European Journal of Sustainable Development Research
2026, 10(3), em0405
e-ISSN: 2542-4742
https://www.ejosdr.com/

MODESTUM

Research Article

OPEN ACCESS

Project proposal development practices of the environment and natural resources office: Basis for a sustainability assessment tool

Alfredo Colorado Padios [1*], John Keeneth Ferrera [2], Edilyn Tomas [3], Ma Eva Dionisio [4], Leah Amor Cortez [5]

[1] Center for Educational Research and Resources Development Services, School of Education, Aurora State College of Technology, PHILIPPINES
[2] President Diosdado Macapagal High School, PHILIPPINES
[3] Quirino General High School, PHILIPPINES
[4] Pampanga State Agricultural University, PHILIPPINES
[5] Philippine Normal University, PHILIPPINES

***Corresponding Author:** alfredopadios@ascot.edu.ph

Citation: Padios, A. C., Ferrera, J. K., Tomas, E., Dionisio, M. E., & Cortez, L. A. (2026). Project proposal development practices of the environment and natural resources office: Basis for a sustainability assessment tool. *European Journal of Sustainable Development Research, 10*(3), em0405. https://doi.org/10.29333/ejosdr/18565

ARTICLE INFO

Received: 21 Oct 2025

Accepted: 03 Apr 2026

ABSTRACT

Assessment of sustainability before implementation is necessary for environmental programs, projects, and activities, but instruments for this purpose are lacking in the literature. Employing a thematic analysis of interviews triangulated by document analysis from the provincial environment and natural resources offices (PENRO) in select provinces of the Philippines, we characterized and documented practices in ensuring and integrating sustainability during the crafting of project proposals. This, in turn, was utilized to develop a project proposal sustainability assessment tool. Interviews using a semi-structured interview guide duly validated by three field experts, together with actual project proposals, annual and three-year plans, were the primary sources of data analyzed. Results showed that PENROs defined sustainability as continuous, beneficial, adaptable, and realistic. To ensure the sustainability of a proposed project, PENROs conduct research, including biophysical, sociocultural, and economic analyses, as well as consultations with various sectors and third-party validations with external agencies, such as universities. Finally, sustainability is integrated into several parts of a project proposal, including the sustainability plan, continuity plan, prospective benefits, geographic specificity, and budgetary requirements. Based on these findings, we developed a sustainability assessment tool designed for project proposals. Funding organizations can utilize this to enhance the likelihood that projects they sponsor do not deplete resources or alter ecological processes that are essential to maintaining vital life functions.

Keywords: sustainability, sustainability assessment, project proposal evaluation, Philippines

INTRODUCTION

The realization and failure of project implementations can be attributed to several factors, but a well-crafted project proposal can significantly increase the likelihood of success. Sustainability is an important concept to make this happen and has been the breadth and depth in almost every field in today's projects and programs that envision leaving a longer-lasting impact (Lazar & Chithra, 2021). Consequently, sustainability assessment becomes an essential part of sustainable development (Kaldas et al., 2021).

The idea of sustainability stems from the 1987 UN Brundtland Report, which states that developments must "meet the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 16). Due to an understanding that resources are finite, followers flocked the idea that more than a hundred countries mandated sustainability in the management of their own. In fact, even projects, programs, and activities (PPA) were required to plan for sustainability hence, several definitions for sustainability were also born. For instance, sustainability is defined by the World Bank as a project's capacity to maintain an appropriate level of benefit flows throughout its economic life. In line with this, there born the three fundamental aspects of sustainability development: Economic growth, environmental stewardship, and social inclusion that are kept balanced by sustainable practices.

Sustainability, on the part of private and government funding agencies, ensure that the implementation of the PPA is not a waste of limited resources. On a more specific note, it could minimize the unintended negative impacts it could cause such as on environment and communities. The meticulous balance in ecosystems will also be left unaltered by sustainable projects; hence its assurance is non-negotiable.

Subsequently, assessment frameworks for sustainability of PPAs have been drafted in specific fields such as in agriculture (Simoncini, 2004; Smyth & Dumanski, 1993), energy systems (Hendiani et al., 2020), management of natural resources (Astier et al., 1999; Frischknecht et al., 2009; Rees et al., 1996), schools and universities (Alhilli & Burhan, 2021; Urbanski & Filho, 2015), and in the global scale (Zagonari, 2019). Recent studies have also renewed the importance of qualitative methods to assessing sustainability (Ramos et al., 2021; Saxena, 2025).

Due to the general nature of frameworks, they cannot be utilized yet to assess sustainability. However, these can be used to develop assessment tools. These tools vary in terms of scoring method, context being assessed and assumptions (de Olde et al., 2016). For example, Zahm et al. (2008) constructed a sustainability assessment tool from an existing framework to evaluate the level of sustainability in agricultural practices, but concluded that such tools must be contextualized in the conditions of farmers. In addition to the many sustainability assessment tools in agriculture (e.g. Acosta-Alba & Van der Werf, 2011; Gerrard et al., 2012; Häni et al., 2002) where focus of assessment varies, Janker and Mann (2020) developed a new tool that centers on social inclusion aspect of sustainability. The impact on sustainability of implemented PPAs may also be assessed (Hernández Maqueda et al., 2021) and serve as a springboard for consideration, understanding, and discussion. However, the herein mentioned assessment tools are used only at post-implementations of PPAs. Pre-implementation would have been more useful as they could prevent damages rather than just determine them.

Sustainability of projects, especially those seeking for funding can be ensured during the crafting of project proposals. It can be incorporated in several stages of the paper, on another section, or another document that demonstrates how a proposed project can be sustainably implemented. Proposed infrastructure projects are the ones mainly assessed in terms of sustainability as they are usually inhabited by humans (e.g. Hosny et al., 2022). Such assessment tools are helpful among decision makers so, even with less expertise, they can decide whether to forego with the project or even decide which infrastructure model is expected to best serve its purpose. Some prudent leaders adopted some of these tools such as that of Assaf and Nour (2015) and Nick (2009) to ensure a sustainable implementation of their infrastructure projects. Nevertheless, these assessment tools are focus-specific and that they are not suitable for use in different fields such as in environmental, agricultural, and social initiatives.

Post-implementation evaluations for sustainability have been performed in the past; several instruments were developed and used for different purposes and aspects. Evaluation of proposals is also being practiced by several funding agencies. Some agencies require a sustainability plan, others only require that a particular portion of proposals have statements on sustainability. However, existing evaluation processes by raters or peer-reviewers are flawed (Dewberry et al., 2013; Tamblyn et al., 2018; Wieczorkowska & Kowalczyk, 2021). Thus, this current study aims to develop an instrument to evaluate the sustainability of proposed projects through documenting and learning from the practices of the Philippine's frontiers in sustainable management of natural resources at the inception of PPAs. Specifically, it sought to answer the following questions:

RQ1 How do the Provincial Environment and Natural Resources Offices (PENRO) define Sustainability?

RQ2 What are the practices of PENROs in ensuring sustainability during crafting of project proposals?

RQ3 How do PENROs integrate sustainability in project proposals?

METHODS

This study is qualitative in nature and employs an exploratory research design in determining the practices of Philippine's frontiers in the sustainable management of natural resources at the inception of PPAs, the project proposal. Exploratory research designs are utilized when researchers want to avoid existing theories and concepts by previous studies (Denscombe, 2014). Lots of studies on sustainability assessments are mostly after but rarely before implementation, and are field specific tools that does not specify which part of project is evaluated. The current study focuses on the project proposal documents which has not been investigated before. Exploration from of the subject matter started from practically no existing theories; thus, exploratory research is a suitable design.

Qualitative instrumentation design is also integrated since the expected output is to develop a tool. An instrumentation design in a qualitative study entails nonprobability or purposive sampling to obtain participants (McGregor, 2018). The researchers then used semi-structured interviews to collect data triangulated by document analysis. The qualitative data were analyzed and categorized, and the findings were used to develop a new evaluation instrument for possible use in quantitative studies (Knafl & Howard, 1984). Nonetheless, the output will be a preliminary instrument and will not be subjected to further validation and pilot-testing, a subject that requires another research.

Participants and Locale of the Study

The informants in the study were officials from the Provincial Environment and Natural Resources Offices (PENRO) in the select provinces of Luzon: Marinduque, Pampanga, Aurora, and Quirino. These provinces are home to rich biodiversity living in watersheds, mangroves, bodies of water, forest, and the like. For instance, the combined forest of just the four provinces covers 365,988 hectares (DENR, 2020) or more than five percent of the Philippines' total forests. Three of these provinces are along the coasts of the Pacific Ocean, all four have lots of river systems while Quirino and Aurora lie in the foot of Sierra Madre Mountain ranges. Naturally, these PENROs are initiators and implementors of sustainable practices in managing natural resources.

PENROs are provincial offices of the Department of Environment and Natural Resources (DENR). Together, they are the Philippines' mandated agency to ensure the conservation, management, development, and proper utilization of the environment and natural resources. Thus, the agency and the informants are befitting sources of sustainability principles and practices.

Table 1. Summary of participants' profiles

Participants (pseudonyms)	Sex	Age (in yrs.)	Position
Ara	Female	44	Managerial level
Maria	Female	54	Managerial level
Petra	Female	31	Managerial level
Isko	Male	57	Managerial level

Table 2. Types of documents analyzed

Documents	No. of printed copies	No. of electronic copies	Total
Project proposals	2	2	4
Annual PPA proposals	0	17	17
3-year plan	0	2	2
Total	2	21	23

The summary of participants' profile and their assigned pseudonyms are presented in **Table 1**, it only presents few profile to increase anonymity as there are only few personnel in provincial offices of environment and natural reseources. It is worth noting that the participants are not necessarily the office head, but hold managerial positions. While the study acknowledge the unique and relevant contributions of field implementers in ensuring sustainability, the current status of the study is shaped by the planning stage and office heads who work in this area have direct participation and contribution in crafting proposals. Each participant possessed enough years of experience in their field ensuring that their responses reflect accumulated, institutionally embedded practice rather than an isolated nor fragmented knowledge. This constitutes a role-specific experience which is a tacit knowledge (Linton et al., 2018) that cannot be obtained from documents alone, making their expertise both epistemically and methodologically sound.

There were four participants interviewed, a number that is usually questioned for its representativeness and generalizability of results. While the number may be limited, its limitation is substantially supplemented by the analysis of 23 official documents ranging from 7 to 97 pages long. Document triangulation is a strategy well-established to verify data from human participants, strengthening research credibility when sample size is an issue (Bowen, 2009; Donkoh & Mensah, 2023; Frey, 2018). This type of research methodological integration aligns with Lincoln et al.'s (1985) criteria of credibility in qualitative research. Furthermore, conducting qualitative studies give the reward of flexibility and spontaneity (Oranga & Matere, 2023). This type of research does not require a large study sample, giving the opportunity to encounter the respondents, boosts discussion with the informants that allows for the gathering and explanation of non-verbal signals (smiles, frowns, tears) and suggestions to search for explanation and gain more profound understanding of the topic under study.

Instrument

In this study, the researchers' semi-structured interview guide was used to determine practices and policies of the Philippines' frontiers in the sustainable management of natural resources during the crafting of project proposals. Most questions were predefined and asked to all respondents in semi-structured interviews, while some come spontaneously as a prompt for more information during a free-flowing conversation. Three experts in the field validated the interview questions. Feedback and suggestions were carried out to finalize the interview questions.

Data Gathering Procedures

Two qualitative datasets were gathered to satisfy the research objectives: Documents and interviews. The researchers requested documents through sending of printed letters where the researchers explained how we intend to use the data and how these can be kept confidential. The participants issued both printed and electronic copies of project proposals and annual plans then gave schedules for an interview. The types and numbers of documents shared are presented in **Table 2**. Most documents were shared through cloud storage or sent through email except for two project proposals given as printed copy.

Three interviews were conducted through video conferencing apps available to the participants while one interview was conducted in-person. The purpose of the interview, how the data will be used and when it will be discarded were explained first then a consent to video-record was asked before asking of questions commenced. Interviews lasted for as short as 33 minutes up to more than an hour.

Data Analysis

Interview recordings were transcribed verbatim by the authors. One informant preferred to be interviewed in English language while three others answered in the mix of Filipino and English Language, a common occurrence among Filipino participants. The transcriptions were then translated into the English language and had it checked by a local translator.

Interview data, the transcription, was analyzed using the Clark and Braun thematic analysis method. Thematic analysis is a technique for recognizing, analyzing, and reporting data patterns. It is typically used to describe a group of texts, such as an interview or transcripts. Braun and Clarke (2006) distinguish between a top-down or theoretical theme analysis, which is guided by the research question(s) and/or the analyst's emphasis, and a bottom-up or inductive analysis. This method consists of six phases which are:

a) Familiarizing the data,
b) Generating initial codes,
c) Searching for themes,
d) Reviewing the themes,
e) Defining the themes,

f) Writing up the themes.

Moreover, document analysis was used to examine the existing documents from the PPA proposals of PENRO. This served as means to support data obtained from interviews. Document analysis is a type of qualitative research in which documentary material is analyzed and particular research questions are answered using a systematic approach (Frey, 2018).

RESULTS AND DISCUSSION

The environment and natural resources offices in the Philippines are indeed practicing and incorporating sustainability in their projects, programs, and activities as evident from interviews and document analysis. Moreover, based on the results in table 3, the assessment tools for PPAs shows three major emerging themes: Definition of Sustainability, practices in crafting a sustainable project proposals, and sustainability integration. Of these central themes, there are also subthemes. These are presented and discussed in the following sections.

Definition of Sustainability: Building Theory and Practice

Sustainability is defined a variety of ways. There are about as many definitions of sustainability as there are people who have sought to describe it. As sustainability is a concern, participating PENROs define it as "the continuity of benefits even after the project implementation". Further analyses of responses and documents showed four characteristics of sustainable PPAs: Continuous, adaptable, beneficial and realistic. This definition both aligns and extends beyond existing sustainability frameworks but in ways meaningful to the practice and research field.

Continuous

Brundtland Commission's definition of sustainability as an aid that meets current difficulties without risking future generations strongly resonates with the PENRO's framework. During the interview, PENRO administrators commonly defined sustainability as something capable of being continued; thus, it is an ongoing process by which something is maintained at a specific level. Isko emphasized that sustainability can be measured after the PPAs are fully implemented and if the PPAs continuously provide long-lasting services to the beneficiaries. Sustainability, from this context, may be defined as the extent to which the net advantages of the intervention remain or are anticipated to continue in the context of delivering development aid through projects. Correspondingly, Petra highlighted that continuity means longevity. Ideally, they firmly believe that PPAs could exist and not be harmed by any political motivation or could not be affected even if there is a change in the organization. This extends sustainability beyond intergenerational equity to accommodate a more immediate concern of institutional sustainability threatened by political and administrative changes.

> For me, continuous implementation must be sustained, right? Our program must have continuity from the start up to the end even with political changes. Actually, that is the primary goal of sustainability; it must be continuously implemented because, if not, it's not sustainable anymore.
>
> (Ara)

Interpreting these findings against the literature, although the results reveal a new form of sustainability challenge, this actually aligns with public administration research field that organizational capacity and political support are critical characteristics of program sustainability (Ayoubian et al., 2020; Fiorino, 2010). Furthermore, the concern for PPAs being harmed by political factors has been identified as one of the primary threats in sustaining public or government programs and projects; they are vulnerable to leadership and political changes (Scheirer, 2005). Similar observation has been revealed in the recent political science views on sustainability which identifies political will as a crucial aspect for SDG implementation (Shawoo et al., 2022) and that transitions almost always interrupt program continuity (Borrás et al., 2024). This implies that Philippines as well as many other democratic countries that changes its local political leaders every three years is challenged in sustaining its PPAs thus, a potential primary benefactor of the study.

Beneficial

In terms of its benefits, PPAs are deemed sustainable if they enhance quality of life while safeguarding environment and natural resources for future generations. This is well reflected in Petra who affirms that sustainability is not only reaching the target clientele, but must be purposeful for the present and future generations. Similarly, Ara and Maria mentioned that PPAs' sustainability could be illustrated even if the activities were done, but the beneficiaries continuously enjoy the impact and benefits. Additionally, analysis of the project proposals showed that sustainability is geared toward social enhancement and economic self-reliance further conforming PENRO's approach to Berkes' (2004), which emphasizes that initiatives must deliver meaningful benefits to local communities to ensure long-term success.

Considered in light of existing theoretical frameworks, this dimension of sustainability extends beyond the corporate sustainability framework of the triple-bottom-line: economic, environmental, and social justice (Elkington, 1997). It prioritizes lived experiences and tangible, long-lasting benefits to intergenerational people. Thus, PENRO's approach to sustainability aligns more with Sen's (2001) who emphasized that development should also be measured by the people's capability, emphasizing more on their freedoms and opportunities.

Adaptable

A sustainable program, projects, and activities can withstand the changes encountered during implementation. PENROs explicitly explained that for a project and program to become sustainable, it must be flexible and adaptable, which means it can be adjusted and resilient to any form of circumstances. Moreover, one of the characteristics of

sustainability is the ability to adapt to the needs of the times by diverting accustomed activities to different channels, means, and ways. From this, adaptation is attributed to sustainability. In any phase of implementation, unavoidable circumstances may occur, but PPAs will not stop. Instead, they will adapt to the change. Indeed, sustainability is workable, as mentioned in Maria's interview:

> PPAs can be adjusted if there are circumstances we cannot avoid, it must be adaptable to the needs of the time. PPAs will not be stopped because changes happen along with the implementation; we need to go with the flow and align our activities to the changes to be relevant and timely.

These responses are consistent with established theories. Adaptability, as characterized in this study, implies a practice consistent with resilience theory and adaptive management (Folke, 2006; Holling, 1973). On the other hand, PENRO's definition of sustainability as flexible, that it is able to adapt to the needs of time, is consistent with resilience thinking – the capacity of a PPA to adapt to challenges while focusing on its programmed goal (Walker et al., 2006). Thus, a PPA to be sustainable must also possess the characteristics of being resilient to expected and unexpected challenges, contrary to static, blueprint approaches to planning – a strategy that has long been advocated (Chambers, 1994; Ramalingam, 2013).

Realistic

Sustainability must consider the achievability of the PPAs, which PENRO elucidates that it planned comprehensively. During the interview, Petra, Isko, and Maria pointed out that a well-thought-out and well-designed plan characterizes sustainability. One of the documents analyzed reflect that sustainability must ensure that it is doable, achievable, and measurable. PPAs are considered sustainable if they carry out activities described in the work plan, they added.

Taken together, the participants' accounts point to a pragmatically grounded concept of sustainability. The current study's definition and characterization of sustainability do not contradict leading definitions, such as that of the UN, but ours, the result of this study, shows a more field-focused concept. It is more rooted explicitly in the projects our participants propose and implement thus, thus reflecting pragmatism, which is often missing from existing sustainability frameworks. Although different, the offices' practical approach to sustainability has support from implementation sciences, which considers practicality as among the critical factors to successful implementation (Fixsen et al., 2005). This also aligns with the critiques of blueprint development approaches that fail because they are not practical in local realities. Such pragmatic orientations of PENRO's decision-making process must have been a result of years of experience with failed development projects that were theoretically ideal but turned out challenging with implementation.

Practices in Crafting a Sustainable Project Proposal: Evidence-based Planning

Documentation of the actual practices of the offices' mandate to ensure sustainable use of the country's resources was performed through in-depth interviews and document analysis. The emerging themes, conduct of research, consultation, and third-party validation, reflect a comprehensive approach to project proposal making that integrates streams of public administration and environmental management.

Multidimensional research and systems thinking

Before crafting a proposal for a conceptualized project, PENROs deemed it necessary to first conduct research and learn about the essential biophysical characteristics of the project. These practices that reflect systems thinking, consistent with the socio-ecological systems framework (Ostrom, 2009; Zipperer et al., 2011), recognize that any environmental projects must acknowledge the interdependence of ecological processes and human systems to succeed. Systems thinking has been reinforced in the recent sustainability literature where they (Aishwarya & Kumar, 2022) argue that it is necessary to involve multiple actors that integrate ecological, social, and economic dimension from the planning stage – consistent with PENROs multidimensional research before crafting the proposal.

Biophysical analysis. Understandably, the most comprehensive of the offices' research prior to crafting of project proposals is on the biological and physical conditions of project sites since the majority of their projects involve management and development of the environment. Indeed, modification of natural landscapes requires the most meticulous study to avoid ecological backlashes such as the negative impacts of establishing the Aswan Dam (Kashef, 1981; Marchetti et al., 2019) and the negative impacts of alteration activities by humans in the natural biological production processes (e.g. Nagarathinam et al., 2021). Mostly, these analyses are conducted by technical experts in ENR field offices, as Ara explains:

> Our field offices conduct different analyses on the biological and physical conditions of targeted project sites. We then collect and make sense of these results and use them as a basis for planning.

These are also evident in the project proposals that the offices provided. For example, in the proposed Integrated Watershed Management Plan, hydrologic and agrometeorological analyses were conducted to determine the current flows and capacities of the river and stream systems. Dependents from these water systems were also profiled from agricultural to domestic users. Along with these is soil analysis, to which they determined erosion possibilities and occurrences, as well as flood and fire hazards in the high and lowlands. Finally, not only was there an analysis on geomorphological characteristics of the site but also on its accessibility from strategic locations, since among the aimed usage of the initiative was to develop it into an agrotourism business that ultimately benefits the locals in the area. Document analysis on these practices also showed that the offices make use of secondary data, such as that found in the Forestland Management Program and the Community Resource Management Framework.

Sociocultural analysis. Another analysis being conducted prior to crafting project proposals includes sociocultural dimensions. This initiative is driven by the departments'

desire to properly serve the people with projects or services they really need and would improve their lives, as Petra explains:

> We want to implement projects that are beneficial to the people because this is what they need and want. It's not difficult for them to participate. We really want the people to own what we started.

Further document analysis of project proposals showed that they conduct community profiling to determine population numbers and ethnolinguistic groups in the area. Such could be due to existing laws in the Philippines recognizing indigenous peoples' rights in their ancestral domains as well as recognizing their participation and expertise in the conservation and protection of forest resources. One of these laws is the Expanded National Integrated Protected Areas System Act of 2018 (ENIPA), which recognizes conservation areas and management regimes duly implemented by the local governments, indigenous peoples, and non-government organizations.

Access to government services was also among the focus of sociocultural analysis in the project proposals examined. This includes access to government institutions, education, health, and medical services.

Economic analysis. Although not explicitly mentioned during any of the interviews, it was very pronounced in all documents analyzed the studies on the economic situations of communities along the targeted areas of project implementation. Annual income was one focus where they have averages for the entire area, for each barangay, and for each household. Sources for this income and how much each source provides for households were also discussed within the proposals. Just like any economic analysis pertaining to income, ENROs also deemed it important how this household income is spent. Thus, an investigation on annual household expenditures as well as the products and services they avail themselves of.

Worthy of note was also the PENRO's exemplary endeavors to specify how each dimension of the projects analyzed can be developed. Specific strategies are laid down in the implementation scheme as well as in tabular form. For example, to realize socioeconomic development in the project site, they intend to plant native dipterocarps rather than exotic trees due to their several financial and environmental benefits. Fruits can be used to craft wines and jams, while the seeds can be used to vegetate other parts of the intended project site. Not only are these plans plausible, they are also based on published research.

These empirical observations align well with established sustainability frameworks. PENRO's thoughtful approach to community profiling beyond cost-benefit analysis is not only commendable, it also aligns well with sustainable livelihood frameworks (Scoones, 1998). The attention to socio-economic feasibility also reminds environmental initiatives to provide alternative sources of income for livelihoods dependent on natural resources to achieve a truly sustainable PPA.

Consultation

Another essential and standard practice by the participating offices before crafting a sustainable project proposal is the conduct of a series of consultative meetings. This practice is evident from both interviews and documents. PENROs ensure that they conduct consultations with as many sectors as possible such as the youths, religious sectors, government agencies, the academe, and intended beneficiaries. Its benefits are deemed important and undeniable to Petra:

> To ensure that the stakeholders are consulted, we conduct regular meetings. Contrary to popular opinion that a meeting is just a waste of time, for us it is an avenue to bring to our attention what is really needed.

They even explain further that the failure to conduct consultative meetings would fail the project, waste government resources, and ultimately waste time because it may not be what people really need and want. When we asked if this practice is mandated by specific policies, they clarified that there are no such policies. It is just an institutionalized practice they perform every time they create project proposals. Consultation is also being done during the crafting of tools for monitoring and evaluation. This suggests conformity to organizational learning and enculturation of participatory values consistent with norm internalization in public organizations.

On the other hand, consultative meetings were observed in project proposals during the crafting of the activity plan stage and during levelling-off workshops. During the crafting of the activity plan stage, consultations were held with the office and management sites involved in the project. For instance, they would consult with watershed management offices for any projects they intend to implement in watershed areas. At levelling-off workshops, participants are people's organizations (POs) and key informants.

Third-party validation

Perhaps the ENRO's most unique practice among other agencies preparing project proposals is the conduct of a third-party validation. At this point, ENROs have already prepared a draft of their proposals. They would then have this validated by third-party agencies that specialized in similar projects. This was clearly and repeatedly made clear by Isko during the interviews:

> There are validation processes or inspection processes. We have third-party validations conducted. These third-party validators come from outside the agency; they are not part of the implementing team… in order to see that the quality of projects and outputs implemented is within the standard.

During interviews, participants mentioned that universities and colleges with specializations in the project are among the third-party validators. In one of the proposals, we also saw other third-party validators, such as private independent consulting firms, that envision and promote the sustainable use of natural resources. The initial draft is then

revised based on the findings and recommendations of the validators.

Sustainability Integration

Sustainable development does not just imply that humanity should meet its current requirements without jeopardizing future generations' ability to do so; it also brings with it the concept of societal progress and an improvement in global quality of life. The basis of what this notion symbolizes is the concept of sustainability, which is also evident in the practices of participating PENROs. Concept of sustainability is integrated in different stages of planning and crafting of PPA proposals, to wit: sustainability plan, continuity plan, prospective benefits, geographic specificity, and budgetary requirements. Sophisticated planning for the most extended term is evident in these practices.

Sustainability planning at multiple stages

A sustainability plan serves as a road map for accomplishing long-term objectives and outlines strategies for keeping the program, activities, and relationships going. Early in the design and implementation stages, sustainability is a crucial program component to consider. Based on our analyses, sustainability plans were crafted before, during, and after the implementation of the PPA proposals, depending on the needs of the project. Thus, ensuring the sustainability of the project after the implementation phase. Sustainability plans were given emphasis in the statement of Isko:

> During the planning process or proposals, we conducted research before any proposals were made. And during the planning process, we seek sustainability plans that are incorporated into the project.

These findings are significant when considered against the literature on public administration. Strategic planning across multiple stages of a project reflects the literature on public administration (Bryson & George, 2024), a practice that addresses critical gaps (Scheirer, 2005). Most programs only focus on the implementation without regards to the aftermaths of the whole project, thus neglecting sustainability described by the participants. The attention to sustainability planning in multiple stages – before, during, and after implementation – demonstrates adaptive management and recognizes that sustainability evolves and is challenged as the project develops. This is explicit in a recent study (Bryson & George, 2024) that confirms multi-stage planning is among the strongest predictors of program sustainability.

Continuity plan and prospective benefits

In the event of a personnel change, a continuity strategy guarantees that critical procedures and data are documented and retained. If different components of the program need to be changed, a continuity plan can assist in determining what is required to keep it running. The analyses shows that community involvement, functional monitoring and evaluation committee, capacity building programs, and school engagement were highly emphasized by the PENROs as effective means in ensuring sustainability of projects.

Continuity plans were created after the implementation period to sustain projects involving the community through private and public sectors, school engagement for both the tertiary and basic education sectors, through seminars and information dissemination purposes, educating the importance of sustainability in the community. Communities and non-government organizations (NGOs) were capacitated through training and seminars, including livelihood training as part of the sustainability and continuity of the project. Moreover, according to Isko, the implementing agency conducts monitoring and evaluation for quality assurance and sustainability. Furthermore:

> Monitoring and evaluation tools being done are all also, we conduct meetings also on this, on the kind of monitoring tool before recommending to the project director for implementation.

These results, read through the lens of organizational resilience and knowledge management theory, reveal important insights. Focus on different sectors, school engagement, and NGO partnerships shows that sustainability is a shared responsibility. Organizational resilience thinking has also been demonstrated when planning for the foresight of personnel changes. This further ensures that expertise in the project is not lost even when individuals leave, a practice reflective of knowledge management literature in public organizations (Willem & Buelens, 2007).

Geographic specificity

Topography and geographic location affect the crafting of PPA proposals - the location may provide a scientific foundation and development of new knowledge, such as biophysical and socioeconomic dimensions, and other aspects that can affect the community. For income-generating PPAs, the project's proposed development sites should be in ideal positions for tourism and businesses since it is envisioned that travelers along these routes will also be part of tourism services. Road accessibility, importing and exporting of local goods and services were also studied in geographic specificity. Furthermore, as mentioned by both Isko and Petra, locations play an important role in accessibility of the projects for both economic and scientific purposes.

Budgetary requirement

Budgetary criteria should contain predicted spending for a specific length of time, as well as money input generated throughout the project. PPAs were granted an annual budget to allocate to projects, ensuring the project's continuity and sustainability. Moreover, projects that were created using the most up-to-date research in the field provide the projects with a solid scientific foundation. The budgetary requirements were also based on the initial research conducted for the PPA projects as part of the basis of planning and implementation. Budgetary requirements need to be reviewed before the implementation and feedback from the validators are some of essential sources of idea. Surveys and research prior to the implementation were given emphasis on the statement of Isko:

> Budgetary requirement is always embedded with sustainability. Project needs a consistent financial support for implementation purposes, buildings and

Table 3. Sustainability assessment tool

Indicators	Evident	Not evident
Research		
Consultative meeting involving different stakeholders		
Conducts biophysical analysis		
Conducts socioeconomic analysis		
Project proposals are subjected to third-party validation		
Characteristics		
Activities in the project are doable by the people		
The project can adapt to the needs of time		
The project is transferable to changing leadership		
Possible impact		
The project's benefit continues even after the scheduled implementation		
The project should lead to social enhancement of the beneficiaries		
The project should lead to economic self-reliance of the beneficiaries		
The project leads to the development, enhancement, and rehabilitation of resources		
Biophysical development is supported		
Monitoring and evaluation		
There are monitoring and evaluation plans during and after implementation		
Stakeholders are involved in the monitoring and evaluation		
Responsibilities of key players are defined		
Presence of monitoring and evaluation tools		
Pre-implementation plan		
Activities are laid out in the plan		
There is a plan for the procurement of materials and equipment		
There are plans and budgets for hiring of personnel		
Post-implementation plan		
There is a plan for proactive participation of the community		
There is a plan for technology/product transfer		
Sustainability integration		
Sustainability is evident in budget		
Sustainability is evident in the objectives		
There is a concrete plan to substantiate sustainability		
Sustainability plan considers the location of the project		

infrastructures, and continuity of the project, in the future.

These are also evident in the documents they shared. For example, one PENRO shared six annual PPA proposals where several projects were consistently funded. On the other hand, there were also portions in the project proposals where they would capacitate people organizations with conservation, development, and financial management. This ensures that there is a continuous budget for the project even if funds cease.

Project Proposal Sustainability Assessment Tool

As a major contribution to the literature, a preliminary assessment tool for the sustainability of projects during proposal development is hereby presented in **Table 3**. It consists of 25 statements or indicators from seven general categories. Since the informants were firm that these practices are necessary, all of the indicators of sustainability must be evident in a project proposal at equal weights conforming to the strong sustainability paradigm described by Gan et al. (2017). This decision however, contrasts from a body of sustainability assessment literature (e.g. Momoh et al., 2024; Sun et al., 2022). For instance, LEED (Leadership for Energy and Environmental Design), a green building rating system, as well as BREEAM (Building Research Establishment Environmental Assessment Method), an instrument that assesses sustainability of infrastructure performance, both assign varied credit weight to indicators based on expert judgments, stakeholders, or statistical methods. Entropy-based statistical method argue that indicator importance should reflect its weight, making equal weighting seem arbitrary. Similarly, stakeholder-based participatory weighting recognizes that different communities may prefer different sustainability dimensions. On the other hand, this study adopts equal weighting based on a substantive rationale: The participants emphasized that no single sustainability practice is dispensable and that each is a prerequisite of a sustainable proposal. This reflects a prescriptive, threshold-based logic consistent with multicriteria evaluation frameworks that require each criteria to be present without allowing tradeoffs between them (Gibson, 2006). As a preliminary exhibit derived from qualitative inquiry, unweighted scoring also reduces rater bias during the early stages of validation. However rigid and valid our methods were in developing the instrument, subjecting it to validation and pilot-testing will further improve for its intended use.

CONCLUSIONS

This paper provides a comprehensive analysis of documents and interview recordings to capture PENRO's definition of sustainability, and their practices in ensuring and

integrating it in their PPA proposals. In so doing, a gap in the literature was filled, and an evaluation tool was developed.

Sustainability was defined as continuous, adaptable, beneficial, and realistic. PPAs should be continuously implemented so that something is maintained at a specific level. On the other hand, PPAs are considered adaptable if they can be adjusted and resilient to any form of circumstances. Moreover, sustainability was defined as beneficial because it must enhance the quality of life of the target beneficiaries, and it protects the environment and natural resources as well. Lastly, the sustainability of PPAs should be realistic, as stated in the sustainability plan.

The emerging themes on the practices of ENROs in ensuring sustainability during the crafting of project proposals were: Conduct of multidimensional research, consultation, and third-party validation. On the conduct of research, biophysical conditions of project sites should be considered since the majority of their projects involve management and development of the environment, such as watersheds and agroforestry. On the sociocultural dimensions, initiative is driven by the departments' desire to properly serve the people with projects or services they really need and would improve their lives. Indirectly, the economic analysis in PPAs plays a significant role in the economic situations of communities along the targeted areas of project implementation. Consultations were well practiced involving the youth, academe, religious groups, and other stakeholders from the start of crafting the PPAs. Furthermore, third-party validation was an institutionalized practice in crafting PPA proposals performed by experts in similar projects for comments and suggestions.

PENROs integrate sustainability in project proposals in terms of a sustainability plan that serves as a road map for accomplishing long-term objectives and outlines strategies for keeping the program, activities, and relationships going. In addition, a continuity plan which includes tools for monitoring and evaluation are crafted to be used to determine what is required to keep the PPAs running. Finally, the study shows that Community Involvement, the presence of a Functional Monitoring and Evaluation Committee, Capacity Building Programs, and School Engagement were highly emphasized as effective means of ensuring sustainability in PPA proposals.

IMPLICATIONS

Previous sustainability assessment tools were crafted based on reviews of literature or existing frameworks and models. The present study employed qualitative research using document analysis and thematic analysis of interview transcriptions to capture the details of practices utilized by the participants in ensuring the sustainability of PPAs. Although seemingly new in the field of sustainability, such a method is standard in social research studies.

This study uncovered four major characteristics of a sustainable proposed project, i.e., it must be continuous, beneficial, adaptable, and realistic. Best practices in ensuring a sustainable PPA were also documented, which include conducting research, consultation, and third-party validation. While sustainability may be integrated into different aspects of a project proposal, these discoveries are necessary to be in the repertoire of project proponents. Furthermore, the practices herein documented integrate elements of governance: Hierarchical planning in research and budget; public management in performance assessment and external validation, and; network governance in consultation and partnerships, which implies that an effective governance may require combinations of different approaches rather than a single paradigm (Osborne, 2006). Systematic reviews of literature on sustainability practices in public sectors (Naveed et al., 2025) revealed that no single governance suffices in ensuring sustainability; it draws on the combinations hierarchical planning, participatory consultation, and network partnerships – consistent with PENRO's documented best practices.

In addition to existing evaluation tools for project sustainability, the current study developed one intended to evaluate the sustainability of proposed projects. This can be used by funding agencies to increase the likelihood of choosing projects that do not deplete resources, nor alter ecological processes necessary to continue important life processes such as food production.

Future studies should consider tracking the performance of projects that follow the herein laid-out paradigm. They may compare its sustainability performance to other projects using different approaches. Finally, studies may also consider combining the presented assessment tool to existing ones, even in different fields such as infrastructures, agriculture, or even hotel management, to increase validity. Pilot-testing the current assessment tool may also be initiated to further develop it into a more robust system.

Author contributions: ALSC: supervision; **ACP, JKF, ET, & MED:** conceptualization, methodology, formal analysis, investigation, data curation, writing – original draft, writing – review & editing. All authors agreed with the results and conclusions.

Funding: Authors declate that was no funding or any grant received in conducting this study.

Ethical statement: The authors stated that the research involving human participants was conducted in accordance with established ethical standards. Informed consent was obtained from all participants prior to data collection. Participants were assured of their right to withdraw at any time without penalty. The authors further stated that all data were treated with strict confidentiality, and no identifying information was disclosed. The study protocol adhered to institutional and national ethical guidelines for research involving human subjects.

AI statement: The authors stated that generative AI tools were used in the preparation of this manuscript for language editing, grammar checking, and improving clarity. All intellectual content, analysis, and conclusions presented in this work are the sole responsibility of the authors. The authors have carefully reviewed and validated all outputs generated by AI to ensure accuracy and integrity.

Declaration of interest: No conflict of interest is declared by the authors.

Data sharing statement: Interview transcriptions are the only available data that can be shared upon reasonable request. Documents such as the project proposals will not be shared as per the agreement with the offices, and because these contain confidential information.

REFERENCES

Acosta-Alba, I., & Van der Werf, H. M. G. (2011). The use of reference values in indicator-based methods for the environmental assessment of agricultural systems. *Sustainability, 3*(2), 424-442. https://doi.org/10.3390/su3020424

Aishwarya, & Kumar, P. (2022). A perspective view of sustainability of natural resources: The governance challenge. In M. Rani, B. S. Chaudhary, S. Jamal, & P. Kumar (Eds.), *Towards sustainable natural resources: Monitoring and managing ecosystem biodiversity* (pp. 3-9). Springer International Publishing. https://doi.org/10.1007/978-3-031-06443-2_1

Alhilli, H. K., & Burhan, A. M. (2021). Developing a system for assessing the sustainability in school building projects. *Environment, Development and Sustainability, 23*(12), 17483-17502. https://doi.org/10.1007/s10668-021-01397-x

Assaf, S., & Nour, M. (2015). Potential of energy and water efficiency improvement in Abu Dhabi's building sector – Analysis of Estidama pearl rating system. *Renewable Energy, International Conference on Renewable Energy: Generation and Applications, 82*, 100-107. https://doi.org/10.1016/j.renene.2014.08.018

Astier, M., Masera, O., & Lopez-Ridaura, S. (1999). *Sustentabilidad y manejo de recursos naturales: El Marco de evaluación MESMIS* [Sustainability and natural resource management: The MESMIS assessment framework].

Ayoubian, A., Nasiripour, A. A., Tabibi, S. J., & Bahadori, M. (2020). Evaluation of facilitators and barriers to implementing evidence-based practice in the health services: A systematic review. *Galen Medical Journal, 9*, Article e1645.

Berkes, F. (2004). Rethinking community-based conservation. *Conservation Biology, 18*(3), 621-630. https://doi.org/10.1111/j.1523-1739.2004.00077.x

Borrás, S., Haakonsson, S., Hendriksen, C., Gerli, F., Poulsen, R. T., Pallesen, T., Somavilla Croxatto, L., Kugelberg, S., & Larsen, H. (2024). The transformative capacity of public sector organisations in sustainability transitions. *Environmental Innovation and Societal Transitions, 53*, Article 100904. https://doi.org/10.1016/j.eist.2024.100904

Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal, 9*(2), 27-40. https://doi.org/10.3316/QRJ0902027

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. https://doi.org/10.1191/1478088706qp063oa

Bryson, J. M., & George, B. (2024). *Strategic planning for public and nonprofit organizations: A guide to strengthening and sustaining organizational achievement* (6th ed.). Wiley. https://www.wiley.com/en-us/Strategic+Planning+for+Public+and+Nonprofit+Organizations%3A+A+Guide+to+Strengthening+and+Sustaining+Organizational+Achievement%2C+6th+Edition-p-9781394274024

Chambers, R. (1994). Participatory rural appraisal (PRA): Challenges, potentials and paradigm. *World Development, 22*(10), 1437-1454. https://doi.org/10.1016/0305-750X(94)90030-2

de Olde, E. M., Oudshoorn, F. W., Sørensen, C. A. G., Bokkers, E. A. M., & de Boer, I. J. M. (2016). Assessing sustainability at farm-level: Lessons learned from a comparison of tools in practice. *Ecological Indicators, 66*, 391-404. https://doi.org/10.1016/j.ecolind.2016.01.047

Denscombe, M. (2014). The good research guide (5th edition). The Good Research Guide.

Department of Environment and Natural Resources (DENR). (2020). *ENR compendium of statistics 2020*. https://denr.gov.ph/denr-data-portal/enr-compendium-2020/

Dewberry, C., Davies - Muir, A., & Newell, S. (2013). Impact and causes of rater severity/leniency in appraisals without postevaluation communication between raters and ratees. *International Journal of Selection and Assessment, 21*(3), 286-293. https://doi.org/10.1111/ijsa.12038

Donkoh, S., & Mensah, J. (2023). Application of triangulation in qualitative research. *Journal of Applied Biotechnology & Bioengineering, 10*(1), 6-9. https://doi.org/10.15406/jabb.2023.10.00319

Elkington, J. (1997). *Cannibals with Forks*. Capstone Publishing Limited. https://www.academia.edu/42948589/Cannibals_with_Forks

Fiorino, D. J. (2010). Sustainability as a conceptual focus for public administration. *Public Administration Review, 70*(s1), s78-s88. https://doi.org/10.1111/j.1540-6210.2010.02249.x

Fixsen, D. L., Naoom, S. F., Blase, K. A., Friedman, R. M., & Wallace, F. (2005). *Implementation research: A synthesis of the literature*. University of South Florida, Louis de la Parte Florida Mental Health Institute.

Folke, C. (2006). Resilience: The emergence of a perspective for social–ecological systems analyses. *Global Environmental Change, 16*(3), 253-267. https://doi.org/10.1016/j.gloenvcha.2006.04.002

Frey, B. B. (2018). *The SAGE encyclopedia of educational research, measurement, and evaluation*. SAGE Publications. https://doi.org/10.4135/9781506326139

Frischknecht, R., Steiner, R., & Jungbluth, N. (2009). *The ecological scarcity method—eco-factors 2006. A method for impact assessment in LCA*. Federal Office for the Environment, FOEN.

Gan, X., Fernandez, I. C., Guo, J., Wilson, M., Zhao, Y., Zhou, B., & Wu, J. (2017). When to use what: Methods for weighting and aggregating sustainability indicators. *Ecological Indicators, 81*, 491-502. https://doi.org/10.1016/j.ecolind.2017.05.068

Gerrard, C. L., Smith, L. G., Pearce, B., Padel, S., Hitchings, R., Measures, M., & Cooper, N. (2012). Public goods and farming. In E. Lichtfouse (Ed.), *Farming for food and water security* (pp. 1-22). Springer Netherlands. https://doi.org/10.1007/978-94-007-4500-1_1

Gibson, R. B. (2006). Beyond the pillars: Sustainability assessment as a framework for effective integration of social, economic and ecological considerations in significant decision-making. *Journal of Environmental Assessment Policy and Management, 08*(03), 259-280. https://doi.org/10.1142/S1464333206002517

Häni, F., Stämpfli, A., Keller, T., & Barth, L. (2002). RISE A tool for a holistic sustainability assessment at the farm level. *Agrarforschung, 9*(5), 194-199.

Hendiani, S., Sharifi, E., Bagherpour, M., & Ghannadpour, S. F. (2020). A multi-criteria sustainability assessment approach for energy systems using sustainability triple bottom line attributes and linguistic preferences. *Environment, Development and Sustainability, 22*(8), 7771-7805. https://doi.org/10.1007/s10668-019-00546-7

Hernández Maqueda, R., Ballesteros Redondo, I., Serrano Manzano, B., Cabrera Martinez, L. Y., Hernández Medina, P., & del Moral Torres, F. (2021). Assessment of the impact of an international multidisciplinary intervention project on sustainability at the local level: Case study in a community in the Ecuadorian Andes. *Environment, Development and Sustainability, 23*(6), 8836-8856. https://doi.org/10.1007/s10668-020-00997-3

Holling, C. S. (1973). Resilience and stability of ecological systems. *Annual Review of Ecology, Evolution and Systematics, 4*, 1-23. https://doi.org/10.1146/annurev.es.04.110173.000245

Hosny, H. E., Ibrahim, A. H., & Eldars, E. A. (2022). Development of infrastructure projects sustainability assessment model. *Environment, Development and Sustainability, 24*(6), 7493-7531. https://doi.org/10.1007/s10668-021-01791-5

Janker, J., & Mann, S. (2020). Understanding the social dimension of sustainability in agriculture: A critical review of sustainability assessment tools. *Environment, Development and Sustainability, 22*(3), 1671-1691. https://doi.org/10.1007/s10668-018-0282-0

Kaldas, O., Shihata, L. A., & Kiefer, J. (2021). An index-based sustainability assessment framework for manufacturing organizations. In *Procedia CIRP, 8th CIRP Conference of Assembly Technology and Systems, 97*, 235-240. https://doi.org/10.1016/j.procir.2020.05.231

Kashef, A.-A. I. (1981). Technical and ecological impacts of the High Aswan Dam. *Journal of Hydrology, 53*(1), 73-84. https://doi.org/10.1016/0022-1694(81)90037-8

Knafl, K. A., & Howard, M. J. (1984). Interpreting and reporting qualitative research. *Research in Nursing & Health, 7*(1), 17-24. https://doi.org/10.1002/nur.4770070105

Lazar, N., & Chithra, K. (2021). Evaluation of sustainability criteria for residential buildings of tropical climate: The stakeholder perspective. *Energy and Buildings, 232*. https://doi.org/10.1016/j.enbuild.2020.110654

Lincoln, Y. S., Guba, E. G., & Pilotta, J. J. (1985). *Naturalistic inquiry*. SAGE. https://doi.org/10.1016/0147-1767(85)90062-8

Linton, R. K., Critch, S., & Kehoe, E. J. (2018). Role-specific versus cross-role preparation for decision-making teams. *Group Dynamics: Theory, Research, and Practice, 22*(1), 45-60. https://doi.org/10.1037/gdn0000081

Marchetti, N., Curci, A., Gatto, M. C., Nicolini, S., Mühl, S., & Zaina, F. (2019). A multi-scalar approach for assessing the impact of dams on the cultural heritage in the Middle East and North Africa. *Journal of Cultural Heritage, 37*, 17-28. https://doi.org/10.1016/j.culher.2018.10.007

McGregor, S. L. T. (2018). *Understanding and evaluating research: A critical guide*. SAGE Publications. https://doi.org/10.4135/9781071802656

Momoh, J., Ige, O., Seidu, R., Ogbenjuwa, L., Young, B., & Ibraheem, Y. (2024). Urban sustainability assessment: An analysis of how weighting and aggregating coefficient system was used in the development of SUCCEED assessment tool for developing countries. *Frontiers in Built Environment, 10*. https://doi.org/10.3389/fbuil.2024.1413757

Nagarathinam, A., Retnamma, J., Loganathan, J., Singaram, P., Mohanan Kannampally Madam, S., Jose, A. K., & Subramanian, P. R. (2021). Implications of an extensive salt water barrage on the distribution of black clam in a tropical estuarine system, Southwest coast of India. *Oceanologia, 63*(3), 343-355. https://doi.org/10.1016/j.oceano.2021.03.005

Naveed, S., Siddique, N., Ul-Durar, S., & De Sisto, M. (2025). Navigating sustainable practices in public sector organizations: Current themes and emerging trends. *Public Administration Quarterly, 49*(3), 202-217. https://doi.org/10.1177/07349149241296011

Nick, B. (2009). *The handbook of sustainable refurbishment: Non-domestic buildings*. Routledge. https://doi.org/10.4324/9781849770224

Oranga, J., & Matere, A. (2023). Qualitative research: Essence, types and advantages. *OALib, 10*(12), Article e11001. https://doi.org/10.4236/oalib.1111001

Osborne, S. P. (2006). The new public governance? *Public Management Review, 8*(3), 377-387. https://doi.org/10.1080/14719030600853022

Ostrom, E. (2009). A general framework for analyzing sustainability of social-ecological systems. *Science, 325*(5939), 419-422. https://doi.org/10.1126/science.1172133

Ramalingam, B. (2013). *Aid on the edge of chaos: Rethinking international cooperation in a complex world*. OUP Oxford.

Ramos, T. B., Domingues, A. R., Caeiro, S., Cartaxo, J., Painho, M., Antunes, P., Santos, R., Videira, N., Walker, R. M., & Huisingh, D. (2021). Co-creating a sustainability performance assessment tool for public sector organisations. *Journal of Cleaner Production, 320*. https://doi.org/10.1016/j.jclepro.2021.128738

Rees, W. E., Wackernagel, M., & Testemale, P. (1996). *Our ecological footprint: Reducing human impact on the earth*. New Catalyst Books.

Saxena, D. A. (2025). Rural development through geo-economic innovations. *International Journal of Multidisciplinary Research in Arts, Science and Technology, 3*(7), 101-123. https://doi.org/10.61778/ijmrast.v3i7.159

Scheirer, M. A. (2005). Is sustainability possible? A review and commentary on empirical studies of program sustainability. *American Journal of Evaluation, 26*(3), 320-347. https://doi.org/10.1177/1098214005278752

Scoones, I. (1998). *Sustainable rural livelihoods. A framework for analysis* (IDS Working Paper 72). Institute of Development Studies, University of Sussex.

Sen, A. (2001). *Development as freedom*. Oxford University Press.

Shawoo, Z., Maltais, A., Dzebo, A., & Pickering, J. (2022). Political drivers of policy coherence for sustainable development: An analytical framework. *Environmental Policy and Governance, 33*(4), 339-350. https://doi.org/10.1002/eet.2039

Simoncini, R. (2004). *The AEMBAC project: Final report*. IUCN. https://www.yumpu.com/en/document/read/12317362/the-aembac-project-final-report-nando-peretti-foundation

Smyth, A. J., & Dumanski, J. (1993). *FESLM: An international framework for evaluating sustainable land management*. Food and Agriculture Organization of the United Nations. https://www.fao.org/3/T1079E/T1079E00.htm

Sun, J., Jin, H., Tsai, F.-S., & Jakovljevic, M. (2022). A global assessment of sustainable development: Integrating socioeconomic, resource and environmental dimensions. *Frontiers in Energy Research, 10*. https://doi.org/10.3389/fenrg.2022.816714

Tamblyn, R., Girard, N., Qian, C. J., & Hanley, J. (2018). Assessment of potential bias in research grant peer review in Canada. *CMAJ, 190*(16), E489-E499. https://doi.org/10.1503/cmaj.170901

Urbanski, M., & Filho, W. L. (2015). Measuring sustainability at universities by means of the sustainability tracking, assessment and rating system (STARS): Early findings from STARS data. *Environment, Development and Sustainability, 17*(2), 209-220. https://doi.org/10.1007/s10668-014-9564-3

Walker, B., Salt, D., & Reid, W. (2006). *Resilience thinking: Sustaining ecosystems and people in a changing world*. Bibliovault OAI Repository, the University of Chicago Press.

WCED. (1987). *Report of the world commission on environment and development: Our common future*.

Wieczorkowska, G., & Kowalczyk, K. (2021). Ensuring sustainable evaluation: How to improve quality of evaluating grant proposals? *Sustainability, 13*(5), Article 2842. https://doi.org/10.3390/su13052842

Willem, A., & Buelens, M. (2007). Knowledge sharing in public sector organizations: The effect of organizational characteristics on interdepartmental knowledge sharing. *Journal of Public Administration Research and Theory, 17*(4), 581-606. https://doi.org/10.1093/jopart/mul021

Zagonari, F. (2019). Responsibility, inequality, efficiency, and equity in four sustainability paradigms: Insights for the global environment from a cross-development analytical model. *Environment, Development and Sustainability, 21*(6), 2733-2772. https://doi.org/10.1007/s10668-018-0159-2

Zahm, F., Viaux, P., Vilain, L., Girardin, P., & Mouchet, C. (2008). Assessing farm sustainability with the IDEA method – from the concept of agriculture sustainability to case studies on farms. *Sustainable Development, 16*(4), 271-281. https://doi.org/10.1002/sd.380

Zipperer, W., Morse, W., & Johnson Gaither, C. (2011). Linking social and ecological systems. In *Urban Ecology: Patterns, Processes and Applications* (pp. 298-308). https://doi.org/10.1093/acprof:oso/9780199563562.003.0035