oliveri</i>	Fabaceae	<i>Sarcocephalus latifolius</i>	Rubiaceae
<i>Delonix regia</i>	Caesalpiaceae	<i>Schrenkia leptocarpa</i>	Mimosaceae
<i>Desmodium tortuosum</i>	Fabaceae	<i>Securnega virosa</i>	Euphorbiaceae
<i>Desmodium velutenum</i>	Fabaceae	<i>Senna siamea</i>	Caesalpiaceae
<i>Dichrostachys cinerea</i>	Dichapetalaceae	<i>Setaria barbata</i>	Poaceae
<i>Digitaria horizontalis</i>	Dichapetalaceae	<i>Sida acuta</i>	Malvaceae
<i>Dioscorea sp</i>	Dioscoreaceae	<i>Sida linifolia</i>	Malvaceae
<i>Dioscorea togoensis</i>	Dioscoreaceae	<i>Sida rombifolia</i>	Malvaceae
<i>Dracena arborea</i>	Agavaceae	<i>Solanum melongena</i>	Solanaceae
<i>Eclipta prostrata</i>	Ebenaceae	<i>Solanum torvum</i>	Solanaceae
<i>Ehretia cymosa</i>	Ebenaceae	<i>Sorghum arundinaceum</i>	Poaceae
<i>Elaeis guineensis</i>	Arecaceae	<i>Sorghum bicolor</i>	Poaceae
<i>Emilia sonchifolia</i>	Asteraceae	<i>Spathodea campanulata</i>	Solanaceae
<i>Entada abyssinica</i>	Mimosaceae	<i>Spermacoceae radiata</i>	Rubiaceae
<i>Entada africana</i>	Mimosaceae	<i>Spigelia anthelmia</i>	Loganiaceae
<i>Eriosema griseum</i>	Fabaceae	<i>Spondias mombin</i>	Anacardiaceae
<i>Erythrina senegalensis</i>	Fabaceae	<i>Sporobolus pyramidalis</i>	Poaceae
<i>Erythrophleum suaveolens</i>	Eriospermaceae	<i>Stachytarpheta indica</i>	Verbenaceae
<i>Eucalyptus citriodora</i>	Myrtaceae	<i>Sterculia Setigera</i>	Sterculiaceae
<i>Eleusine indica</i>	Poaceae	<i>Sterculia tragacantha</i>	Sterculiaceae

<i>Euphorbia heterophylla</i>	Euphorbiaceae	<i>Stereospermum kunthianum</i>	Bignoniaceae
<i>Euphorbia hirta</i>	Euphorbiaceae	<i>Strychnos spinosa</i>	Loganiaceae
<i>Euphorbia hyssopifolia</i>	Euphorbiaceae	<i>Stylosanthes erecta</i>	Papilionaceae
<i>Ficus asperifolia</i>	Moraceae	<i>Synedrella nodiflora</i>	Asteraceae
<i>Ficus capraifolia</i>	Moraceae	<i>Tapinanthus sp</i>	Loranthaceae
<i>Ficus capensis</i>	Moraceae	<i>Tectona grandis</i>	Verbenaceae
<i>Ficus exasperata</i>	Moraceae	<i>Terminalia laxiflora</i>	Combretaceae
<i>Ficus sp</i>	Moraceae	<i>Theobroma cacao</i>	Sterculiaceae
<i>Ficus sur</i>	Moraceae	<i>Thevetia peruviana</i>	Apocynaceae
<i>Ficus sycomorus</i>	Moraceae	<i>Tiliacora funifera</i>	Tiliaceae
<i>Ficus vallischooudea</i>	Moraceae	<i>Triclisia subcordata</i>	Menispermaceae
<i>Fimbristylis ferruginea</i>	Euphorbiaceae	<i>Tridax procumbens</i>	Asteraceae
<i>Flueggea virosa</i>	Euphorbiaceae	<i>Uapaca togoensis</i>	Phyllanthaceae
<i>Gardenia ternifolia</i>	Rubiaceae	<i>Urena lobata</i>	Malvaceae
<i>Gliricidia sepium</i>	Gesneriaceae	<i>Uvaria chamae</i>	Fabaceae
<i>Gmelina arborea</i>	Verbenaceae	<i>Vernonia amygdalina</i>	Asteraceae
<i>Gomphrena celosioides</i>	Amaranthaceae	<i>Vernonia cinerea</i>	Asteraceae
<i>Gomphrena globosa</i>	Amaranthaceae	<i>Vernonia colorata</i>	Asteraceae
<i>Gossypium hirsutum</i>	Malvaceae	<i>Vernonia glamensis</i>	Asteraceae
<i>Grewia flavescens</i>	Tiliaceae	<i>Vigna sp</i>	Fabaceae
<i>Gymnosporia senegalensis</i>	Celastraceae	<i>Vitellaria paradoxa</i>	Sapotaceae
<i>Hibiscus asper</i>	Malvaceae	<i>Vitex doniana</i>	Verbenaceae
<i>Hibiscus sabdariffa</i>	Malvaceae	<i>waltheria indica</i>	Malvaceae
<i>Holarrhena floribunda</i>	Apocynaceae	<i>Xanthosoma mafaffa</i>	Araceae
<i>Hygrophila auriculata</i>	Acanthaceae	<i>Xanthozilum xanthoziloides</i>	Rubiaceae
<i>Hymenocardia acida</i>	Euphorbiaceae	<i>Zea mays</i>	Poaceae
<i>Hyptis suaveolens</i>	Lamiaceae		
<i>Imperata cylindrica</i>	Poaceae		
<i>Indigofera hirsuta</i>	Fabaceae		
<i>Ipomoea obscura</i>	Convolvulaceae		
<i>Ipomoea eriocarpa</i>	Convolvulaceae		
<i>Ipomoea involucrata</i>	Convolvulaceae		

Annex VIII – Stakeholders consultation evidences

Togo	RENCONTRE AVEC LES PARTIES PRENANTES	Janvier 2015
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Évaluation des Hautes Valeurs pour la Conservation Plantation de palmier à huile Kalyan – Région des Plateaux

NOM	ORGANISATION	MAIL	DATE	SIGNATURE
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Togo	RENCONTRE AVEC LES PARTIES PRENANTES	Janvier 2015
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**Évaluation des Hautes Valeurs pour la Conservation
Plantation de palmier à huile Kalyan – Région des Plateaux**

NOM	ORGANISATION	MAIL	DATE	SIGNATURE
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SEANCE DE TRAVAIL AVEC UNE EQUIPE DE L'AGRICULTURE

Date : jeudi 15 janvier 2015
 Lieu : ANGE

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Annex IX – Land Use Change (LUC) analysis

LANDSAT images from 2000 and 2013 have been used to determine changes in vegetation cover since 2000. This Land Use Change (LUC) analysis has shown no evidences of clearance of primary forests since 2005 and furthermore 2000, as the area is dedicated to industrial and small-scale agriculture since the 70's (see paragraph III.1.1 – Site History).

Land Use category	Area in 2000 (ha)	Area in 2013 (ha)	Difference
Constructions / bare land	34.7	274.4	+ 239.7
Crops / Fallows / Degraded savannas	2894.4	5925.8	+ 3,031.4
Wooded savannas / Young plantations	3767.2	799.3	- 2,967.9
Secondary forests	555.9	252.8	- 303.1
TOTAL	7252.2	7252.3	+0.1

The changes in land cover can be explained as follow :

- **Constructions / Bare lands** : while their has been a growth of population since 2000 and therefore of the constructed areas, especially in the town of Avetonou, most of the growth can be explained by the fact that the two images have been taken at different periods of the year. The 2013 image has been taken at the end of the dry season, when fields have been plowed, showing them as “Bare land” in the analysis;
- **Crop/Fallows/degraded savannas AND Wooded savannas/Young plantations**: the analysis between those two strata can sometimes be complicated, as it exists a continuum of structures between fields made at 100% of crops, savannas, fields cultivated with shading trees, hedges, small areas of fallows, wooded savannas, woodlands. Furthermore, in 2000, a significant part of the lands were used for oil palm plantations, which have been totally cut down in the years 2006-2009 (again see paragraph III.1.1 – Site History), but the process has started since years 1999. This explains the shift between the land use categories “Wooded savannas / young plantations” and “Crop/Fallows/degraded savannas” between 2000 and 2013 to the profit of the last one.
- **Secondary forests**: in a context of growing population, degradation of secondary forests has continued, leading to the loss of around 300 ha for small-scale agriculture during 13 years.

Conclusion of Land Use Change analysis

Between 2000 and 2013 the major shift has been the destruction of industrial oil palm plantations because of the failure of SONAPH, leading people of the area to shift from salaried work to small-scale agriculture.

No primary forests have been destructed during this period, as the area has a long history of agricultural lands. The majority of ecosystems are fully or partially anthropized.

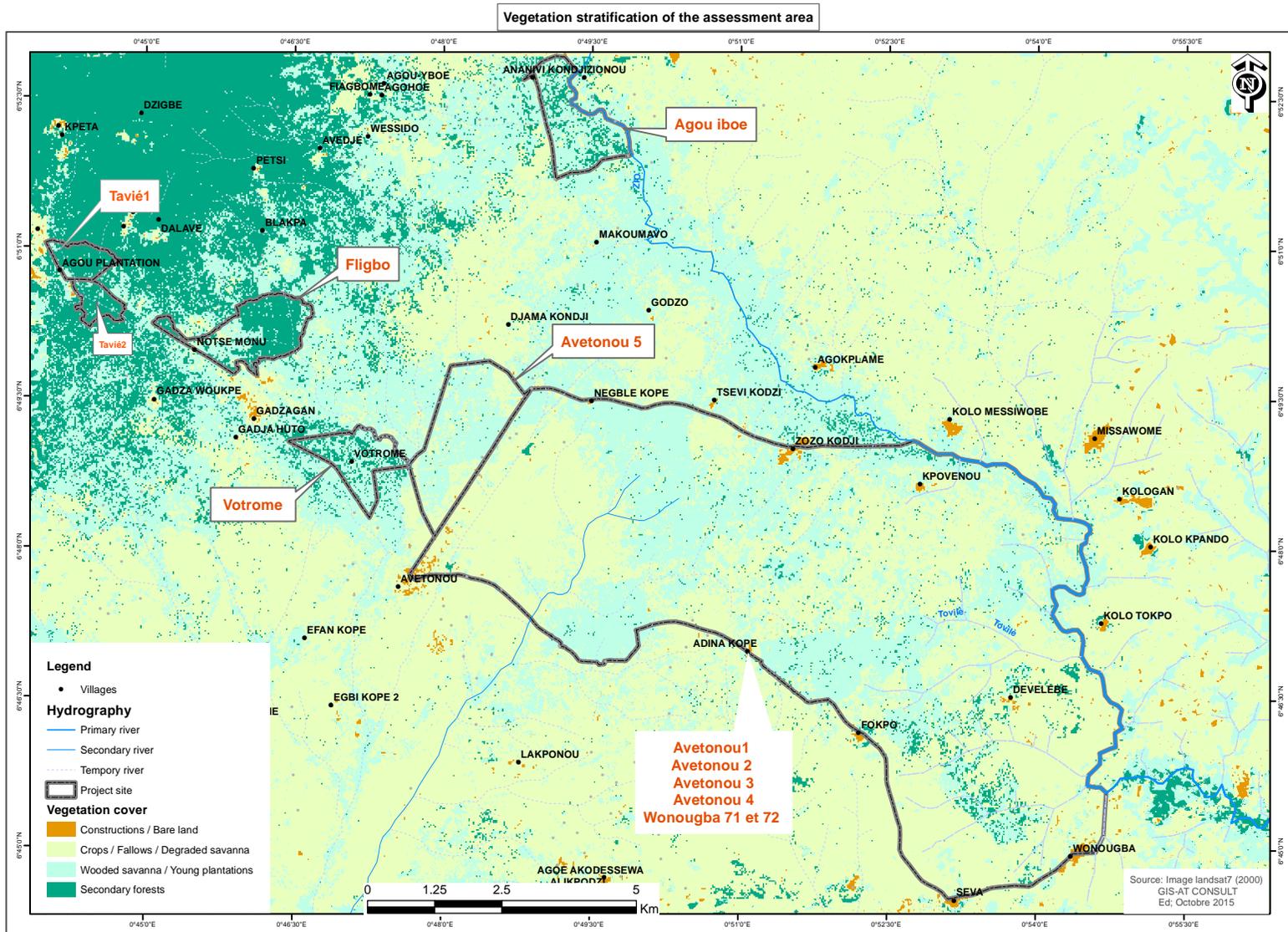


Figure 10 - Land Uses in 2000

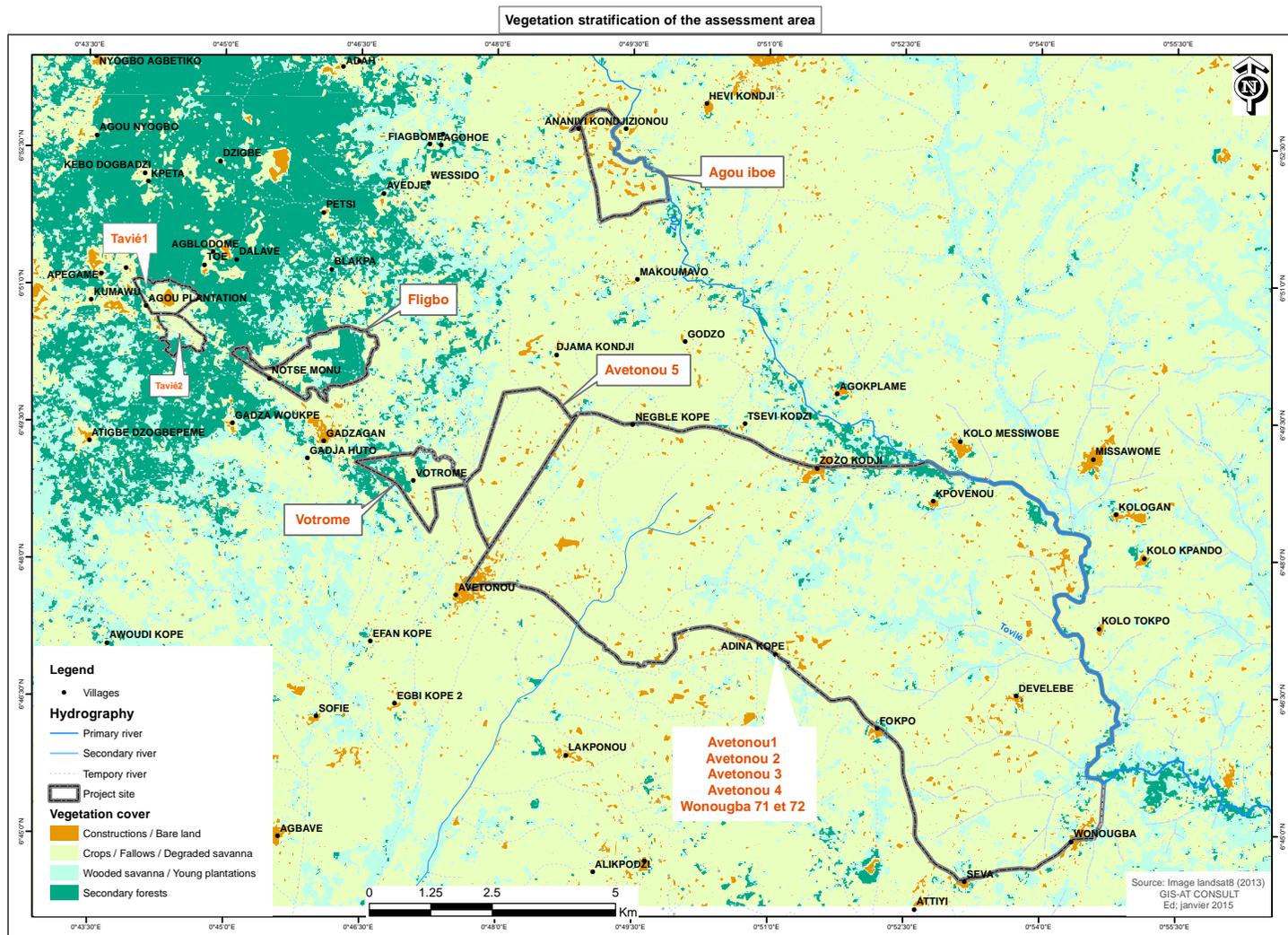


Figure 11 - Land Uses in 2013