

**Research Article**

**Application of Sustainable Architectural Design Principles to Enhance Eco-tourism in Cross River State, Nigeria**

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Article Info	Abstract
Article History	Architecture transcends all aspects of human endeavours, including its relationship with place, culture, recreation, and nature/historical sites of a people, which contributes to its tourism potential. However, sustainable eco-tourism enhances natural ecological attraction, conservation, and development through sustainable architectural planning frameworks. This paper aimed to explore and enhance the eco-tourism potential of Agbokim and Kwa Falls in Cross River State Nigeria as case studies by providing attractive infrastructure and landscaping associated with architecture. The study methodology used was a qualitative case study using interviews, observations through visitation, and a literature review. The analysis was carried out using inferential statistics in a table for presentations. The study revealed that both Kwa Falls and Agbakim waterfall sites in Cross River State, Nigeria, were not fused with architecture for development as attractive tourism and historic sites that can boost the tourism potential of any place. The study emphasized the need to develop and maintain these historic and nature-given sites using sustainable architectural design practices to enhance their eco-tourism values/potentials that will attract millions of tourists and be recognized by the World Tourism Organization (WTO) and UNESCO as tourist sites, respectively.
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**1. Introduction**

Architecture and tourism are related in several ways, not just because they bring people together in an environment but due to their uniqueness and versatility as both transcend all human endeavours. This is why other professions view these subjects from their different perspectives. Thus, this study looks at tourism from the architectural perspective regarding its relationships in enhancing the eco-tourism potentials of any place or people. Architecture relates to a place's people, spaces, nature, and culture to bring about comfort and relaxation and enhance the socio-economic status of individuals and communities through sustainable architectural principles and practices.

On the other hand, tourism refers to traveling for leisure, business, pleasure, and enjoyment to places of interest, which brings about revenue to the government irrespective of the negative effect on the environment [1]. Eco-tourism, sustainable tourism, is "traveling to relatively natural or undisturbed areas with

the specific objectives of studying, admiring, and enjoying the natural scenery including sites and any existing cultural manifestations in such areas [2]. Although many countries depend on tourism on a large scale for foreign exchange earnings, it is becoming unattractive as the environment is being threatened daily. The solution to this challenge is the introduction of eco-tourism to replace mass tourism. Thus, eco-tourism, being the major approach towards the protection of the ecosystem and the natural environment for the benefit of all humans, animals, and plants, is now globally recognized as nature-based tourism which takes into consideration the nature-given attractions, their conservations/preservations as well their development [3].

From its origin, architecture is part of everyone's daily life since humans interact and live in buildings and transit between open and enclosed spaces as a product of architecture. In the relationship between architecture and tourism, it is an undisputed fact that humans are attracted to architectural products such as buildings and planned landscapes. Hence, it is a dominant marketing tool in tourism management because it appeals to human emotions. The cultural value of any place and its natural landmarks and landscapes are usually augmented by architecture; hence, architecture is similarly a place, event, and symbol and helps to brand the image and identity of a place and its people [4].

Although there are several waterfalls worldwide, this study focuses on Agbokim and Kwa falls, located in Cross River State, Nigeria, which are considered wonders of nature. Though these two waterfalls have received few visitors as tourists to these sites over the years, the absence of architectural concepts and creations such as accommodation, landscape planning, and other basic infrastructure has weakened these sites' awareness and eco-tourism potential. Undoubtedly, there has not been a proper utilization of the Agbokim Waterfall and Kwa Falls in terms of their eco-tourism potential since their existence, as shown by studies and observations. Thus, this study aimed to provide sustainable architectural frameworks and principles required for the planning and development facilities, especially accommodations in lodges for tourists, roads, and landscaping, constituting sustainable eco-tourism concepts globally. This will ultimately increase tourists' interest and promote and strengthen eco-tourism potentials of these areas for the benefit of the host communities and the State in general.

## **2. Literature Review**

The literature review focuses on architecture and relationships with tourism, recreation, nature, and eco-tourism to establish the fundamental components of architectural tourism and the economic viability of the affected communities and people. However, for a clearer understanding, it is important to define key concepts that constitute this study's core themes to establish the relationship between architecture, culture, natural environment, and eco-tourism.

## 2.1 Tourism and Ecotourism

The discussion on eco-tourism cannot be completely isolated from the parent word tourism because eco-tourism is a subset of tourism. Tourism, in general, is described as the totality of the events and relationships that emanate from the traveling experience of and stay of non-residents (tourists) to places of attraction for a short period not exceeding a year for leisure and other purpose not related to remuneration from within the places visited [5, 6]. It is also seen as a business activity connected to providing accommodation services and entertainment for tourists visiting a place for pleasure and relaxation [7].

Eco-tourism is described as nature-based tourism that deals specifically with natural ecological attractions, conservation, and development. Hence, authors have defined eco-tourism in several ways based on the location in which eco-tourism occurs as a determining factor. Thus, some definitions are provided here for a better and clearer understanding of the term. Accordingly, Fennell [8] defines eco-tourism as a 'sustainable form of natural-based tourism whose primary focus is on experiencing and learning about nature which is ethically managed to be low-impact (that is, contributing to the conservation and preservation of such areas), non-consumptive and locally oriented'. In his view, Weaver [9] describes 'eco-tourism as a segment of alternative tourism (AT) which is commonly defined in its ideal configuration, as a locally controlled sector adhering to vernacular architectural norms and attracting more community-minded categories of people or clients'. Similarly, eco-tourism has also been defined as purposeful time spent in an environment in a sustainable manner that endeavour to study other cultures, assist the host community economically, and work towards the conservation of the ecosystems [10].

Similarly, the International Eco-tourism Society views eco-tourism as responsible travel to natural destinations, protecting the environmental resources and developing the indigenous people's well-being [11]. In their submissions, Blangy and Mehta [12] viewed eco-tourism as a sustainable activity that directly attempts to protect and develop both environmental potential and socio-cultural structure in the host areas. The components of the various definitions and meanings of eco-tourism given by several authors make eco-tourism more attractive, thereby drawing increasing attention globally as it is now seen as a better alternative to mass tourism with the potential to bring about the development of the ecosystem with minimal negative influence as well as conserve the environment and attract tourists [3].

From the above definitions, the core issue is that eco-tourism must be sustainable and should not negatively impact the ecosystem. However, it has been argued that 'insistence on sustainability' rather than 'emphasis on sustainability' is an impossibility and unrealistic as it is impossible to develop a natural ecosystem for tourist attractions and visits without some significant negative impact on the area [9]. However, according to Mahravan and Vale [13] and Fiskén [1], it should be noted that conservation and protection of the natural environment through sustainable management practice is one of the most important aspects of

eco-tourism. It is the author's view that concerted efforts through long-term commitment should be employed by the developers and community alike to conserve the natural ecosystem of the study areas.

However, certain principles enhance eco-tourism. According to the International Eco-tourism Society, eco-tourism principles include: 1. allow visitors to experience nature directly (Natural Area Focus); 2. Provide opportunities to experience nature in ways that lead to greater understanding, appreciation, and enjoyment, 3. Embrace Environmental Sustainability Practice); 4. Minimize impact; 5. Contribute directly to the conservation of natural areas; 6. Provide ongoing contributions to the local community; 7. Provide financial benefits and empowerment for local people; 8. Be sensitive to, interpret, respect, and involve the culture/s existing in the area; 9. Consistently meets consumer expectations [14].

## 2.2 Relationship between Architecture and Tourism

Architecture and tourism have always been related because one cannot discuss architecture without referencing people and their cultures who constitute the clients. The culture of a people, which describes their way of life, is a vital component of architectural design and cultural tourism. Cultural tourism involves visits to historical sites and monuments, architectural sites, and places of historical and religious importance to satisfy cultural and intellectual curiosity [15]. Throughout history, architectural works have been an attractive factor in tourism as famous architectural wonders of ancient, medieval times, or recent times were tourists' motives [16].

Architecture is seen as the face of a destination, which expresses the society's history, artistic styles, and preferences and gives tourists an impression of a place. Thus, architecture, through its designed and constructed edifices, has always worked mutually with tourism to break the unfamiliarity of any culture by providing the original spirit of the place, its evolution, and culture through a sequential method, thereby 'exposing' the place for attractions. This assertion was supported by Scerri, Edwards, and Foley [17] when he noted that historical buildings are significant attractors while contemporary architecture could extend the cultural offers. This is because it is impossible to separate tourists' motives for visiting architectural monuments from motives for visiting other cultural attractions. This relationship gave rise to the term 'Archi-tourism', a relatively new concept that describes 'architecture as a destination for tourism'.

Architecture has been known to play two major roles in tourism: as infrastructure and as attraction and complementary to tourism [18]. Thus, architecture complements works of nature, such as beautiful landscape, and plays a supporting role in the enhancement of the physical assets of destinations and creating the opportunity for tourists to travel to such places to identify and associate with these architectural landmarks and for leisure, relaxation, education, sightseeing and to appreciate monuments, buildings, and places of historical importance [19, 20].

This study evaluated a few studies related to the current study through extensive review. Subsequently, Eko, Ifere, and Udonwa [21], in their study titled 'Diversifying the Cross River State Economy

through Tourism: Opportunities and Challenges', the study discussed the need for Cross River State, Nigeria, to invest in tourism development owing to the enormous tourism potential of the State. The authors listed potential tourism sites located across the State, including Kwa Falls, Agbokim Waterfalls, Drill Rehabilitation and Breeding Centre Boki, and Cross River National Park, to mention but a few. The research methodology employed was descriptive research, and the findings showed that although the state government has revamped the tourism industry in the past few years, many challenges still hinder the State's tourism drive. Among other challenges related to the current study is the lack of development of tourism sites, evidenced by the non-provision of state-of-the-art facilities such as good roads and hotels/lodges for accommodation. The study recommended the need for wider publicity, planning, and development of various tourism sites with adequate facilities to boost tourist attractions.

Similarly, the study by Eneyo et al. [22] on 'Tourism Viability Status of Kwa Falls Eco-tourism Site of Aningeje Rural Community, Cross River State, Nigeria', assessed the tourism viability status of Kwa Fall eco-tourism site in Cross River State with the objectives of evaluating tourists' perception of the site and the level of patronage across different years from 2011 to 2020. The methodology used was a qualitative participatory approach using stratified random sampling to select respondents, while data was collected through field observation, questionnaires, and respondent interviews using a simple random sample technique. Their study revealed that the site is still unique, viable, and attractive, with low tourists' visitation during the years, but lacks necessary support services and facilities. The study concluded that the viability of Kwa Falls can only be enhanced through adequate funding and development of the sites to attract tourists globally. The methodology, findings of the study, and the eco-tourism sites of the study area are useful and are adopted for use in this study.

The study carried out by Kolo, Abdullahi, and Lembi [23] on 'Role of Architecture in Promoting Tourism for Economic Development in Nigeria' explored the role of architecture in promoting tourism that furthers economic development through the built environment in Nigeria. The study methodology was based on a qualitative research method. Data was largely collected through questionnaires and semi-structured interviews, including reviewing relevant literature to elucidate useful information on the subject matter. Their findings showed the indelible mark of architecture on tourism growth and development. However, the availability of tourism infrastructure and the attractiveness of these attractions remain inadequate and below average. The study, therefore, concluded that, given the needed considerations, modern tourism is closely linked to architectural development, which could turn tourism in Nigeria into a key driver of socio-economic development and growth. This study, with the research methods used here, is closely related and adapted to this study.

In addition, the study was carried out by Jakupi, Veseli, and Grajčevci [24]. On 'Eco-tourism Value Defined through the Eco-Lodges Design - A Case Study of Kosovo' is worth appraising. The study identified the tourism potential across Kosovo to create a viable offer of accommodation based on eco-tourism. The study aimed to increase tourists' interest and awareness and strengthen eco-tourism development. The study was based on theoretical and empirical research methods. Analysis and findings revealed that Kosovo has the potential for rich natural surroundings, which should be considered as positioning eco-tourism principles for development. The study concludes that well-planned, sustainable approaches to the eco-lodge design will expose the great potential that nature and the local community can bring into the overall strategic planning. It recommends an intervention that will adapt to the natural preservation of the environment and sustainable development, creating higher awareness among visitors and the local community. The principles of planning and designing eco-tourism lodges through sustainable developments advocated in the study are highly valuable and, therefore, adopted in this study.

### 3. Methodology

The study methodology will include qualitative case study research methods involving an extensive literature review. Data were collected using interviews, questionnaires, and observation. In addition, the study adopted the research findings and data of recently concluded research on the study areas (though from other perspectives), which were the bases for evaluating the areas from the viewpoint of architecture, which forms both the primary and secondary data sources, respectively. One hundred twenty questionnaires were distributed to respondents to express their opinions on the subject matter, out of which 98 were retrieved, representing an 81.7% response rate. Also, 20 professional architects, planners, Cross River Tourism Development Board staff, and tourist organizations were selected through a purposive sampling method for the interview. The study focused on two historic sites: Agbokim waterfall in the Etung Local Government Area and Kwa rapids (falls) in the Akamkpa Local Government Areas of Cross River State, respectively. These sites are chosen mainly because of their uniqueness as natural waterfalls and the seeming neglect of the sites by the government over the years, as asserted by Eko, Ifere, and Udonwa [21]. The analysis was carried out using inferential statistics in tables and charts for presentations.

### 4. Materials and Methods

#### 4.1 The Study Areas

Cross River State is one of the states in the south geopolitical Zone of Nigeria. The State is endowed with tourism potential across the various local government areas. The State prides itself as the most famous State in tourism drive in Nigeria and has been nicknamed 'Destination Cross River'. The government, over the last two decades, has shown serious commitment towards tourism development through unprecedented

investment in the sector, resulting in the establishment of the Cross River State Tourism Bureau and the Carnival Commission, as well as the identification and upgrading of some tourist sites to international standards namely the Obudu Ranch in Obudu, the Marina Resort in Calabar, the Cable Car at Obudu Ranch Resort; the Bebi Airstrip in Obanliku, Tinapa Business/Holiday Resort in Calabar and the popular Calabar Christmas Carnival [21].

However, despite all the government's efforts, the non-development of eco-tourism sites such as the Agbokim Waterfalls and Kwa Falls in the State to experience the wonder of nature is worrisome and has limited the influx of tourists globally into the State. This view is supported by Onor [25], who opined that the world's interest in nature and the environment is increasing; hence, Cross River State must find its relevance and fulfillment in eco-tourism. He stressed that Cross River State must venture deeply into the eco-tourism potential embedded in her history and natural ecosystem to attract a ceaseless flow of tourists into the State with its attendant benefits.



**Figure 1.** Agbokim waterfall shows the 7 Streams constituting the falls [26].

#### 4.1.1 Agbokim Waterfalls

Agbokim Waterfalls is located in Etung Local Government Area of Cross River State, about 15km from Ikom and 320km from the State Capital, Calabar, Nigeria. The waterfall lies 62.3m above sea level between  $4^{\circ}71'$  latitude and  $8^{\circ}55'$  longitude. It is surrounded by swampy wetlands and rivers between three to five kilometers southeast of the Cameron border and West of the Ikom and Obudu stations, respectively. Agbokim Waterfalls is one of the wonders of nature, consisting of seven streams bordered by steep hills,

valleys, and vegetation, bordered in a rainbow-like atmosphere. The waterfall exhibits a unique flow of fresh water tumbling down from the high cliff into the attractive scenery of the tropical rainforest. This is why the waterfall is described as a 'Seven-faced Wonder'.

The architectural landscape of this waterfall is associated with a glowing beauty and serene environment, in addition to getting lost in the euphoria of nature's awesomeness. It is an ideal location for that creative natural environment surrounded by the ever-greenish great spot for a picnic with family, friends, tourists, and other recreational activities [26].

#### 4.1.2 Kwa Falls

On the other hand, Kwa Falls is in Anegeje village, Akamkpa, one of the most visited natural sites in Cross River State and one of the most popular Waterfalls in Nigeria. The source of the falls is traced to a narrow, steep gorge on the headwaters of the Kwa River. It flows from the Cameroon River into the Atlantic Ocean, forming a deep plunge pool at the bottom of the waterfall.

The plunge of the Kwa Falls descends through a wide vertical gash on a cliff, cutting across the Great Kwa River channel, which flows graciously through Cross River State, Nigeria, draining the east side of the beautiful city of Calabar. Interestingly, there are 234 steps in the Kwa Falls, and the waterfall flows into a canopy of the tropical rainforest and mangrove forest with its fascinating landscape. The sparkling waters of Kwa Falls flow down basement rocks at the Oban Hill side of the Cross River National Park and southwards to the Cross River estuary. The Kwa Falls is a natural wonder for tourists to feel and experience [22].



**Figure 2.** Kwa Falls [22].



## 5. Results, Data Analysis and Discussion

The data for the table below was generated using questionnaires. One hundred twenty questionnaires were distributed to respondents to express their opinions on the general functionality and development of the Agbokin, and Kwa falls in terms of infrastructure provision as the focus of this study. A total of 98 questionnaires retrieved from respondents out of the 120 questionnaires, representing 81.7%, were analyzed from the response rate presented in the table.

**Table 1.** Respondents' Perception on the Development of Agbokin and Kwa Falls Sites. Source: Author's fieldwork, 2023

S/N	Respondents perception	Yes	%	No	%	Total	%
1.	Awareness/Publicity	41	41.8	57	58.2	98	100
2.	Patronage	39	39.8	59	60.2	98	100
3.	Road infrastructure	36	36.7	62	63.3	98	100
4.	Unique environment	89	90.8	9	9.2	98	100
5.	Lodging/hotel Facilities	0	0.0	98	100	98	100
6.	Security of the sites	35	35.7	63	64.3	98	100
7.	Landscaped/recreational facilities	37	37.8	61	62.2	98	100
8.	Attractiveness of sites	58	59.2	40	40.8	98	100
9.	Cottage/Cultural affinity	50	51.0	48	49.0	98	100
10.	Development of sites	31	31.6	67	68.4	98	100

From Table 1 above, 98 persons form the total number of respondents who expressed their views on the variables presented for analysis by the study. Thus, the results indicate that the site's uniqueness is rated highest by respondents with 89, 90.8%, followed by the site's attractiveness with 58, 59.2%. Cottage/cultural affinity is rated next with (50, 51.0%), followed by awareness/publicity (41, 41.8%) and patronage with 39, 39.8%. However, the lowest rated variable by the respondents is Lodging/hotel facilities with (0, 0.0%), followed by the development of the sites (35, 35.7%); security with 35, 35.7%; road infrastructure (36, 36.7%); landscape/recreation facilities (37, 37.8%).

From the analysis above, it is clear that the study areas Agbokim waterfalls and Kwa Falls lack lodging hotel facilities, and the sites are poorly developed. In addition, the sites lack good security and infrastructure in terms of good roads and planned landscape/recreational facilities to enhance the attractiveness and eco-tourism potentials of the nature-given sites. This is the meeting point of nature, ecosystem, and architecture for sustainable eco-tourism development.

From the interview analysis, architectural interest and proper development of the sites were the focus; hence, themes such as providing lodging/accommodation facilities, good landscaping/recreational facilities, and good road/accessibility emerged. Respondents agreed the sites were poorly developed and lacked

accommodation facilities such as well-designed eco-lodges. Similarly, according to the respondents, the sites were devoid of designed landscaped and recreational facilities for leisure, thereby not creating the feeling of relaxation to experience natural wonders at their best. It was also the views of the respondents that access to the sites was inferior, and due to the long distance from the nearest town, visitors to the sites get strained in and out of the sites, which was very discouraging to tourists. However, observation showed the availability of a small cottage/ administrative building serving as a registration point and relaxation area for visitors. In all, based on the analysis above and the views of the respondents, the study has revealed that the two sites under review lack the touch of architecture in the planning of the sites and in the provision of basic infrastructure that will enhance patronage and attract tourists from all walks of life both locally and international for diverse motives.

## **6. Proposal for the Architectural Design and Planning based on Eco-tourism Principles**

The discussion in this study is focused on sustainable architectural design principles necessary for enhancing the eco-tourism potentials of the Agbokim and Kwa waterfalls of Cross River State, respectively.

The sustainable architectural design and planning contributions to eco-tourism are majorly around the provision of accommodation known as eco-lodges and planned landscape/recreational facilities, which now form the focus of discussion hereafter. Eco-lodge is a concept synonymous with accommodation provision in eco-tourism development. This is because traveling tourists need a place to rest as a home to enjoy recreation. Eco-lodges are designed to make the surrounding nature an asset of inestimable value. This is so because it intertwines without damaging nature but in harmony with the landscape, which is one of the principles of sustainable architecture [27, 28].

The development of eco-lodges and landscape planning shall be based on highlighting the concept and principles of eco-tourism and sustainable architecture for the desired benefits from eco-tourism. Thus, the following constitute the basic concepts that would be applied in the proposed planning and development of the natural sites' eco-tourism accommodations and landscape planning.

- i. Design Concept: the concept of the architectural framework chosen for this study is to 'design with nature'. This means the development of the accommodation facility will embrace a system where design blends and flows with the natural ecosystem to give a feeling of a typical natural environment.
- ii. African Cultural Affiliations: the design should basically and largely be and look original African in nature with minor contemporary touches for universal acceptability. In other words, the study proposes that the design suitable for such natural sites should be an vernacular architecture that carries the characteristics of the host community rather than an alien building form in such locations. This will help promote the host community's cultural values and give them a sense of pride, as supported by Kazimee [29].

iii. Site Layout Design: The layout should be planned and designed to accommodate the various buildings to be developed on the study site, the positioning of the buildings, roads and path networks, and other planned outdoor areas. The buildings will include accommodations in the form of lodges of three categories: single room, double, and suite for married spouses on honeymoons, holidays, and families visiting. The design should be flexible and easily convertible to host tourists. Other buildings included are administrative units, restaurants, and bars (with outdoor restaurants /bars) built with local building materials in thatched roofs positioned around the various points to view the wonders of nature with paths/walkways to link the entire landscaped areas adorned with nature given plants, shrubs, and grasses given a feeling of nature-abode.

The design of the lodges will emphasize natural lighting and ventilation to enjoy the benefits of nature, which is now becoming the desired architecture of today in terms of sustainable designs in line with the opinion of Atamewan [30]. In the proposed design, the vernacular architecture of the host community will be on display and evidenced in the use of local building materials, which are easily available and recyclable, as well as in the finishes to reflect the culture of the people.

The site's arrival should signal excitement, wonder, and surprises as one journeys onto another planet. With roughly windy tarred roads, visitors/tourists should have a warm embrace in the administrative building for registration formalities. The planning of the entire site should be in and around the waterfalls to allow tourists to experience this wonder of nature wherever they are within the site and at any given time. The parking lots should be located some distance from the site's hub to allow visitors/tourists to take a walk deep into the site to begin to appreciate nature before getting accommodated. In addition, security posts with personnel would be stationed at the entrance and around the sites to give the tourists a sense of security and safety.

In all, the architectural framework for the planning and development of the eco-tourism potentials of the study areas shall fully embrace the principles of sustainable design concepts, which help to minimize waste, create a healthy environment, encourage the use of renewable sources of energy through energy efficiency, water efficiency, adequate indoor environmental quality and enhance maintenance and operational practices.

## **7. Conclusion**

This study has established the intertwined relationship between architecture and tourism, revealing that only architecture can enhance the drive required to attract tourists to any tourism site. Tourism/eco-tourism cannot thrive without architecture as the later design and planning of the natural landscape gives a sense of value, aesthetic, and cultural appreciation of a place. The study also revealed that the eco-tourism potential of Agbokim waterfalls in Etung and Kwa Falls in Akamkpa communities in Cross River State,

though unique, lacks the required infrastructure to make the area viable and more attractive. The uniqueness of these 'wonders of nature' can be enhanced by architectural touches through space manipulations and provisions in terms of designed eco-lodges, restaurants and bars, outdoor recreations, and planned landscapes using sustainable eco-tourism design principles outlined in this study.

The study has also demonstrated that architecture is a potent marketing tool in promoting the eco-tourism potential of any place and emphasizes that eco-tourism enhances the relationship between architecture, nature, the environment, local community, and tourists. This study contributes to knowledge by projecting the role architecture plays as an attraction force in tourism and outlining the architectural design framework for planning and developing eco-tourism accommodations using sustainable eco-tourism principles.

Therefore, the study recommends that both Agbokim waterfalls and Kwa fall sites should be vigorously planned and designed by professional architects using sustainable architectural concepts from the planning, construction, post-construction, and maintenance phases of the development as outlined in this study for better patronage, which ultimately will make Cross River State the tourism hub of Nigeria with its attendant economic benefits.

**Declaration of Competing Interest:** The authors declare that he has no known competing of interest.

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