



Non-Market Social Value and Conservation in a Tourist Corridor of a Protected Natural Area: Evidence from the Salinas y Aguada Blanca National Reserve (Peru)

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ABSTRACT

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This study examines the non-market social value generated by experiential, community-based tourism in the Salinas y Aguada Blanca National Reserve, a protected natural area in southern Peru, and its relevance for conservation-oriented planning and sustainable management. The aim was to estimate the non-market social value associated with a proposed tourist corridor by integrating stakeholders' perceptions with a structured assessment of social, cultural, environmental, and economic impacts. A qualitative design was adopted, combining documentary review, fieldwork, semi-structured interviews with 42 stakeholders, observation, and triangulation. Stakeholders were identified and classified according to their roles, and the Matrix of Alliances and Conflicts: Tactics, Objectives and Recommendations (MACTOR) approach was used to analyze relationships, influence, and convergence among actor groups. Based on these results, key value variables were defined and monetized through the Polyhedral Social Accounting Model (SPOLY) approach using observable indicators and indirect economic proxies. The findings estimate a total non-market social value of S/ 311,030 (approximately USD 82,941), mainly associated with employment generation, rural accommodation, pollution reduction, basic services, and the strengthening of local cultural practices. These results show that experiential tourism can generate measurable social value beyond direct economic revenues and support conservation-compatible territorial planning.

1. INTRODUCTION

The conservation of ecosystems and the sustainable management of protected natural areas represent key challenges for rural territories that aim to reconcile environmental protection with local development [1]. In this regard, tourism has emerged as an important strategy for valuing natural and cultural resources while contributing to both conservation and community wellbeing [2]. Experiential and sustainable tourism can generate economic opportunities for local populations, respect environmental limits, and reinforce local social structures [3-5]. Therefore, tourism policies in protected natural areas should adopt an integrated approach that incorporates social, economic, and territorial dimensions, while fostering inclusive governance, responsible use of resources, and long-term ecosystem conservation [6-10].

In this context, the Salinas y Aguada Blanca National Reserve, located in the Arequipa region, constitutes a relevant case due to its remarkable biodiversity and the cultural richness of the communities living in its surroundings [11]. The promotion of experiential tourism in this reserve requires a comprehensive evaluation of its impacts, considering not

only economic benefits but also the social, cultural, and environmental dimensions closely linked to conservation processes [12]. For this reason, it is necessary to adopt an approach that can account for the diverse values generated by these places, including the social, cultural, and environmental benefits that are often not reflected in conventional economic assessments [12, 13].

In this regard, the Polyhedral Social Accounting Model (SPOLY) can help to partially address this need by making visible forms of value that are not captured through conventional economic assessments [14-16]. Within this framework, non-market social value is understood as the value created for stakeholders through non-market relationships, that is, benefits generated without a direct financial transaction but still perceived as relevant by the actors involved. This perspective is closely related to stakeholder support, trust, social exchange processes, and the experiential dimensions associated with tourism development [17-19]. In addition, non-market value has been conceptualized as a relevant outcome perceived by stakeholders even in the absence of direct economic transactions [14, 15]. These benefits may include improvements in community wellbeing, cultural strengthening, environmental care, and other collective

outcomes that are not reflected in direct revenues or observable market prices [14, 20].

Methodologically, this approach is especially useful because it begins with the identification of value variables perceived by stakeholders, mainly through phenomenological or in-depth interviews, and subsequently translates those variables into indicators, outputs, and financial proxies that allow their indirect monetization [20]. In this sense, SPOLY is particularly appropriate for the present study, since the proposed tourist corridor has not yet been fully implemented and many of its expected effects are collective, intangible, and only partially observable through market data [20]. Thus, the model provides a structured way to estimate non-market social value from stakeholder perceptions and to integrate those results into a broader assessment of the corridor's contribution to conservation and local development [15, 20].

2. LITERATURE REVIEW

Social value refers to the set of benefits perceived by different stakeholders in a tourism community, arising from the economic, social, cultural, and environmental interactions generated by tourism activities [14, 15, 21-23]. Recent studies have emphasized the importance of sociocultural indicators and value co-creation processes in understanding how tourism generates benefits for communities and multiple stakeholder groups [21, 22]. From a sustainable tourism perspective, these dimensions strengthen tourism development when local communities, public institutions, and other stakeholders actively participate in decision-making and implementation processes [4]. In protected natural areas, this is especially relevant because tourism may support local development, biodiversity conservation, environmental awareness, and the preservation of cultural practices, but only when governance and resource management remain consistent with conservation objectives [16].

From the perspective of experiential and sustainable tourism, social value is closely linked to community participation, stakeholder support, and trust in decision-making, particularly in protected areas where conservation goals may also create trade-offs for local populations [12, 17-19, 24]. Experiential tourism encourages direct engagement with nature, local ways of life, and cultural expressions, allowing visitors to connect with everyday practices and intangible heritage in ways that can reinforce cultural identity and social cohesion within host communities [18]. In this sense, tourism should be understood as a multidimensional process whose effects depend not only on visitor flows and expenditure, but also on territorial governance, local participation, and conservation priorities [25-27].

Although literature has developed several methods to assess impacts beyond direct economic income, recent studies have highlighted the importance of social sustainability indicators, evidence-informed decision making, and social value assessment frameworks for understanding the broader impacts of tourism on communities and territories [28-30]. However, the systematic evaluation of social, cultural, environmental, and wellbeing effects still faces important methodological limitations. In this context, the non-market social value approach broadens conventional analysis by incorporating benefits that are not captured through direct revenues or observable market prices [12, 20]. From this perspective, non-market social value refers to the value perceived by

stakeholders that is generated through non-market relationships and collective outcomes, even when it is not reflected in market transactions [14, 15, 20]. This includes dimensions such as community wellbeing, environmental care, cultural strengthening, public returns, organizational improvements, and other forms of value that may be relevant for stakeholders but remain outside conventional financial accounting [20, 30-32].

Several methodological approaches have been used to address these dimensions. Social Return on Investment (SROI) is one of the most widely applied because it monetizes social and environmental outcomes and facilitates comparison between investment and social return [33]. However, SROI is mainly oriented toward relating value to an identifiable investment, and methodological reviews have pointed out challenges associated with attribution, deadweight, proxy selection, and comparability across cases [34, 35]. Social Impact Analysis (SIA) is useful for identifying and describing social effects, particularly in relation to employment, poverty reduction, and community strengthening [36], but it does not necessarily provide a structured monetary estimation of stakeholder-perceived value. Likewise, contingent valuation is useful for estimating willingness to pay for non-market goods and services [16, 37], but it is based on stated preferences and does not fully capture the broader collective and relational dimensions of value perceived by stakeholders.

Within this methodological field, Integrated Social Value offers a broader framework because it combines monetary and non-monetary dimensions through stakeholder-based indicators, outputs, proxies, and algorithms [15, 31]. Within this framework, SPOLY functions as the operational process used to identify value variables through stakeholder engagement and to translate them into monetary estimates [20]. This makes it possible to quantify forms of non-market social value that are perceived by stakeholders but are not directly observable through market data, including social, environmental, cultural, organizational, and territorial contributions [15, 20, 38-40]. At the same time, this approach is not free from limitations, since the results depend on the identification of relevant stakeholders, the definition of value variables, and the selection of context-sensitive proxies and reference values [15, 38, 39].

For the present study, this framework is especially appropriate because the proposed tourist corridor has not yet been fully implemented and many of its expected effects are still expressed through stakeholder perceptions rather than through observed market outcomes. On this basis, the study adopts the Integrated Social Value framework and applies the SPOLY model to estimate the non-market social value associated with the proposed corridor by identifying stakeholders' perceptions, relevant indicators, and externalities linked to its future development [20, 41-44].

3. MATERIALS AND METHODS

The study adopted a qualitative, cross-sectional, and non-experimental design with an exploratory and prospective orientation. Rather than evaluating an already implemented intervention, it examined a proposed tourist corridor that had not yet been fully implemented and remained at an early planning stage. The purpose was to estimate its potential non-market social value and to generate evidence capable of informing future territorial planning and decision-making [45-

48].

The units of analysis were the communities associated with the proposed tourist corridor of the Salinas y Aguada Blanca National Reserve, a protected natural area located in the regions of Arequipa and Moquegua. The corridor proposal included experiential tourism activities such as alpaca herding, artisanal weaving, visits to high Andean lagoons, and cultural exchange with local communities. The geographical location of the reserve and the communities linked to the corridor is presented in Figure 1.

The methodological design combined documentary review,

field observation, and in-depth fieldwork in the reserve communities. In-person visits and direct dialogue with community members and community presidents made it possible to present and discuss the corridor proposal, assess its territorial relevance, and gather local perceptions from a participatory perspective. Although the study was qualitative in nature, it also incorporated a structured monetization procedure as analytical support for estimating non-market social value. This did not replace the qualitative logic of the study; rather, it extended it through the Integrated Social Value framework and the SPOLY process [48-51].

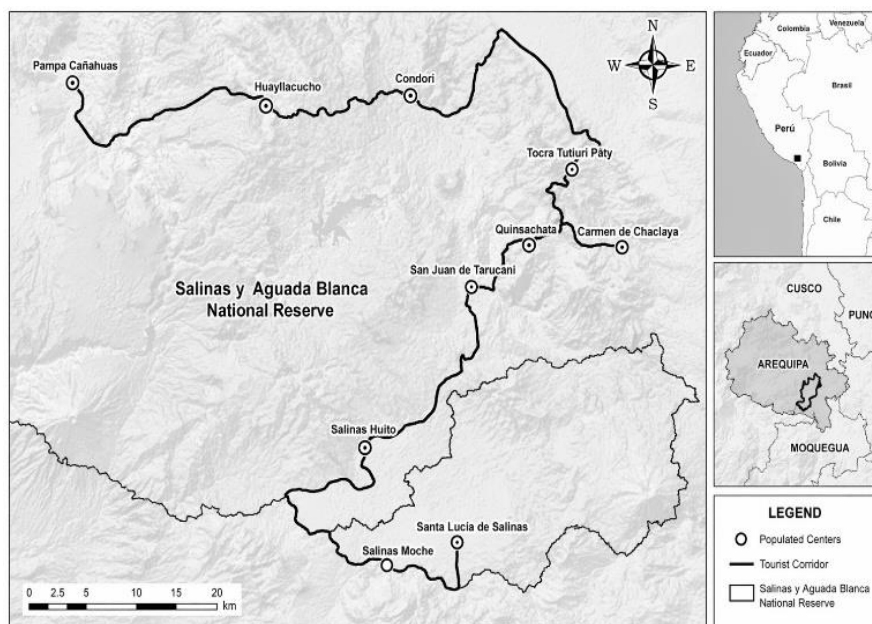


Figure 1. Location of the Salinas y Aguada Blanca National Reserve and communities along the tourist corridor

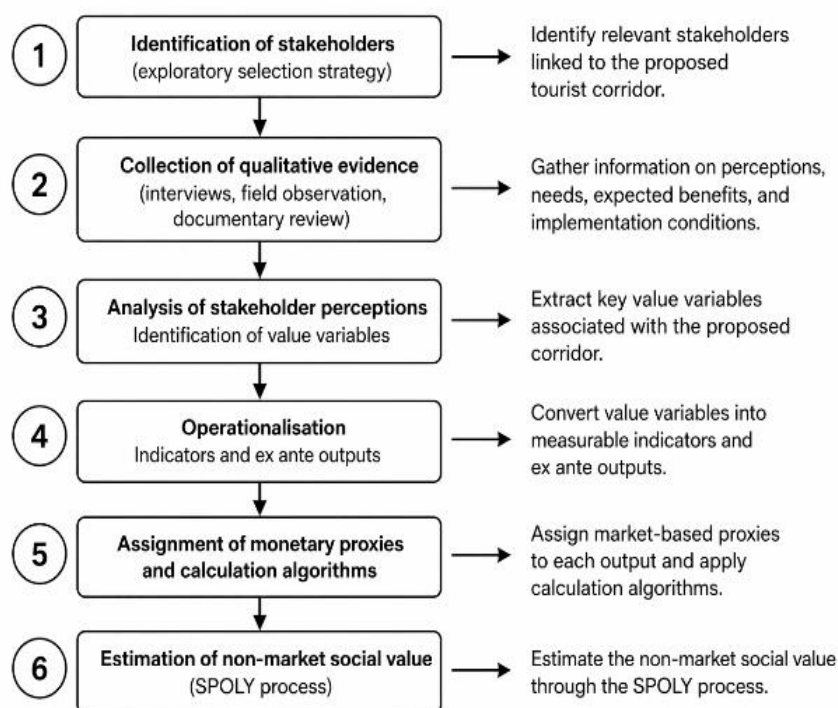


Figure 2. Step-by-step methodological process for estimating non-market social value

Note: The figure summarizes the methodological sequence followed in the study: exploratory stakeholder identification, qualitative data collection, triangulation of evidence, definition of value variables, MACTOR-based relational analysis, operationalization into indicators and ex ante outputs, assignment of monetary proxies, and estimation of non-market social value through the SPOLY process.

The qualitative sample was selected through an exploratory and purposive strategy. Participants were not chosen statistically, but intentionally, according to their role, knowledge, experience, and direct relationship with the proposed corridor. This strategy made it possible to include actors who could provide relevant information about expected benefits, local needs, implementation conditions, and possible externalities. The final sample consisted of 42 participants: 32 community members and 10 tourism entrepreneurs and public authorities directly linked to the corridor. The sample size was defined according to theoretical saturation criteria, ensuring the inclusion of diverse perspectives from different communities and stakeholder groups.

Data were collected through two questionnaires adapted from previous studies [28, 40]. These instruments addressed perceived impacts, visible improvements, signs of progress, community needs, and expected social value dimensions. Validation was carried out through expert judgement with the participation of five specialists. Fieldwork was conducted between November 2024 and February 2025, and the information collected was analyzed through a triangulation process integrating interviews, documentary review, and field observation.

To improve methodological transparency, the procedure used to estimate non-market social value was organized as a sequential process. First, relevant stakeholders were identified through an exploratory selection strategy. Second, qualitative evidence was collected through interviews, field observation, and documentary review. Third, stakeholder perceptions were analyzed to identify value variables associated with the proposed corridor. Fourth, these variables were operationalized into indicators and ex ante outputs. Fifth, monetary proxies and calculation algorithms were assigned. Finally, the non-market social value was estimated through the SPOLY process. This step-by-step sequence is summarized in Figure 2.

Within the Integrated Social Value framework, SPOLY was used as the operational process for estimating non-market social value [15, 20, 49-50]. In this study, non-market social value was not directly observed in market transactions; instead, it was indirectly estimated from the value perceived by stakeholders through a structured procedure. The interviews were used to identify the main needs, expected benefits, missing conditions, and enabling factors associated with the future implementation of the tourist corridor. This made it possible to detect not only expected positive effects, but also the items, services, and territorial conditions that were not yet present and were considered necessary for the corridor's viability and sustainability.

The qualitative findings were then grouped into value variables representing the principal dimensions of perceived non-market social value. These included employment and family income generation, improvement of accommodation and basic services, increase in visitor flows and cultural visibility, environmental conservation and pollution control, and training and formalization of tourism management. In SPOLY terms, these value variables constituted the basis for the later definition of indicators, outputs, and proxies [50, 51].

These value variables were subsequently operationalized into indicators and ex ante outputs. Because the tourist corridor had not yet been fully implemented, the outputs used in the SPOLY estimation were not treated as currently observed results, but as empirically grounded scenario estimates derived from stakeholder expectations, field

observation, triangulated evidence, and expert validation [47, 48]. In other words, the interviews did not directly produce the final monetary figures; rather, they provided the qualitative basis for identifying what kinds of value, needs, and expected outcomes were considered relevant by stakeholders.

After defining the outputs, each one was linked to a monetary proxy based on local reference prices or equivalent market values available during the study period. Algorithms were then applied to combine outputs and proxies in order to estimate the monetary expression of the corresponding non-market social value. Therefore, the resulting figures should be interpreted as structured indirect estimations of stakeholder-perceived value rather than as direct market values or observed financial returns [15, 20, 49-51].

MACTOR analysis was used as a complementary tool to examine relationships among stakeholder groups, particularly their influence, dependence, and convergence in relation to the proposed corridor [45, 46]. In this sense, MACTOR supported the interpretation of the stakeholder structure surrounding the initiative, but it did not generate the monetary values reported in the SPOLY estimation. Its function was analytical and relational rather than monetizing.

For the MACTOR analysis, the 42 interviewees were not treated as individual actors, but were grouped into five stakeholder categories according to their role in the territory and their relation to the proposed tourist corridor: community residents (A1), community leaders (A2), representatives of tourism organizations or tourism entrepreneurs (A3), local authorities (A4), and government representatives linked to the protected area, including the National Service of Natural Protected Areas by the State (Servicio Nacional de Áreas Naturales Protegidas por el Estado, SERNANP) (A5). The strategic objectives used in the relational analysis were defined by grouping the main expected impacts repeatedly identified in the interviews and later operationalized as value variables in the SPOLY estimation.

The broader qualitative analysis process used to integrate interviews, documentary review, and field observation is presented in Figure 3. This figure complements the procedural sequence shown in Figure 2 by illustrating how the qualitative diagnosis, triangulation, and analytical interpretation supported the construction of the results.

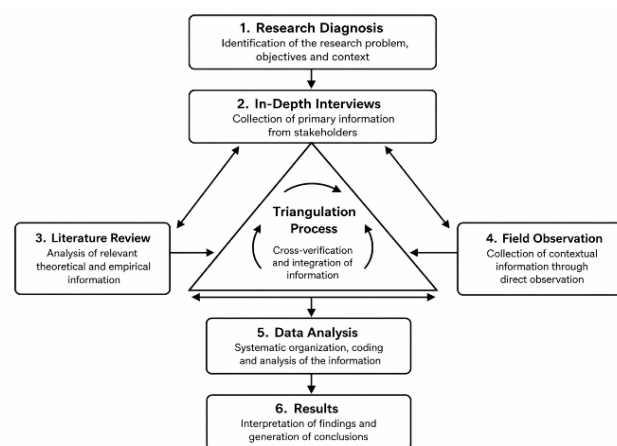


Figure 3. Qualitative analysis process

Note: The figure summarizes the qualitative analysis process used in this study. It shows the sequence from research diagnosis and in-depth interviews to methodological triangulation based on literature review and field observation, followed by data analysis and results generation.

Throughout the study, the ethical principles of social research were respected, including confidentiality, informed consent, and proper citation of sources. All participants were informed about the purpose of the study before the interviews were conducted. Participation was voluntary, and informed consent was obtained prior to data collection. To protect confidentiality, participants' names were not recorded in the analytical sections and were replaced by codes linked to communities or stakeholder groups. The information collected was used exclusively for academic purposes and analyzed in aggregate form. No sensitive personal data were included in the study.

4. RESULTS

This section presents the empirical results derived from stakeholder analysis, perceived value variables and the estimation of non-market social value associated with the tourist corridor.

4.1 Characteristics of stakeholders and perceived value variables

The first stage of the analysis involved identifying the communities and stakeholders linked to the proposed tourist corridor. Table 1 presents the coding system used for the interviews conducted in the participating communities. This coding helped organize the qualitative evidence, preserve participant confidentiality, and systematize the territorial distribution of the interviewees across the study area.

Table 1. Community coding

Communities	Coding	Interviews
Carmen de Chaclaya	CH1	4
	CH2	
	CH3	
	CH4	
Condori	C1	4
	C2	
	C3	
	C4	
Huayllacucho	HU1	2
	HU2	
Pampa Cañahuas	PC1	3
	PC2	
	PC3	
Patty	PA1	2
	PA2	
Quinsachata	QU1	4
	QU2	
	QU3	
	QU4	
Salinas Huito	SH1	4
	SH2	
	SH3	
	SH4	
Salinas Moche	SM1	3
	SM2	
	SM3	
San Juan de Tarucani	ST1	3
	ST2	
	ST3	
Santa Lucía de Salinas	SLS1	3
	SLS2	
	SLS3	

This initial organization also supported the subsequent identification of stakeholder categories and perceived value variables associated with the proposed corridor. By comparing responses across communities and actor groups, the analysis linked the testimonies to broader dimensions such as local livelihoods, basic services, cultural visibility, environmental concerns, and organizational conditions for tourism development. In this sense, the coding process functioned not only as a confidentiality mechanism, but also as an analytical basis for the MACTOR and SPOLY analyses.

Based on this initial coding, a stakeholder map was developed to classify actors according to their role within the tourist corridor. As shown in Table 2, this classification distinguishes among community residents, local leaders, representatives of tourism organisations, local authorities, and government representatives linked to the protected area. This step provided the basis for understanding the institutional structure and territorial dynamics surrounding the initiative.

Table 2. Identification and classification of stakeholders in the tourism corridor

Category	Subcategory / Role	Specific Stakeholders
Community residents	Community members	- Carmen de Chaclaya
		- Condori
		- Huayllacucho
		- Pampa Cañahuas
		- Patty
		- Quinsachata
		- Salinas Huito
		- Salinas Moche
		- San Juan de Tarucani
		- Santa Lucía de Salinas
Community representatives	Local leaders	- Carmen de Chaclaya
		- Condori
		- Huayllacucho
		- Pampa Cañahuas
		- Patty
		- Quinsachata
		- Salinas Huito
		- Salinas Moche
		- San Juan de Tarucani
		- Santa Lucía de Salinas
Representatives of tourism organizations	Tourism guide	- Association of Professional Tourism Guides of Arequipa
		- Local police
Local authorities	Local policies Government representatives	- SERNANP

After stakeholder identification, MACTOR was used to analyze the relationships among the main actors involved in the proposed tourist corridor. For this purpose, interviewees were grouped into five categories: community residents (A1), community leaders (A2), tourism organizations (A3), local authorities (A4), and government representatives linked to the protected area (A5). In parallel, five strategic objectives were defined from the interviews: employment and family income (O1), accommodation and basic services (O2), visitor flows and cultural visibility (O3), environmental conservation and pollution control (O4), and training and formalization of tourism management (O5). Figures 4 and 5 present the main MACTOR results used to interpret stakeholder positions and their convergence around strategic objectives.

Figure 4 shows an unequal stakeholder structure. Community residents (A1) occupy the strongest position, with high influence and low dependence. Community leaders (A2) also play a significant role, although they depend more on other actors. Tourism organizations (A3) and local authorities (A4) occupy intermediate positions. Government representatives linked to the protected area (A5) appear to be the most dependent and one of the least influential actors. Overall, these results reveal unequal capacities for coordination and decision-making within the proposed corridor.

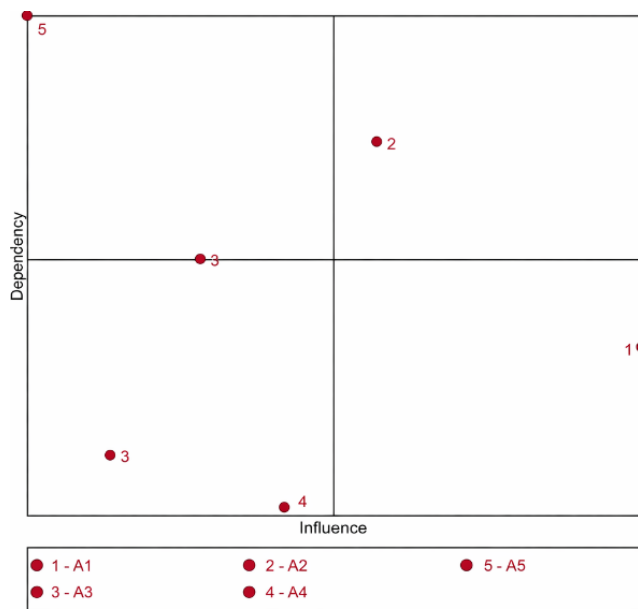


Figure 4. Influence and dependence among stakeholders

Note: Relative position of stakeholder groups according to their levels of influence and dependence in the MACTOR analysis.

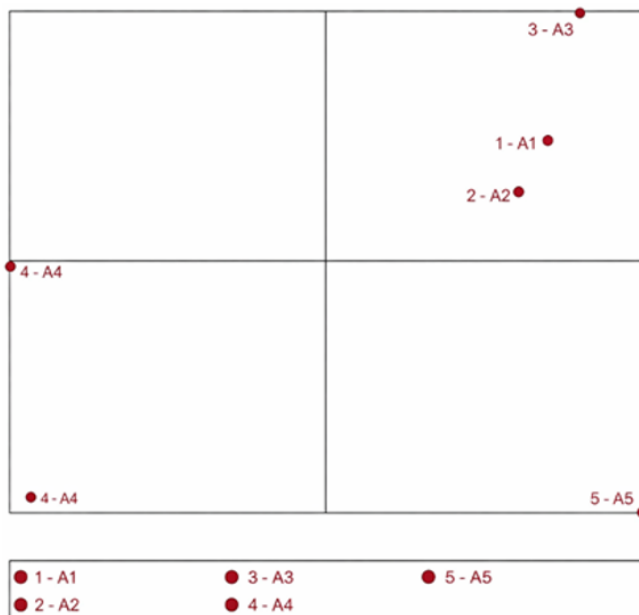


Figure 5. Order 2 convergence plane among stakeholders

Note: Degree of convergence among stakeholder groups with respect to the strategic objectives defined in the MACTOR analysis.

Figure 5 shows that community residents (A1), community leaders (A2), and tourism organizations (A3) form the main convergence cluster. This indicates greater alignment around

the corridor's strategic objectives. In contrast, local authorities (A4) and government representatives (A5) appear in more peripheral positions, suggesting lower convergence with the core group. These results indicate that community and tourism actors constitute the main support base for the corridor proposal.

Based on the interviews and the relational analysis, the study identified a set of perceived value variables associated with the proposed corridor. These included employment and family income generation, improvement of accommodation and basic services, greater cultural visibility, increased visitor flows, environmental conservation, pollution control, and training and formalization of tourism management. Together, these variables formed the analytical basis for the subsequent SPOLY estimation of non-market social value.

Key actors in the proposed tourist corridor were grouped according to their functions. Community leaders assumed roles related to decision-making and project coordination. Following the methodological approach used in Integrated Social Value and the SPOLY process [15, 49-51], stakeholder interviews were analyzed to identify the priority value variables associated with the corridor. In this study, these variables were defined from the perceptions, expectations, and needs expressed by the different actors. More specifically, the value variables were derived from two analytical dimensions: personal and social impact, and signs of progress. Each dimension included specific indicators that were interpreted from the responses obtained in the interviews.

With regard to the personal and social impact dimension, the analysis was based on three indicators: cultural and social impact, sustainable development, and community investment. In relation to cultural and social impact, one of the value variables identified was pollution reduction, as some community members mentioned that the arrival of tourists could lead to an "...increase in rubbish" (JSTC). Another value variable identified under this dimension was visits to tourist attractions in the reserve, as reflected in statements such as "the flow of visitors and overnight stays will increase" (PC1), which in turn "will bring good results and economic benefits" (C2).

Regarding the sustainable development indicator, employment emerged as one of the value variables to be strengthened. Some participants referred to "greater job opportunities" and "knowledge of the community" (JSER, JASG), which would generate an "...economic benefit and increase in trade...". This indicator also gave rise to a second value variable, namely opportunities to showcase the culture of the communities, as reflected in responses such as "it will be very good for the community, because we can show tourists how we live and our traditions" (JSM), together with the expectation of an "increase in overnight stays" (PA1).

With respect to the third indicator, community investment, the value variables identified were water services, Wi-Fi access, training, and road improvements. These variables were consistently reflected in interview responses such as "invest in improving roads and bathrooms" (SLS1), "improve water, electricity, and signage services" (SM2), and "invest in the creation of services such as Wi-Fi" (SH1).

The second analytical dimension, referred to as signs of progress, was examined through the indicator of perceived sustainability. Based on the interview results, two value variables were identified under this dimension. The first was the formalization of processes, as expressed in the opinion that "once the activity is formalized, follow-up should be carried

out with visitors, operators, guides, and the community...” (JSER). The second was accommodation, as reflected in statements such as “it will be perceived as sustainable with the increase in the number of tourists staying in the community guesthouse” (JQU).

Overall, the analysis of the interviews across these dimensions made it possible to identify the following value variables: pollution reduction, water services, Wi-Fi access, training, road improvements, increased employment, visits to tourist attractions in the reserve, opportunities to showcase local culture, formalization of processes, and accommodation. These variables were later grouped into two blocks for their monetization: pollution and services, and training and community.

4.2 Indicators of the economic, social, environmental and cultural impact of the tourist corridor

Tables 3 and 4 present the outputs and proxies used for the ex-ante monetization of non-market social value. These outputs do not represent current observed achievements of the

tourist corridor. Rather, they correspond to scenario-based assumptions derived from stakeholder expectations regarding the corridor’s implementation, combined with reference costs and observable indicators required by the SPOLY framework.

The analysis of Tables 3 and 4 as a consolidated whole (100%) shows that the variables with the greatest share in the estimation of non-market social value are the implementation of guest houses (33.66%) and increased employment (24.69%), demonstrating that accommodation infrastructure and job creation are the most decisive factors. These are followed by access to Wi-Fi (10.51%) and the reduction of pollution (11.66%), reflecting the need to improve digital connectivity and ensure the environmental sustainability of the reserve.

On a second level of importance are water services (7.93%) and road improvements (6.43%). Finally, variables such as community training (2.64%), formalization of processes (1.61%), participation in trade fairs (0.58%) and visits to tourist sites (0.29%), although with a lower percentage weighting, contribute to the social, cultural and organizational sustainability of the project.

Table 3. Monetization of pollution and services

Value Variables	Indicators	Scenario Output	Proxy	Algorithm	Calculation	Total Value Variable	Percentage Share of Non-Market Value
Pollution reduction	No. of rubbish bins	50	169.90	No. of rubbish bins * No. of communities * Unit cost	8495	36270	11.66%
	No. of people trained in pollution control	20	240	No. of community members per community * No. of communities * Unit cost of the course	4800		
	No. of people trained in pollution control	20	1000	No. of posters in total in the communities * Unit cost.	20000		
	No. of people trained in reserve care	10	150	No. of people * cost of the course	1500		
	No. of leaflets distributed to tourists.	5	295	No. of thousands * Cost per thousand	1475		
	No. of cisterns.	20	649	(No. of communities * no. of houses) * (Cvu cistern)	12980		
Water service	No. of motors, pumps and equipment.	20	585	No. (communities*number of houses) *(Cost of motors + Cost of pumps + Cost of meter)	11700	24680	7.93%
Wi-Fi access	No. of internet antennas.	10	750	No. of communities * cost of antenna	7500	32680	10.51%
	No. of strategic centers with internet access.	10	1259	No. of communities with internet centers * cost of computer	25180		

Note: Output values represent ex ante scenario assumptions derived from stakeholder expectations, triangulated qualitative evidence, expert validation, and reference prices. Monetary estimates should be interpreted as indirect estimations of stakeholder-perceived non-market social value.

Table 4. Monetization of training and community

Value Variables	Indicators	Scenario Output	Proxy	Algorithm	Calculation	Total Value Variable	Percentage Share of Non-Market Value
Training	No. of community members trained in tourist services.	20	90	No. of community members * training cost	1800	8200	2.64%
	No. of community members trained in recycling.	20	80	No. of community members trained * training cost	1600		
	No. of community members trained in cost and budget optimization.	20	80	No. of community members trained * training cost	4800		

Road improvements	No. of signage posters.	20	1000	No. of posters * unit cost (Number of counsellors per community)	20000	20000	6.43%
Increased employment	No. of people in employment	20	3840	*(Hourly rate * total hours of service per month)	76800	76800	24.69%
Visit tourist attractions in the reserve.	No. of visits to tourist attractions in the community	60	15	(Number of hours of visits * Number of communities) * (Hourly rate)	900	900	0.29%
Opportunities to showcase the culture.	No. of participations in local trade fairs	300	6	(Cost of attending an expo fair)* (Number of times)	1800	1800	0.58%
Formalization of processes.	No. of formalization processes for the corridor	10	500	Number of communities * Unit cost of formalization	5000	5000	1.61%
Accommodation.	No. of houses equipped for accommodation	10	10000	Number of furnished homes * Furnishing cost	100000	104700	33.66%
	No. of overnight stays	10	470	Total number of rooms * Implementation cost	4700		

Note: Output values follow the same ex ante estimation procedure described in Table 3.

A simple sensitivity analysis was conducted to assess the robustness of the estimated non-market social value. The main value variables with the largest weights in the model accommodation, increased employment, pollution reduction, and Wi-Fi access were varied by $\pm 10\%$. The results showed that the total estimated social value changed proportionally, but the overall structure of the valuation remained stable, with accommodation and employment continuing to represent the largest shares. This suggests that the estimation is sensitive to the largest scenario outputs, but the relative prioritization of the main value dimensions remains consistent.

4.3 Perceived externalities associated with the implementation of the tourist corridor

Externalities are positive or negative aspects that could impact the future sustainability of the tourist corridor. These include:

In relation to the expectation of economic benefit, stakeholders agreed that the tourist corridor would generate income for families and employment opportunities. They expressed this as follows: ‘There would be economic benefits, we must be trained’ (JASG); ‘More tourists will come, bringing economic benefits and increased sales’ (C2).

Regarding the environmental assessment of future impact, they stated that tourism can contribute to the care of the reserve and waste control: ‘...putting up signs and rubbish bins’ (SH4); and ‘teaching about the reserve’ (SM1).

In terms of visitors' anticipated satisfaction, they emphasized their interest in showcasing customs and traditions: ‘so they can learn about our customs’ (JSLs); and ‘they will be able to see our crafts, alpaca breeding, lagoons’ (JPA).

Community participation was perceived as positive, although conditional: ‘the communities are encouraged to participate’ (JC); ‘if they see that they are gaining something, they commit themselves’ (JSER).

In relation to recommendations for improvement, they suggested: ‘improve roads, bathrooms, signage’ (JSER); ‘clean water and training courses’ (JASG, JSM). This reinforces investment in basic infrastructure, adequate signage, community training, and technical support.

Regarding the impact on future environmental education,

they highlighted the need to involve tourists and residents in awareness-raising processes: ‘educate tourists and the community not to litter’ (JCH); and ‘...with signs and local guides’ (SH4).

On the perception of improvement in future quality of life, they commented: ‘if there is more work and money, yes’ (JASG); and ‘with more visitors, everyone's life will improve’ (JSLs). Thus, it is concluded that the tourist corridor will contribute to increased income and well-being, generating new opportunities for young people and strengthening community life.

Finally, in assessing future biodiversity conservation, they pointed out that experiential tourism can be a protective mechanism: ‘vicuñas and alpacas will be protected...’ (JC); ‘experiential tourism will help preserve nature’ (JCH); and ‘rules will be needed to avoid damaging the environment’ (JSER).

The analysis of externalities shows that the tourist corridor is perceived as a source of economic benefits and a tool for environmental conservation through awareness-raising and infrastructure improvements.

4.4 Estimation of non-market social value using the SPOLY method

The application of the SPOLY method made it possible to estimate the non-market social value associated with experiential tourism in the Salinas y Aguada Blanca National Reserve, based on the identification, classification and assessment of variables linked to economic, social, environmental and cultural impacts. The methodology integrated empirical information from fieldwork with testimonies obtained in interviews and the use of observable indicators and economic proxies contextualized in the communities of the tourist corridor.

The estimated non-market social value amounts to S/ 311,030 (approximately USD 82,941, according to the average exchange rate for 2024), reflecting the local economic and social context of the protected natural area. This value is distributed across four dimensions. In the economic dimension, there is evidence of the strengthening of local productive activity through the generation of employment and the development of lodging facilities. In the environmental

dimension, actions aimed at reducing pollution, environmental education and landscape conservation stand out. In the social sphere, access to basic services, such as drinking water and digital connectivity, has a direct impact on the quality of life of the population. Finally, in the cultural dimension, there is a strengthening of local traditions, participation in fairs, community training processes, and the formalization of tourist activities.

5. DISCUSSION

The estimated non-market social value of the proposed tourist corridor, S/ 311,030, suggests that experiential tourism in the Salinas y Aguada Blanca National Reserve should not be understood only as a revenue-generating activity, but as a governance issue involving the distribution of collective benefits, conservation responsibilities, and territorial priorities. In this sense, the main contribution of the study is not merely to show that tourism can generate value beyond direct expenditure, but to demonstrate that many of the most relevant expected effects in protected areas are non-market in nature and therefore remain invisible if planning is based only on visitor numbers, spending, or financial return. The findings therefore complement the broader literature on social value by showing that, in protected natural areas, tourism governance must also account for community wellbeing, environmental control, cultural continuity, and enabling territorial conditions as central dimensions of decision making [14, 15, 21, 22].

A second important implication concerns the internal distribution of that value. Accommodation (33.66%) and increased employment (24.69%) together account for 58.35% of the estimated total, followed by pollution reduction (11.66%), Wi-Fi access (10.51%), water services (7.93%), and road improvements (6.43%). This distribution is theoretically meaningful because it shows that stakeholders do not prioritize tourism value in abstract terms, but in relation to the practical and territorial conditions that make tourism viable and socially legitimate. In other words, the largest shares of value are concentrated not in promotional or symbolic dimensions, but in those conditions that sustain everyday life and make participation in tourism possible. This finding adds nuance to existing debates on protected area governance by suggesting that community support for tourism is not only linked to expected income, but also to the extent to which tourism contributes to local infrastructure, service provision, and the reduction of environmental risks [24-26].

This point is especially relevant when compared with other valuation approaches. Studies using SROI or contingent valuation have shown that tourism and conservation can generate measurable social benefits or willingness to pay [16, 33], but the present findings indicate that the governance value of tourism in protected areas cannot be reduced either to return-on-investment logic or to stated preferences alone. What emerges here is a more territorially embedded form of value, one that depends on stakeholder perceptions of whether tourism improves the material and organizational conditions of community life while remaining compatible with conservation. From this perspective, non-market social value does not simply complement economic valuation; it also challenges governance approaches that privilege market indicators while overlooking the enabling conditions required for equitable and conservation-compatible tourism development [15, 37, 40].

Another important contribution of the findings is that they reposition conservation within tourism governance rather than treating it as an external constraint. Pollution reduction, water services, digital connectivity, and community-oriented infrastructure account for a substantial share of the estimated value, which indicates that stakeholders perceive tourism as acceptable and valuable when it is linked to environmental care, quality-of-life improvements, and controlled territorial management. This complements the literature on protected areas by suggesting that governance should not be framed as a trade-off between tourism and conservation only. Instead, the findings support the idea that tourism can become a conservation-compatible territorial strategy when governance arrangements are able to align local benefits with environmental protection, infrastructure provision, and collective regulation [9, 27, 43]. In this sense, the estimated value structure highlights that non-market benefits are not peripheral to governance; they are part of the conditions that make governance workable.

The interviews reinforce this interpretation. Stakeholders repeatedly associated the corridor with higher family income, greater employment opportunities, stronger cultural visibility, and better conditions for accommodation and services. At the same time, they also identified risks related to weak organization, insufficient technical support, limited infrastructure, and environmental deterioration. This duality is significant because it shows that non-market social value is not simply a list of expected benefits; it also reflects the governance conditions under which those benefits may or may not materialize. The findings therefore complement theories of community-based and experiential tourism by showing that support for tourism in protected areas depends not only on demand or product attractiveness, but also on trust, organizational capacity, institutional backing, and the perception that tourism will be managed in ways that distribute responsibilities and benefits fairly [17-19, 42].

The MACTOR results deepen this governance interpretation. Community residents occupy the strongest position in terms of influence, while community leaders remain important but more dependent on other actors. At the same time, residents, community leaders, and tourism organizations form the main convergence cluster around the corridor's strategic objectives. This means that the core support for the corridor is socially embedded in community and tourism actors rather than in the state actors linked to the protected area. Theoretically, this matters because it reveals a governance configuration in which local legitimacy is strong, but institutional articulation remains uneven. Rather than interpreting this only as a coordination problem, the findings suggest that governance in protected areas depends on how local influence is connected to formal decision-making structures, technical support, and conservation rules. If this articulation is weak, tourism initiatives may have local support but still lack the institutional capacity needed for long-term implementation [43-48].

From this perspective, the proposed corridor should be understood as a multidimensional territorial strategy rather than as a simple tourism product. Its expected value lies in the combination of employment, accommodation, basic services, environmental control, cultural visibility, and community organization. The governance implication is that future implementation should prioritize those dimensions in which value is most strongly concentrated, while also strengthening institutional coordination, monitoring mechanisms, and

conservation-compatible rules. In practical terms, this means that planning in protected areas should incorporate non-market social value not only as an evaluative result, but also as a criterion for prioritizing investment, sequencing interventions, and aligning tourism development with territorial and environmental governance.

Finally, the study also contributes methodologically by showing that the SPOLY framework can be applied *ex ante* to estimate the potential social value of a tourism proposal before full implementation. This is relevant for protected area governance because decision making often takes place under conditions of uncertainty, before impacts can be directly observed in markets or in long-term visitor statistics. In such contexts, the *ex ante* estimation of non-market social value can function as a prospective tool for identifying priority dimensions, anticipating governance tensions, and supporting conservation-oriented planning. Therefore, beyond the specific case of the Salinas y Aguada Blanca National Reserve, the findings suggest that non-market social value can play a strategic role in the design of tourism policies and interventions in protected natural areas where collective benefits, environmental responsibilities, and stakeholder coordination are inseparable [15, 20, 47, 48].

6. CONCLUSIONS

The objective of this research was to estimate the non-market social value generated by experiential tourism in the Salinas y Aguada Blanca National Reserve, to analyze its contribution to the sustainability of a protected natural area. The results show that experiential tourism generates economic benefits, such as the creation of local employment and the development of rural accommodation, along with social, cultural and environmental impacts that reinforce the conservation of the territory. Community participation, local training and the improvement of basic services emerge as key factors for tourism management that is compatible with the protection of ecosystems. In this sense, the measurement of non-market social value is consolidated as a useful tool to support planning and decision-making aimed at the conservation and sustainable development of local communities.

The monetization of impacts allows specific indicators of non-market social value to be established and provides a technical basis for assessing the real contribution of tourism activity. The analysis of positive and negative externalities shows that tourism produces effects that are not reflected in direct economic income but have a significant impact on the territory and local communities.

The results show that the management of experiential tourism requires an adaptive approach. The social and environmental dynamics of the study area are constantly changing, which influences the functioning of the tourism corridor. The effectiveness of experiential tourism as a conservation strategy depends on coordinated governance structures, sustained institutional support and long-term planning aligned with ecosystem protection goals.

Analysis of the community context shows that local organizations play a significant role in the sustainability of experiential tourism. Institutional coordination, tourist guidance, environmental education, basic infrastructure, and monitoring mechanisms directly influence the visitor experience and the community benefits derived from tourism.

Despite the relevance of the results obtained, the study has some limitations. Its qualitative nature and focus on a single protected natural area restrict the generalization of the findings to other contexts. Future research could incorporate comparative studies and mixed methodological approaches to further refine the estimation of non-market social value in tourism corridors.

Finally, the application of social value measurement methodologies demonstrates their ability to capture social, cultural, and environmental impacts that have no direct monetary expression. The incorporation of non-market social value broadens the understanding of experiential tourism and allows for the evaluation of its contribution to the sustainable development of the territory beyond traditional economic approaches. These findings provide practical evidence to support policy design and sustainable tourism planning in protected natural areas.

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