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Premature Aging Among Cocoa Farmers and Restorative Effects of Ecotourism in Ikom Local Government Area

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Bassey Bernard Obagha[1], Itu Prince-Charles Omin[2], Bassey Rekiyat Abdullahi[3], Ntino Samuel Okang[1]

[1]Department of Geography and Environmental Science, University of Calabar, Calabar, Nigeria,

[2]Department of Environmental Standard, University of Calabar, Calabar, Nigeria,

[3]Department of Social Work, University of Calabar, Calabar, Nigeria

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Correspondence: Bassey Bernard Obagha, bobassey@unical.edu.ng

Abstract

The case of early aging in small-scale farmers is becoming increasingly common among labour-intensive farming systems in sub-Saharan Africa. This study aimed to analyse premature aging predictors among cocoa farmers in Ikom Local Government Area as well as the restorative potential of ecotourism. Cross-sectional research methods involving 320 farmers were applied, and data collection was conducted through surveys, interviews and focus groups, using descriptive and regression analysis of results. High percentages of fatigue (72.5%), joint pains (68.1%) and stress (66.9%) were identified among farmers, with working hours and agrochemical use being associated with a higher risk of aging and income and better access to healthcare being protective factors. Only 31.9% participated in ecotourism, although farmers experienced less fatigue and stress as well as higher income from the activity.

Keywords: Premature Aging, Cocoa Farmers, Occupational Health, Ecotourism, Rural Livelihoods, Ikom

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INTRODUCTION

Agriculture constitutes a crucial economic foundation for communities in developing nations, offering jobs and ensuring the continuity of food and culture. In sub-Saharan Africa, agriculture remains a prevalent means of production and a primary source of employment in its labour market. As a cash crop, cocoa plays a significant role in generating exports and income for many households across Nigeria. The production of cocoa constitutes an important aspect of the livelihood of Cross River State residents, especially those of Ikom Local Government Area. Nonetheless, traditional and labour-intensive methods used in the process increase the physical toll on the farmers, exposing them to the dangers of agrochemicals and difficult climatic conditions.

Recent literature has paid growing attention to the issue of early aging of employees engaged in physically intensive work, but the topic is yet poorly investigated among African farm workers (Christiaensen, & Maertens, 2022). Early aging means an accelerated biological aging process compared with the person's chronological age due to cumulative impacts of various environmental, occupation-related and socio-economic stress factors (Cheng, 2024). For rural farmers, stress factors can include the permanent involvement in exhausting work, poor living conditions and insufficient medical care. Common signs of early aging are chronic fatigue, musculoskeletal problems, weakness of the body and psychological stress (Grosman, & Kalichman, 2025). Moreover, the peculiarities of cocoa farming contribute to the risk of early aging since they involve frequent repetitive movements, prolonged exposure to sunlight and improper use of pesticides (Ekundayo, 2022). However, it should be acknowledged that research concerning early aging among Nigerian cocoa farmers is still rather limited.

In addition to occupation-related risks, wider socioeconomic circumstances have profound implications on health and well-being. Chronic poverty in rural settings restricts access to healthy nutrition, medical services and education, thus making people more vulnerable to premature aging (Folorunsho, 2025). Lacking efficient social protection systems, farmers are forced to remain in the sphere of hard physical labour throughout their lives. The gender component is yet another issue to consider, as women typically have to engage both in agriculture and family routines, thus being subjected to physical and emotional stress (Becot, et. al., 2025). Thus, the development of sustainable livelihoods becomes vital, and ecotourism appears to be a valuable strategy for achieving this goal. This concept implies the exploitation of natural and cultural resources available to communities to promote alternative sources of earnings (Gudeman, 2022).

The healing effects of ecotourism can be explained by theories such as Attention Restoration Theory (ART) and Stress Reduction Theory (SRT), which point out the health benefits associated with exposure to natural settings (Menardo, et. al., 2022). Studies have proven that being in contact with nature relieves stress and improves health and mental well-being (Menardo, et, al., 2022). Through ecotourism, cocoa farmers are likely to benefit from physical restoration and reduction of stress from the demanding work in farms. Although ecotourism is well-known for its benefits to communities and environments, very little is known about how it could help address health problems like premature aging among farmers (Saxena, et. al., 2025). This study will thus fill this gap through an examination of premature aging among cocoa farmers in Ikom and the effects of their engagement in ecotourism.

MATERIALS AND METHODS

The study was carried out in the Ikom Local Government Area, one of the main cocoa-producing areas in the humid tropical rainforest, where there are abundant rainfall, fertile soils and vegetation necessary for extensive production of cocoa. The study area is rural and mainly agricultural, where the farmers depend on manual farming and the application of conventional farming practices, and where there are possibilities

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for ecotourism. A cross-sectional research approach was employed to investigate the relationships between occupational health hazards, premature aging and participation in ecotourism. The target study population consisted of registered farmers producing cocoa, amounting to 1,200, from which the sample of 320 people were selected using Cochran's formula (n_0 = 384 at 95% confidence level with 5% margin of error); it was then adjusted for finite population to be 291 and inflated by 10% in order to compensate for potential non-responses.

The collection of data was done by the use of structured questionnaires, interviews with key informants and focus group discussions with the support of secondary sources where variables were measured objectively through factors like number of hours worked, years of exposure to occupational risks, and physical health symptoms like fatigue and joint pains among others, through composite indices. Independent variables were composed of occupational and socioeconomic determinants, while ecotourism was considered the mediating variable that affects restorative processes, including physical rehabilitation, psychological benefits and economic gains. Data collection tools underwent pre-testing, where reliability was tested using Cronbach's alpha and validity was achieved through expert assessment. Methods of data analysis comprised descriptive and inferential statistics with the application of regression and correlation methods with the help of software such as SPSS and STATA. Ethical considerations included informed consent, confidentiality and voluntary participation despite some weaknesses such as self-reporting, recall biases and the limitations of cross-sectional research in establishing cause and effect relationships.

FINDINGS AND DISCUSSION

The findings on the early indicators of aging and the positive impact of ecotourism engagement are presented and analyzed in this part of the research paper. This analysis will focus on achieving the research objectives of the study, comparing them with related theories to see similarities and differences.

Table 1 Socio-Demographic Profile of Cocoa Farmers (n = 320)

Variable	Category	Frequency	Percentage (%)	Interpretation
Age (years)	<30	28	8.8	Very low youth involvement
	30–44	76	23.8	Active workforce
	45–59	124	38.8	Dominant age group
	≥60	92	28.8	Aging farmers
Gender	Male	214	66.9	Predominantly male dominated
	Female	106	33.1	Significant female participation
Education	No formal	98	30.6	Low literacy levels
	Primary	112	35.0	Basic education dominant
	Secondary+	110	34.4	Moderate literacy
Farming Experience	<10 yrs	42	13.1	Limited new entrants

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	10–20 yrs	108	33.8	Not much experience
	>20 yrs	170	53.1	Highly experienced and aging
Income (Monthly)	Low	188	58.8	Widespread poverty
Healthcare Access	Adequate	96	30.0	Limited access
	Inadequate	224	70.0	High vulnerability

Source: Authors fieldwork, 2026

It can be clearly seen from table1 that cocoa production is dominated by the old population as 67% of the individuals are more than 45 years. This finding has been confirmed by the findings of Maniriho, et. al., (2022), they discovered the existence of a trend where youths from West African states moved into urban cities, leaving the agricultural field with the old generation of farmers.

Table 2 Occupational Exposure Characteristics

Variable	Category	Frequency	Percentage (%)	Implication
Daily Working Hours	<6 hrs	38	11.9	Low workload
	6–10 hrs	142	44.4	Moderate
	>10 hrs	140	43.7	High physical strain
Agrochemical Exposure	Frequent	196	61.3	High health risk
Protective Equipment	Regular use	74	23.1	Low protection
	Rare/None	246	76.9	High vulnerability
Nature of Work	Manual	268	83.8	Labor intensive
	Semi-mechanized	52	16.2	Limited mechanization

Source: Authors fieldwork, 2026

The results show that cocoa farming in Ikom Local Government Area is highly labour-intensive, with most farmers working long hours under manual conditions, a pattern that supports existing studies linking prolonged physical exertion to fatigue and musculoskeletal disorders (Motaqi, & Ghanjal, 2025). Similarly, the high level of agrochemical exposure and low use of protective equipment align with findings by Aksüt, and Eren, (2024) which associate such conditions with increased occupational health risks.

Table 3 Distribution of Premature Aging Indicators

Indicator Type	Specific Indicator	Prevalence (%)	Severity Interpretation
Physical	Chronic fatigue	72.5	Very high
	Joint pain	68.1	High
	Reduced mobility	54.4	Moderate

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Physiological	Chronic illness	49.7	Moderate
	General weakness	63.8	High
Psychological	Stress	66.9	High
	Mental exhaustion	58.1	Moderate–High

Source: Authors fieldwork, 2026

The low utilization of personal protective equipment among cocoa farmers in Ikom Local Government Area, despite high exposure to agrochemicals, supports the findings of Aksüt and Eren (2024), who reported that inadequate use of protective gear significantly increases health and safety risks in pesticide application. This consistency suggests that the limited adoption of PPE observed in the study area contributes to heightened occupational vulnerability and reinforces the likelihood of adverse health outcomes, including premature aging among farmers.

Table 4 Regression Results for Determinants of Premature Aging

Variable	Coefficient (β)	Significance (p-value)	Interpretation
Working hours	0.41	0.000	Strong positive effect
Chemical exposure	0.36	0.002	Significant risk factor
Income level	-0.29	0.005	Protective effect
Healthcare access	-0.33	0.001	Reduces aging risk

Source: Authors fieldwork, 2026

The regression results indicate that occupational factors such as long working hours ($\beta = 0.41$, $p < 0.001$) and chemical exposure ($\beta = 0.36$, $p = 0.002$) significantly increase the likelihood of premature aging among cocoa farmers in Ikom Local Government Area, supporting existing evidence that prolonged physical strain and toxic exposure accelerate health deterioration (Henning, 2024). Conversely, higher income levels ($\beta = -0.29$, $p = 0.005$) and access to healthcare ($\beta = -0.33$, $p = 0.001$) were found to reduce aging risk, aligning with Osareme, et. al., (2024), who emphasizes the protective role of socio-economic conditions in health outcomes. These findings collectively reinforce the health risk accumulation theory, suggesting that cumulative exposure to occupational hazards increases vulnerability, while improved socio-economic conditions mitigate adverse aging effects.

Table 5 Ecotourism Participation Profile

Variable	Category	Frequency	Percentage (%)	Conclusion
Participation	Yes	102	31.9	Low participation rate
	No	218	68.1	Majority are not included
Type	Guiding	28	—	Limited roles
	Crafts	34	—	Supplementary income
	Hospitality	40	—	Emerging sector

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Income Contribution	Significant	46	45.1 (of participants)	Meaningful diversification

Source: Authors fieldwork, 2026

The results show that ecotourism participation among cocoa farmers in Ikom Local Government Area remains relatively low, with only 31.9% engaged, indicating limited inclusion in alternative livelihood opportunities, however, this finding does not fully align with studies that report higher rural participation where structured tourism support exists (Broegaard, 2022). Despite the low participation rate, those involved derive meaningful economic benefits, particularly through hospitality, crafts and guiding services, supporting Rosalina, (2025), who argues that ecotourism can enhance income diversification in rural communities. This suggests that while access and participation remain constrained, ecotourism has significant potential as a viable supplementary livelihood strategy when adequately developed and supported.

Table 6 Comparison of Participants vs Non-Participants

Variable	Participants	Non-Participants	Difference
Prevalence of fatigue (%)	54.2	79.8	Lower among participants
Average monthly income	Higher	Lower	Significant gap
Working hours	Reduced	Higher	Less strain
Level of stress (%)	48.0	74.3	Improved well-being

Source: Authors fieldwork, 2026

Farming communities involved in ecotourism activities have much less fatigue and stress, along with increased earnings and decreased physical work. This shows that ecotourism is linked with health benefits and less exposure to occupational stressors. The results clearly demonstrate that the practice of ecotourism has tangible restorative effects for farmers. Specifically, farmers who were engaged in ecotourism experienced less physical exhaustion as they did not need to engage in arduous agricultural practices, and at the same time felt better psychologically because of social interactions in the natural environment. This is consistent with the Stress Reduction Theory (SRT) and the Attention Restoration Theory (ART), according to which recovery from stress and mental tiredness is possible through contact with nature.

The research presents a direct relationship between occupational hazard and early aging because it has been proven that work and physical activities together with chemical exposure results in significant negative consequences for health. On the other hand, the participation of cocoa growers in ecotourism represents a way of overcoming the impact of physical exertion and improving their health status.

CONCLUSION

In this investigation, premature aging symptoms among cocoa farmers in Ikom LGA were evaluated while at the same time determining the rejuvenation benefits of engaging in ecotourism as an additional source of livelihood through the application of a combined perspective on the field, including occupational health, ecotourism, and livelihood in rural areas for a holistic perspective on the relationship between physical activities in agriculture and health conditions as well as the economic possibilities for such workers. It was determined that cocoa cultivation in the research setting is characterized by an aged labour force that works under tough socio-economic circumstances, such as poverty and poor access to medical care, while the following factors cause premature aging among cocoa farmers, including long working days, frequent use of agrochemicals, and manual labour; nevertheless, ecotourism proved to alleviate these problems

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because the subjects involved in ecotourism experience less physical and psychological exhaustion along with additional income sources.

Theoretically and empirically, this paper will make contribution to literatures on occupational health and ecotourism by showing that nature tourism can act as both an economic enterprise and a restorative and health-promoting intervention, based on the application of theories such as Stress Reduction Theory, Attention Restoration Theory, and the Sustainable Livelihood Approach, which help to elucidate the connections between occupational stress, nature interaction, and health. Moreover, the results emphasize the necessity of policies to facilitate more safe agricultural operations, regulation of agrochemicals, better rural healthcare access, and the integration of ecotourism into development planning, even though the paper is limited by the cross-sectional approach and self-reporting bias. All in all, the study makes a solid base for further research in the subject, while recognizing that early aging of cocoa farmers is a complex problem that requires a multi-faceted solution.

Recommendation

From the findings of the study conducted in Ikom Local Government Area, the following are some of the recommendations that are made:

i. Occupational safety and health practices in cocoa farming should be enhanced.
ii. Rural healthcare provision should be improved.
iii. Ecotourism should be promoted as an alternative source of income.
iv. Capacity building should be encouraged.
v. Multi-sector collaboration should be encouraged.

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