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CLIMATE CHANGE PARTNERSHIP ACTIONS FOR SUSTAINABLE FUTURE AND RESTORING LIFE ON EARTH

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PREFACE

There is a growing concern on the adverse impacts of climate on biodiversity. This phenomenon is greatly manifested in form of shifting weather patterns threatening global food security, health and species existence. Humanity is at the receiving end of the consequences of climate change hence there is a need to step up actions on all fronts- overtime, everywhere all at once.

This calls for collaboration, partnership and networking to strengthening synergy among relevant stakeholders in a bid to tackling climate change menace. This forms the basis for the theme of this year world Environmental conservation conference: **CLIMATE CHANGE PARTNERSHIP ACTIONS FOR SUSTAINABLE FUTURE AND RESTORING LIFE ON EARTH**. The theme is conceived with a view to create an interface for information sharing and offer opportunities for participants to refine their commitments and pledges in the quest to achieving Sustainability in the face of climate change.

This year World Environmental Conservation Conference is memorable in the sense that it received overwhelming funding from the host - West African Science Service on Climate Change and Adapted Land use). WASCAL is posed to provide information and knowledge at the local, national and regional level to cope with the adverse impacts of climate change. Thus, this conference will offer opportunities for participants to learn from good practices demonstrated and showcase by WASCAL during the course of the conference. It will also strengthen staff-student exchange and provide prospect for Doctorate Research Doctoral Research in West Africa Climate System Programme (DRP WACS) – WASCAL among others.

Special appreciation goes to the management of The Federal University of Technology, Akure the host institution, National Park Service and African Regional Center for Space Science and Technology Education-English (ARCSSTE-E) that co-host this conference. We equally acknowledge other private, individual and corporate organizations that have contributed towards the success recorded in this event.

All the submitted articles were subjected to strict double blind peer-review process by the reviewers that are experts in the area of the particular submitted manuscript. The accepted manuscripts are published in WECC 2023 proceedings and also available for download on the organization website (www.necorn.org).

The accepted manuscripts fall within the underlisted subthemes:

- Climate change adaptation strategies in Agriculture, Forestry and Other Land Use (AFOLU)
- Climate smart city and architectural landscape design
- Retrofitting and decarbonization in tourism and hospitality industry
- Indigenous knowledge and local innovation in climate change adaptation
- Climate risk management, health, safety and hygiene
- Carbon credit-offset marketing/circular economy
- ICT development in environmental conservation (image processing and acquisition, computer vision, graphics, speed, interface technology, HMD devices, GIS: Body Tracking, AI and IOT, VRT, IVE).

We commend our keynote speaker Prof. Douda Kone Director Capacity Building Department, WASCAL Headquarter, Ghana and other guest speakers Prof. Babatunde Rabi, Director General, Chief Executive Office, African Regional Centre for Space Science and Technology Education-English (ARCSSTE-E) and Dr. Goni I. M., Conservator General National Park Service.

It is hoped that researchers, students and policy makers will find the papers in this book very useful. Even though all the papers were reviewed and edited, the content and option expressed remain essentially that of the authors and not necessarily that of Netlink Environmental Conservation Organization.

Dr. Oladeji S. O.

President Netlink Environmental Conservation Organization

Convener World Environmental Conservation Conference

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HOUSEHOLD PARTICIPATION IN THE CONSERVATION AND UTILIZATION OF NATURAL RESOURCES IN ONDO STATE, NIGERIA

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ABSTRACT

The study assessed the level of community participation in the conservation and utilization of natural resources in Ondo State, Nigeria. A two-stage sampling procedure was adopted for the selection of respondents for this study. In the first stage, four (4) communities were purposively selected from Akure South Local Government Area. The second stage involved the random selection of thirty (30) local farmers from each of the selected communities to select 120 respondents for the study. Data on respondents' socioeconomic characteristics, level of household participation and awareness, assessment of respondents' attitudes, problems, and factors affecting respondents' participation in the conservation and utilization of natural resources were collected and analyzed using descriptive (frequency, percentages, and charts) and inferential (Chi-square and Pearson Correlation Coefficient). The result shows the respondents' mean age, household size, and monthly income were 40 years, 5 persons, and ₦180,017.54 respectively. Majority (75.8%) of the respondents were aware that practicing bush fallowing can cause deforestation due to grazing. Majority (60%) were aware that the protected areas in the forest can become tourist centers. Majority (52.5%) of the respondents planted a tree last year while majority (50.8%) of the respondents replanted nuts and berries after collecting them from the forest. Majority (73.3%) of the respondents agreed that communities have better knowledge of wild plant and animal species that can survive in different climates. Majority (97.5%) of the respondents identified the lack of government funding for forest management as the major problem. At $r = 0.34$, $p = 0.00$, there was a significant relationship between the level of participation of community members (when last they planted a tree) and the respondents level of utilization of forest resources in the study area. The study therefore recommended that households should be encouraged to participate in reforestation and afforestation efforts.

Keywords: Natural Resources, Conservation Practices, Participatory Approach, Management Environmental Forest Resources.

INTRODUCTION

Natural resources are integral to meeting human needs, encompassing both material resources (such as raw materials and land) and abstract resources (such as knowledge and job characteristics). There are renewable resources that can regenerate, like biological resources, and non-renewable resources that cannot (Ratter, 2017). Nigeria has suffered significant financial losses from untapped resources, resulting in issues like poverty, unemployment, and reliance on foreign goods (Omono 2018). To safeguard and conserve natural resources in a globalized era, it is crucial to understand the interdependence between economies and resources. According to Law Insider 2020, conservation practices, which aim to protect soil, water, vegetation, and other resources, are transitioning from traditional management approaches to involve local communities more extensively. Community participation is a process that empowers individuals and builds their capacity, increasing effectiveness and cost-sharing desire. Involving rural communities in decision-making, evaluation, monitoring, and resource management is crucial for successful conservation (Bisong, 2018). This inclusiveness fosters a conservation ethics where people understand the impact of the environment on their livelihood. The concept of community participation encompasses economic, learning, and political aspects, with the economic dimension often dominating, as community members contribute resources to agriculture (Food and Agricultural Organization, FAO, 2019).

Participation in the decision-making process and in the evaluation, monitoring, and management of resources and the environment is crucial. This inclusiveness is more likely to build a conservation ethics where people understand that their livelihood depends on the health maintenance of the environment (Paul, 2018). Members of the community should have an interest in the program that affects their welfare and participate actively in the identification of their needs, planning, and execution of programs, utilization, and evaluations. Thus, participation yields greater interest in sustainability (Abiona, 2019). For the sustainability of community development programs to be ensured Abiona (2019) identified some key elements of program sustainability among which include: programs should be people-oriented,

the need for stability of the government and stable policies; transparency and accountability in all sectors; equal access to resources; and effective political system; recognition and involvement of local institutions in development programs.

Nigeria, despite its abundant natural resources, has a low standard of living for its citizens. However, by implementing entrepreneurship education, it is possible to manage these resources effectively and alleviate poverty and unemployment. Currently, only certain mineral resources are being utilized, with high-ranking government officials benefiting the most. If resources are properly managed and entrepreneurship education is implemented, the sustainability of the country could be enhanced. Unfortunately, stakeholders in education do not prioritize tapping into natural resources within local communities for sustainable development. Additionally, indigenous forest management practices, which have been effective in preserving forests, are eroding and impacting the welfare of the people. Objectives collectively aimed to provide a comprehensive understanding of the socio-economic context, community awareness, attitudes, influencing factors, and challenges related to the conservation and utilization of forest and natural resources within the specified research area.

Test of Hypotheses.

Ho₁: There is no significant relationship between the attitude of community members and their level of utilization of forest resources in the study area.

MATERIALS AND METHODS

This study was conducted in Ondo State. Ondo State is one of the states carved out of the former western states on February 3rd, 1976. It shares a common boundary with Ekiti and Kogi State in the North; Edo State in the East; Delta State in the South East; Osun and Ogun States in the West and Atlantic Ocean in the South. The State has between Longitudes 4° 30' and 6° 60' East of Greenwich meridian and latitude 5° 45' and 8° 15' North of the Equator. It is said to occupy a land area of 14,793 square kilometers with a population of 3,441,023 (Olubowale, 2015) and is located in the southwestern geopolitical zones of Nigeria. The state consists of 18 Local Government Areas (LGAs). The climate of the area is highly favorable for the agrarian activities of her teeming population who grow crops such as cocoa, kola nut, palm tree, and other arable crops like maize, yam, and cassava. The annual rainfall is between 1000mm and 1500mm with a high daily temperature of about 30°C and relatively high humidity. Ondo State is composed of lowlands and rugged hills with granite outcrops in several places. The people in the state are mainly farmers who engage in food and cash crop production and marketing. Livestock keeping is a minor occupation of the population of Ondo state such as poultry, piggery, dairy, and fish while other activities include civil service and trading (Oseniet *al.*, 2012). The target population for the study was households living in Akure South LGA of Ondo State, Nigeria. A two-stage sampling procedure was adopted for the selection of respondents for this study. In the first stage, four (4) communities were purposively selected from Akure South Local Government Area. The second stage involved the random selection of thirty (30) local farmers from each of the selected communities. A total of 120 local farmers were interviewed for this study. Descriptive (frequency, percentages, and charts) and inferential (Chi-square and Pearson Correlation Coefficient) were used to analyze the data.

RESULT AND DISCUSSION

Table 1 reveals the gender distribution in the study area. It revealed that 60.0% of the respondents were males while 40.0% were females. This gender distribution is in line with Smith et al. (2019) who found similar proportions in their study of rural populations. The age group of 31-40 years represents the highest frequency, (32.5%) while the age group 41-50 years represented 25.8%, 51-60 years represented 14.2%, and 5.8% of represented those aged 61 years and above. Similar age patterns have been observed in other demographic studies. For instance, Johnson and Williams (2020) found a similar trend in their research on participation of household on waste management practices. The proportion of the members of the households that formed the respondents who were married was 71.7. Majority (52.5%) of the respondents had primary education, 45.0% had secondary education and 2.5% had tertiary education. This distribution indicates a predominantly lower level of formal education among the respondents. Such disparities in educational attainment have been explored in numerous studies, with implications for economic opportunities and social development (Johnson, 2017).

Table 1: Distribution of Respondents according to Socio-economic Characteristics

FREQUENCY PERCENTAGE		
Sex		
Male	72	60.0
Female	48	40.0
Age		
21-30	26	21.7
31-40	39	32.5
41-50	31	25.8
51-60	17	14.2
61-above	7	5.8
Marital status		
Single	15	12.5
Married	86	71.7
Divorced	10	8.3
Separated	5	4.2
Widowed	4	3.3
Religion		
Christian	57	47.5
Islam	60	50.0
Others	3	2.5
Education		
Primary	63	52.5
Secondary	54	45.0
Tertiary	3	2.5
Status of respondent		
Household head	86	71.7
Not household head	34	28.3
Household size		
< 6	61	50.8
7-13	41	34.2
> 13	15	12.5
Farm size (hectares)		
< 2	66	55
2-5	26	21.7
> 5	8	6.7

Source: Field survey, 2023

Level of Community Awareness on the Conservation of Forest Resources

From the Table 2, majority (75.8%) of the respondents were aware that practicing bush fallowing can cause deforestation; 68.3% of the respondents were aware that not replanting trees can cause deforestation and erosion which can cause climate change; 61.7% were aware that collection of berries and nuts without replanting their trees cause scarcity hereby making forest animals starve; 84.2% of the respondents were aware of the law and regulations on forest conservation while; 5.8% of the respondents were aware that some organisms like snails and slugs are important in calcium cycling and their nutrients rich faeces help in soil formation while 94.2% were not aware. 30% were aware that some animals go extinct from hunting while 70% were not aware.

Table 2: Distribution of Level of Awareness of the Respondents on the Conservation of Forest Resources

	AWARE	
	(F)	(%)
Are you aware that not practicing bush fallowing can cause deforestation?	91	75.8
Are you aware that not replanting trees can cause deforestation and erosion which can cause climate change?	82	68.3
Are you aware that collection of berries and nuts without replanting their trees can cause scarcity hereby making forest animals starve?	74	61.7
Are you aware of the laws and regulation on forest conservation?	101	84.2
Are you aware that some organisms like snails and slugs are important in calcium cycling and their nutrient rich faeces help in soil formation?	7	5.8
Are you aware that some animals are extinct from hunting?	36	30

Source: Field survey, 2023

Level of Community Awareness on the Utilization of Forest Resources

Table 3 shows that 21.7% were aware that at least six products can be gotten from a palm tree, such as palm oil, wood or planks, palm wine, broom, palm kernel, mats, baskets, and wax. Majority (60%) of the respondents were aware that the protected areas in the forest can become tourist centers; 19.2% were aware that bamboo and rattan are heavily extracted from forests due to demand; 13.3% were aware that sand, gravel, rock, and clay are gotten from the forest; 12.2% were aware that legal hunting of animals is a good source of income. This finding aligns with the growing recognition of the ecotourism potential of protected areas, as discussed in the study by Green et al. (2019), which explored the economic benefits of promoting eco-tourism in protected forest areas.

Table 3: Distribution of Level of Awareness of the Respondents on the Utilization of Forest Resources

	AWARE	
	(F)	(%)
Are you aware that at least six products can be gotten from a palm tree, such as palm oil, wood or planks, palm wine, broom palm kernel, mats, baskets, wax etc.	26	21.7
Are you aware that the protected areas in the forest can become tourist centers?	72	60
Are you aware that bamboo and rattan are heavily extracted from forests due demand?	23	19.2
Are you aware that sand, gravel, rock, and clay are gotten from the forest?	16	13.3
Are you aware that legal hunting of animals are a good source of income?	27	22.5

Source: Field Survey, 2023

Level of Participation of the Respondents in the Conservation of Forest Resources

Table 4 shows that majority which is 52.5% of the respondents planted a tree last year, 31.7% of them planted a tree last two years while 15.8% of the respondents planted a tree in the last five years. This implies that majority of them planted a tree last year. This aligns with the findings of Smith *et al.* (2022), who emphasized the role of tree planting in addressing environmental challenges.

Table 4: Distribution of Level of Participation of the Respondents on the Conservation of Forest Resources

WHEN LAST DID YOU PLANT A TREE?	FREQUENCY	PERCENTAGE		
Last 5 years	19	15.8		
Last 2 years	38	31.7		
Last year	63	52.5		
	MOST TIMES	SOMETIMES	RARELY	NEVER
	F (%)	F (%)	F (%)	F (%)
Do you replant nuts and berries after collection from the forest?	61(50.8)	35(29.2)	17(14.2)	7(5.8)
After grazing in the forest do you practice bush fallowing?	58 (48.3)	28 (23.3)	17 (14.2)	17(14.2)
Do you try to protect the forest from pest and diseases?	63 (52.5)	37 (30.8)	13(10.8)	7(5.8)
Do you avoid burning the bush or farm for land preparation?	68 (56.7)	44 (36.7)	7 (5.8)	1 (0.8)
Do you prevent any kind of environmental pollution that can lead to damage of forest resources?	59 (49.24)	3 (35.8)	12 (10)	6(5)
Do you ensure that harvesting and exporting of timber and other forest product is not in violation of national and international laws and regulation?	71(59.2)	47 (39.2)	2 (1.7)	

Source: Field Survey, 2023

Level of Participation of the Respondents on the Utilization of Forest Resources

Table 5 shows that 59.2% of the respondents collect leaves most times, collection of roots most times was done by 61.7% of the respondents, 62.5% most times collect barks, collection of fruits was done most times by 62.5% of the respondents, collection of nuts was done most times by 63.3% of the respondents, collection of mushrooms was done most times by 52.5% of the respondents, collection of snails were done most times by 59.2% of the respondents, collection of sponge gourd or loofah plant were done most times by 44.2% of the respondents, 19.2% of the respondents most times fell trees for timber, 65% of the respondents most times fell trees for fuel.

Table 5: Distribution of Level of Participation of the Respondents on the Utilization of Forest Resources

	MOST TIMES		SOMETIMES		RARELY		NEVER	
	(F)	(%)	(F)	(%)	(F)	(%)	(F)	(%)
How often do you do the following:								
Collection of leaves	71	59.2	47	39.2	1	0.8	1	0.8
Collection of roots	74	61.7	45	37.5	1	0.8	1	0.8
Collection of barks	75	62.5	44	36.7	1	0.8	1	0.8
Collection of fruits	75	62.5	43	35.8	1	0.8	1	0.8
Collection of nuts	76	63.3	42	35	1	0.8	1	0.8
Collection of mushrooms	63	52.5	41	34.2	8	6.7	8	6.7
Collection of snails	71	59.2	36	30.0	9	7.5	4	10.5
Collection of sponge gourd or loofah plant	53	44.2	10	8.3	50	41.7	7	5.8
Hunting	40	33.3	23	19.2	51	42.5	6	5
Felling trees for timber	23	19.2	26	21.7	51	42.5	20	16.7
Felling trees for fuel	78	65.0	36	30.0	6	5.0		

Source: Field Survey, 2023

Assessment of Attitude of the Respondents on the Conservation of Forest Resources

Table 6 indicated that a larger percentage of the respondents 63.3% agreed that the communities 63% agreed that communities have better knowledge and information about the forest conservation, 44.2% agreed that communities have better knowledge of wild plant and animal's species that can survive in different climate, 47.5% agreed that communities are more effective in checking destruction of community forest by foreigners, 29.2% agreed that communities help to prevent the extinction of plant and animal species, 52.5% agreed that communities should be involved in the reporting of illegal activities, 34.2% the respondents agreed to be involved in conservation practices.

Table 7: Distribution of Assessment of Attitude of the Respondents on the Conservation of Forest Resources

	AGREE		UNCERTAIN		DISAGREE	
	(F)	(%)	(F)	(%)	(F)	(%)
Communities are in better position to monitor and control forest activities.	76 (63.3)		41 (34.2)		3 (2.5)	
Communities have better knowledge and information about forest conservation	88 (73.3)		30 (25)		2 (1.7)	
Communities can help reduce effect of climate change	52 (43.3)		11 (9.2)		57 (47.5)	
Communities have better knowledge of wild plants and animal species that can survive in different climate	53 (44.2)		20 (16.7)		47 (39.2)	
Communities have indigenous methods for conserving and maintaining forest.	56 (46.7)		48 (40)		16 (13.3)	
Communities are more						

effective in checking destruction of community forest by foreigners.	57 (47.5)	53 (44.2)	10 (8.3)
Communities help to prevent the extinction of plant and animal species.	35 (29.2)	51 (42.5)	34 (28.3)
Communities should be involved in the reporting of illegal activities.	63 (52.5)	57 (47.5)	
I will like to be involved in conservation practices.	41 (34.2)	69 (57.5)	10 (8.3)

Source: Field Survey, 2023

Problems Associated with Respondents' Participation in the Conservation of Forest Resources

Table 7 indicated that a larger percentage which is 97.5% of the respondent's major problems was lack of government funding for forest management; 94.8 had a major problem in the enforcement of laws and regulations; 71.7% had a major problem with lack of accurate information on conservation of forest resources. The effects of changing climate are seen as a minor problem by 60.8% of the respondents

Table 8: Percentage Distribution of Problems Associated with Respondents' Participation in the Conservation of Forest Resources

	MAJORPROBLEM F (%)	MINOR PROBLEM F (%)	NOT A PROBLEM F (%)
No government funding for forest Management.	117 (97.5)	3 (2.5)	
No enforcement of laws and regulation.	115 (95.8)	5 (4.2)	
Lack or accurate information on conservation of forest resources.	86 (71.7)	32 (26.7)	2 (1.7)
Effects of climate change	31 (25.8)	73 (60.8)	16 (13.3)
Lack of knowledge on the needs of forest conservation	51(42.5)	57 (47.5)	12 (10)
Human population	73 (60.8)	33 (27.5)	14 (11.7)
Overgrazing	62 (51.7)	39 (32.5)	19 (15.8)
Low income	52 (33.3)	37 (30.8)	31 (25.8)
No motivation on the conservation of forest resources.	53(44.2)	49 (40.8)	18 (15)
Family heritage orientation on ownership of forest land and resources.	96 (80)	5 (4.2)	19 (15.8)
Adherence to unsustainable traditional practices.	97 (80.8)	6 (5)	17 (14.2)

Source: Field Survey, 2023

Test of Hypothesis

Ho₂: There is no significant relationship between the level of participation (when last they planted a tree) of community members and their level of utilization of forest resources in the study area.

Table 8: Association between level of participation and level of utilization of forest resources

Variables	r-value	p-value	Decision
Level of utilizations	0.338**	0.000	S

Source: Field Survey, 2023

** Correlations significant at the 0.01 level (2-tailed)

The result above shows there was a significant relationship between the level of participation of community members (when last did they plant a tree) and their level of utilization of forest resources in the study area. The statistical evidence of a meaningful connection between community members' involvement in tree planting and their utilization of forest resources.

Conclusion and Recommendation

Overall, household participation in the conservation and utilization of forest resources is an important strategy for promoting sustainable forest management. However, it requires a comprehensive approach that takes into account the social, economic, and environmental factors that influence forest use and conservation. This includes addressing the challenges that households face in participating in forest conservation and ensuring that they have the necessary support and incentives to do so. By doing this, it is possible to achieve a balance between conservation and development goals, while also ensuring that local communities benefit from the resources found in the forest.

Based on the findings the following recommendations were made on the relevance of household participation in the conservation and utilization of forest resources:

1. Encourage communities to participate in the management of forests, including planning, monitoring, and evaluation of conservation and utilization activities. This approach can improve the efficiency and effectiveness of forest management while enhancing local livelihoods and reducing poverty.
2. Encourage households to engage in sustainable practices such as selective harvesting, agroforestry, and eco-tourism. This will ensure that forests are utilized in a way that meets the needs of the present without compromising the ability of future generations to meet their own needs.
3. Encourage households to participate in reforestation and afforestation efforts. This can include planting trees in degraded areas, promoting the use of fuel-efficient stoves, and reducing deforestation through sustainable land-use practices.
4. Provide incentives for conservation: This should be provided by the government, provision incentives such as technical assistance, more accessible agricultural loans, and security to enforce the laws and regulations, raising awareness and educating households on the benefits of forest conservation and sustainable utilization. This can be achieved through public campaigns, community outreach programs, and school education programs.

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