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Economic Aspects Evaluation of Agroforestry Implementation in the Framework of Sustainable Development in Indonesia

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Abstract : The implementation of agroforestry involves the integration of annual staple crops with various types of woody plants (and others) that provide various benefits to their users. This study attempts to evaluate the economic aspects of the implementation of agroforestry within the framework of sustainable development in Indonesia, which includes funding sources and agroforestry financing schemes, as well as the economic and environmental impacts of its implementation. The results of the study indicate that the implementation of agroforestry requires a large initial investment of 5 to 15 million rupiah per hectare. However, operational costs tend to be lower compared to monoculture farming because it allows for more efficient and sustainable land use. The implementation of agroforestry provides long-term economic benefits through increased farmer income and diversification of income sources. The impact on the environment is an efficient use of energy, improving soil quality, reducing carbon emissions, increasing productivity and land market value. The actual income from agroforestry will be felt to be greater than the potential income from carbon trading.

Keywords : Forestry, Green economy, Sustainable development, Agroforestry.

INTRODUCTION

BPS noted that Indonesia's economic growth in 2021 showed an increase of 3.69% Year on Year (YOY), with the industrial sector (18.80%), trade (12.71%), agriculture (11.39%), construction (10.48%), and mining (10.43%) as the main contributors to Gross Domestic Product (GDP). Rapid economic development is often directly proportional to increased carbon emissions. In countries that still rely on the extractive sector, such as Indonesia, land clearing for agriculture is inevitable in order to meet domestic and global food needs. Indonesia has a forest cover of 95.6 million ha, which is the eighth largest in the world (Rohmaningtyas, 2022). However, the forestry sector has not been fully optimized in utilizing the potential economic value of environmental services, such as carbon sequestration. There is a significant gap between the potential revenue from Indonesia's carbon trade, estimated at 5.2 billion USD, and the actual revenue of only around 58 million USD. In this context,

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agroforestry is a land use system that combines woody plants and agricultural crops, becoming a potential solution to overcome land degradation while increasing the efficiency of energy use through sustainable management (Wattie & Sukendah, 2023).

National critical land area in 2022 reached 12,7 million hectares, with details in the Forest Area covering an area of 7,4 million hectares, and outside the Forest Area covering an area of 5,3 million hectares. Degraded land is characterized by land cover in the form of shrubs, open land, former mines, and grasslands. Rehabilitation of degraded land through agroforestry systems can increase productivity and improve environmental quality. Agroforestry, which in Indonesia is more commonly known as Agrosilviculture, combines forestry and agricultural plants simultaneously or in rotation to create mutually beneficial ecological and economic interactions (Wattie & Sukendah, 2023). This system is considered capable of facing the challenges of climate change and improving the welfare of local communities through increased production and income which can be daily, weekly, seasonal or annual.

Paul et al. (2017) and Li et al. (2021) discuss the role of agroforestry in combining agricultural production with the provision of ecosystem services, with an emphasis on land and resource use efficiency, and adaptation to climate change. Doddabasawa et al. (2020) in their study broadened the economic and energy insights of agroforestry, highlighting the advantages of tree-based systems in production and energy efficiency. While Premono & Lestari (2018) focused on the financial and economic analysis of agroforestry in a specific context, showing the financial feasibility and resilience of agroforestry systems to changes in price and production. Each study makes a different contribution to the understanding of the green economy and agroforestry, from basic concepts to practical applications in various geographical and economic contexts.

There is a research gap that can be filled through this study, that evaluating the economic aspects of agroforestry implementation as a form of green economy within the framework of sustainable development in Indonesia. This evaluation of the economic aspect includes funding sources and agroforestry financing schemes, as well as the economic and environmental impacts of agroforestry implementation. The agroforestry system is considered capable of facing the challenges of climate change and improving the welfare of local communities through increased production and income that can be daily, weekly, seasonal, or annual. In addition, agroforestry also has the potential to create jobs, although the need for labor depends on the type of plant combined. This study is expected to contribute to seeing

the role of agroforestry application to encourage sustainable economic development according to the Sustainable Development Goals (SDG) 2030 framework.

RESEARCH METHODS

A literature review was used in these studies as a methods that searches for existing research and literature. The study was conducted by reviewing the literature to obtain references that are in accordance with the research topic. This method is used to conduct critical studies, ideas, findings, and knowledge for drawing theoretical conclusions to be used as references for further research. This literature review method will be summarized in a descriptive analysis according to the needs of researchers based on the findings of each literature obtained. The results of the study are arranged in such a way and presented to readers in a form that is easy to understand. Literature search strategies through online media include searching on Google Scholar, PubMed, Research Gate, Elsevier, NCBI. The keywords that will be used as alternative searches are keywords that are adjusted to the research title, namely green economy, agroforestry, finance.

The literature used for this study must meet the Inclusion criteria, that journal publications from the period 2014 - 2024 in both Indonesian and English. Keywords are adjusted to the research topic, namely green economy, agroforestry, and finance with a full access category (full text) from the site that has been used as a source of literature data. The research data that has been collected will be curated or collected according to the research method and will be summarized narratively based on the research result group. After the research curation process and research grouping according to the inclusion criteria and methods used, the research method, research process, and research results obtained from the full text article of the research will be reviewed more clearly.

RESULTS AND DISCUSSION

Agroforestry in the Context of Green Economy. Agroforestry is a farming model that involves the integration of annual staple crops with various types of woody plants or other plants (Widiyanto & Hani, 2021). The agroforestry implementation by farmers can be seen from the commodities planted, the scale of management and the social background (Anesa et al., 2022). Fardiansyah et al. (2022) argue that agroforestry is a land use system that combines annual plants, agricultural crops and/or livestock/fish in the same area, with the aim of increasing the value of land productivity in the form of results from woody plants, agricultural

crops/livestock/fisheries so that tiered income is obtained, both in the short, medium and long term (Harinawati & Candrasari, 2023).

Agroforestry is one of the natural resource management models and in the context of the green economy must fulfill the aspect of long-term resource management to meet the needs of current and future generations, also in line with the Sustainable Development Goals (SDGs). Agroforestry is one of the alternative green economy practices implemented in Indonesia through community-based sustainable forest management. Agroforestry has been recognized for its potential to act as a catalyst for the rehabilitation of degraded land and the provision of ecosystem services, not only help reduce the negative impacts of climate change, but also contribute to climate change adaptation through carbon sequestration in trees and soil (Ulya et al., 2023).

Muttaqin (2019) describes the benefits of agroforestry, including, *first*, supporting productivity and soil protection. Deep plant roots help maintain soil structure and reduce nutrient loss. *Second*, supporting biodiversity conservation by creating diverse habitats for various plant and animal species. *Third*, mitigating global warming through plant species in agroforestry systems can contribute to reducing greenhouse gas emissions and reducing global warming. *Fourth*, improving water and environmental quality by absorbing and filtering agricultural waste and reducing surface water flow that can cause erosion and pollution. *Fifth*, supporting food security by increasing food production by utilizing land efficiently. *Sixth*, supporting community health resilience by providing food resources, traditional medicines, and natural materials that support public health in general.

Funding Sources and Financing Schemes for Agroforestry in the Context of Indonesia's Green Economy. The implementation of agroforestry in remote rural areas of Indonesia requires adequate financial support. *Dana Alokasi Khusus* (DAK) is one source of funding that can be utilized. Nurfatriani et al. (2022) showed that the allocation of DAK for the agricultural sector reached IDR 15 trillion, some of which was allocated for agroforestry projects. International grants are also an important source of funding for agroforestry implementation. Various international organizations such as Global Environment Facility (GEF) and United Nations Development Programme (UNDP) often offer grants aimed at sustainable projects in developing countries. For example, the GEF Small Grants Programme in Indonesia has provided grants of up to USD 50,000 for local communities implementing agroforestry practices in rural areas. However, to access these grants, farmers and local communities often have to meet certain requirements, such as having a strong and well-

organized proposal and the ability to report on the environmental impacts of the projects being implemented.

Private investment also plays a significant role in funding agroforestry practices in Indonesia. A number of large companies, especially in the forestry and agribusiness sectors, are beginning to see the economic potential of investing in agroforestry. They often engage through Corporate Social Responsibility (CSR) or green investment schemes, which not only provide financial benefits but also enhance the company's image. For example, Asia Pulp & Paper has invested in an agroforestry project in Sumatra, which aims to integrate agriculture with critical land rehabilitation.

Green credit or loan schemes are also an important financing alternative for rural farmers. Banks in Indonesia, including Bank Rakyat Indonesia (BRI) and Bank Negara Indonesia (BNI), have introduced green credit products that offer lower interest rates for sustainable agricultural projects, including agroforestry. Kredit Usaha Rakyat (KUR) program, subsidized by the government, is also one of the schemes widely used by farmers to obtain initial capital. Sahara et al. (2017) revealed that KUR distribution for the agricultural sector reached IDR 140 trillion with relatively low interest, which is around 6% per year, which facilitates access for small farmers to finance agroforestry projects. Despite the availability of various sources of funding, rural farmers often face challenges in accessing these funds. These challenges include a lack of information on available financing schemes, complex administrative procedures, and a lack of capacity to develop proposals that meet funding requirements. Raza et al. (2023) showed that lack of financial literacy and technical support are major barriers for smallholder farmers in accessing green credit.

The government has taken important steps to support agroforestry by developing various financial policies, incentives, and regulations. These policies aim to encourage environmentally friendly agricultural practices, reduce pressure on forests, and improve farmers' welfare. One of the main fiscal policies that has been implemented is the provision of subsidies for tree seedlings and other agricultural inputs for farmers who adopt agroforestry systems. Neya et al. (2021) revealed that the government provides IDR 500 billion per year as a form of national subsidy to support reforestation and agroforestry in critical areas. This fund has helped lower the initial costs required to start agroforestry, so that more farmers can engage in this practice.

The government also provides tax incentives for companies and individuals investing in agroforestry projects. These incentives aim to attract private investment into sectors that

were previously considered less economically attractive. Government Regulation No. 94 / 2010 provides tax reductions for companies involved in reforestation and agroforestry activities. This tax incentive has driven an increase in investment in the agroforestry sector by 15% in the last five years. With this incentive, companies can reduce their tax burden while contributing to environmental conservation and increasing food security (Setyawan, 2020).

The Agricultural Extension Program organized by the Ministry of Agriculture provides training on efficient and environmentally friendly agroforestry techniques. Latif et al. (2022) showed that farmers who received this training tended to be more successful in managing their land and increasing productivity, with yields increasing by up to 20% compared to farmers who did not participate in the extension program. This technical support is critical in ensuring that existing financial policies are followed by effective implementation in the field. These policies significantly influence investment decisions and the sustainability of agroforestry projects in villages. With subsidies and tax incentives, the financial risks faced by farmers and investors in adopting agroforestry can be reduced, so that more projects can be implemented with more affordable capital. In addition, technical support provided by the government increases the confidence of farmers and investors that agroforestry projects can be economically and environmentally successful.

Colfer et al. (2009) showed that comprehensive financial policies can increase participation in agroforestry projects by up to 25%, especially in areas that were previously reluctant to shift from conventional farming practices. Although these financial policies have had positive impacts, challenges still remain. Not all farmers have equal access to subsidies and tax incentives, and often, complicated bureaucratic processes are a major obstacle. The government needs to improve the distribution mechanism for subsidies and incentives to be more inclusive and transparent. In addition, there needs to be strict monitoring to ensure that the funds and resources allocated are actually used for their intended purpose, namely promoting sustainable agriculture through agroforestry.

Cost and Benefit Analysis of Agroforestry in Indonesia. Implementing agroforestry requires significant initial costs. These costs include purchasing tree seedlings, land preparation, and installing efficient irrigation systems. Mayrowani & Ashari (2011) stated that the initial cost of implementing agroforestry in various regions in Indonesia can reach IDR 5 million to IDR 15 million per hectare, depending on the type of tree planted and land conditions, and in various regions of Africa ranges from USD 300 to USD 1,500 per hectare (Place et al. (2016). These costs are often a major barrier for smallholder farmers to adopt the

technique. After the initial stage, operational costs in agroforestry practices are relatively lower compared to conventional farming systems. Agroforestry allows for more efficient and sustainable land use, which can reduce the need for inputs such as chemical fertilizers and pesticides. Sileshi et al. (2020) shows that agroforestry can reduce the need for agricultural inputs such as chemical fertilizers by up to 30% due to increased natural soil fertility through the decomposition of organic matter. The use of trees in agroforestry systems helps in more efficient water management, reduces soil erosion, and increases overall land productivity.

From a long-term economic benefit perspective, farmers can earn additional income from by-products such as timber, fruits, and other non-timber products. In several areas in Asia, farmers who adopted agroforestry had an income increase up to 50% within five years of implementation. This is due to the diversification of income generated from various commodities in the agroforestry system, which also serves as an economic buffer for farmers when the price of one commodity falls. Agroforestry also has the potential to generate cost savings through more efficient use of resources and reduced environmental impacts. By improving soil structure and increasing biodiversity, agroforestry can reduce the need for external inputs (synthetic fertilizers and pesticides), which have negative impacts on the environment (Dhyani et al., 2021).

Cost-benefit analysis of agroforestry practices shows that despite high initial costs, the long-term benefits gained from increased income, cost savings, and reduced environmental impacts are significant. Charnley (2023) underlines that investment in agroforestry can ultimately yield returns far exceeding the initial investment, especially when considered in the context of long-term sustainability and food security. Agus et al. (2002) showed that the use of agroforestry techniques in several areas in East Java reduced agricultural input costs by up to 25% within a five-year period. In addition, this system also helps in maintaining soil fertility and reducing erosion, which in turn reduces land maintenance costs.

Bulu et al. (2020) do their studies in several regions such as Sulawesi and Kalimantan, farmers who implement agroforestry will increase their income by up to 40% in five to seven years after adoption. This benefit comes largely from the diversification of products produced, such as wood, fruits, and non-timber forest products, which can be harvested at different times throughout the year, thereby helping to increase farmers' economic resilience to commodity price fluctuations. Furthermore, Achmad et al. (2022) showed that farmers involved in agroforestry have a more stable source of income and are less affected by fluctuations in the market price of a single commodity. East Java farmers who planted timber trees and food

crops in an agroforestry system reported an increase in income stability of up to 50%, especially during less-than-ideal harvest seasons for staple crops.

In Indonesia, agroforestry also offers more efficient use of resources and reduced environmental impact. Octavia et al. (2022) found that agroforestry in critical lands in Sumatra and Kalimantan can reduce carbon emissions by up to 2 tons of CO^2 per hectare per year, which opens up opportunities for farmers to participate in carbon trading programs in the future. Improved soil quality and water conservation can also increase the productivity and market value of the land. This provides benefits for farmers who own land but also increases the attractiveness of investment in the rural agricultural sector (Siarudin et al., 2021). Furthermore, Jaya et al. (2022) study found that villages in Kalimantan that implemented agroforestry were better able to withstand the negative impacts of climate change compared to villages that relied on monoculture farming.

The right arrangement between food crops, shade plants, and trees produces a more stable microclimate, which can reduce the energy needs for climate control (Smith et al., 2013). Intercropping trees with crops can reduce wind speeds and surface temperatures, thereby reducing water and energy losses through evaporation. Local climate conditions also affect energy efficiency in agroforestry. Areas with humid tropical climates tend to have higher levels of energy efficiency due to higher levels of photosynthesis throughout the year, while in areas with dry climates, energy use can increase for irrigation and crop maintenance (Tarjuelo et al., 2015). The use of low-energy technologies and soil conservation practices, such as minimal or no-till, can reduce overall energy consumption (Lou et al., 2021). This technology not only reduces the use of fossil fuels but also maintains soil fertility that supports long-term plant growth. Good land management that includes crop rotation, proper tree pruning, and organic fertilization can reduce the need for energy inputs, such as synthetic fertilizers and pesticides, which require a lot of energy in their production process (Tariq et al., 2019).

Comparison of Potential Revenue from Carbon Trading and Agroforestry. The following are a comparison of the potential income from carbon trading and agroforestry:

Table 1. Comparison of Potential and Actual Income

Aspect	Potential Revenue from Carbon Trading	Actual Income from Agroforestry
Income Range per Hectare	IDR 3.000.000 - IDR 6.000.000	IDR 10.000.000 - IDR 20.000.000
Determining Factors	Carbon sequestration, carbon pricing	Production of wood, fruit, food crops

Dependence on Market	High (depending on global carbon price)	Medium (depending on local market access)
Income Stability	Fluctuating	More stable

Table 1. shows a comparison of potential income from carbon trading and actual income from agroforestry. Potential income from carbon trading in agroforestry systems in Indonesia can vary depending on the type of trees planted, land area, and ecological conditions. According to a study by Yulianingrum et al. (2020), the potential for carbon sequestration in agroforestry systems in Indonesia ranges from 10-20 tons of CO2 per hectare per year. Assuming an international carbon price of around IDR 300,000 per ton of CO2 (fluctuating price), the potential income per hectare could reach IDR 3,000,000 - IDR 6,000,000 per year. The actual income from agroforestry in Indonesia can vary more, depending on the combination of crops chosen, land management, and access to markets. According to a study by Udianto (2017), actual income from agroforestry in Indonesia can reach IDR 10,000,000 to IDR 20,000,000 per hectare per year, depending on the success of the harvest and the selling value of the product. Although the potential income from carbon trading shows promising figures, actual income from agroforestry tends to be higher and more stable. This is because actual income includes various sources, such as harvests and additional products, which provide direct economic benefits to farmers. However, carbon trading can still be a significant addition to farmers' income if carbon prices increase or if carbon trading schemes are better regulated.

CONCLUSION

Implementing a green economy through agroforestry in rural areas in Indonesia will require significant initial costs, including the purchase of tree seedlings and land preparation. However, after the initial investment, operational costs can be lower than conventional farming, and provide long-term economic benefits through increased farmer incomes and diversification of income sources. Agroforestry will improve energy efficiency in villages through the integration of various crops and trees in one system, which helps in water management and soil fertility. This practice also reduces the need for external inputs such as chemical fertilizers, thereby reducing costs and environmental impacts. In addition, the implementation of agroforestry will have a positive impact on the economy and environment of the villages. Agroforestry not only increases farmers' income and land value, but also contributes to environmental conservation through reduced carbon emissions and increased

biodiversity. The potential for income from carbon trading through agroforestry practices can be a significant additional source for farmers. Agroforestry has the potential to generate cost savings and economic value through carbon trading mechanisms, although this requires strong policy support to be implemented effectively.

REFERENCES

Achmad, B., Sanudin, Siarudin, M., Widiyanto, Diniyati, D., Sudomo, A., Hani, A., & Fauziyah, E. (2022). Traditional subsistence farming of smallholder agroforestry systems in Indonesia: A review. *Sustainability*, *14*(14), 8631. https://doi.org/10.3390/su14148631

Agus, A. F., Gintings, N., & van Noordwijk, M. (2002). *Pilihan Teknologi Agroforestri/Konservasi Tanah untuk Areal Pertanian Berbasis Kopi di Sumberjaya, Lampung Barat*. Retrieved from: https://apps.worldagroforestry.org/downloads/Publications/PDFS/BL02282.pdf

Anesa, D., Qurniati, R., Fitriana, Y. R., & Banuwa, I. S. (2022). Budaya dan kearifan lokal dalam pengelolaan lahan dengan pola agroforestri di Kesatuan Pengelolaan Hutan Lindung Batutegi Provinsi Lampung. *Ulin : Jurnal Hutan Tropis*, *6*(1), 26–37. https://doi.org/10.32522/ujht.v6i1.5840

Bulu, Y. G., Sari, I. N., & Utami, S. K. (2020). Motivasi Petani dan Tingkat Adopsi Teknologi Terhadap Pendapatan Usahatani Kacang Tanah Pada Pertanian Lahan Kering. *Jurnal Agrica*, *13*(1), 10–23. https://doi.org/10.31289/agrica.v13i1.3243

Charnley, S. (2023). Livelihood investments as incentives for community forestry in Africa. *World Development*, *168*, 106260. https://doi.org/10.1016/j.worlddev.2023.106260

Colfer, C. J. P., Dahal, G. R., & Capistrano, D. (2009). *Pelajaran dari desentralisasi kehutanan: mencari tata kelola yang baik dan berkeadilan di Asia-Pasifik*. Bogor: CIFOR. https://doi.org/10.17528/cifor/002653

Dhyani, S., Murthy, I. K., Kadaverugu, R., Dasgupta, R., Kumar, M., & Gadpayle, K. A. (2021). Agroforestry to Achieve Global Climate Adaptation and Mitigation Targets: Are South Asian Countries Sufficiently Prepared? *Forests*, *12*(3), 303. https://doi.org/10.3390/f12030303

Doddabasawa, Chittapur, B. M., & Murthy, M. M. (2020). Economics and energy potential of traditional agroforestry systems under contrasting ecosystems in semi arid tropics. *Agroforestry Systems*, *94*(1–3), https://doi.org/10.1007/s10457-020-00545-y

Fardiansyah, D., Kusuma, A. B., & Pathiassana, M. T. (2022). Kajian Penerapan Model Agrosilvopastura Dalam Peningkatan Kesejahteraan Dan Pendapatan Kelompok Tani Hutan Sorowua. *Jurnal Tambora*, *6*(2), 66–77. https://doi.org/10.36761/jt.v6i2.2004

Harinawati, & Candrasari, R. (2023). Program Pengabdian masyarakat Kegiatan Penanaman 1000 Pohon Alpukat Di Lut Atas Kecamatan Bukit Kabupaten B Ener Meriah Untuk Mewujudkan Hutan Lestari Masyarakat Sejahtera. *Jurnal Abdimas Madani Dan Lestari*, *5*(1), 38–47. https://doi.org/10.20885/jamali.vol5.iss1.art5

Jaya, A., Elia, A., Antang, E. U., Octora, M., Ichriani, G. I., Dohong, S., & Sulistiyanto, Y. (2022). A study of agroforestry farming for tropical peatland conservation and rehabilitation in Central Kalimantan, Indonesia. *Mires and Peat*, *28*(22), 1–34. https://doi.org/10.19189/MaP.2021.OMB.StA.2368

Latif, A., Ilsan, M., & Rosada, I. (2022). Hubungan Peran Penyuluh Pertanian terhadap Produktivitas Petani Padi. *Wiratani: Jurnal Ilmiah Agribisnis*, *5*(1), 11–21. https://doi.org/10.33096/wiratani.v5i1.91

Li, M., Li, H., Fu, Q., Liu, D., Yu, L., & Li, T. (2021). Approach for optimizing the water-land-food-energy nexus in agroforestry systems under climate change. *Agricultural Systems*, *192*, 103201. https://doi.org/10.1016/j.agsy.2021.103201

Lou, S., He, J., Li, H., Wang, Q., Lu, C., Liu, W., Liu, P., Zhang, Z., & Li, H. (2021). Current Knowledge and Future Directions for Improving Subsoiling Quality and Reducing Energy Consumption in Conservation Fields. *Agriculture*, *11*(7), 575. https://doi.org/10.3390/agriculture11070575

Mayrowani, H., & Ashari, N. (2011). Pengembangan Agroforestry untuk Mendukung Ketahanan Pangan dan Pemberdayaan Petani Sekitar Hutan. *Forum Penelitian Agro Ekonomi*, *29*(2), 83–98. https://doi.org/10.21082/fae.v29n2.2011.83-9

Muttaqin, Z. (2019). *Panduan Praktis Penanaman Pola Agroforestri campuran. Program Kemitraan Masyarakatan (PKM)*. Universitas Nusa Bangsa.

Neya, T., Abunyewa, A., & Semde, I. (2021). MRV of support: National keys actions for forests conservation and reforestations promotion in Burkina Faso from 1985 to 2015 to mitigate climate changes. *South Florida Journal of Development*, *2*(3), 4929–4944. https://doi.org/10.46932/sfjdv2n3-084

Nurfatriani, F., Ramawati, Sari, G. K., Saputra, W., & Komarudin, H. (2022). Oil Palm Economic Benefit Distribution to Regions for Environmental Sustainability:

Indonesia's Revenue-Sharing Scheme. *Land*, *11*(9), 1452. https://doi.org/10.3390/land11091452

Octavia, D., Suharti, S., Murniati, Dharmawan, I. W. S., Nugroho, H. Y. S. H., Supriyanto, B., Rohadi, D., Njurumana, G. N., Yeny, I., & Hani, A. (2022). Mainstreaming Smart Agroforestry for Social Forestry Implementation to Support Sustainable Development Goals in Indonesia: A Review. *Sustainability*, *14*(15), 9313. https://doi.org/10.3390/su14159313

Pandey, D. N. (2002). Carbon Sequestration in Agroforestry Systems. *Climate Policy*, *2*(4), 367–377. https://doi.org/10.1016/S1469-3062(02)00025-6

Paul, C., Weber, M., & Knoke, T. (2017). Agroforestry versus farm mosaic systems – Comparing land-use efficiency, economic returns and risks under climate change effects. *Science of The Total Environment*, *587–588*, 22–35. https://doi.org/10.1016/j.scitotenv.2017.02.037

Place, F., Garrity, D., Mohan, S., & Agostini, P. (2016). *Tree-based production systems for Africa's drylands*. The World Bank. Retrieved from https://documents1.worldbank.org/curated/en/853851472195970141/pdf/108020-PUB-PUBLIC-PUBDATE-8-24-16.pdf

Premono, B. T., & Lestari, S. (2018). Financial Analysis on Agroforestry System of Coffee with Marrango Tree (Azadirachta Excelsa Jack.) in Rejang Lebong Regency, Bengkulu Province, Indonesia. *Indonesian Journal of Forestry Research*, *5*(1), 45–56. https://doi.org/10.20886/ijfr.2018.5.1.45-56

Raza, A., Tong, G., Sikandar, F., Erokhin, V., & Tong, Z. (2023). Financial Literacy and Credit Accessibility of Rice Farmers in Pakistan: Analysis for Central Punjab and Khyber Pakhtunkhwa Regions. *Sustainability*, *15*(4), 2963. https://doi.org/10.3390/su15042963

Rohmaningtyas, N. (2022). Hutan Wakaf Sebagai Solusi Deforestasi di Indonesia. *ADILLA : Jurnal Ilmiah Ekonomi Syari'ah*, *5*(2), 92–102. https://doi.org/10.52166/adilla.v5i2.3560

Sahara, Haryadi, & Kusumowardhani, N. (2017). Smallholder finance in the palm oil sector: Analyzing the gaps between existing credit schemes and smallholder realities. *CIFOR: Info Brief*, *185*, 1–4. https://doi.org/10.17528/cifor/006582

Setyawan, H. (2020). *Mengoptimalkan Insentif Fiskal Untuk Menggerakkan Investasi di Masa Normal Baru*.

Siarudin, M., Rahman, S. A., Artati, Y., Indrajaya, Y., Narulita, S., Ardha, M. J., & Larjavaara, M. (2021). Carbon sequestration potential of agroforestry systems in degraded landscapes in West Java, Indonesia. *Forests*, *12*(6), 714. https://doi.org/10.3390/f12060714

Sileshi, G. W., Mafongoya, P. L., & Nath, A. J. (2020). Agroforestry Systems for Improving Nutrient Recycling and Soil Fertility on Degraded Lands. *Agroforestry for Degraded Landscapes*, *1*, 225–253. https://doi.org/10.1007/978-981-15-4136-0_8

Smith, J., Pearce, B. D., & Wolfe, M. S. (2013). Reconciling productivity with protection of the environment: Is temperate agroforestry the answer? *Renewable Agriculture and Food Systems*, *28*(1), 1 – 13. https://doi.org/10.1017/S1742170511000585

Tariq, M., Ali, H., Hussain, N., Nasim, W., Mubeen, M., Ahmad, S., & Hasanuzzaman, M. (2019). Fundamentals of Crop Rotation in Agronomic Management. *Agronomic Crops*, 545–559. https://doi.org/10.1007/978-981-32-9151-5_24

Tarjuelo, J. M., Diaz, J. A. R., Abadía, R., Camacho, E., Rocamora, C., & Moreno, M. A. (2015). Efficient water and energy use in irrigation modernization: Lessons from Spanish case studies. *Agricultural Water Management*, *162*, 67–77. https://doi.org/10.1016/j.agwat.2015.08.009

Udianto, M. (2017). *Penilaian Ekonomi Hutan Mangrove Muara Sekampung (Register 15) Sebagai Sumberdaya Pesisir Kecamatan Pasir Sakti Kabupaten Lampung Timur*. Universitas Lampung. Retrieved from http://digilib.unila.ac.id/29659

Ulya, N. A., Harianja, A. H., Sayekti, A. L., Yulianti, A., Djaenudin, D., Martin, E., Hariyadi, H., Witjaksono, J., Malau, L. R. E., Tirta, M. R., & Astana, S. (2023). Coffee agroforestry as an alternative to the implementation of green economy practices in Indonesia: A systematic review. *AIMS Agriculture and Food*, *8*(3), 762–788. https://doi.org/10.3934/agrfood.2023041

Wattie, G. G. R. W., & Sukendah. (2023). Peran Penting Agroforestri Sebagai Sistem Pertanian Berkelanjutan. *Jurnal Ilmu Pertanian Dan Perkebunan*, *5*(1), 30–38. https://doi.org/10.55542/jipp.v5i1.506

Widiyanto, A., & Hani, A. (2021). Role And Key Success Of Agroforestry (A Review). *Jurnal Agroforestri Indonesia*, *4*(2), https://doi.org/10.20886/jai.2021.4.2.69-80

Yulianingrum, H., Yunianti, I. F., & Ulu, M. A. N. (2020). Budidaya kopi rakyat dengan pengelolaan bahan organik mengurangi emisi gas rumah kaca dan cadangan karbon. *Jurnal Ilmu Lingkungan*, *18*(1), 97–106. https://doi.org/10.14710/jil.18.1.97-106.