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The Role of Investment in Non-Timber Forest Resources in Achieving Sustainable Development: A Case Study of the Shea Butter Market in West Africa

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Abstract: This study aims to highlight the role of investment in non-timber forest resources in achieving sustainable development, with a focus on the Shea butter market in West Africa as an applied model. The research adopted the descriptive-analytical method, which is most suitable for examining economic and social phenomena in their real context. Among its techniques, the case study approach was employed to analyze the Shea market based on secondary data from international organizations and recent market reports. This method allowed for both a detailed description of the phenomenon and an analysis of its implications on the economic (job creation and income improvement), social (empowerment of rural women), and environmental (forest cover preservation) dimensions. The study concludes that investment in non-timber forest resources, when carried out within sustainable policies, can serve as a genuine lever for achieving the Sustainable Development Goals, particularly in rural African areas.
Key words: Non-Wood Forest Products; Sustainable Development; Green Economy; Shea Butter.
Jel Classification Codes : Q01, Q23, Q56, Q57, O13.

1.Introduction:

Non-timber forest resources (NTFRs) represent a key component of sustainable development, offering integrated economic, social, and environmental benefits. Among them, shea butter has gained increasing attention as a responsible investment model capable of generating economic returns while preserving ecological balance and empowering rural women in West Africa.

❖ Research Problem:

Despite growing global interest, investment in non-timber forest resources remains limited and uneven across the three dimensions of sustainable development.
The central research question is:
To what extent does investment in non-timber forest resources contribute to achieving the economic, social, and environmental dimensions of sustainable development with a case study of the shea butter sector in West Africa?
The following subsidiary questions are formulated within the scope of this issue:

- What are non-timber forest resources, and how do they differ from traditional timber resources?

- What is the economic, social, and environmental importance of investing in these resources?
- How does investment in the shea butter sector reflect the interconnection among the three dimensions of sustainable development?

❖ Study Hypotheses:

To address the research problem, the following main hypothesis can be proposed:

- ✓ Investment in non-timber forest resources promotes sustainable development by enhancing economic growth, fostering social empowerment, and preserving the environment.

The main hypothesis encompasses the following subsidiary hypotheses:

- Non-timber forest resources represent a promising economic and environmental asset distinct from traditional timber resources;
- Investment in these resources contributes to job creation and income improvement, reinforcing the economic and social pillars of sustainability;
- The shea butter sector serves as a practical model illustrating how investment in NTFRs can balance the three dimensions of sustainable development.

❖ Significance of the Study:

This study highlights the growing importance of NTFRs as a strategic tool for achieving sustainable development and provides an applied model from the African context that can inform future policy design and environmental-economic integration.

❖ Objectives of the Study:

The objectives of this study are as follows:

- To clarify the concept and characteristics of non-timber forest resources;
- To analyze the developmental importance of investment in NTFRs from economic, social, and environmental perspectives;
- To present the shea butter sector as a case study illustrating sustainable investment practices.

❖ Methodology:

The study adopts a descriptive and analytical approach, combining theoretical analysis of international reports with an applied case study of the shea butter sector, to assess the impacts of NTFR investment on sustainable development dimensions.

❖ Structure of the Study:

The study can be structured around the following main axes:

- Section I: The Concept and Dimensions of Sustainable Development;
- Section II: Investment in Non-Timber Forest Resources: Concept and Developmental Importance;
- Section III: The Shea Butter Market in West Africa — A Model for Investment in Non-Timber Forest Resources.

2. The Concept of Sustainable Development.

The term *sustainable development* has been widely used in contemporary development literature, as it represents a rational and balanced model of development. It deals simultaneously with economic activities aimed at achieving growth and with measures designed to protect the environment and its resources. Today, the world recognizes that sustainable development is the only viable path to ensure the availability of the essential components of a healthy life for both present and future generations.

2.1. The Definition of Sustainable Development:

A variety of definitions have been proposed for sustainable development, among which:

- Sustainable development was defined at the Rio Conference (1992) as: *"The necessity of achieving the right to development in such a way as to equally meet the developmental and environmental needs of present and future generations."* (Othman & Abu Zant, 2009, p. 23)
- According to the International Union for Conservation of Nature (IUCN), sustainable development is: *"Development that takes into account the environment, society, and the economy."* (Corinne, 2006, p. 166)
- The World Bank defines sustainable development as: *"Development that focuses on maintaining intergenerational equity by ensuring that future generations have access to the same opportunities as the present ones, through maintaining or increasing total capital over time."* (World Bank , 1992, p. 46)
- According to the Food and Agriculture Organization of the United Nations (FAO), sustainable development is: *"The management and conservation of the natural resource base and the orientation of technological and institutional change in such a manner as to ensure the continued satisfaction of human needs for present and future generations."* (Food and Agriculture Organization of the United Nations , 1989, pp. 5-6)
- According to Edward Barbier, sustainable development is: *"An activity that enhances social welfare while maintaining the available natural resources and minimizing environmental degradation. Sustainable development, therefore, differs from conventional development in that it is more complex and integrates both the natural and social dimensions of growth."* (Barbier, 1987, p. 104)
- Sustainable development has also been defined as: *"The necessity of using renewable natural resources in ways that do not lead to their depletion, degradation, or decline in productivity for future generations, while maintaining a constant or increasing stock of essential resources such as groundwater and biological biomass."* (International Union for Conservation of Nature and Natural Resources, 1980)

From the above definitions, it can be concluded that sustainable development is the form of development that achieves a balance among environmental, economic, and social systems, contributing to the maximum possible growth within each of these three dimensions.

2.2. Dimensions of Sustainable Development:

Sustainable development is characterized by its interrelated and integrated dimensions, which,

when addressed collectively, lead to the achievement of sustainable development. These dimensions are economic, social, and environmental.

2.2.1. The Economic Dimension:

This dimension refers to improving individuals' standards of living by meeting their needs for goods and services. It revolves around the impact of economic activity on the environment. The economic dimension of sustainable development can be summarized as follows: the share of individual consumption of natural resources; achieving sustainable economic growth; ensuring efficiency in the use of capital; modifying consumption patterns that threaten biodiversity to stop the depletion of natural resources; the responsibility of developed countries for pollution and its remediation; reducing the dependence of developing countries; dedicating natural resources to continuously improving living standards; reducing income inequality; promoting equality in resource distribution; and minimizing military expenditures. (Pearce, Markandya, & Barbier, 1989, p. 45)

2.2.2. The Social Dimension:

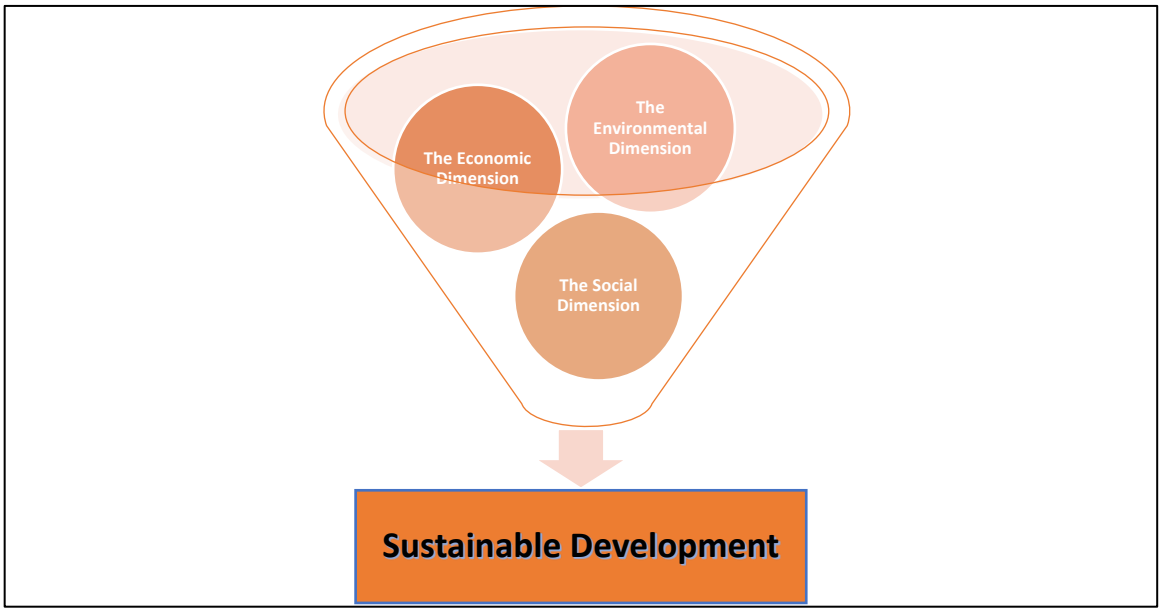
The social dimension of sustainable development focuses on eradicating extreme poverty, hunger, unemployment, and the wide gap between the rich and the poor. This dimension is crucial for achieving sustainable development through social justice. Its main elements include stabilizing population growth; ensuring an optimal distribution of population between urban and rural areas; improving health and education; optimizing the use of human resources; encouraging public participation; promoting cultural diversity; and achieving social justice among individuals of the current generation, as well as between present and future generations. (Filipowicz, 2024)

2.2.3. The Environmental Dimension:

The environmental dimension of sustainable development holds great importance as it addresses the relationship between economic development and the environment by setting policies that define the limits that should not be exceeded. This dimension involves preserving natural resources and anticipating potential impacts of development on ecosystems for precautionary and preventive purposes. The main elements of the environmental dimension include: avoiding soil degradation through the misuse of pesticides, preventing the destruction of vegetation cover, conserving water resources by limiting wasteful uses and improving water network efficiency, protecting habitats of biological species to ensure biodiversity for future generations, combating climate change and global warming, and ensuring the rational use of energy and mineral resources. (Arkaitz, Fairbrass, & Ekins, 2024)

The fundamental dimensions of sustainable development can be illustrated in the following figure:

Fig.1. The Basic Dimensions of Sustainable Development



Source: Prepared by the researchers.

2.3. Objectives of Sustainable Development

Sustainable development, through its mechanisms and principles, seeks to achieve a set of objectives summarized in the *Millennium Development Goals*, which were redefined in September 2014 to include 17 new *Global Sustainable Development Goals* for the period 2015–2030. These goals are: (United Nations, 2015)

2.3.1. A World without Poverty: By 2030, global poverty should be eradicated.

2.3.2. A World without Hunger: The United Nations calls for ensuring sufficient food for all people by 2030.

2.3.3. Health Care for All: Guaranteeing adequate healthcare, medicines, and vaccines for all by 2030.

2.3.4. Education for All: Education should be accessible to all children regardless of gender, financial, social, or religious background.

2.3.5. Gender Equality: Achieving equality between men and women in public and political life, and eliminating all forms of violence and discrimination against women.

2.3.6. Water for Life: Providing sufficient drinking water for all people by 2030, as over 770 million people currently live without access to clean water.

2.3.7. Access to Energy: Ensuring universal access to electricity by 2030 through infrastructure development and the use of renewable energy, given that over 1.3 billion people currently lack electricity.

2.3.8. Decent Work and Economic Justice: Promoting fair and equitable working conditions and creating suitable employment opportunities for youth.

2.3.9. Sustainable Infrastructure: Developing infrastructure that respects environmental protection and resource sustainability.

2.3.10. Fair Distribution of Wealth: Reducing wealth inequality, as a small fraction of the global population currently holds more than half of the world's wealth.

2.3.11. Sustainable Cities: Ensuring that large cities become environmentally friendly and responsive to residents' needs in terms of housing, employment, and climate resilience.

2.3.12. Recycling and Sustainable Production: Promoting recycling and reuse of materials, especially plastics and electronic devices, in an environmentally sustainable manner.

2.3.13. Environmental Protection: Supporting developing countries in environmental protection initiatives and reinforcing international agreements on climate change.

2.3.14. Protection of Oceans: Safeguarding oceans from pollution by 2025 to preserve marine life and livelihoods.

2.3.15. Stopping Environmental and Biological Destruction: Halting biodiversity loss and species extinction by 2020.

2.3.16. Rule of Law and Justice: Ensuring equality and justice in the application of laws by 2030.

2.3.17. Global Solidarity: The new sustainable development goals require all signatory countries to implement them, while urging wealthy nations to contribute 0.7% of their gross national income to global development programs.

3.Investment in Non-Timber Forest Resources: Concept and Developmental Importance.

Non-timber forest resources constitute an important economic and environmental asset, contributing to income diversification and sustainable development. Investing in these resources reflects a strategic approach that combines environmental conservation with the enhancement of local economies.

3.1. Concept of Non-Timber Forest Resources:

Non-wood forest products (NWFPs) have been defined by FAO as *"goods of biological origin other than wood derived from forests and other wooded land and trees outside forests"* Different variations of the term are also widely used, for example, non-timber forest products (NTFPs), wild species or wild edible plants (WEPs) and animals. (Food and Agriculture Organization of the United Nations, 2025)

Examples of NWFPs include products used as food and food additives (edible nuts, vegetables, mushrooms, fruits, herbs, spices and condiments, aromatic plants, game, insects), fibres (used in construction, furniture, clothing or utensils), resins, gums, and plant and animal products used for medicinal, cosmetic or cultural purposes.

Other terms commonly used include gathering or harvesting - the collection of untended foods and other products not grown intentionally. The term "wild" (species) refers to "populations existing and reproducing without human agency", "spontaneous forest products of biological origin", or "untended biological resources obtained from the activity of gathering" and by extension not grown intentionally. However, many "wild" products are semi-domesticated, cultivated or managed to some degree by people, and most habitats considered "wild" have been shown to be managed and modified by humans over time. (Food and Agriculture Organization of the United Nations, 2025)

3.2. The Importance of Investment in Non-Wood Forest Resources

Investment in non-wood forest resources holds significant importance on the economic, environmental, and social levels, which can be summarized as follows:

3.2.1. Economic Importance: The economic significance of investing in non-wood forest resources can be summarized as follows:

- Diversifying national income sources and reducing dependence on wood-based products;
- Creating local employment opportunities, particularly in rural areas;
- Supporting small and medium-sized enterprises (such as pharmaceutical, food, and cosmetic industries);
- Enhancing exports of natural and organic products with high added value.

3.2.2. Environmental Importance: The environmental importance of investing in non-wood forest resources can be summarized as follows: (Başkent, Keleş, & Kadıoğulları, 2024)

- Contributing to the preservation of forest cover by exploiting resources without destroying trees;
- Maintaining biodiversity and reducing desertification;
- Promoting the sustainable use of ecosystems.

3.2.3. Social Importance: The social importance of investing in non-wood forest resources can be summarized as follows:

- Improving the living conditions of forest and mountain populations;
- Encouraging solidarity-based economies and local cooperatives;
- Preserving traditional knowledge related to the collection and use of medicinal and aromatic plants.

4.The Shea Butter Market in West Africa — A Model for Investment in Non-Timber Forest Resources.

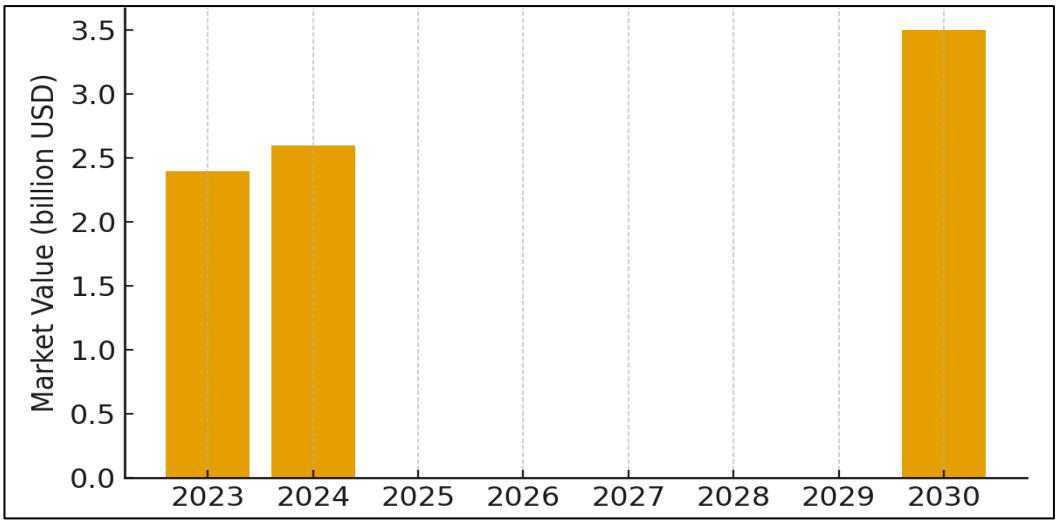
The shea tree (Vitellaria paradoxa) grows naturally across the so-called *"Shea Belt"* in West and Central Africa. It provides substantial monetary income for hundreds of thousands of local communities—most of which are women's groups. This makes shea a clear example of how the utilization of non-timber forest resources (NTFRs) connects the social, economic, and environmental dimensions of sustainable development.) Global Shea Alliance. ،n.d)

4.1. Market Size and Production:

- **Global Market Value**: The global shea butter market is valued at approximately USD 2.4–2.6 billion (2023–2024), with continuous growth projected through 2030. (Grand View Research, 2024).

This can be illustrated by the following figure:

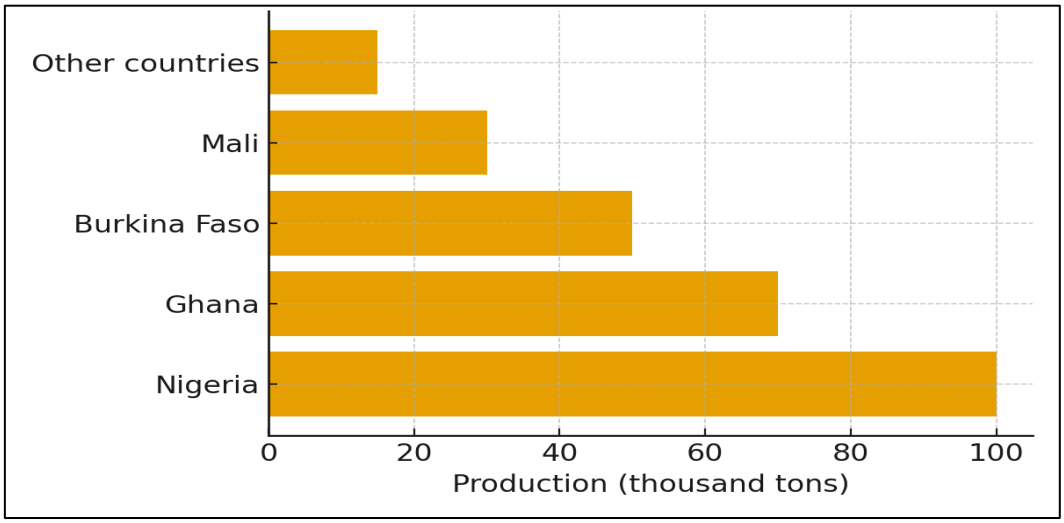
Fig.2. Global Shea Butter Market Value (billion USD)



Source: Grand View Research (2024); Private Finance for the SDGs (n.d.); Global Shea Alliance (n.d.); Adetayo (2025); Baussan (2008); Hyolmo (2025) — adjust per figure as needed. We observe from the above figure that the global market value of shea butter increased moderately from around 2.4 billion USD in 2023 to approximately 2.6 billion USD in 2024, and is expected to reach about 3.5 billion USD by 2030. This represents an overall growth of nearly 46% over seven years, driven by the growing international demand for natural cosmetic ingredients and the expansion of investments in sustainable supply chains.

- **Production Volume:** Development platforms and financial institutions estimate the annual availability of hundreds of thousands of tons of shea nuts. Sectoral reports often cite an indicative figure of around 250,000 tons, representing a seasonal or market benchmark used in investment studies. (Private Finance for the SDGs, n.d)
- **Country Rankings:** The main suppliers and aggregators are Nigeria, Burkina Faso, Ghana, and Mali. Official government statements and trade statistics (UNCTAD, Tridge, national reports) confirm this. (Example: Ghana's production data available via Tridge), Further details can be illustrated by the following figure:

Fig.3. Shea Nut Production by Country (thousand tons/year)



Source: Grand View Research (2024); Private Finance for the SDGs (n.d.); Global Shea Alliance (n.d.); Adetayo (2025); Baussan (2008); Hyolmo (2025) — adjust per figure as needed.
We observe from the previous figure that Nigeria ranks first in global shea nut production with about 100 thousand tons per year, followed by Ghana with 70 thousand tons, and Burkina Faso with 55 thousand tons. Meanwhile, Mali and other producing countries contribute smaller shares, each not exceeding 30 thousand tons. These data indicate that more than two-thirds of global production is concentrated in West Africa, highlighting the strategic importance of the region within the shea value chain.
Note: Figures vary annually depending on climatic conditions and policy changes (for instance, the recent ban on raw shea nut exports in Nigeria).

4.2. The Value Chain and Economic Roles:

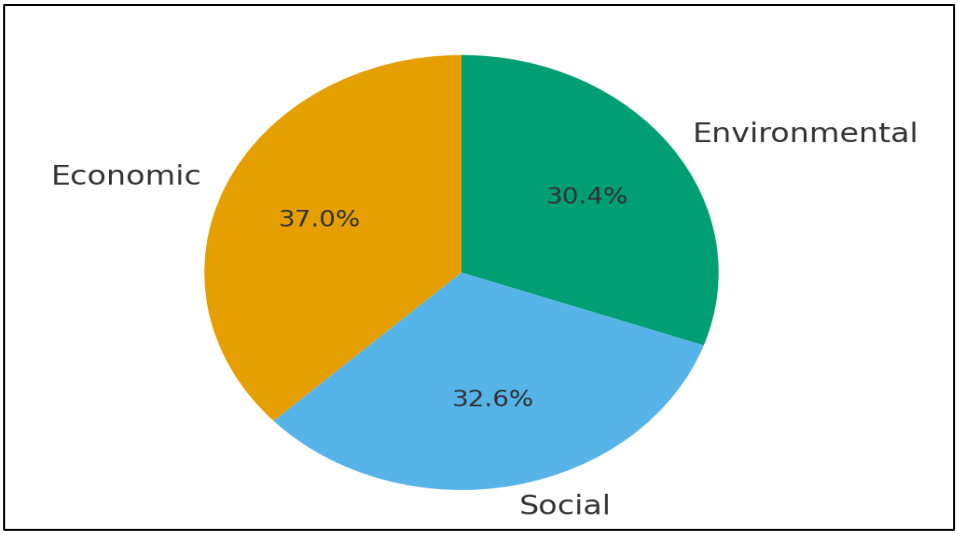
- **Nut Collectors:** Primarily rural women who gather shea fruits, providing essential household income.
- **Local Primary Processing:** Some women and cooperatives engage in traditional butter extraction at the household or village level. While this process adds local value, it remains limited in both quality and production capacity. (Global Shea Alliance, n.d)
- **Industrial Processing and Export:** A significant portion of the high-value segment (cosmetic and food-grade products) is realized in consumer countries or through large industrial plants. Shifting the value chain toward domestic processing increases the local share of market value. Government policies such as export bans on raw nuts encourage local processing but require adequate infrastructure, skills, and financial support. (Adetayo, 2025)

4.3. Investment Impacts (Economic, Social, and Environmental)

- **Economic Impact:** Investment reports reveal that shea processing projects in West Africa generate relatively high returns on investment (ROI) and create hundreds of thousands of informal jobs in nut collection, processing, and packaging. (Private Finance for the SDGs, n.d)
- **Social Impact:** Partnerships between international cosmetic firms (e.g., L'Occitane) and local cooperatives have demonstrated tangible improvements in women's livelihoods, working conditions, and community education. (Baussan, 2008)
- **Environmental Impact:** The economic value of shea trees motivates communities to preserve forest cover rather than cut down trees. Scientific and journalistic reports confirm that sustainable harvesting practices contribute to forest conservation.

Further details can be illustrated by the following figure:

Fig.4. Investment Impacts on Shea Sector by Sustainability Dimension



Source: Grand View Research (2024); Private Finance for the SDGs (n.d.); Global Shea Alliance (n.d.); Adetayo (2025); Baussan (2008); Hyolmo (2025) — adjust per figure as needed.

The figure shows that investments in the shea sector generate impacts across all three dimensions of sustainable development, with the economic dimension representing the largest share (37%), followed by the social dimension (32.6%) and the environmental dimension (30.4%). This distribution indicates that while economic outcomes—such as income generation and market expansion—remain the primary focus of investment, significant attention is also given to social empowerment and environmental protection. Overall, the data reflect a balanced yet economically driven approach to sustainability within the shea value chain.

Conclusion

This study set out to answer the central question: To what extent does investment in non-timber forest resources contribute to achieving the economic, social, and environmental dimensions of sustainable development?

Through the case study of the shea butter market in West Africa, the research validated the main hypothesis that such investment—when aligned with sustainable policies—can serve as a true lever for achieving sustainable development.

The findings revealed that investment in non-timber forest resources (NTFRs) generates balanced and multidimensional impacts:

- Economically, it diversifies income sources, stimulates rural employment, and enhances exports of high-value natural products;
- Socially, it empowers rural women, promotes community-based cooperatives, and improves living standards in marginalized areas;
- Environmentally, it incentivizes forest preservation, biodiversity conservation, and the sustainable use of natural ecosystems.

Thus, the research confirms the validity of its hypotheses and demonstrates that NTFR investment represents an integrated development model capable of harmonizing economic efficiency, social inclusion, and environmental protection.

Recommendations:

Based on the findings of the study, the following recommendations can be proposed:

- Develop national and regional policies to promote sustainable investment in NTFRs linked to the UN 2030 Agenda;
- Strengthen women's cooperatives through targeted funding, training, and modern extraction techniques;
- Encourage local investment through fiscal incentives and logistical support for SMEs in the NTFR sector;
- Support scientific research on NTFRs and their contribution to green and circular economies;
- Establish regional marketing platforms to facilitate international market access with certified sustainability standards.

Future Research Perspectives:

In light of the obtained results, this study constitutes an initial contribution to the academic discussion on the role of investment in non-timber forest resources in achieving sustainable development. However, it also opens the door for further and more comprehensive research that could address aspects not fully covered in the present work.

Accordingly, the following topics can be proposed:

- Explore other NTFR-based investment models (e.g., gum arabic, aromatic plants);
- Assess the long-term impacts of such investments on rural poverty reduction and ecosystem restoration;
- Develop quantitative indicators to measure the contribution of NTFR investment to the Sustainable Development Goals (SDGs);
- Analyze the role of international partnerships and green finance in expanding sustainable value chains.

In conclusion, investment in non-timber forest resources stands out as a strategic and multidimensional pathway toward achieving sustainable development, especially in resource-rich but economically vulnerable regions.

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