

Background review



A historical review of oil palm plantations and forest loss in Cross River State, Nigeria

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Summary

The paper focuses on the historical review of forest loss since 1980 and the possible causes in Cross River State. Although this was considered, the paper aimed at reviewing the loss of the tropical rainforest in Cross River State to plantation especially oil palm plantations. Oil palm plantations having been the major agricultural activity which had attracted a lot of financial benefits to the eastern region, Cross River State and Nigeria at large have seriously impacted the forest ecosystem. From the statistics gathered from various sources, it was seen that there are ten forest reserves in Cross River State with a total of 280,147 ha and Oban group forest appeared to be the largest with 73,257 ha making up 26.1% of the total forest area.

Specifically speaking, oil palm plantations in Cross River State started in 1947 (Kwa falls plantations now Wilmer plantations). Therefore, the 1980s did not witness much forest loss as compared to the 1940's, 1950's, 1960's, 1970's, and then 2002-2012. However, the 1980's was the period most private owned (small scale plantations) sprang up especially among the communities where oil palm plantations were located which is observed to have high paucity if not complete lack of data is witnessed in Cross River State. In relation to the aforementioned, the area of tropical rainforest in Cross River State in 1907 was estimated at 436,747 ha (4,367.47 km²). But with the advent of oil palm plantations in the area, the total forest is seen to be reduced to about 166,747 ha (1,667 km²). Therefore, it is the Cross River National Park (CRNP) that has a reserved area of 400,000 ha (4000 km²), that is currently the saving grace to the once luxuriant and rich Cross River Rainforest ecosystem.

In spite of these, the Cross River National Park is under threat as plantations are now being established along its fringes. Therefore, oil palm plantations have posed more problems to both the environment and the people as green livelihood options are fast eroded with the replacement of oil palm plantations. Hence, data on the currency of forest cover and oil palm plantations in general alongside their impacts on green livelihood options for sustainability is lacking. Consequently, it is therefore recommended that a comprehensive study be conducted in order to ascertain the total area covered by oil palm plantations and its consequences and or implications on green livelihood of the host communities.

Introduction

The fertile and tropical Cross River State (CRS), located in south-south Nigeria along the Cameroon border, has since the colonial era been one of Nigeria's largest producers of export crops such as cocoa, rubber, and oil palm (Udo, 1965). However, this was so due to the location advantage of the state, which lie in the humid tropical region of Nigeria, West Africa. Incidentally, this area holds the largest tropical

rainforest area in Nigeria. Hence, it attracted a lot of Greenfield plantation agriculture especially oil palm plantations to the area which have actually become the major driver of deforestation viz-a viz forest loss and its associated resources.

Based on these, this paper therefore seeks to examine the forest loss in Cross River state taking into

considerations the area once covered by tropical rainforest ecosystem which was the mainstay of the rural dwelling people of forests areas in terms of livelihood sustainability (food, income, revenue, medicine/ healthcare, employment, spices, recreation, water resources, cultural value, environmental aesthetics, conducive climate, games, religion and worship, raw materials for construction and so on) options. But with the coming of oil palm plantations and the argument that "plantations are forest" which is not in any way true, livelihood sustainability options that were highly enjoyed from the forest are now farfetched. In this regard, the people of the areas occupied by plantations today such as Calaro, Ibiae, Biase, Kwa falls, Obasanjo Farms, Eyop plantation (Wilmer), Oban oil palm plantation, Ayip Eku, Borum and Nsadop oil palm plantations etc, are now becoming impoverished by day as they do not have a major source of survival, thereby leading to conflicts, loss of socio-cultural values, environmental degradation and potential land grabbing issues in the area. In so doing, this paper offers an insight into the historical drivers of forest loss in Cross River State alongside the forest status and the level in which oil palm and other plantations have impacted the forest ecosystem and its resultant effects on green livelihood sustainability options.

Effects of forest loss on livelihood

Several studies have reported the negative impacts forest loss has on livelihood mostly rural sustenance. For instance, Yaro et al. (2016) evaluated the impact of forest encroachment on rural livelihood in Akamkpa, Cross River State and reported that collector of NTFPs constituted the highest number of encroachers, while farming was the second. The study also revealed the dwindling of livelihood opportunity due to the continuous forest loss, while lack livelihood alternative was the main reason for forest encroachment. Makki (2010) noted that deforestation increases food insecurity as 1.6 billion people in the developing world depend on forests for their food, fuel, and livelihoods. The real economic value of forests is much greater than the short-term benefits of logging or clearing land for agriculture. In the longer-run, the loss of biodiversity, habitat, and natural resources will affect food production in both developed and developing countries.

Appiah (2009) had it that human beings need food, water, fuel wood and shelter as intrinsic part of their domestic and livelihood survival systems. These necessities, however, should not in any way condone unsustainable exploitation of these base resources. With the increasing encroachment of concessionaires

into farming areas many farmers have started cutting down all timber that sprout on their farms to avoid future problems of timber felling on their farms. These attitudes by farmers are ostensibly in protest against their marginalization in the sharing of timber royalties. Besides, the activities of loggers destroy cash and food crops, endangering livelihoods of off-reserve farmers. The illegal felling of timber by chainsaw operators has become a major problem in recent years.

Tyler (2006) and Jempa (1995) contended that both the timber concessionaires and chainsaw operators are now focusing on the farming areas in off-reserve forests. Thus, timber resources in the farming areas especially in off-reserves are put under intense pressure. For instance, current estimates indicate that illegal chain saw activities alone account for about 1.7 million m³ of timber harvested in the country, while illegal logging also accounts for about 900,000 m³. These illegal activities together with estimated legal harvests of 1.1 million m³, sums up the total harvest of timber in the country to 3.7 million m³. Furthermore, environmental degradation and its attending problem of deforestation arising from unsustainable agricultural practices has resulted in the creation of impoverished soils and the changes in the micro-climatic patterns of forested areas, which hitherto supported vibrant vegetation. In many areas, agricultural policies are developed without considering the impact on forestry. The bias towards vigorous agriculture and the exploitation of wood fuel from forest areas leads to the tendency to treat forests as though they are convertible rather than renewable resource. This scenario invariably characterizes many areas with abject poverty.

Kotey et al. (1998) reasoned that continuous depletion of the ecological resources has the long-term tendency of exacerbating the poverty situation in these communities. A perilous situation as this leaves these people worse-off than before. The notion persists that most tropical forests are being depleted owing to a rise in human consumption rather than a rise in human numbers. Thus, there is a sort of intensive consumption of the forest relative to the ostensible growth in the population numbers it subsists. In the forest communities, loggers, by establishing a network of long-truck tracks, open up forest areas that had hitherto remained inaccessible to the small-scale (subsistence) farmers. This action they argue have encouraged farmers, who are arguably, the principal agent of deforestation at least in most tropical environments, to use their slash-and-burn methods in the depletion of both off and forest reserves. This therefore calls for some stringent measures that will safeguard the sustainability of the resource by

prescribing up-to-date, well-monitored activities intended for the better management and conservation of off-reserve tree and other forest resources. Thus, the overexploitation of forest resources has endangered the livelihood of forest fringe communities than has improved it.

Effects of plantations on forest and biodiversity loss

The severity of oil palm plantations' impact is driven by a number of factors, including changes in the forest structure, use of dangerous chemicals, frequent human disturbance, and increasing habitat fragmentation. Plantations are markedly less complex than natural forests, as they have a uniform tree age structure, lower canopy height, and sparse undergrowth (Yaap et al., 2010). Aboveground biomass of mature palm trees is less than 20% of the original forest (Saxon and Roquemore, 2011), which has consequences for microclimate and shade-adapted species (Yaap et al., 2010). The conversion of complex native forest to oil palm (*Elaeis guineensis*) monoculture results in the local removal of the majority of specialized species. The resulting biological community reflects the available habitat: simpler, species-poor communities dominated by a few generalist species (Petrenko et al., 2016).

Studies are in agreement that forest clearing for any reason has strong, negative impacts on biodiversity (Petrenko et al., 2016). Though, plantation agriculture has assumed increasing importance and acceptance in tropical countries like Nigeria where they are grown in large commercial scale, as one of the possible ways of meeting the increased demands for wood and latex production as well as ensuring environmental conservation among others. However, plantations result in the modification or degradation of the environment (Aweto and Enaruvbe, 2010). On this note, Tilman et al. (2001) cited in Petrenko et al. (2016) stated that given the limited global land area for agriculture, the rapid expansion of the oil palm industry comes at the expense of other cropland, secondary forest, and native tropical forest. Most (96%) of palm oil production occurs on the island of Sumatra and in Kalimantan (Indonesian Borneo), where crops such as cacao and rubber are also grown.

Early palm plantations were thought to be replacing existing croplands and utilizing degraded land (Gibbs et al., 2010), but evidence has accumulated to show that intact tropical forests have been, and will continue to be, a major source of new land for palm plantations (Koh and Wilcove, 2008). Petrenko et al. (2016) stated that the staggering amount of land required for

oil palm plantations translates into competing uses of land, and in most cases, the destruction of ecologically valuable tropical forests. Losses of endemic species, foregone carbon sequestration, forest fires, and negative impacts to human health and welfare are all consequences of this phenomenon. They further noted that although not all biodiversity loss is directly attributable to oil palm plantations, palm production has been found to reduce biodiversity more than other types of crop plantations. Fitzherbert et al. (2008) found that oil palm supports fewer species than rubber, cocoa, or coffee plantations, although all plantation types decrease species richness when compared to intact forest. For example, the conversion of rubber plantations to oil palm resulted in a 14% decline in bird diversity (Peh et al., 2006).

FAO (2006) noted that though, plantations have become increasingly important sources of wood and fibre, they have also become increasingly criticized by some for their environmental and social impacts. Plantations mostly industrial timber plantations (ITPs) in their various forms have the greatest potential to cause damage on the environment (Menne, 2003). However, 'woodlots' have similar impact as they multiply and invade, eventually becoming a large single ITP. The problem of plantation trees escaping into natural areas is very serious. In parts of South Africa (SA) where forests cover larger areas, such as Knysna in the southern Cape, much forest was destroyed by logging and replaced with ITPs in the early part of the last century. Although it is no longer encouraged, this still happens when a small patch of forest is an inconvenient obstacle to the establishment of a larger plantation, or when plantations (and forest) are felled between rotations. The narrow but ambiguous SA definition of forest encourages the view that woodland and thicket are worthless. A lack of adequate monitoring and enforcement of the local timber planting permit system has led to a situation where illegal plantations are established with impunity, or permit conditions simply ignored (Bainbridge and Allerton, 2002). Also, plantation agriculture is believed to cause loss of habitat.

Menne (2003) stated that birds and mammals that have evolved in bush-clump/grassland mosaic, where small non-contiguous patches of forest occur within grassland, need both vegetation types. For instance, some birds that nest within forest are dependent on grasslands for much of their food and nesting material. Similarly, grazing herbivores need to forests for shelter, and refuge from predators. Only protecting the forest, whilst allowing the grassland to be converted into timber plantations or some other monoculture, must affect species that depend on both habitats.

Rosoman (1994) argued that trees generally increase diversity compared to pasture and croplands. However, exotic monoculture tree plantations do not help maintain landscape and biological diversity. Regimented, uniform rows of monocultural plantations are the opposite of diversity. Compared to natural forests the biological diversity of monocultural tree plantations is low. Diversity has been suggested to be a primary indicator of ecosystem sustainability. Young pine plantations have been found to be poor habitat for native birds. Species that feed on fruit and nectar (such as tui and kereru), and those that nest in holes or are insectivorous are particularly absent from plantations (Rosoman, 1994). The frequent disturbance caused by short rotation clear felling and herbicide spraying are among the most destructive and limiting factors on biodiversity. However, old growth plantations can provide good habitat for native species, especially orchids. Exotic monocultures also increase fire risk and can act as a source of pests and pathogens that spread into adjacent indigenous forest. Pine plantations act to cut off islands of remnant indigenous forest from each other, reducing the chances of native species populations exchanging genes (Rosoman, 1994).

On this note, Rosoman (1994) stated that around the world monocultures have been found to be susceptible to pests and diseases. Major international agencies such as the World Bank and the ITTO recommend mixed species forests, preferably of indigenous species. Putting all our eggs in the monoculture basket does not make sense. Alternative species and ecologically sustainable forestry systems must be pursued as a safeguard. The flora of tropical forests not only serves as the lattice for a complex ecosystem, but constitutes a major source of biodiversity. Oil palm plantations lack forest trees, lianas (woody climbing vines), epiphytic orchids and indigenous palms (Danielsen et al., 2009). Furthermore, a decreased abundance of fruit-eating birds and mammals greatly reduces seed dispersal, while a decline in bee abundance reduces pollination; both dispersal and pollination are necessary for maintaining plant variety (Senior et al., 2013).

Prescott et al. (2015) found 58 epiphytic species recolonizing palm plantations after deforestation, which are then typically removed in order to protect the intended crop. However, the study found that epiphytes did not affect crop yield and suggests that native biodiversity should not be removed from plantations. Oil palm plantations do appear to host more mosses and ferns than old growth forests, but the species are those that commonly colonize disturbed areas (Danielsen et al., 2009). Petrenko et al. (2016)

reported that plantations like oil palm do not support the biodiversity of native forests. Few of the species in native forests may survive in plantations, and the biological community becomes dominated by invasive and generalist species. Species that are highly specialized to live in the unique tropical forests of the region, and that requires specific diets and habitat features are the most vulnerable to expansion of plantations. Furthermore, measurements of biodiversity loss are likely underestimated given that (a) sampling efforts may be less accurate in dense, tropical forest (especially when many species reside high in tree canopies and (b) there is a time lag between habitat loss and extinction, so the presence of a species does not indicate it is thriving or its ultimate survival.

Cross River State forest reserves

In Cross River State, the government of the state had gazetted certain areas as forest reserves even before the establishment of the Cross River National Park (CRNP) in 1991 (FAO, 1998). In line with these, ten forests that have been gazetted are as follows: Afi River, Agoi, Cross River North, Cross River South, Ekinta, Oban Group, Ukpon river, Lower Enyong, and Uwet Odot reserves (Beak consultants, 1998). From Table 1, it was observed that the entire forest reserves in Cross River State had a total land cover of 280,147 ha (2,801 km²). Invariably, the forest reserves span across the entire state.

Furthermore, the forest reserves in the state simply shows that the areas with the largest coverage are Oban group (73,257 ha), having about 26.1% of the total reserves, Ekinta, 38,263 ha (13.7%), Ukpon River, 34,274 ha (12.2%), Cross River South, 29,119 ha (10.4%), Uwet Odot, 25,088 ha (8.95%) and Cross River North with 16,422 ha (5.86%). Hence, these areas where the forest are reserved are the same areas that the same governments have allocated lands for plantation agriculture. Therefore, the plantations serve as the major provider of easy access into the forest area thereby exposing the remaining largest rainforest in Africa to threat of degradation, biodiversity erosion, loss and subsequent extinction.

In the same vein, in spite the reserved forests areas which are under threat, the Cross River National Park have actually saved the tropical rainforest by conserving 4,000 km² (400,000 ha) (CRNP, 2010) within the Oban and Okwangwo division. This chunk of protected areas is what is actually left in the state as the total areas occupied by plantations that are officially established and information placed in the public domain, the plantations are already occupying about 2,499 km² (249,938 ha) as against 2,801 km²

(280,147 ha) forest reserves. Therefore, it can be deduced that what might be left is about 302 km² (30,209 ha) (see Table 1 and Figure 1). This figure is quite threatening to the forest reserves. On the other hand, Dunn (1994) in Philip et al. (2014) posits that the tropical high forest areas including the Cross River National Park has a total area of 7,290 km² (792,000 ha) while other forest which includes community forest is 216 km² (21,600 ha), and plantations cover 460 km² (46,000 ha). From here, it can still be seen that plantations are still of immense threat to the rainforest ecosystem.

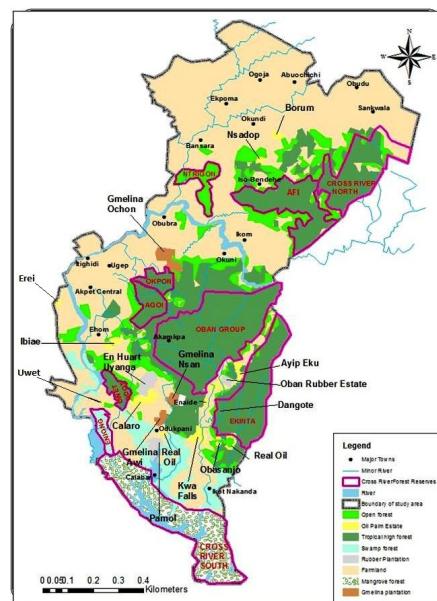


Figure 1: Forest Reserves in Cross River State
(Source: Cross River State Forest Commission, 2002)

Table 1: Cross River State forest reserves

S/N	Location	Hectares	%
1	Afi River	53605	19.1
2	Agoi	5490	1.96
3	Cross River North	16422	5.86
4	Cross River South	29119	10.4
5	Ekinta River	38263	13.7
6	Ikigon	1882	0.67
7	Oban Group	73257	26.1
8	Ukpon River	34274	12.2
9	Lower Enyong	2747	0.98
10	Uwet Odot	25088	8.95
Total		280,147	100

(Source: FAO (1998); modified by Offiong (2017))

Plantation agriculture in Cross River State

In Cross River State, considering its advantage position in terms of location in the humid tropics which is the most preferred environment for the growth and cultivation of oil palm (*Elaeis guineensis*) rubber (*Hevea brasiliensis*) and cocoa (*Theobroma cacao*). This conducive environmental characteristic is what gave site to the acquisition of land within and around forest reserves for the establishment of oil palm plantations across the State, especially the southern part of the State which was the then Akamkpa local Government Area now Akamkpa and Biase Local Government areas respectively.

Within the region, Calaro oil palm estate, Ayip Eku oil palm estate, Kwa Falls oil palm estate, Oban rubber/oil palm estate, Cross River rubber plantation (CREL), and Uyanga, excluding private estates were located here. In the same vein, establishment did not end here, as it was also established in the present Biase Local Government Area, with Ibiae oil palm, Erei oil palm, Biase oil palm, Ikot Okpura, and Biakpan Estates.

Furthermore, the estates were further established in the central Cross River region with specific emphasis on Nsadop oil palm estate, Borum oil palm etc. it is worthy of note at this point that all the estates were located around the tropical rainforest belt (see Table 2, Figure 2). Moreover, taking a close look at the various Cross River State official gazettes, individual

survey plans, field research and investor questionnaire, it has been keenly noticed that the establishment of plantations dates back to 1907 in Cross River State, Nigeria. A total area of 122,172 ha have been lost to plantations with oil palm plantations taking about 75% of the converted forest areas in Cross River State. In addition to these, Table 2 shows privatization in Cross River State Estates (Schoneveld, 2014).

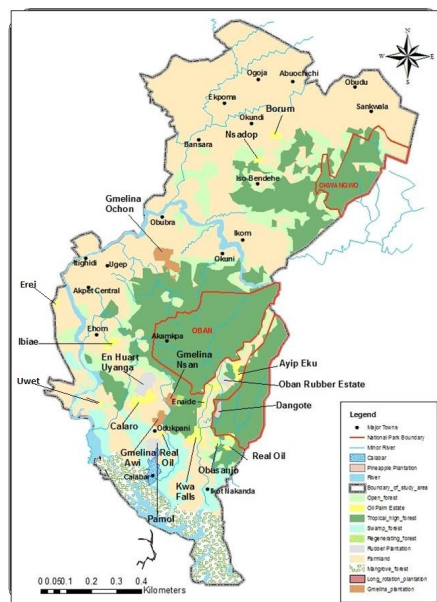


Figure 2: Plantations distributions in Cross River State (Source: ENDC (1962), Commission of Inquiry (1990); various privatization notices, CRS Forestry Commission, 2002).

Table 2: Privatization status of Cross River State estates.

Plantation name	District	Year established	Gross area (in ha)	Area planted on acquisition (ha)	Crop	Investor	Year of privatization/ status
Kwa Falls	Akamkpa	1947	2,826	1,877	Oil palm	Obasanjo Farms*	2003
CREL-1	Akamkpa	1957	8,844	7,901	Rubber	Eng Huat Industries	2003
CREL-2	Akamkpa	1979	18,537	0	Rubber	Eng Huat Industries	2003
Ikot Okpora	Biase	1959	6,092	518	Rubber	Pamol	2003
Biakpan Rubber	Biase	1962	2,584	1,605	Rubber	Royal Farms	2003
Agoi/Nko Rubber	Yakurr	1963	3,915	1,693	Rubber	Pamol	2003
ONREL	Akamkpa	1955	4,688	1,262	Rubber/oil palm	Real Oil Mills	2003/2006
Ayip Eku	Akamkpa	1979	12,411	3,606	Oil palm	Wingsong M-Housea	2008
Calaro	Akamkpa	1954	6,398	4,977	Oil palm	Wilmar	2011
Biase (former CDC estate)	Biase	1960	8,688	0	Oil palm	Wilmar	2011
Ibiae	Biase	1963	5,561	2,419	Oil palm	Wilmar	2011
NNMC	Akamkpa/Odukpani	1986	25,000	10,349	Gmelina	Negriz Group	2012 ^b
Boki	Boki	1963	4,618	1,735	Oil palm	-	Under negotiation
Nsadop	Boki	1964	5,411	1,280	Oil palm	-	Under negotiation
Erei Oil Palm	Biase	1979	4,153	758	Oil palm	-	Unclear
Various cocoa estates (7)	Boki/Ikom/Obubra	1954-1965	15,274	7098	Cocoa	-	Under negotiation
Total			135,000	47,078			

These estates were purchased by Wilmar in 2012. According to the Forestry Commission, a total of 100,000 ha will be allocated to Negriz Group within forest reserves, though the precise location is still to be determined (Source: ENDC (1962), Commission of Inquiry (1990); various privatization notices).

With regards to the state-owned estates, a total land area of 135,000 ha was given out. From this information, it can be seen that a total land area of 47,078 ha have already been cultivated. The implication of these activities on the ecosystem is that, from the total area occupied by plantations, oil palm alone occupies about 62.5% while the remaining 37.5% is occupied by rubber and cocoa plantations. This simply shows that forest loss in Cross River State actually started in 1907 with the establishment of Pamol plantation. This was continued with the establishment of Kwa Falls oil palm estate in 1947 and subsequent ones in 1950's, 1960's, 1970's, 1980's up to 2008. In the same vein, more estates are still being established by individuals especially with improved seedlings of oil palm and ready market by multinational companies like; Wilmer PZ, Pamol, Real oil mills, Eng Huat industries etc., in the State. With all of these plantations around the tropical rainforest belt of Cross River State, with fertile soil and a conducive environment, the rainforest is under serious threat of degradation, and upsetting both the ecological equilibrium and rural livelihood sustainability options for forest dwelling and bearing communities in Cross River State.

Trend of forest loss

The tropical rainforest loss in Cross River State can be traced back to 1907 when Pamol started the development of rubber plantation. This was later followed by Wanton destruction of the tropical rainforest for oil palm plantation between 1947 and 1979. This plantation establishment was mainly done around the forest region due to the conducive soil and other environmental attributes such as; climate, water etc. In considerations of the plantations owned and established by the Cross River State government between 1947 and 1979 (oil palm plantations), it can be seen that large part of the forests areas were and have been lost to oil palm plantations in 1979, 1965, 1960 and 1957 respectively (Figure3).

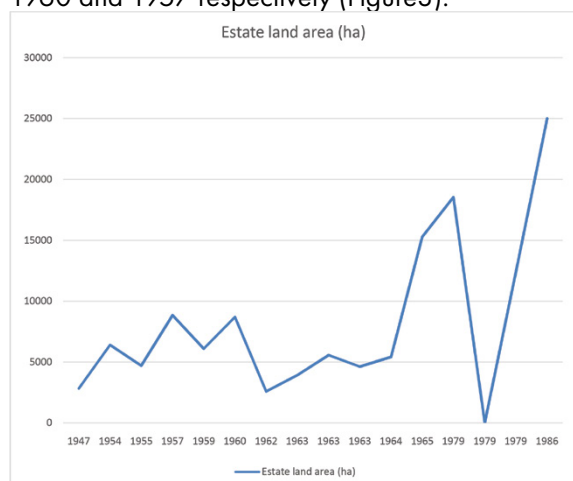


Figure 3: Cross River State owned plantations showing developmental trend and acquisition

Furthermore, while these activities were ongoing within the tropical rainforest belt, more access was further created to the human population who now brought other forms of land uses in the area. Hence the open forest (Figure 2), were once covered by tropical rainforest ecosystem. In the same vein, the recently acquired area for green field plantations by private companies and individuals in the area, Pamol inclusive as depicted in figure 4, it can be seen that the Government of Cross River State had concessioned 50,000 ha of land to NNPC/Petrobas and another 7,756 ha for the cultivation of oil palm plantation. This area is found around the Ukpon river forest reserve. Invariably, in Akamkpa Local Government Area where the Oban group, Ekinta and Uwet Odot forest reserves are allocated, about 75% of the oil palm plantations are specifically located there and about 15% in Boki Local Government Area where the Cross River North forest reserve is located (Figure 1).

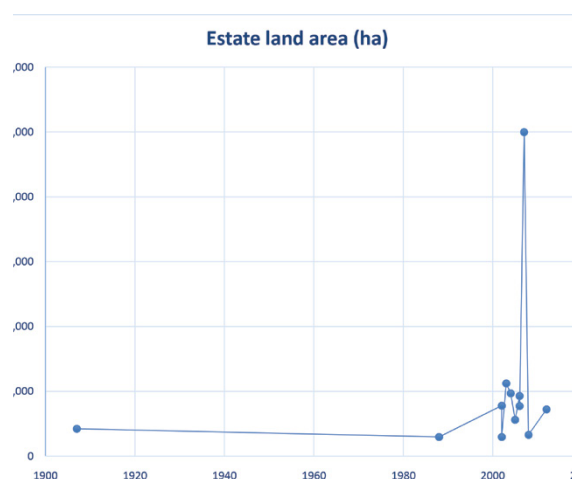


Figure 4: Private owned plantations showing developmental trend and acquisition.

Threats of oil palm plantations on forest ecosystem

However, it is worthy of mention here that with pervasive nature of oil palm and other plantations establishment and expansion, the Cross River National Park is under threat as it is located within the Oban group. Ekinta and Cross River North forest reserves which have been highly encroached by human populations. Therefore, with the total forest reserve areas of 280,147 ha, other forests (community forest) of 21,600 ha giving a total of 301,747 ha (FAO, 1998; Dunn et al., 1994), and the total area of plantations being 135,000 (Tables 2 and 3). It can be seen that, the area covered by tropical rainforest before 1907 was 436,747 ha (4367 km²). Sequel to these, the total forest area left now is about 166,747 ha (1,667 km²) in Cross River State excluding the Cross River National Park.

Table 3: Areas of rainforest ecosystem converted to Large-Scale Greenfield Plantations in Cross River State

Project developer	Location	Year planted	Gross area (ha)	Crop	Note
Pamol	Odukpani	1907	4,229	Rubber	Used to be almost 6,500 ha in extent, parts have been acquired for urban expansion. Entire estate is developed.
Real Oil Mills	Akamkpa/ Odukpani	1988	2,975	Oil palm	Was purchased in 2005 from Pamol. Approx 1,270 ha converted.
Obasnajo Farms	Akamkpa	2002	7,805	Oil palm	Purchased by Wilmar in October 2012. Approx 4,740 ha converted. Additional 930 ha converted outside concession boundaries
Obasnajo Farms	Akamkpa	2002	7,805	Oil palm	Purchased by Wilmar in October 2012. Approx 4,740 ha converted. Additional 930 ha converted outside concession boundaries
Obasnajo Farms	Akamkpa	2002	2,986	Oil palm	Purchased by Wilmar in October 2012. Approx 1,095 ha converted.
Sea Agriculture	Akamkpa	2003	11,246	Oil palm	Considered a speculator. Was sold in 2012 to an unspecified buyer. No land developed.
Real Oil Mills	Akamkpa	2004	9,700	Oil palm	Approx 300 ha converted. To saw mills within estate.
Dansa Agro-Allied	Akamkpa	2005	5,621	Pineapple	Commenced in 2012. 450 ha converted plans to develop entire estate by 2016.
Dansa Agro-Allied	Akamkpa	2006	9,313	Oil palm	To commenced in 2013. None converted-plans to develop entire estate by 2018.
Unknown	Ikom/Obubra	2006	7,756	Oil palm	Acquired by the government, but unclear who it has been allocated to.
NNPC/ Petrobas	Obubra	2007	50,000	Oil palm	Yet to commence development
Nedu limited	Akamkpa	2008	3,300	Oil palm	Approx. 1,000 ha converted. Has not obtained a certificate of occupancy.
Southgate	Ikom	2012	7,241	Cocoa	Certificate been revoked. The government is searching for a new land.
Total			122,172		

From threats in remaining forest area and the Cross River National Park, further encroachment through settlement expansion, agricultural activities and expansion (farmlands), plantation expansion, cultivation (Rubber, oil palm, cocoa and others), infrastructural development, industrial activities due to the already established plantations, which serves as the “sphere of influence” to the aforementioned drivers of threat (Figure 5). It is obvious that the most vulnerable forest area with high concentration of oil palm plantations is the Oban group, Agoi, Uwet Odot, Ukpon River and Ekinta forest reserves. This threat is capable of impacting the Oban division of Cross River National Park.

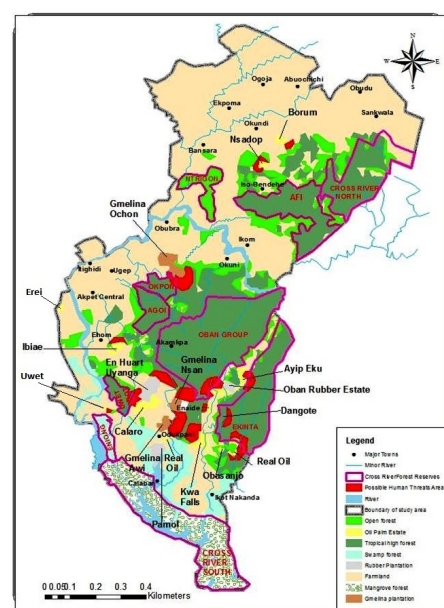


Figure 5: Trends and potential threats to forest ecosystem due to oil palm plantations (Source: Cross River State Forestry Commission, modified by Offiong, 2017).

Implications of oil palm plantations on host communities

In the light of the oil palm plantations establishment, expansion and infrastructural developments in the estate as specifically witnessed in WIMER (Eyop, Kwa Falls, Calaro, Biase, Ibiae) plantations in Akamkpa and Biase Local Government Areas, the following are the associated problems in the area:

- Loss of arable farmlands for cultivation of food crops especially in Calaro oil palm estate.
- Loss of land for settlement expansion as the population of the area is increasing annually.
- Pollution of streams and water bodies by fertilizers and other agrochemicals used by companies.
- Consequent upon further expansion, forested watersheds dry up due to exposure to high levels of sun. This exposure has given way to high level of evapo-transpiration within the watersheds.
- Loss of source of income that were usually generated from the extraction of non-forest timber products (NTFPS) in the area.
- Occupational dislocations have also been observed in the area as most of the community people depended on the forest resources for their daily livelihood. These have become a very serious problem as WILMER have not been able to absorb majority of them into their company as staff.
- The loss of raw materials, medicinal herbs, forest snacks and spices, etc. However, for those who still depend on forest herbal products now travel long distances to fetch required materials.
- Conflicts among landlord communities and the companies have also arisen as the result of royalties, rent, job opportunities, contracts allocation and the general allocation of resources in the area.
- Loss of biodiversity is high as animals cannot be longer seen within and around the plantations.

Conclusions

In the light of the review on the forest loss in Cross River State, plantation agriculture and subsequent expansion is the main driver of forest loss in the area. This is consequent upon the fact that both Government and private owned plantations especially oil palm plantations are mainly located within the forest region of Cross River State. Cross River State has ten forest reserves that are currently facing degradation and subsequent degradation of forest resources. However, Information on the current states of forest reserves, community forest, total number of oil palm plantations

inter alia, the ecological impacts of oil palm plantation development and expansion, the impact of oil palm plantation on livelihood sustainability among other forest loss issue and conflict arising from oil palm plantation in Cross River State is yet to be known.

Therefore, the major gap in knowledge is that, the total number of large, medium, and small scale oil palm plantations holders is not yet fully known alongside, their corresponding impacts on rural dwellers who depend on the forest resources.

Policy decisions and recommendations

In line with the review so far, the following recommendations are hereby put forward for consideration towards further research such as;

1. A study should be conducted on the total area covered by oil palm plantations in Cross River State. Focusing on the rainforest belt.
2. The current status of the rainforest ecosystem should be determined for effective, efficient and sustainable framework development for rainforest conservation.
3. The impact of oil palm plantations on forests ecosystem and its associated resources.
4. The impact of oil palm expansion on the social, economic, health and livelihood sustainability options of forest-dependent communities where forest conversion to oil palm plantations have taken place should be studied.
5. Identifying and mapping of oil palm plantations (large, medium, and small) in the entire Cross River State and its resultant impact on land use and land cover changes should be encouraged.

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