

## Research Article

# Leveraging Baobab Trade for Rural Development: A Pathway to Poverty Alleviation in Rural Ghana

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**Abstract** — Addressing poverty in rural Ghana is pivotal for sustainable development, where households grapple with basic needs amid limited resources. This study explores the transformative potential of *Adansonia Digitata* (baobab) in selected communities within the Nabdam District of the Upper East Region. Employing a mixed-method explanatory sequential design grounded in pragmatic perspectives, 296 participants were randomly sampled from a population of 1135, along with 10 key informants chosen through purposive sampling. The findings demonstrate that engagement in baobab-related activities contributes inclusively to both economic growth and the empowerment of marginalized community members, lifting them out of poverty. The revenue generated is instrumental in meeting essential household needs, including education and healthcare expenses. To enhance livelihoods and cultivate resilience, the research recommends significant government support in the form of grants and loans to facilitate the expansion of businesses within the baobab sector. Moreover, it suggests integrating the sector into skill development programs offered by institutions such as the National Board for Small Scale Industry (NBSSI). This integration aims to boost product value and innovation, ultimately fostering sustainable rural prosperity.

**Keywords**— Baobab Trade, Rural Development, Poverty Alleviation, Economic Empowerment, Economic Diversification, Ecosystem, Dawadawa, Sheer trees

## 1. Introduction

Poverty eradication has long been acknowledged as one of humanity's greatest concerns, with more people living in poverty today than at any other time in history. Goal 1 of the Sustainable Development Goals (SDGs) aims at eliminating severe poverty in all its forms [1]. Poverty in rural communities thrives well where there is overexploitation of resources by authorities. According to the United Nations report (1998), poverty is the limitation to quality education, health services, economic freedom, proper sanitation, and the inability to effectively carry out social responsibilities. It is the inability of one to attain an acceptable standard of living within a society. The concept stems from the lack of sustainable jobs, effective policies, and programs by governments and allied institutions aimed at leveraging the standard of living in society. This limits the emotional, physical, mental, and social development of individuals [2]. This increases the rate of exposure to a myriad of risks, such as malnutrition, sicknesses of all kinds, and a high rate of mortality [3]. Africa is gifted with an abundance of resource ecosystems, such as the baobab, Dawadawa, and sheer tree; in contrast, it is the most poverty-endemic continent, largely due to bad governance, wars, resource exploitation, unfavorable trade conditions, and unemployment [4]. The ecosystem's

significance is paramount in fostering the socio-economic advancement of communities throughout Africa [5], it supplies humans and animals with life-sustaining services as well as other fundamental necessities such as fodder, food, timber, and terrestrial assistance [6]. The *Adansonia digitata* (Baobab tree), also known as the African wooden elephant, is one of the world's oldest trees [7]. The European Union has designated the baobab fruit as a novel food [8]. A novel food is a fruit that has not previously been widely used or consumed by humans [9]. The Savanna Forest is crucial for poverty alleviation in Sub-Saharan Africa, especially for rural farmers whose main source of income is agrarian [10]. According to the World Bank (2019), about 82 percent of rural dwellers live in severe poverty and survive on hunting and gathering. Agribusiness plays a significant role in the development of most rural economies, as it creates jobs and the well-being of most rural residents in Ghana. Given this, much attention has been paid to the sector, particularly the commercialization of baobab products in rural Ghana, owing to the plethora of benefits obtained from baobab activity in the form of food, medicine, local beer, jam, and juice, as well as its potential for rural poverty reduction, rural growth, and economic well-being. Most rural dwellers rely on the baobab business to supplement their low profits from traditional farming activities, especially during the dry season [11]. Many families and households in numerous rural

communities in Northern Ghana that engage in the baobab business see it as a 'game-changer' [12]. Although [13] and [14] researched this gray area, the focus of the study was on the importance of baobab to rural communities and its therapeutic value for families, respectively. The main purpose of this research is to explore the economic value of the baobab fruit (*Adansonia Digitata*) in reducing rural poverty in selected communities of the Nabdam District of the Upper East Region of Ghana. The paper is structured into 4 distinct sections. It begins with an introduction in section 1, followed by a delineation of materials and methods in section 2. Section 3 is dedicated to data analysis, while section 4 encompasses discussions and conclusions. The study examines the following hypothesis:

**H0:** There is no significant connection between the use of income earned from baobab activities and the expansion of baobab businesses for females.

**H1:** There is a significant association between females and the utilization of income earned from baobab activities for business expansion.

**(H0):** There is no significant correlation between an increase in household participation in baobab activities and the demand for baobab.

**(H1):** There is a significant positive correlation between an increase in household participation in baobab activities and the demand for baobab.

## 2. Conceptual Framework

The research is anchored on the economic framework introduced by [15], illustrated in Figure 1. It emphasizes involvement in baobab business endeavors, financial empowerment, investment strategies, and the overarching goal of poverty alleviation as central components and principles of the theory. However, critics argue that the theory is overly simplistic and fails to account for the complex dynamics of consumer behavior, market competition, and external factors that influence demand [16]. Also, it has been criticized due to its over reliance on supply-side factors such as increased production while neglecting demand-side factors such as consumer preferences, tastes, and income levels [17].

### 2.1.1 Engagement in Baobab Activities

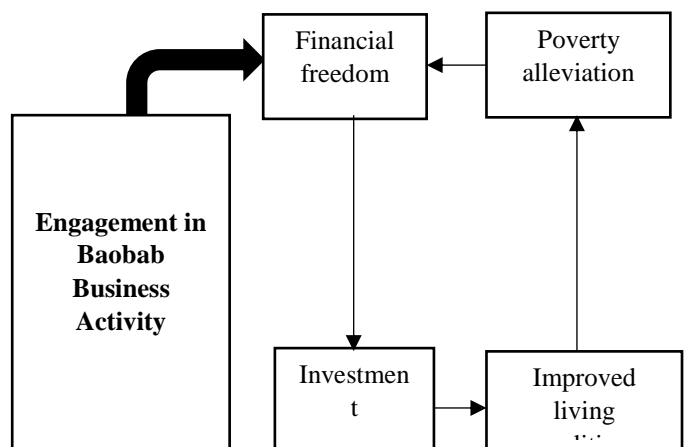
The participation of a community's household members in any business activity boosts their income. This allows them to support and help family members financially. Again, they are able to take on additional duties such as paying school tuition, paying medical expenses, building residential facilities, and other responsibilities as a result of their participation in the business activity.

### 2.2 Financial Freedom

As stakeholders get more involved in the firm, they gain financial power to plan for and make decisions about their family's education, health, and social security [18]. Financial empowerment has a tremendous positive impact on a person's emotional well-being since it causes people to experience greater joy, calm, and happiness, which is a conduit for development [19]. They become protected from social exclusion, prejudice, and abuse because they are empowered.

### 2.3 Investment

The participation of household members in baobab powder business activities allows them to diversify their revenue streams by engaging in other economic activities, such as farming. Farming is the lifeblood of rural communities and the principal source of income in many countries throughout the world. Increased agricultural operations aid society in increasing employment opportunities, savings, and investment [20]. Economic diversification in rural areas increases households' income and investment savings. This has the potential to reduce poverty, improve food and livelihood security, and increase coping strategies in rural households. Furthermore, community members' investments provide the youth with new professional and entrepreneurial opportunities [21]. This progressively lifts members of the household and society out of extreme poverty.



**Figure 1:** Conceptual issues on Benefits of Baobab Activities on Households  
Source: Adopted and modified from Mawunyo (2017).

## 3 Materials and Methods

### 3.1 Study Area

The study was conducted in four communities situated within the Nabdam District, located in the Upper East Region of Ghana. These communities include Kongo, Logre, Pelungu, and Zanlerigu. The Upper East Region itself boasts a population of 1,301,221 individuals, with females comprising 51.6% and males 48.4% of the population. This region contributes approximately 4.2% to Ghana's total population [22]. Notably, 41.7% of the region's population falls below the age of 15 years, highlighting a substantial youth demographic. Those between the ages of 15 and 64 make up 52.3% of the population, representing the working-age group, while individuals aged 65 and above constitute 6.0% of the population [22]. The district's capital is Nangodi, which is located in Ghana's Upper East Region. The Bongo, Talensi, Bawku-West, and Bolgatanga Municipalities, respectively, border it on the north, south, east, and west [1]. The district lies between 10.15° and 10.60° north latitude and 0.31° and 10.50° west longitude. It covers a total area of 244.94 km<sup>2</sup> [22]. The district has a greater poverty rate and a dependency ratio of 94.1 percent, which means that one individual out of a hundred (100) has around 94 people to look after. The terrain of the Nabdam District is characterized by gently undulating lowlands and gentle slopes ranging from 1% to 5%, with high

levels of rock and highland slopes. Residents are mostly peasant farmers who raise cattle, guinea fowl, and pigs as well as cultivate maize, beans, sorghum, and millet. Baobab, DawaDawa, shea trees, and neem are among the district's economically valuable trees. The it has only one rainy season, which runs from May to October each year, with the remainder of the year being dry [22].

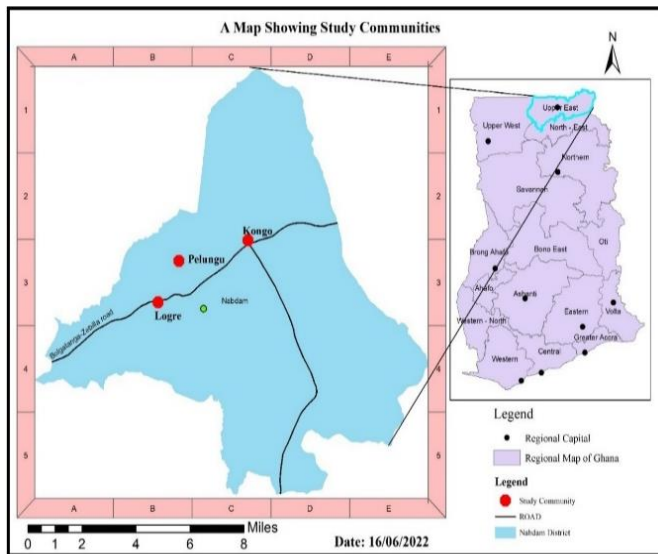


Figure 2: Study area Map

**3.2 Methods**

The research used a mixed-method explanatory sequential design approach based on pragmatism perspectives. A mixed-method strategy involves the collection and analysis of data by a researcher, the synchronization of findings, and the establishment of connections and patterns utilizing both qualitative and quantitative methods [23]. The method allowed the data to be triangulated which further enhanced the possibility of the strengths and weaknesses of both the qualitative and quantitative methodologies to overlap, thus, striking out any mistakes in the results. Key informant interviewees, focus group discussants, and the management of the Ghana Enterprise Authority in the region were used for the qualitative data phase. participants for the qualitative phase included regional manager of the GEA, Market Women, Men and children above fifteen years engaged in the activity. The qualitative data was transcribed, processed, and analyzed into themes, content, and patterns, and subsequently presented in the form of direct quotations and paraphrases from participants. Furthermore, the quantitative data was solicited from important stakeholders (both men and women) in the baobab business activity using open and closed-ended surveys (questionnaires), interviews and observation. Data obtained underwent inferential statistical analysis, using tools such as Pearson correlation and Pearson chi-square, facilitated with the assistance of a statistical package for social sciences (SPSS) version 27. The quantitative data was later presented in the form of tables and graphs for easy comprehension. Stratified sampling was used to sample participants for the study due to its reliability and precision. It was also considered for the study because of the heterogeneity of participants. Given this, two hundred and ninety-six (296)

participants in the district's fringe communities were sampled from a population of 1135 using Yamane's (1967) sample size determination formular  $n = N / (1 + N(e^2))$  Where: n = Sample size, N = Total population size, e = Margin of error (expressed as a proportion) and, 1= constant.  $N = 1135$  (Total population size)  $e = 0.05$  (Margin of error)  $n = N / (1 + N(e^2))$ ,  $n = 1135 / (1 + 1135(0.05^2))$ ,  $n = 1135 / (1 + 1135(0.0025))$   $n = 1135 / (1 + 2.83)$   $n = 1135 / 3.83$ .  $n \approx 296$

**4. Results**

**4.1 Classification of Household Members Involved in Baobab-Related Activities**

According to the findings, roughly 84 respondents, or 37.2% of the household members, believe that every member of the study community is free to engage in baobab commercial activities without prejudice. However, 14.2% of the household interviewed held the view that only boys and girls are permitted to work in the baobab industry. The findings also revealed that 16.8% and 31.9% of males and females respectively are independently given the opportunity to participate in the baobab business activity. This suggests that the baobab business is inclusive and welcomes participation from individuals of all genders. Furthermore, it implies that members of marginalized or fringe communities view the baobab business as a positive endeavor aimed at uplifting those who are economically disadvantaged. There is an indication that engaging in this business could potentially improve the livelihoods of individuals and have a positive impact on rural economic development. Overall, it portrays the baobab business as a promising avenue for socioeconomic empowerment and community development.

**Table 1:** Category of Household Members Involved in Baobab Related Activities

Measured variables	Frequency	Percent	Valid Percent	Cumulative Percent
Boys and Girls	32	14.2	14.2	14.2
Men only	38	16.8	16.8	31.0
Women only	72	31.9	31.9	62.8
Everyone	84	37.2	37.2	100.0
Total	226	100.0	100.0	

According to a narration of a district rural enterprise officer of the National Board for Small Scale Authority (NBSSI): *"There is no discrimination against women, men, boys, or girls of any gender or group. Everyone is provided with an equal opportunity to participate in the sector. Despite the fact that all household members have an equal opportunity to participate, many of the participants are women." Men, on the other hand, are heavily involved in providing services such as harvesting fruits and leaves and crushing them into powder form.*

**4.2 Economic Effects of Baobab-Related Activities on Households**

The results presented in Table 2 illustrates the income distribution among stakeholders engaged in baobab business activities. It shows that a significant portion of respondents earn varying amounts of income from their involvement in the

baobab industry. Specifically, 27.9% earn between GHC300 and GHC500 monthly, 12.8% generate between GHC600 and GHC800, and the majority, 57.5%, make between GHC900 and GHC1200 monthly. One notable observation is that many of these income brackets surpass the daily minimum wage or monthly earnings of GHC375.31, indicating that the baobab business provides a source of income that exceeds basic living standards. This suggests that individuals engaged in this activity have the potential to improve their living standards and financial well-being. The improvement in living standards resulting from higher incomes can have a ripple effect on other aspects of stakeholders' lives, such as education and healthcare. With increased financial stability, individuals may be better able to afford educational expenses for their children, such as school fees, books, and uniforms. Additionally, improved access to healthcare services becomes feasible as individuals have more disposable income to allocate towards medical expenses, health insurance, and preventive care measures.

**Table 2:** Range of Income Earned Per Month from Baobab Related Activities

Amounts	Frequency	Percent	Valid Percent	Cumulative Percent
300-500	63	27.9	27.9	27.9
600-800	29	12.8	12.8	40.7
900-1200	130	57.5	57.5	98.2
1300-1700	4	1.8	1.8	100.0
Total	226	100.0	100.0	

\*Multiple responses were used in the analysis\*.

**4.3 Application of Income Earned from Baobab Activities**

Furthermore, other key applications of the financial resources generated by baobab operations by industry stakeholders have been uncovered. According to the findings, 39.4% of the participants reported that they utilized the proceeds to cover their children's school expenses. Moreover, 33.6% of the respondents used their financial gains from the baobab value chain operations to construct residential facilities, and 15.9% allocated their earnings towards medical expenditures. Investing in children's education is a powerful tool for rural emancipation and development. By covering school expenses, families ensure that their children have access to quality education, which can break the cycle of poverty and empower future generations. Education not only enhances individual opportunities but also strengthens the human capital base of rural communities, fostering innovation, entrepreneurship, and economic growth. Also, construction of residential facilities using financial gains from baobab operations addresses a critical need for decent housing in rural areas. Improved housing conditions not only enhance living standards but also contribute to community stability and cohesion. Adequate housing infrastructure attracts investment, improves property values, and creates a conducive environment for economic activities, thereby promoting rural development.

**Table 3:** Usage of Income Earned from Activity

Usage of Income Generated	Frequency	Percent	Valid Percent	Cumulative Percent
Payment of School Fees	89	39.4	39.4	39.4
Building of Housing facilities	76	33.6	33.6	73.0
Settlement of Medical Bills	36	15.9	15.9	88.9
Investment In Baobab Business	25	11.1	11.1	100.0
Total	226	100.0	100.0	

**4.4 Chi-square Test of Independence**

A Pearson Chi-square test was performed to determine the significant association between gender and use of income earned from the baobab activity in the expansion of baobab businesses.

**Table 4:** Chi-Square Tests of independence

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	22.864 <sup>a</sup>	3	.000
Likelihood Ratio	27.883	3	.000
Linear-by-Linear Association	14.528	1	.000
N of Valid Cases	226		

Note: \* p<0.1, \*\* p<0.05, \*\*\*p<0.01

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 11.73.

The findings from Table 4 reveal a significant association between female respondents and the utilization of income earned from baobab activities ( $\chi^2 = 22.86$ ,  $df = 3$ ,  $p = 0.00$ ) at the 1% significance level. Thus, we reject the null hypothesis (H0) and accept the alternative hypothesis (H1), suggesting a notable correlation between females and the allocation of earned income towards the expansion of baobab businesses. This implies that female stakeholders predominantly utilize their income to grow their businesses, thereby contributing to the empowerment of the girl-child and fostering inclusive decision-making within households.

**4.5 Category of Household Members Engaged in Baobab Activities, Range of Income Earned and Utilization of Income: Correlation Analysis**

A correlation analysis was performed to assess the relationship between three variables: the category of household members engaged in baobab activities, the range of income obtained from the baobab business, and the utilization of the income earned from these activities.

**Table 5:** Correlation of Measured variables

		Correlations			
		Category of People Involved in Baobab Activities	Usage of income earned from activity	Range of Income Earned Per Month	
Category of People Involved in Baobab Related Activities	Pearson Correlation Sig. (2-tailed)	1			
	N	226			
Usage of income earned from activity	Pearson Correlation Sig. (2-tailed)	.134*	1		
	N	226	226		
Range of Income Earned Per Month from Baobab Related Activities	Pearson Correlation Sig. (2-tailed)	-.178**	-.044	1	
	N	226	226	226	

**Note:** \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

The findings indicate a weak negative correlation [ $r(224) = -0.178$ ,  $P < 0.05$ ] between an increase in household participation in baobab activities and the demand for baobab. This is demonstrated by the correlation coefficient ( $r$ ) of  $-0.178$ , where the negative sign indicates the direction of the correlation (negative), and the magnitude of the coefficient ( $0.178$ ) suggests a weak strength of association. The significance level ( $P < 0.05$ ) indicates that this correlation is statistically significant at the 5% level, meaning that it is unlikely to have occurred by random chance. It suggests that as household participation in baobab activities increases, there tends to be a slight decrease in the demand for baobab products. This could be due to several factors: market saturation and economic conditions of buyers.

## 5. Discussions

The study's goal was to analyze the impact of baobab economic activities on poverty levels in outlying communities. Economic trees as natural resources play a significant role in social capital, economic development, and rural development. They provide a litany of direct and indirect benefits through a wide range of products for survival. The results of the study reveal that the involvement of the vulnerable in baobab business activity creates opportunities for economic empowerment, jobs, and social development, which supports the findings of [23] that trees give a wide range of advantages to households, particularly in rural areas, including job opportunities, economic growth, and other livelihood support mechanisms. It further falls in line with the economic theory propounded by [24], which holds the view that engagement in an economic activity leads to economic emancipation, investment, and poverty reduction in most societies. The results further indicate that many of the residents earn above the minimum wage of GHS14.88, which helps to improve the living conditions of household members

in the study communities. This statistic is significant as it indicates that a substantial portion of baobab workers are surpassing the minimum wage threshold, which is often used as a benchmark for poverty levels in many countries. By earning above the minimum wage, these individuals are likely to have improved standards of living and greater financial stability. The findings align with [24]. This suggests that the baobab business activity is contributing to poverty alleviation by providing sustainable income opportunities for a notable portion of its participants. The income generated from the business is used to meet households' basic needs, including but not limited to investing in food production, investing in baobab business activities, the building of residential facilities, payments of school fees, and the settlement of medical bills. This conclusion supports [25] findings that rural inhabitant's profit from the value chain of economic trees, as well as [25] finding that income earned from a rural enterprise is used by households as a livelihood support plan to boost family responsibilities. Furthermore, the fact that 56% of the population participates in the baobab business regardless of gender demonstrates its potential to challenge and bridge existing gender disparities in economic participation. By providing equal opportunities for women to engage in income-generating activities, the baobab industry serves as a catalyst for reshaping societal norms and promoting gender equality. This inclusive approach not only benefits individual women by providing them with avenues for economic empowerment but also contributes to broader socio-economic development by harnessing the full potential of all members of society. Thus, the baobab activity stands as a promising example of how economic initiatives can play a pivotal role in addressing gender marginalization and discrimination while advancing progress towards sustainable development goals. Despite the opportunities for household members who participate in the activity, the study found that there was a negative externality emanating from the baobab business activity, as people cut down the baobab trees for other purposes. This supports [25] findings that deforestation worsens the plight and livelihoods of rural communities as a result of climate change. Deforestation affects soil fertility and crop productivity in impacted areas, putting a strain on rural households' economies and livelihoods.

## 6. Conclusions

The primary objective of this research was to examine the role of *Adansonia Digitata* (baobab) in reducing rural poverty in the Nabdram District of the Upper East Region. In the selected communities, a significant number of household members, especially those who are vulnerable, and rely on baobab related activities for survival. Notably, many of these individuals earn more than the GHS13.75 minimum wage, which surpasses the World Bank's definition of extreme poverty. Engaging in baobab powder activities enables households to fulfill their short- and long-term goals, such as paying school fees for their children and making investments in the baobab powder industry. Consequently, many households experience financial independence, as their participation in this activity is not hindered by prejudice. This freedom empowers them to actively participate in decision-

making processes concerning community development. Overall, the evidence suggests that the baobab business activity serves as a vital lifeline for rural communities, offering not only economic opportunities but also contributing to social welfare and resilience. As such, fostering and supporting the sustainable growth of the baobab industry can play a crucial role in achieving broader development objectives, including poverty reduction, food security, and sustainable livelihoods, in line with the Sustainable Development Goals and the aspirations of rural communities for a better future. The study recommends that the national board for small-scale authority (NBSSA), in collaboration with the Nabdram District Assembly, should collaborate to provide skills training to participants to add value to the product, as that will attract more customers. Again, there is a need for the institutions stated above to collaborate with the Business Sector Advocacy Challenge Fund (BUSAC) of Ghana to provide seed capital based on terms and conditions to some of the vulnerable persons who are in the baobab industry to expand their business. Regarding future studies in the field, the study recommends research into the effects of Baobab economic activities on climate change.

#### Data Availability

Data to this study is available and shall be provided upon request

#### Conflict of Interest

There is no conflict of interest regarding the study

#### Funding Source

There is no funding source to the study

#### Author's Contribution

Author undertook the study single handedly from conceptualization to data collection and drafting of paper

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#### AUTHOR'S PROFILE

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I am **Samuel Akonga** (Ph.D.) a dedicated scholar and researcher passionate about environmental sustainability and resource management. My academic journey began at the University for Integrated Development Studies, where I pursued my first degree in Environment and Resource Management. It was during this time that I developed a deep appreciation for the intricate connections between human activities and the environment, sparking my interest in pursuing further studies in this field. Driven by my desire to contribute meaningfully to the discourse on environmental issues, I continued my academic pursuits and earned a Master of Philosophy (MPhil) in Environment and Resource Management at the University for Integrated Development Studies. This period of advanced study allowed me to delve deeper into various aspects of environmental science and management, refining my research skills and expanding my knowledge base. Undeterred by the challenges of rigorous academic study, I furthered my educational journey by pursuing a Doctorate degree at the Simon Diedong Dombo University of Business and Integrated Development Studies. Following the successful completion of my doctoral studies, I transitioned into a role as a Research Fellow at the Bolgatanga Technical University in Ghana. In this capacity, I have had the privilege of collaborating with esteemed colleagues and engaging in research projects aimed at addressing pressing environmental issues facing our society. Through my research endeavors, I am committed to generating evidence-based solutions that promote sustainable development and enhance the resilience of our natural ecosystems.

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