

STRENGTHENING THE POST-FLOOD CREATIVE ECONOMY THROUGH AN ASTRONOMY VILLAGE BASED ON ASTROTURISM AND QIBLA DIRECTION EDUCATION IN SEKOCI VILLAGE, LANGKAT REGENCY

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Abstract: Recurrent flooding in Sekoci Village, Langkat Regency, not only causes physical damage but also weakens the community's economic capacity. This study aims to strengthen the post-flood creative economy through the development of an Astronomy Village based on astrotourism and Qibla direction education as an integrated community empowerment model. The method used is qualitative research with a participatory approach through field observations, in-depth interviews with community leaders and business actors, FGDs, and mentoring in astrotourism training, the creation of astronomy-themed creative products, and Qibla direction education based on celestial body observations. The results show that the Astronomy Village program is able to: (1) increase the capacity of community knowledge about astronomy and determining the Qibla direction; (2) give rise to new creative business units (souvenirs, culinary, tour guide services); and (3) strengthen partnership networks with schools, astronomy communities, and religious institutions. The implementation of astrotourism contributes to the diversification of household income sources, increases tourist visits, and strengthens the village's identity as an educational-religious destination. These findings indicate that the integration of astronomy, tourism, and religious education can be an effective strategy for strengthening the creative economy in disaster-prone areas. The Lifeboat Astronomy Village model has the potential to be replicated in other post-disaster village contexts by adapting to local socio-cultural characteristics.

Keywords: Creative Economy, Post-Flood, Astronomy Village, Astrotourism, Education On The Direction Of The Qibla, Community Empowerment

Introduction

Floods are a hydrometeorological disaster with increasing frequency in various regions of Indonesia and directly impact infrastructure damage, disrupt economic activity, and reduce the quality of life for rural communities. In the context of agrarian villages, floods not only damage land and settlements but also disrupt production and distribution chains, resulting in prolonged economic vulnerability if not accompanied by a targeted and sustainable recovery strategy. Various studies and community service practices indicate that post-disaster recovery that relies solely on material assistance is short-term and insufficient to build economic independence for residents. Recovery that focuses on empowerment and strengthening local capacity through the creative economy, community entrepreneurship, and innovation based on village potential is considered more promising in the long term. (Nurlaelia, Thantawi and Anwar, 2021; Saefullah, Thantawi and Putra, 2021; Setiaji, 2023; Abdussamad and Abdussamad, 2024; Makarim and Dewi, 2025)

Nationally, the creative economy has been recognized as one of the important pillars of new, inclusive economic development, with significant contributions to GDP and employment, especially through the culinary, crafts, and fashion sub-sectors. (Nurlaelia, Thantawi and Anwar, 2021; Makarim and Dewi, 2025). At the village level, the creative economy approach has proven capable of converting skills, local culture, and natural resources into value-added products, expanding micro-business opportunities, and strengthening local identity. (Umalihayati *et al.*, 2025). Community empowerment through product development, packaging, and marketing training, including digital marketing, has been proven to increase residents' understanding of creative business opportunities and encourage the formation of community-based business groups. (Listyorini, Dewi and Satato, 2023). In several villages, structured mentoring activities have resulted in improved production skills, business management, and digital literacy, which ultimately strengthens the economic independence of households and vulnerable groups such as housewives. (Makarim and Dewi, 2025).

In the rural development landscape, tourism development—particularly tourism villages—is often linked to the creative economy because the two are mutually reinforcing. Research in Temanggung shows that when natural and cultural tourism potential is synergized with local creative economy clusters, tourism development can make the creative economy sector a primary axis for improving community welfare. (Cemporaningsih, Raharjana and Damanik, 2020). However, in many regions, the management of tourism and creative economy potential has not been optimally synergized, hampered by low human resource competency, weak institutions, and the absence of a clear development strategy. (Butar-Butar *et al.*, 2022; Kusumawardhani *et al.*, 2023). To address this, various community service programs in tourist villages emphasize the importance of establishing a creative economic ecosystem through strengthening the capacity of MSME actors, establishing creative village institutions, strengthening legal and promotional aspects, and diversifying educational tourism products based on the creative economy. (Arfan *et al.*, 2020).

One emerging innovation is creative economy-based educational tourism, which integrates learning activities with the production and sale of local creative products. In Sukajadi Village, for example, an ecobrick-based educational tourism simulation is used as an effort to diversify tourism products, enabling the village to generate revenue not only from product sales but also from educational tourism activities that provide learning experiences for visitors (Kusumawardhani *et al.*, 2023). A similar approach is also seen in the development of geotourism with educational and local wisdom content, where local natural and cultural resources are used as a medium to increase community income through professional destination management, human resource training, and diversification of processed products (Arfan *et al.*, 2020). These patterns demonstrate that the integration of tourism, education, and the creative economy can create double added value: increasing knowledge and strengthening the local economy simultaneously.

In the context of Langkat Regency, the potential for strengthening the village creative economy has also received attention, for example through empowering digital literacy as a means of strengthening the creative economy in Kuta Parit Village. Seminars and mentoring activities in the village demonstrated that increased digital literacy impacted the community's ability to utilize social media as a means of promoting creative products, a previously underutilized tool. This confirms that, in addition to product and packaging innovation, mastery of information technology and digital marketing are key components in the contemporary village creative economy ecosystem (Makarim and Dewi, 2025).

However, the majority of initiatives to strengthen the village creative economy still focus on subsectors such as culinary arts, crafts, and processed agricultural products, leveraging the potential of local natural resources and culture. There are very few studies specifically linking post-flood economic recovery to the development of niche tourism models such as astrotourism, especially those integrated with religious educational content such as Qibla direction education. Yet, astrotourism has the potential to be developed in villages relatively far from light pollution, with relatively low physical investment but high educational value, and can be synergized with the community's religious identity through teaching Islamic astronomy, Qibla direction determination, and the Hijri calendar.

Sekoci Village in Langkat Regency is one of the villages affected by the floods and boasts a socio-cultural and religious base as well as potential for creative economic development, which can be directed towards the educational tourism sector. Post-flood recovery strategies are needed that not only restore the original conditions but also enhance the community's adaptive capacity through livelihood diversification, strengthening creative businesses, and creating unique new tourist attractions. The Astronomy Village concept, based on astrotourism and Qibla orientation education in Sekoci Village, offers an integrative model that combines post-flood economic recovery, the development of an educational tourism village, and the strengthening of a creative economy based on local wisdom and religious values.

Observing the development of research and empowerment practices, a gap in knowledge is evident regarding how the astronomy village concept can be operationalized as an instrument for strengthening the creative economy post-flood in rural areas, particularly in areas like Langkat Regency, which boasts a combination of religious, socio-cultural, and night sky resources. To date, studies on the creative economy in villages have focused largely on the processing of local products, culinary delights, crafts, or natural and cultural tourism villages (Arfan et al., 2020; Cemporaningsih, Raharjana, and Damanik, 2020; Kusumawardhani et al., 2023; Abdussamad and Abdussamad, 2024), but have not yet addressed the systematic integration of astrotourism, Qibla education, and post-flood economic recovery strategies.

Based on this gap, research on "Strengthening the Post-Flood Creative Economy through Astrotourism-Based Astronomy Villages and Qibla Education in Sekoci Village, Langkat Regency" is crucial. This research is expected to: (1) map the potential and conditions of the post-flood creative economy in Sekoci Village; (2) formulate a conceptual model for the Astronomy Village that integrates astrotourism, Qibla education, and local creative economy products; and (3) analyzing the implementation and community empowerment strategies so that Astronomy Village can function as a driving force for strengthening a sustainable and adaptive creative economy to future disaster risks. Thus, this research contributes to the enrichment of the literature on rural creative economy, the development of educational tourism villages, and the design of a post-flood economic recovery model rooted in the potential of the night sky and religious-cultural identity.

Method

The following methods were developed to align with the context of strengthening the village creative economy and developing educational tourism destinations, as widely used in studies of the creative economy in tourist villages and creative villages (Cemporaningsih, Raharjana, and Damanik, 2020). The research employed a qualitative approach with a case study design in Sekoci Village, Langkat Regency. This approach was chosen to gain an in-depth understanding of the process of strengthening the creative economy post-flood through the initiation of an

Astronomy Village based on astrotourism and Qibla orientation education, involving key local actors and local socio-cultural dynamics (Wawuru and Aryaningtyas, 2024).

Specifically, this research is descriptive and exploratory, focusing on:

1. mapping the conditions and potential of the creative economy post-flood,
2. analyzing the design and implementation of the Astronomy Village,
3. formulating a strategy for strengthening the creative economy based on astrotourism and education on the direction of the Qibla.

Results and Discussion

1. General Overview of Post-Flood Conditions and the Creative Economy of Sekoci Village

Observations and interviews indicate that the flooding in Sekoci Village not only damaged homes and basic infrastructure but also disrupted residents' economic activities, particularly small businesses based on natural resources and services. This pattern aligns with many villages that rely on local resources and are vulnerable to shocks, necessitating an empowerment and creative economy approach for economic recovery and strengthening (Fussalam et al., 2020; Jusriadi et al., 2023; Abdussamad and Abdussamad, 2024).

Before the flood, most residents relied on: garden produce (coconuts, bananas, and other agricultural products), capture fisheries and household-scale aquaculture, and daily labor in the informal sector. The flood caused: damage to production equipment, reduced purchasing power of tourists/visitors, and decreased motivation to do business due to the feeling of "returning to zero."

Similar to the case of palm sap, which is still sold as raw material and not yet processed into value-added products, much of the local potential in Sekoci Village remains unoptimized and is still sold as raw material, resulting in relatively low economic value for residents (Abdussamad and Abdussamad, 2024).

On the other hand, Sekoci Village boasts: a relatively dark and clear night sky, an attractive geographic location for celestial observation, and strong religious traditions, making the issue of Qibla direction important and readily accepted as educational content.

This combination of astronomical and religious potential is the basis for the idea of an Astronomy Village based on astrotourism and Qibla direction education as a strategy to strengthen the creative economy post-flood.

2. Results of Mapping Community Potential and Needs Identified Creative Economic Potential

Through observations, interviews, and focus group discussions (FGDs), several creative economic potentials linked to the Astronomy Village were identified, including:

1. Local culinary products for tourists: Processed garden produce and local natural resources (bananas, coconuts, fish, etc.) as snacks/souvenirs. This approach is similar to processing palm sap into palm sugar or processing bananas into chips as strategies to increase the selling value of agricultural products.
2. Astronomy-themed crafts and merchandise. T-shirts, key chains, mugs, or wooden crafts with motifs of the moon, stars, Qibla compasses, and mosque silhouettes. This concept aligns with the development of creative products as part of cultural tourism packages, which have been proven to open new economic opportunities.
3. Astrotourism guide services and Qibla direction education. Involvement of village youth as guides for night sky explorations, introducing constellations, and practicing Qibla

direction determination using traditional methods and simple technology. This youth empowerment model as a driving force for the creative economy has also proven effective in other village contexts.

4. Integrated tourism packages: Combination: night sky exploration + Qibla direction education + traditional culinary + staying in a local homestay. As in the development of tourist villages and cultural tourism, packaging attractions, education, and creative products into one package increases income opportunities for many households at once.

Community's Primary Needs

From the FGD with MSMEs, youth, and religious leaders, several key needs were identified: Improved business skills (life skills): product processing, packaging, pricing, and marketing, as also needed in villages processing palm sap and bananas. Knowledge of basic astronomy and the direction of the Qibla: so that residents, especially youth, are confident in becoming tour guides and educational facilitators. Business and institutional management assistance: formation/strengthening of business groups, fair profit-sharing systems, and simple financial management. Access to digital promotion: use of social media and community networks to attract visitors, based on the experience of strengthening the economy of other villages through online promotion.

3. Implementation of the Astronomy Village and the Role of Astrotourism

Establishment of a Management Structure

The results of the fieldwork indicate that the Astronomy Village initiative requires a clear management structure. Through village deliberations and focus group discussions (FGDs), the following were formed: a core team (village officials, representatives of religious leaders, youth representatives, and MSMEs); working groups (pokja) to handle: astrotourism attractions (youth); Qibla direction education (religious leaders/teachers); culinary and craft products (MSMEs and housewives); and promotion and documentation (digitally literate youth). This structure aligns with village creative economic empowerment practices that emphasize partnerships between the village government, the community, and local businesses.

Astrotourism Activity Design and Implementation

Observations revealed several forms of astrotourism activities that were agreed upon and tested:

Sky Observation Night: simple observation of the moon, bright stars, and constellations. The use of simple equipment (binoculars, small telescopes) is accompanied by basic explanations of popular astronomy by local guides.

Qibla Direction Educational Tour: Explanation of the Qibla direction concept, practical exercises in determining the Qibla using a compass, sun shadows, and digital applications, integration with religious values and the history of Qibla determination.

Mini Creative Product Workshop: Visitors are invited to participate in making simple astronomy-themed souvenirs or trying local culinary creations, similar to the tourist engagement pattern in creative product workshops in tourist villages.

Initial trials demonstrated high enthusiasm from village youth and children. Residents felt a renewed sense of pride in their village, no longer seen merely as a "flood-prone area," but also as a "unique village with beautiful skies and Qibla education."

4. Impact on Strengthening the Creative Economy Capacity and Life Skills Improvement

In line with findings from the palm sap and banana processing programs, education, training, and mentoring in Sekoci Village improved residents' knowledge and skills in several areas: Residents began to understand the importance of processing local produce into value-added products, rather than simply selling raw materials. Youth gained new skills as tour guides and promotional content managers. Housewives who were previously solely involved in domestic work are now involved in culinary and craft production for tourists, similar to the strengthening of micro-enterprises for housewives in other villages.

Qualitatively, residents reported: Increased insight into creativity-based business opportunities, Increased confidence in speaking in front of outsiders (tourists and guests), and a change in mindset that their village has unique selling points. These findings are consistent with evidence that planned training and mentoring can improve community life skills and creative entrepreneurial behavior.

Diversifying Income Sources

Although the initial scale of tourist visits is not yet large, diversification of income sources is already evident: Some families sell local snacks during observation nights, young people receive fees as guides, and simple craft products are being marketed to visitors and through online channels.

In another study, developing a village creative economy through processing agricultural products and crafts has been shown to expand market share and increase residents' profits after they are able to manage products, brands, packaging, and marketing. This trend is also beginning to emerge in Sekoci Village, although it is still in its early stages.

Strengthening Networks and Institutional Support

The Astronomy Village initiative encourages intensified collaboration between the village, local communities, and universities/external partners. The village government provides support in the form of use of public facilities for activities and possible budgeting in the Village Medium-Term Development Plan (RPJMDes). Universities/research partners act as facilitators, similar to the thematic KKN (Community Service Program) model for the creative economy in other villages, which has been shown to strengthen community capacity and independence. This network is crucial for the program's sustainability, as is the revitalization of traditional arts and the empowerment of other creative economies, which rely heavily on multi-stakeholder collaboration and policy support.

5. Socio-Cultural and Religious Dimensions: Qibla Direction Education as a Unique Attraction

One key finding is the acceptance of Qibla direction education as a highly effective entry point for developing the Astronomy Village. The religious community responded positively to the Qibla direction determination and Islamic astronomy knowledge enrichment program. Religious leaders felt that this program simultaneously strengthened religious understanding and was not merely a tourism initiative.

This approach is similar to the revitalization of traditional arts, which combines spiritual, social, educational, and economic values, and is therefore accepted as part of preserving identity and developing the creative economy.

By making Qibla direction one of the main components of astrotourism, Sekoci Village has a differentiated position compared to other tourist villages that only offer natural landscapes or general cultural aspects. Muslim visitors are attracted by the added religious value and practical knowledge that can be applied in their mosques or homes.

6. Challenges and Limitations

Although initial results show promising results, several challenges have been identified:

1. Limited facilities and infrastructure. Sky observation tools are still rudimentary and limited in number. Road access and basic tourist facilities (toilets, standard homestays) need improvement.
2. Dependence on weather and seasons. Astrotourism is highly dependent on clear skies; during the rainy or cloudy season, the program must be replaced with indoor content.
3. Continuity of mentoring and institutional support. The program risks weakening if it is not included in village planning documents or if there is no management regeneration. Experience in various villages shows that the sustainability of the creative economy requires consistent mentoring and strengthening of local institutions.
4. Digital marketing skills are still in their infancy. Young people are beginning to learn how to promote via social media, but their content creation and account management skills still need to be improved, as is a challenge in other villages that are just beginning to learn digital marketing.

7. Implications and Conceptual Discussion

Post-Flood Creative Economy as a Recovery Strategy

The findings in Sekoci Village reinforce the idea that the creative economy is a relevant strategy for post-disaster recovery, not just for "normal" areas. This approach leverages ideas, creativity, and networks, not just physical capital, making it relatively adaptive to infrastructure damage. By transforming the potential of the night sky (Raisal et al., 2021) and local religiosity into tourism products and educational services, Sekoci Village has moved from being a "flood victim" to becoming an "innovative village with a new identity."

This aligns with the experience of other villages that have successfully leveraged local potential (agricultural products, traditional arts) to become the basis for a creative economy through education, training, and mentoring.

Synergy of Astrotourism, Education, and Empowerment

The Astronomy Village in Sekoci Village demonstrates a three-dimensional synergy: Astrotourism → attracts visitors and opens opportunities for guide services, culinary arts, and crafts. Education on the direction of the Qibla and Islamic astronomy → improves religious and scientific literacy among residents, while also creating a unique attraction. Empowering the creative economy → engages residents so they are not merely "spectators" but key actors who derive economic benefits.

This synergy is also evident in the traditional arts revitalization program, which combines cultural preservation with the development of tourist products and attractions, resulting in both economic and social impacts.

The Role of Youth and Housewives

The experience in Sekoci Village underscores the importance of youth and housewives as central actors in the creative economy: Youth: driving activities, tour guides, and social media

managers, in line with evidence that youth empowerment can increase village participation and innovation. Housewives: key actors in micro-enterprises (culinary and crafts), as in the agricultural product processing program that has successfully increased family income and economic independence.

The involvement of these two groups ensures that the program is not merely oriented towards a fleeting "tourism event," but is rooted in daily economic activities.

Conclusion

The results of this study indicate that the development of an Astronomy Village based on astrotourism and Qibla direction education in Sekoci Village: Strengthens the village's new identity, transforming it from a flood-prone area into an educational, religious, and astronomical destination; Serves as a platform for empowering residents, especially youth and housewives, to develop creative businesses; Triggers diversification of income sources through culinary delights, crafts, guide services, and tour packages; and Strengthens networks and institutional support between the village, local community, and external partners.

Conceptually, the case of Sekoci Village adds evidence that the creative economy can be an effective instrument for post-flood recovery when linked to unique local potential (in this case, the night sky and Qibla direction education) and integrated with a participatory empowerment approach as recommended by various studies on empowerment and the village creative economy.

The Astronomy Village program based on astrotourism and Qibla direction education in Sekoci Village is an effective strategy for strengthening the community's creative economy after the flood. Integrating the potential of the night sky with religious education can create a unique tourist attraction, opening new business opportunities in the culinary, craft, and tour guide sectors, while simultaneously increasing local incomes. Empowerment through training and mentoring encourages increased community capacity, particularly among youth and housewives, in managing creative businesses and tourism activities, and strengthens networks between the village, government, and external partners. In addition to its economic impact, this program also contributes to increased scientific and religious literacy, self-confidence, and pride in local identity. Therefore, the Astronomy Village model in Sekoci Village deserves to be recommended as an alternative model for developing the creative economy and educational tourism in other disaster-prone areas, provided it is supported by institutional strengthening, sustainable promotion, and improvements to supporting infrastructure.

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