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## FOREST MANAGEMENT IN NIGERIA: CASE STUDY OF YANTUMAKI FOREST RESERVE, KATSINA STATE

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### ABSTRACT

*Forests are one of the most important resources on the planet Earth as they supply vital products that are useful to humans and perform life-supporting functions. This calls for the management of forests to prevent their degradation and inability to supply the products and perform the services. In many developing countries, forest management has become a daunting task as they are under pressure due to several competing demands and uses. The objectives of the paper are to explain the forest management practices and the challenges of managing forests in Nigeria using the Yantumaki Forest Reserve in Danumsa local government area as a case study. The methods of data collection are through field visit to the forest reserve at Yantumaki village and the administration of a questionnaire. The major findings show that the forest management practices include legislation, demarcation, enforcement, and additional enforcement and reforestation programs. The major findings further show that there are several forest management challenges which hinder the effective management of the forest reserve. The paper recommends a number of measures that should be adopted towards ensuring the effective management of the forest reserve. Institutional involvement and policy should focus more on educating the people on the importance of maintaining forest reserves within their locality.*

**Keywords:** Forest management, forest reserve, government policy, Yantumaki, Nigeria.

### INTRODUCTION

Forests are the third most important resources of nature on the planet Earth, after air and water (Garg et al, 2007). They essentially support life on Earth, by absorbing carbon dioxide and releasing oxygen, thereby sustaining and balancing gaseous atmosphere, and also assist in the completion of hydrological cycle to make rainfalls (Garg et al, 2007).

Based on this, the importance of forest management cannot be over emphasized in order to maintain sustainable and healthy environment on the planet Earth. Forest management is a branch of forestry concerned with the overall administrative, legal economic and social aspects of overseeing forests as well as scientific and technical aspects such as protection, regulation, and silviculture (MFR, 2009). This includes man-

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agement for timber extraction, plant genetic resources, wood products, aesthetics, water, wildlife, recreation, urban values, inland near shore fisheries and other forest resources values (MFR, 2008).

Forest Management includes the economic, legal, social, scientific, technical and general administrative aspects of overseeing forests (Denny, 2023). Forest management practices include reduced impact logging, thinning of forest trees, forest fire prevention and management, afforestation, reforestation, watershed management and others (FSC, 2023).

Forest are complex ecological systems that are vulnerable to human activities which threaten, harm or even kill them. Uncontrolled cutting or logging, farming, hunting, construction and other human activities within a forest all harm forest, stressing its ecosystem and making management difficult (Denny, 2023).

The United Nations Department of Economic and Social Affairs State of the World Forest 2022 edition report show how to achieve green recovery and tackling environmental crises caused by forest loss (UNDESA, 2022). The report indicates the commitment of 140 countries to drastically reduce forest loss by 2030 and to support forest restoration, sustainable production and consumption (UNDESA, 2022).

The report clearly indicates how it becomes difficult to manage forest in the countries with forest vegetation. In fact, in many developing nations, forest management has become a daunting task as forests are under pressure due to several competing demands and uses.

In Nigeria, forest management started as early as 1889 with the creation of the “Office of Woods and Forests” in the then colony and protectorate of Lagos (Kio et al, 1992 and Lowe, 1994). The establishment of forest reserves was done in agreement with local communities, who were allowed to continue with their former uses of the forest as long as the uses did not threaten the management of the forests (Mohammed and Danjuma, 2014). In recent times, most of the forest reserves have been abandoned without annual maintenance and are threatened by encroachment.

In Katsina State, the State Governor Dikko Umaru Radda had on August 21st 2023, inaugurated an investigative committee to identify sensitive and strategic forest areas that were given out as farmlands (KTSG, 2024). The committee has submitted its report on 20th December 2023 and the outcome is being awaited as it will show the commitment of the new Government on how to tackle incidences of forest mismanagement.

The objectives of the present study are to trace the history of the Yantumaki Forest Reserve, to describe its nature and composition, to identify and explain its management practices, to highlight the challenges of managing it as a reserve and to offer recommendations for its management.

## *The Study Area*

Yantumaki is the name of a village in Danmusa Local Government of Katsina State on longitude 7°32'41' east of Greenwich and latitude 12°15'39' North of the equator. Yantumaki is situated 97 Kms in the western part of Katsina metropolitan the capital of Katsina State along the Katsina- Dutsinma - Kankara road.

Yantumaki is one of the two district headquarters in Danmusa Local Government (Bawa, 2012), The main occupations of the inhabitants are farming, animal rearing and trading activities particularly on Tuesdays which is the weekly market day. The whole of Danmusa Local Government comprising Danmusa and Yantumaki districts has a population of 113,190 people made up of 58,031 males and 55,159 females based on the 2006 National Population Census (Bawa, 2012).

The physical setting of the area shows the relief is part of the high plains of Hausa land of Northern Nigeria that is dotted with few hills as the Tsaunin Sani hill located along Yantumaki- Maidabino and Dinya hill located in Dinya Forest. The drainage consists of series of streams that rise from the central part of the Local Government to drain or flow into Safana Local Government. The climatic type is tropical continental that is characterized by long dry season from September to April and Short wet season from May to August (Ladan, 2022). Rainfall is between May and September, with a peak in August and an annual average of about 700 mm (Ibaje et al, 2014).



The vegetation type is Sudan Savanna, characterized by scattered, trees, shrubs, and grasses. But in some areas, the trees grown in close formations to give rise to forests. The forests include the Yantumaki Forest Reserve in the Northeast, part of the Rugu Forest reserve in the Northwest and the Dinya forest in the South-western part of the LGA (See Figure 1).

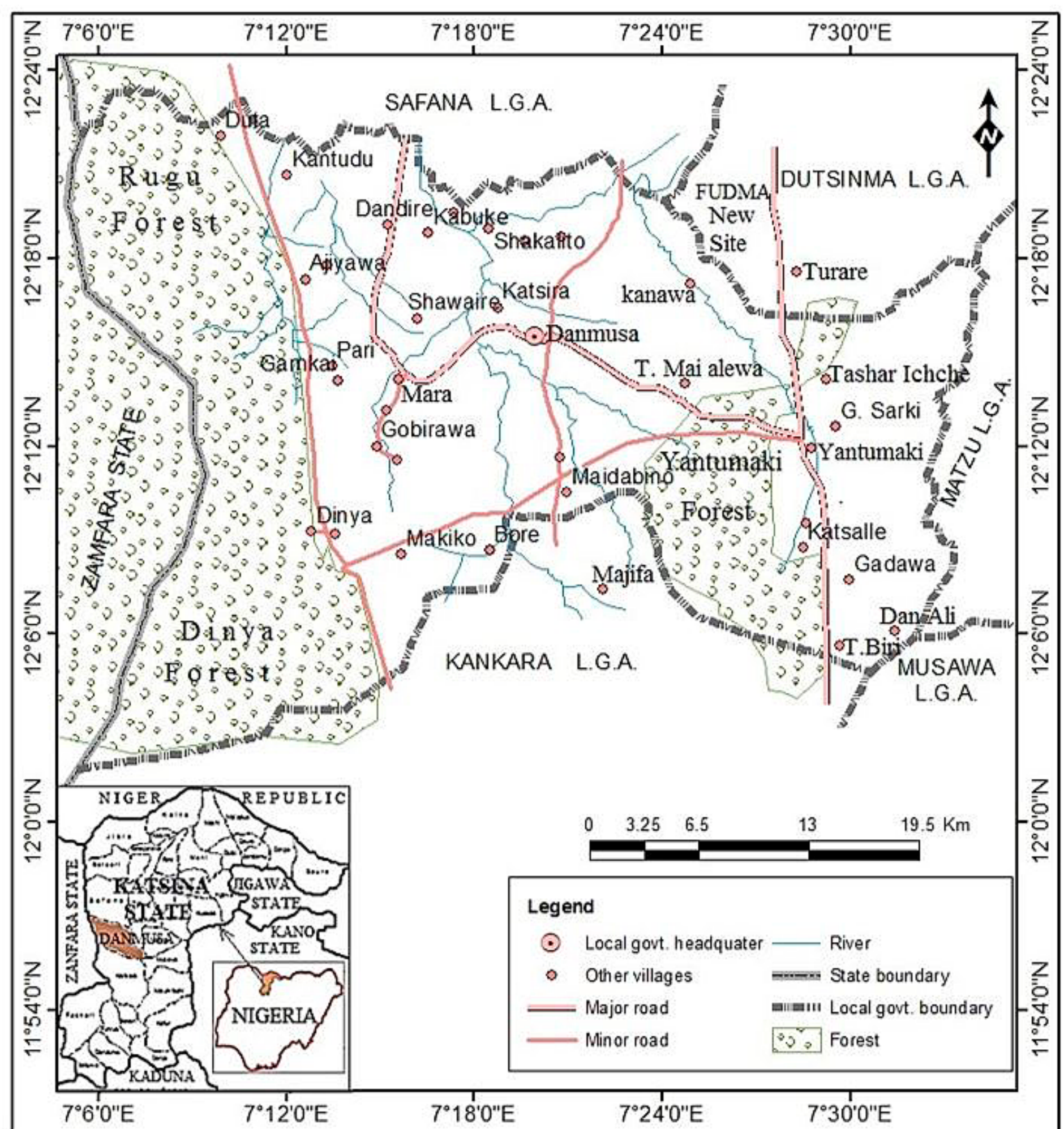


Figure 1. Map of the Study Area Danmusa Local Government Area, Katsina State Nigeria

## METHODS AND DATA

The Map of the study area, Danmusa Local Government is one of the materials used in the study. The map was drawn at the cartography unit of the Department of Geography Umaru Musa Yar'adua University, Katsina. The Map is included for the description of the location of the local government area, Yantumaki Village, the forest reserve, other forests/forest reserves in the LGA. A WX<sub>3</sub> Tecno Phone is another material used for the study, it was used to snap the picture of the forest reserve which that gives visual impression of the reserve. The picture of the reserve was snapped at one of the Yantumaki Village sides of the reserve.

Direct observational technique is one of the method of data collection which was done visually while moving from one part of the reserve to another to observe the location, nature, and composition of the forest reserve. The observations also include ascertaining some forest management practices used to reserve the current status of the reserve and factors militating against its management. The direct observation was made during a field visit to the Yantumaki Village on Friday 19<sup>th</sup> January 2024 which was a weekly market day with many people present. The Yantumaki Forest Reserve is selected on purposive basis among the three forests and forest reserves in the LGA. Furthermore, it is surrounded by many village communities, located along a major federal highway and therefore more accessible to the people than the other two.

A structured questionnaire was used to collect additional data which was administered on Primary and Secondary school teachers from the local government area, on Sunday 14<sup>th</sup> January 2024. The teachers were



reached at Safana town during the Teacher Training Program for 32,000 Public School Teachers in Katsina State organized by Katsina State Ministry of Basic and Secondary Education. A total of seventy (70) questionnaires were distributed and completed by the teachers on the spot at the workshop venue. The teachers are readily available during the workshop for the questionnaire administration and as teachers are among the literate segment of the population in the LGA who can understand and complete the research questionnaires.

The main research questions are What is the background history of the Yantumaki Forest Reserve? What is the nature and composition of the Yantumaki Forest Reserve ? What management practices are used for the Yantumaki Forest Reserve? What are the challenges of managing the Yantumaki Forest Reserve ? The research hypothesis is that legislative measures and enforcements are the most effective measures of managing the Yantumaki Forest Reserve.

Key Informant Interviews (KII) were held with two Dutsin-ma Zonal Forest Officers, the one who served from 2012 to 2014 and the other who served from 2018 to 2024. The two officers provided additional data on the forest reserve concerning the research questions.

Secondary sources of data were collected through desk research from textbooks, journal articles, book chapters, conference papers, master’s dissertation, doctoral degree thesis, emirate council memos, official releases from government, environmental action plan report, grazing reserve and cattle route gazette and internet sourced materials. The data collected from the primary and secondary sources were edited and analysed through descriptive statistics in the form of percentages, means, tabulations and pictorial evidence.

## RESULTS AND DISCUSSION

### *Demographic Characteristics of the respondents*

The demographic characteristics of the respondents can be seen on the table below:

Table 1. Demographic characteristics of the respondents

S/No	Characteristics	Frequency	Percentage
1	Gender		
	Males	60	85.72
	Females	10	14.28
2	Age Range		
	20-29 years	10	16.66
	30-34 years	16	26.66
	35-39 years	24	34.28
	40-44 years	10	16.66
	45-49 years	10	16.66
3	Marital Status		
	Single	10	14.28
	Married	60	85.72
4	Number of Wives		
	One	40	66.66
	Two	10	16.66
	Three	10	16.66

S/No	Characteristics	Frequency	Percentage
5	<b>Number of Children</b>		
	1-5	32	53.33
	5-9	16	26.66
	10-14	08	13.33
	15-19	04	06.66
6	<b>Educational Qualification</b>		
	National Certificate of Education (NCE)	50	71.42
	Bachelor's Degree	20	28.58
7	<b>Residential Status</b>		
	Dan Ali	10	14.28
	Danmusa	20	28.57
	Maidabino	10	14.28
	Mara	05	08.71
	Yantumaki	24	34.28

Source: Data analysis (2024).

Table 1 shows that majority of the respondents (85.75%) are males while minority (14.28%) are females based on gender. This is because in the study area, more males are employed as teachers than females and readily travel to the workshop venue. The age range of the respondents shows that those within the age range of 35-39 years are the majority (40.00%). The marital status of the respondents shows that majority (85.72%) are married to one wife (66.66%). Among those that are married, majority among them (53.33%) have 1-4 children. In terms of educational qualification, all the respondents who are teachers have undergone tertiary level education. Majority among them (71.42%) have NCE while those with bachelor's degrees are the minority (28.58%). The residency status shows that those from Yantumaki constitute 34.27% followed by those from Danmusa town (28.57%). All the settlements are close to the forest reserve and have knowledge about its management.

### Background History of Yantumaki Forest Reserve

On the research question what is the background history of the Yantumaki Forest Reserves? The narration below is from the respondents, the KII with the Zonal Forest Officers complemented by secondary sources of data.

The Yantumaki Forest Reserve is one of the forest reserves created to reduce the tide of desertification and halt the encroachment of the Sahara Desert in the defunct Katsina Province (Alo et al, 1998). The reserve was officially constituted as the Katsina Native Authority Forest Reserve No. 40 by order 10 of the supplement Gazette No.7 of 1950 (Musbahu, 2015).

From the time of its creation from 1950 to 1960, the reserve consists of dense vegetation with variety of trees forming a dense canopy. This could be attributed to the low population that existed at that time plus the people who abided by the law that demarcated the forest as a reserve. By 1986, the reserve was affected by the economic downturn that affected Nigeria as a whole. The Government of the defunct Kaduna State allocated 1,036 hectares of forest land to Structural Adjustment Program (SAP) relief farming to some people (Alo et al, 1998).

The introduction of the National Directorate of Employment (NDE) Farm Program in 1986 led to mass encroachment into the reserve. About 1,030 hectares of forest reserve area were cleared for the commencement of the scheme (Ibrahim, 2021). This encroachment paved the way for some forest officials convince traditional rulers to allocate part of the reserve to farmers (Ibrahim, 2011).

In 1992, the then Katsina State Government received several complains and petitions on encroachment into forest reserves. A committee was set up to inquire about the illegal land acquisition and encroachment into forest reserves, communal forest areas and grazing grounds as of June 1992. The report of the committee on Yantumaki Forest Reserve showed that part of the reserve was leased to Dutsinma Construction Com-



pany on an annual rent of N33, 000 which was not paid for three years (Alo et al, 1998). Also, the Chairperson and District Head of Safana allocated parts of the reserve for illegal farming for 31 people (Alo et al, 1998).

In 1997 there were incidences of encroachment into the forest reserve by farmers bordering the reserve in villages such as Yardanko to the east. A legal action was taken against persons who encroached into the forest reserve who were later ordered to vacate the reserve. Meanwhile the encroachment did not stop as forest officials and traditional rulers continued to allocate the forest land for farming. This was strictly opposed by the herders who were living around the forest reserve and were using it to graze their cattle. This led to communal crisis and violence in 2004 between the farmers who are Hausa and the herders who are Fulani.

In 2005, the State Government under Governor Umaru Musa Yar'adua intervened and directed a halt to the encroachment and illegal allocation of the forest land. By the year 2011, the Fulani became aggrieved by the loss of pastureland occupied sections of the forest reserve setting up camps from where they launch attacks on the farmers from 2011 to date (2025). The Fulani bandits have been using the reserve to keep kidnapped victims beside rusted cattle.

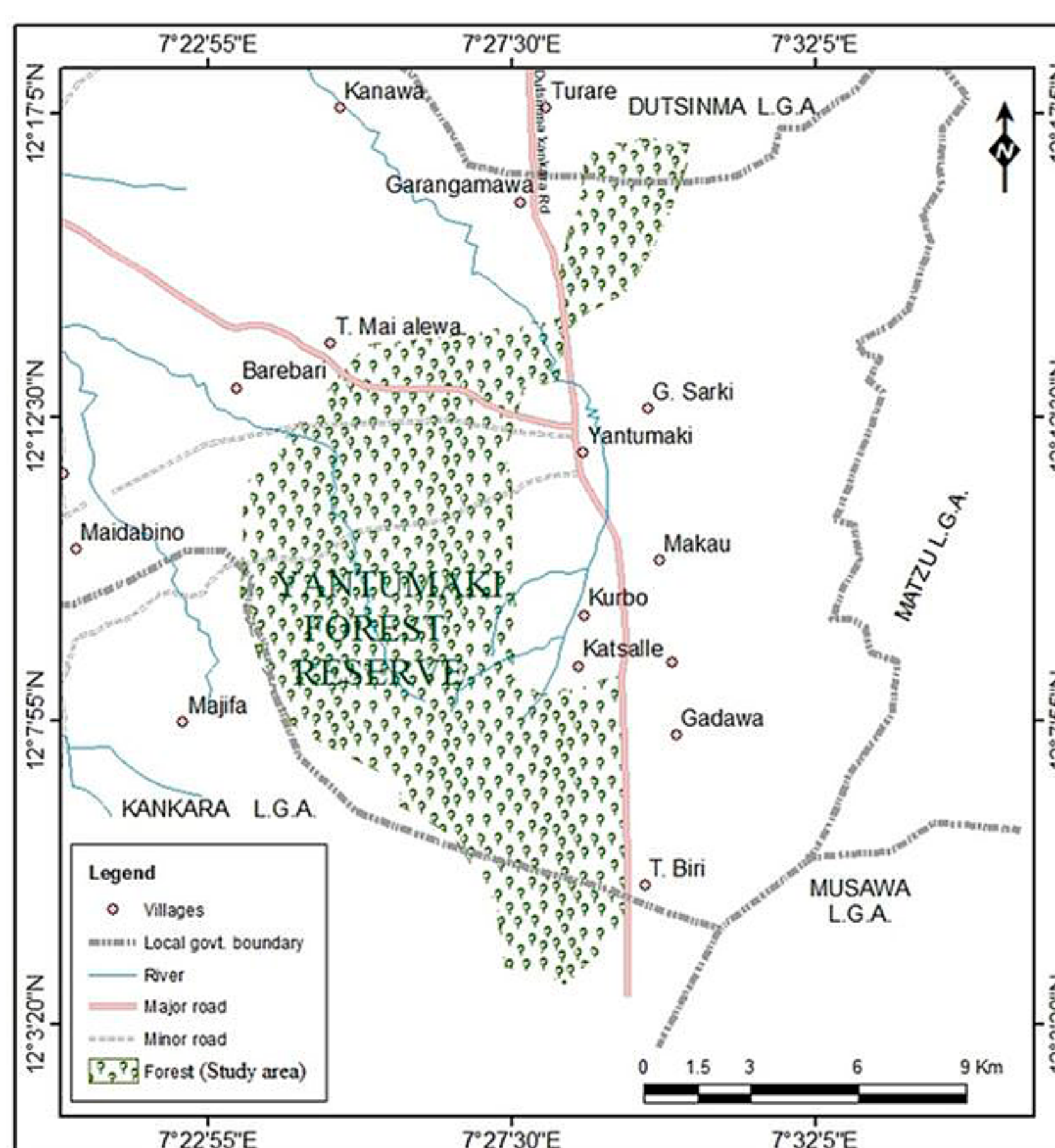


Figure 2. Map of Yantumaki Forest Reserve, Danmsa LGA, Katsina State, Nigeria

### *Nature and Composition of the Yantumaki Forest Reserve*

On the research question of what is the nature and composition of the Yantumaki Forest Reserve? The explanation below is based on the response from the respondents, the KII with the Zonal Forest Officers and the data from the secondary sources of data.

The Yantumaki Forest Reserve is one of the three forest areas in Danmusa LGA. The other two forests are an extension of the Ruma-Kukar Jangarai forest reserve located in the Northwest and the Dinya Forest located in the Southwestern part of the Local Government Area. The reserve is located to the western and northern part of Yantumaki Village covering a total land area of 51 square miles or 30.639 square kilometres (Ibrahim, 2021). The reserve is entirely located in Danmusa Local Government with only a small portion of the reserve within Dutsin-ma Local Government to the northern part. Several villages share boundaries with the forest reserve which include Yanshantuna to the north, Yandanko village to the east, Majifa Village to the south, and Dantakuri Village to the west (Musbahu, 2015).



The Forest reserve is a Sudan Savanna Forest comprising various species of trees, and shrubs that dominate the landscape. The forest is typical of most savanna forests but there is thick forest from Yantumaki to Kalere and from Tashar Kadanya to Kwantamawa (Ibrahim, 2021). The Most common species found in the reserve are *Azadirachta indica*, *Vitex doniana* *Sclerocarya birrea* *combretum glutinosum*, *Tamarindus indica*, *Khaya senegalensis*, *Parkia bigilibosa* and *Butyrospermum Paradoxa*.



Figure 3. A section of the Yantumaki forest reserve near Yantumaki Village, Danmusa Local Government Area

These species of trees support the lives of the local people in terms of supply of herbs, fruits, fodder, fuel wood among other uses. The proximity of the forest reserve to Yantumaki village (Just 2-3 Kms in some sections) and a section of the Dutsinma to Kankara highway passing through the reserve mean that it is under pressure from many competing uses by the people. Some of the wild animals still present in the forest reserve are lower animals such as hares, rabbits and reptiles. The figure below shows a section of the forest reserve.

*Management Practices for Yantumaki Forest Reserve, Danmusa Local Government Area*

Respondent’s response to the research question what management practices are used for the Yantumaki Forest Reserve is varied. The proportion of respondents indicating particular management practice is shown on table 2.

Table 2. Proportion of Respondents Indicating Particular Forest Management Practice at the Yantumaki Forest Reserve, Danmusa LGA

S/No.	Management practice	Frequency	Percentage
1.	Legislation	20	28.57%
2.	Demarcation	15	21.42%
3.	Enforcement	13	18.57%
4.	Additional enforcement	12	17.14%
5.	Reforestation programs	10	14.28%

Source : Data analysis (2024)



1. **Legislation** is the first management practice for the management of the forest reserve according to 28.57% of the respondents. The then Katsina Native Authority (N.A) officially constituted the reserve as number 40 by order 10 of the supplement gazette No. 7 of 1950 (Musbahu, 2015). The legislation made it illegal to anybody to encroach into the reserve for any activity such as extraction of firewood, clearing for farming activities, extraction of laterite and even grazing of domestic animals. The legislation proved effective in managing the reserve as the N.A. had powers which the people abide by keeping the intact from 1950 up to 1975. The control of the N.A. over the forest reserve was handed over to the Local Government Chairperson following the Local Government reforms of 1975. According to a study by Ankhiero (2006), the application of forest law in forest management can be an effective practice that could ensure the management of forest reserves in Nigeria.
2. **Demarcation** of the forest reserve is the second management practice according to 21.42% of the respondents. The demarcation of the forest reserve clearly shows the area of land that is a reserve and people were prohibited from going into it to carry out any activity. According to the Zonal Forest Officers, beacons are constructed at the edge of the forest reserve area to clearly demarcate it. Also at strategic positions, signposts were erected with inscriptions in English and Hausa warning people to keep off. The strategic positions are along the roads such as Dutsinma to Kankara and Yantumaki to Danmusa including the outskirts of the Yantumaki village. The erection of signposts by Katsina State government under the Department of Forestry is a common management practice as found out by Ladan (2022) in a study on the Barawa Forest reserve in Batagarawa LGA.
3. **Enforcement** by the forest staff of the Department of Forestry under the Ministry of Agriculture and Natural Resources (MANR) is the third management practice according to 18.57% of the respondents. This practice is the enforcement of the legislation declaring the Yantumaki forest as a reserve. The Yantumaki Forest Reserve is under the authority of the Dutsinma Zone Forest Officer who has one staff, a forest extension officer and two staffers deployed from the Danmusa Local Government Council. The staffers go round for routine inspection to check for any form of encroachment into the forest reserve. Any form of encroachment is reported to the Zonal officer, who in turn reports the case to the MANR. Those found guilty of encroachment were taken to court to face prosecution. A study by Kolade et al (2019) stressed that forest legislation enforcement is an important strategy needed for the regulation of use and development of forest reserves.
4. **Additional enforcement** of the forest as a reserve is also done by the heads of traditional institutions that are also in-charge of the management of the forest reserve based on 17.14% of the respondents. According to the Zonal Forest Officers the heads of traditional institutions such as District and Villages Heads play important roles in forest management as they can go to check encroachments into forest reserves even at night. This is because as they are remarkably close to the people and therefore get information about forest encroachment promptly. Besides, the three staffers from the MANR and the Local Government are inadequate to check encroachment into forest reserve particularly after working hours. For example, the District Head of Yantumaki periodically receives report of forest encroachment from residents of villages surrounding the reserve such as Yardanko. Such reports are submitted to the Local Government who investigates with the village Head concerned with encroachment (Ibrahim, 2021). The use of the heads of traditional institutions to manage forest reserves has been reported by Ladan (2022) in the study on Barawa forest reserve where the Village Head of Barawa goes round in the evenings to monitor and warn persons who encroach into the reserve.
5. **Reforestation programs** are practices of forest management according to 14.28% of the respondents. This is carried out in the forest reserve especially during the period when the State Government carries out the Annual Tree Planting Campaigns. In 2013, a reforestation programs were carried out by one of the Zonal Forest Officers who planted *azadirachta indica* tree species in the forest reserve to create a woodlot along Yantumaki to Danmusa road. In 2014, the same tree species were planted to create a plantation near Tashar Mai Alewa village along the same road. In 2018, the other Zonal Forest Officer carried out planting programs that created tree plantations in the forest reserve as a measure



of reforestation, but due to insecurity, some of the plantations were cut to deny the bandits hideouts. Also, Danmusa Local Government Area under the Department of Agriculture has created nurseries from where tree seedlings were sourced to carry out reforestation programs in the reserve by creating several woodlots to improve the tree cover (Ladan and Saulawa, 2022). A study by Ogana (2022) found that reforestation programs that involve the participation of local communities can aid restoring degraded forest reserves.

### Challenges of Managing the Yantumaki Forest Reserve

Respondent's response to the research question about the challenges of managing the Yantumaki Forest Reserve is varied. The proportion of respondents indicating particular management challenge is shown on table 3.

Table 3. Proportion of respondents indicating the challenges of managing Yantumaki Forest Reserve.

S/No.	Challenges of management	Frequency	Percentage
1.	Changes in government structure	16	22.85%
2.	Illiteracy	14	20.00%
3.	Inadequate enforcement	12	17.14%
4.	Inadequate protection and conservation	10	14.28%
5.	Insecurity arising from banditry	08	11.42%
6.	Creation of camps in the forest reserve	06	08.57%
7.	High demand for trees as fuel wood	04	05.71%

Source: Data analysis (2024).

- (i) Changes in the governance structure from the NA to the Local Government system affected the management of the reserve according to 22.85% of the respondents. The people follow strictly legislations made by the NA and do not abide much by such legislations under the local government system. This has resulted in encroachment into the forest reserve by traditional rulers, Local Government Chairperson, private individuals and farmers. Owese (2021) noted that that under the local government system, the forestry sector lacked transparency and participation which affects effective forest management not only in southwestern Nigeria but in Nigeria as a whole.
- (ii) Illiteracy is a management challenge of the Yantumaki Forest Reserve based on 20.00% of the respondents. This is because many people who could not read the inscription warning people to keep off the forest area as it is a reserve even in the local Hausa language. According to the Zonal Forest Officers, they sometimes have to seek for the assistance of the heads of traditional institutions to educate the people what the signposts mean and the warnings it contains. Awareness about the forest and its reserve status differs by location as most of the people of the Yantumaki village are aware of the forest as a reserve as the village has primary and secondary schools than other villages without schools and located in the interior such as Tashar Mai Alewa in the western part (See figure 2). Also, due to poverty, some people encroach into the forest land to create farmlands and search for edible fruits, leaves, and nuts to be used as food. A study by Mohammed et al (2017), found that education is a significant sociodemographic characteristics of the respondents in determining participation in forest management.
- (iii) There is inadequate enforcement of the status of the forest as a reserve based on 17.14% of the respondents. This is because the staffers and personnel that are to enforce the legislation of the forest as a reserve are inadequate to cover the aerial extent of the forest reserve. There are only three staffers who are grossly inadequate to monitor the forest to prevent and report cases of encroachments into the forest reserve.



The Zonal Forest Officers stated that they have five LGAs under their authority and therefore found it difficult to effectively enforce the status of forests as reserves. This factor of inadequate enforcement of the status of forests as reserves is also a management challenge in the Rugu Forest reserve according to a study by Ladan and Saulawa (2022).

- (iv) Inadequate protection and conservation of the forest as a reserve is the fourth management challenge according to 14.28% of the respondents. This occurs as the State Government has not established a Forestry office at the local government headquarter, Danmusa or Yantumaki Village. The staffers' in-charge of the protection and conservation of the reserve do not live in Yantumaki. Also, the conservation measures in the forest reserve such as selective cutting of trees in slanting manner and not cutting trees that are few in number are not practiced. Oche and Bawa (2019) found that one of the constraints to forest management in Nigeria is that forest reserves are inadequately protected and conserved.
- (v) Insecurity arising from the use of the forest reserve by bandits who set up camps and keep kidnapped victims/rustled cattle is the fifth management challenge according to 11.42% of the respondents. Due to the insecurity the forestry Department staffers are unwilling to go deep into the forest to patrol and monitor incidences of encroachment into the reserve. The people of Yantumaki village and the Community Watch Corps have been cutting trees in the section of the reserve from Gandun Sarki to Yantumaki Village. This is because the bandits hide within the area to launch attacks on travellers along the Dutsin-ma to Kankara road. Larinde and Chima (2014) study found that one of the challenges of forest management in Nigeria is that the forest reserves have become hideouts of criminals who launch attacks on unsuspecting members of the society as well as public and private properties.
- (vi) The creation of camps deep inside the forest by the bandits is the sixth management challenge according to 08.57% of the respondents. This has led to the destruction of vegetation including spaces where kidnapped victims were hidden. Also, periodically security forces invade parts of the forest reserve in an attempt to clear the bandits out. For example, on May 2<sup>nd</sup> 2021, security forces stormed the Yantumaki Forest Reserve in search of the bandits while members of the vigilante surrounded the section of the forest reserve to prevent the bandits from escaping (Ladan, 2024). This kind of military activity in the forest reserve affects the vegetation and can lead to the loss of some species. This is the same situation in the forests and forest reserves in the LGAs located along the Zamfara State boundary to the west as reported in the study by Ladan (2014).
- (vii) High demand of trees as fuel wood for cooking food in Katsina State is the seventh management challenge according to 05.71% of the respondents. This high demand has made many people to engage in rampant cutting of trees for firewood. Besides this, there are also people who cut the trees to convert the tree logs into charcoal for cooking. This practice of charcoal making by charcoal merchants has depleted some sections of the Yantumaki Forest Reserve. This is also the situation in other States in northern Nigeria such as Gombe, where charcoal merchants have depleted forest reserves (Daily Trust Sunday, 2023). Adamu and Musa (2019) found out those human anthropogenic activities such as fuel wood extraction is one of the main challenges of managing forest reserve in Adamawa State, Nigeria.

## RECOMMENDATIONS

The following recommendations are offered towards ensuring proper management of the forest reserve. They are:

- (i) The State Government should formulate strong legislations that will make it difficult for people to encroach into forest reserves. This can be done through the Katsina State House of Assembly which will enable forest reserves to be protected as reserves.



- (ii) There should be massive public enlightenment programs with the objectives of stressing the importance of trees and forest in the environment. Based on this, alternative sources of domestic energy such as biofuels as against the use of firewood should be sourced.
- (iii) Katsina State Government should increase the number of staffers in the department of forestry who should be deployed to serve as forest guards, forest extension officers and others. This will provide enough personnel that are needed for effective management of the Yantumaki Forest Reserve
- (iv) The Federal and State Government Ranch Development Program that was commissioned in 2023 should provide ranches where the Fulani can rear their cattle away from the forest reserves such as the Yantumaki Forest Reserve. This is significant in order to keep away the rearing of domestic animals within the forest reserve which affects the vegetation.
- (v) Security forces should launch massive aerial and ground operations to drive out the bandits out of the forest reserve. This is an important way of ensuring the security of the forest reserve to allow forest personnel to carry out their duties effectively.
- (vi) Massive reforestation programs should be carried out by the Department of Forestry and environmental organizations once the bandits have been cleared out. This is important in order to reforest the sections of the forest reserve that were degraded due to encroachment and the criminal habitation of the forest reserve by bandits.

## CONCLUSION

The Yantumaki Forest Reserve is among the major reserves in Katsina State Northwestern Nigeria. This study found out that a number of forest management practices are used to manage the forest as a reserve. But the practices have not fully succeeded due to several challenges which have lasted for decades. The recent habitation of the forest by bandits has made it more difficult to manage the forest as a reserve. There is therefore the urgent need to carry out massive security operations to drive the bandits out of the reserve for effective management. The implications of the study are that the legal management system has not fully succeeded in the effective management of the forest reserve. There should be a review of the forest reserve management practices to sustain the reserve by the State government. Efforts should be made towards educating the local communities on the importance of the forest reserve and its continued existence.

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**DEPARTMENT OF BASIC AND APPLIED SCIENCES  
HASSAN USMAN KATSINA POLYTECHNIC, KATSINA KATSINA STATE, NIGERIA**

This research questionnaire is intended to collect data for the research titled “Forest Management in Nigeria: A Case Study of Yantumaki Forest Reserve, Katsina State” You are required to provide answers to the best of your knowledge and the answers provided will be used for the research purpose only.

**SECTION A: Demographic Characteristics of respondents**

- 1. What is your gender?  
(a) Male (b) Female
- 2. Which age range do you belong to ?  
(a) 15-19 (b) 20-24 (c) 25-29 (d) 30-34 (e) 35-39 (f) 40-44 (g) 45-49 (h) 50-54 (i) 55-59 (j) over 60 years
- 3. What is your marital status ?  
(a) Single (b) Married (c) Divorced (d) Separated
- 4. If married, how many wives are you married to ?  
(a) One (b) Two (c) Three (d) Four
- 5. How many children do you have?  
(a) 1-4 (b) 5-9 (c) 10-14 (d) 15-19 (d) 20 and above
- 6. What is your educational qualification as a primary/secondary school teacher ?  
(a) National Certificate of Education (NCE) (b) Bachelor’s degree.
- 7. Where do you live in Danmusa Local Government Area ?  
(a) Dan Ali (b) Danmusa (c) Maidabino (d) Mara (e) Yantumaki.

**SECTION B (MAIN QUESTIONNAIRE)**

- 1. What is the background history of the Yantumaki Forest Reserve ?  
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- 2. What is the nature and composition of the Yantumaki Forest Reserve ?  
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- 3. What management practices are used for the Yantumaki Forest Reserve ?  
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- 4. What are the challenges of managing the Yantumaki Forest Reserve ?  
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