

## WORLD'S NATURAL HERITAGE SUNDARBAN ENRICHES COMMUNITY DEVELOPMENT THROUGH SUSTAINABILITY OF ECO-SYSTEM

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### **Abstract:**

Heritage sites are contemplated as a nation's pride, by virtue of their individuality and parameters. Immense tourist approaches favoring heritage sites, elevated heritage tourism and contrived an intrinsic network in the midst of the past with the present. Among innumerable heritage sites, Sundarbans is approved by UNESCO as a unique natural heritage of the world for its largest and most splendid mangrove forest, majestic land of Royal Bengal Tigers along with exotic flora and fauna. The biodiversity of flora and fauna of Sundarbans' Rhizophora mangroves is situated over an area of ten thousand sq. kilometers in the convergence area of major rivers of South Asia such as the Hooghly, the Ganges, Padma, Meghna, and Brahmaputra. Mangrove species community is dominated by trees like Heritiera (Sundari tree) and also includes species of Xylcarpus, Avicennia, Bruguiera, Rhizophora, Sonneratia, Aegicera, Cereops etc. Mangrove species can withstand high salinity of water and tidal waves, but sea-water rise instigating a slow death for endangered mangrove community, disbalancing the eco system of Sundarbans. Conserving this fragile ecosystem is a challenge due to flow of several criss-crossed rivers over this vast delta region. Government imposed strict conservation rules helps to sustain the Eco-system and enhances socio-cultural activities among local community. Again, strict conservation policies negatively affecting on entirely forest dependent local community towards extreme poverty. Positive scenario resonates with conservation of Sundarbans Forest are the formulation and broadening scope of alternative employment for local community. Increasing number of tourists, forest camps in protected areas (PA), boat rowing, mangrove tour, Bon Bibi Drama, selling local foods, Art crafts, hiring local people in creation of eco-resorts constantly empowering and boosting up the economic growth of local community towards socio-cultural advancements. Though the progress is quite slow but steadiness in process will be able to stamp out local community's forest dependency and also augment socio-cultural development.

**Keywords:** Heritage tourism, Socio-cultural, Local community, Sundarban, Ecosystem

### **1. Introduction:**

Heritage demonstrates our past lifestyle patterns and how that lifestyle connects with the present and future generations. Our cultural and natural heritage are irreplaceable sources of life and inspiration [23]. Heritage tourism considers and experiences all the tourist places, Art crafts, and

activities which depict a clear story regarding the culture, and living style of people which significantly connects with the former and coeval. National forests and reserves are also coming under this heritage category, as these derive tourists towards their history. Sundarbans, a world-famous National Forest which got prestige from UNESCO has a unique beauty that attracts tourists from various parts of the world [19]. This delta is fully covered by lush green mangrove species, among which *Heritiera* is mostly seen. Community people termed that species as “Sundari Tree” and thus the entire delta is renowned by its name as “Sundarban” [15,19].

Mangrove shrubs easily survive over 40 meters from the water level, require little amount of oxygen to survive, and tolerate high saline coastal environments. The largest part of this forest comes under the jurisdiction of the Bangladesh Government and the rest part under the Government of India (West Bengal) [15].

### **1.1 Heritage Tourism and Community Development:**

As Sundarbans South, East, and West parts are protected by Bangladesh and these areas possess dense forest which is the safest place for Royal Bengal Tigers. The Sundarbans is one of the 3 largest mangrove timbers in the world and a UNESCO World Heritage Site [23]. This area is the residence of some of the world's impecunious people, with low situations of socioeconomic performance. still, it's one of the most prolific areas within the world for natural coffers and biodiversity [6].

Owing to its geographical location, beautiful nature, climatic conditions, and unique things this place can be known as one of the ideal tourist places all over the world. Bangladesh and India both are developing countries and immense opportunities are present for tourism to develop. In the past few decades' remarkable changes noted in the growth of the tourism sector worldwide and this sector has already established itself as the rapidly rising one.

The great natural, cultural as well as historical resources of this world heritage region of India and Bangladesh attract numerous tourists for archeological places, beaches, picnic spots, monuments, forests, vivid wildlife species, resorts, etc. [19]. Adventure and entertainment activities also play a significant role to attract tourism like –water skiing, angling, river cruising, rowing, sea bathing, hiking, etc. to name a few. These unique spots can easily attract a lot of tourists, resulting boost in heritage tourism for both countries. Community people are very much accustomed to the natural resources and they can guide these tourists in various activities, that lead to their development of lifestyle. New professions of numerous community people will encourage heritage tourism to boom up rapidly.

### **2. Study Area:**



Figure 1: Sundarbans over unified Indo-Bangladesh area(S. Chaudhuri, 2020)

Sundarban is spread over 10,000 km<sup>2</sup>. among which 6000 km<sup>2</sup>is in Bangladesh and the remaining part comes under West Bengal [4,23]. In West Bengal, Sundarban is spread across North 24 Parganas and South 24 Parganas, which includes Kakdwip, Namkhana, Sagar, Patharpratima, 1 & 2 Mathurapuer, Kultali, Basanti, 1&2Jaynagar-,blocks of Gosaba and Hasnabad, Hingalgunj, Haroa, Minakhan block, Sandeshkhali- 1& 2. The boundary of this forest on Bangladesh front is formed by: the South Bay of Bengal- constituted with Sathkhira, Khulna, and North-Bagerhat districts; Hariabhang and West-Raimangal rivers,Barisal district, Perojpur, and East Baleshwar (or Haringhata) river [5]. West Bengal's coastline expands from West to Eastfrom the river islandsof Ganga overshadowing the major part of the coastline (60/0)of West Bengal onward to the Bay of Bengal [5].

### 3. Sustainability of Sundarbans Attractions and Ecosystem:

Sundarban is completely based on natural resources. This UNESCO-awarded site earned global popularity for the following attractions –



*Figure2: Mangrove plants of Sundarban rising in high Saline water(Tuccinardi, 2015)*

### **3.1 Sundarbans Mangrove Woodland:**

Brahmaputra, Meghna, and Ganga these three rivers created alluvium on the Sundarbans surrounding the Bay of Bengal, and its mangrove forests showcase the highest mangrove biodiversity [10]. Diversified and unique floral species are found in Sundarban starting from Malvaceae and Euphorbiaceae. Majorly noticed plant species of the Sundarban region are – Goran, Geowa, Sundari, and Keora. Another important species is Pashur (*Xylocarpus mekongensis*), derived from the Meliaceae family, possesses several significant uses [24]. This forest is the safest place as the one and only Tigerland on the planet. The forest consists more than 300 plant species, some of them are – *Aegiceras corniculatum* (Khalsi), *Sonneratia caseolaris* (Keora), *Avicennia alba* (Kalo Baine), *Lumnitzera racemos* (Kripa), *Finlaysonia obovate* (Kalak Kambing), *Pongamia pinnata* (Karanja), *Bruguiera gymnorrhiza* (Kankra), *Ceriops decandra* (Garan), *Excoecaria agallocha* (Geowa), *Nypa fruticans* (GolPata), *Avicennia marina* (Peara Baine), *Rhizophora apiculata* (Garjan), *Kandelia candel* (Goria), *Avicennia officinalis* (Jat Baine), *Phoenix paludosa* (Hental), *Thespesia popul* (Habli), *Acanthus ilicifolius* (Hargoja), *Hoya parasitica* (Hoya), *Rhizophora mucronate* (Bhara), *Aegialitis rotundifolia* (Tora), *Dendrophthoe falcate* (Baro Manda), *Viscum ori entale* (Manda), *Sonneratia apetala* (Tak Keora), *Bruguiera cylindrical* (Son Champa), etc. which is more than 90% of the Indian mangrove species. Natural and Anthropogenic reasons caused the shrunken of mangrove forests during last 200 years [7]. High coastal waves and tides also affect the fragile ecosystem of this world heritage site.

### **3.2 Sundarbans Pride – Bengal Tigers:**

Sundarban's natural habitat, the single-patched Royal Bengal is noticed in the major parts(60%) of this mangrove region [5].Tiger to be the habitant of Sundarban. More than 260 numbers are present in the "Sundarban Tiger Reserve" and also in the Protected Areas of Bangladesh. Royal Bengal Tiger is the center of attraction for Sundarban Visit and the sustainability of this species entirely depends upon the sustainability of the herbivores along with a dense forest. Other animals like- jungle fowls, spotted deers, wild boars, monkeys, crocodiles, and lizards also attracts tourists while traveling[5]. But due to continuous rise of sea water levels, causes harm to the forest density and becomes a big thrust for the Royal Bengal Tigers [18].

### **3.3 The Aquatic Fauna:**

Not only the Royal Bengal Tiger but this forest also is the natural habitat for many other animals like – Gangetic Dolphins, River Terrapins, different types of turtles, several species of crabs, numerous fishes, lobsters, and prawns. The dependency of community people on the fragile ecosystem such as fishing, and honey harvesting, increases the uncertainty of the sustainable future of these natural resources [5].

### **3.4 Birds Variety:**

Melody and music created by known and unknown species of birds fill up the sky of the Sundarban with varied colours. Rose-ringed Parakeet, Bulbul, Tailor bird, Crow Pheasant, Robin, Pied Myna, Magpie, Drongo, Spotted Dove, Adjutant Stork, Brahmini Kite, and many more species of migratory birds come in Sundarban [5]. Birds are completely based on the trees, which are needs to be sustained at any cost to save the beauty and uniqueness of Sundarban.

### **3.5 Katka:**

Katka comes under Bangladesh's jurisdiction and is considered a Heritage site. A 40 ft. wooden watch tower is the uniqueness of this spot, where tourists enjoy the scenic beauty of Sundarban. Along with that, the wonderful sea beach provides add-on features to tourists and offers a relaxed atmosphere [8].

### **3.5. Hiron Point:**

Another Heritage spot of Sundarban is Hiron Point, where tourists gaze at the walking, running, and other different activities of Deer [8].

Kochikhali, and Mandarbaria are also heritage spots of Sundarban and are at risk due to the fragile ecosystem, community profession, and lifestyle practices [8].

### **3.6 Karamjol:**

Rangers forest station and deer breeding centre are situated here. This spot is heaven for bird watchers and even tourists can gather knowledge about fishermen's lifestyle in detail from their village [8].

Sundarbans full moon night life also creates a majestic beauty and mysterious environment, for forest lovers and adventure likers.

Likewise, in the winter season fire camps in safe areas of forests also provides an unforgettable experience for tourists. These fire camps, different attractions, natural beauty, flora, and fauna create a mesmerizing experience of Sundarban for the tourists as a whole. These attractions are mainly based on the ecosystem of nature. As Sundarbans estuarine ecosystem is fragile and is at



risk, due to the sudden rise of sea water level, a consistent increase in pollution, piles of debris thrown by people into the Sea water, and stacking of this debris in the coastal area - causing serious harm to the natural ecosystem [12]. Different fishes and other estuarine animals like – crocodiles, turtles, terrapins, and dolphins found these chemical substances as their food and as a result, these pollutants sometimes took their lives also [14].

In addition to that, the community people's lifestyle is entirely dependent on this fragile ecosystem. Fishing, Honey collection these two are the most common and easy earning processes for the Sundarbans community people. Consistent dependency of community people on natural resources becoming the biggest threat to the Sundarbans forest and in the broader aspect to the entire ecosystem [16].

Ecosystem and the nature can be saved only through diverting the profession of Sundarbans local community people. Direct involvement of nature in their earning profession needs to be shifted towards some other livelihood where nature is present but not directly involved in it. Additionally, obvious restrictions created by the government must be applied for the marine life near the coastal area to check the pollution caused by people while traveling on a serious note. Not only that, removal of pollutants has to be done, in the estuarine area expeditiously to extricate and limit the chemical debris, already fabricated by travellers, proving harmful to the flora and fauna of Sundarban [9].

#### **4. Transformation of Community Dependability from Ecosystem:**

Sundarban got its name from a specific kind of mangrove species Sundari which is scientifically termed as – *Heritiera fomes*. Except for this species, Sundarban is the homeland for more than 300 plant species which provides shelter for many animals, insects, and birds. Sundarbans forest is renowned for its natural honey production. Forest's true climate, encourages honeybees to naturally reproduce and as an obvious result production of enormous honey barges in. Depending on this honey, most of the local community people choose honey collection as their profession [4]. They collected honey from the dense forest by risking their lives and then sale it to the local market. Being a coastal area, Sundarban is the dwelling for several kinds of seafood like – crabs, prawns and also for numerous types of fishes. So, fishing is again another kind of livelihood for the community people, based on the natural resource [11].

Absence of a proper social structure and extreme poverty level people are bound to choose a risky livelihood which occasionally leads to death also due to tiger attacks [21]. But with the help of the government, this problem is started to solve presently. Various branded hotel chains are creating resorts over Sundarban for providing safe and secure stays to tourists. These new companies require a huge mass of local people for starting their business, in that area. Helps to range from bringing the raw materials, buying materials from villagers, construction help, maintenance, and up to hiring the local people in different designations as per their capability in those resorts finally [20]. Nowadays tourists are also eager to boat rowing, and Sundarbans village tours to gather more information regarding local people lifestyle and also to enjoy the forest beauty from the best possible near. Local community started to act a play on their Goddess Bonbibi, how she saves life

of them, in a form of a show in front of the tourists. This is another way to get economic stability. Local foods and art crafts sold by the local people in different stalls creates a lot of curiosity and eagerness to taste local food and buy the handcrafted products.

This largest mangrove ecosystem existing in the world today is declared as “Ecologically Critical Area”, providing coastal protection and tidal surges [25]. Agro and inputs on fishing, through technical capacity building, by providing health and education facilities and skill development training to the community people by government to preserve this volatile ecosystem of Sundarban [13]. Government is also taking initiatives to provide benefits of various projects started in Sundarban for the development of the local community people without disturbing the natural life [1]. These initiatives divert the mind of local community people to change their over-exploitative earning policy and forest dependency to some other logical lifework. Transformation in the profession of local community people in Sundarban directly helps to maintain the sustainability of natural resources as well as it will save this fragile ecosystem [2].

### **5. Exploratory Research Approach:**

Development of Ecotourism encourages the population to maintain the sustainability of that specific location through recognizing the potential of that place. Here a mixture of geology with ecology noticed, like with the geographical location and the local community depending on that location. Here a specific type of ecotourism, based on geology enriches the conservation of regional culture, thoughts, community lifestyle. But the location possessing a huge threat due to over usage of the natural resources for human wellbeing. In contrary, heritage tourism focuses more on archaeology and historical structures, and also on ecological diversity. By combining all these forms of travel creates its own innovative theory which is improvable.

As per the World Travel and Tourism Council, the tourism sector of India is ranked seventh globally and is one of the largest contributors to global GDP. Domestic trips over 2.3 billion were made in the United States in 2019, which shows an increase from the previous year. Unfortunately, it resulted in significant biodiversity loss. The pressure on these remote locations has increased as a consequence of growing tourist traffic in these areas, which are typically removed from the hectic pace of urban life and abundant in scenic views. Because of their distinctiveness and limitations, heritage sites are seen as the pride of the nation. The popularity of heritage sites among tourists has increased, and heritage tourism has been elevated. This has created a natural connection between the past and the present. In addition to the numerous heritage sites, the Sundarbans, home to the world's wide-ranging and most beautiful forest of mangroves, the majestic Royal Bengal Tiger, and exotic flora and fauna, has been recognized by UNESCO as a special natural heritage of the world. The convergence of the Hooghly, Ganges, Padma, Meghna, and Brahmaputra rivers is where the biodiversity of the Sundarbans' flora and fauna, including the Rhizophora mangle, is found. This area is ten thousand square kilometres in size. In addition to species of *Xylcarpus*, *Avicennia*, *Bruguiera*, *Rhizophora*, *Sonneratia*, *Aegicera*, *Cereops*, etc., the mangrove species community is dominated by trees like *Heritiera* (Sundari tree). Mangrove species can withstand high salinity and tidal waves, but sea-water rise causes a slow demise for an endangered mangrove

community, off-setting the Sundarbans eco system. Due to the flow of numerous rivers over this vast delta region, protecting this delicate ecosystem is difficult. Government-imposed strict conservation rules aid in preserving the eco-system and enhancing local community socio-cultural activities. Once more, strict conservation policies are driving a completely forest-dependent local community into extreme poverty. The creation and expansion of alternative employment opportunities for the local community ring true with discussions of Sundarbans Forest as positive scenarios.

A growing number of tourists, forest camps in protected areas (PA), boating, mangrove tours, the Bon Bibi Drama, the sale of local foods and Art crafts, and the employment of locals in the construction of eco-resorts all contribute to empowering and advancing the local populace's economic development towards socio-cultural advancements. Even though the pace of progress is quite slow, consistency in the process will be able to end the local community's reliance on the forest while also promoting socio-cultural development.

#### **6. Research gap and problem statement:**

Tree tents in nature reserves (NR), boat rowing, tourist numbers, mangrove tours, Bon Bibi Drama, selling local foods, Art and crafts, and hiring local people in the creation of eco-resorts are a process towards the empowerment and boost up in case of growing economy for the local community along with socio-cultural advancements. Very slow but consistency in the progress process will help to eliminate local communities' forest dependency. However, ecotourism is very different from the concept of conservation of the natural environment, which often focuses on the main aspects of ecotourism, that is, the preservation of the unrefined environment and the natural assets and the ecosystem, primarily focusing on the relationship between the environment and the communities in that place.

On ecotourism, multiple research has been conducted, but the majority of work based on specific location whereas the majority of them has been conducted in separate nations. While some of the important works also noticeable in India, specifically in West Bengal. As a result, this type of ecotourism research is extremely unique in India, particularly in West Bengal. Thereby, the rationale of the existing report is to develop the analysis methods for promoting environmental conservation, as well as the Rational Unified Procedure method which is used to evaluate location appropriateness as well as anticipate new regions of ecotourism in West Bengal.

People are forced to choose a risky lifework due to the lack of a proper social structure and the extreme poverty level, which occasionally results in death due to tiger attacks. However, with the assistance of the government, this problem is now being addressed. Various branded hotel chains are developing resorts throughout Sundarban to provide tourists with safe and secure stays. These new businesses in that area require a large number of local residents to get started. Helps range from bringing raw materials, purchasing materials from villagers, construction assistance, maintenance, and finally hiring locals in various positions based on their abilities in those resorts. Nowadays, tourists are also interested in boat rowing and Sundarbans village tours to learn more about local people's lifestyles and to enjoy the forest's beauty up close. The local community began to stage a play in front of tourists about their Goddess Bonbibi and how she saves their lives. This



is yet another method of achieving economic stability. Local foods and handcrafted items sold by locals in various stalls create a lot of curiosity and eagerness to try local foods and buy handcrafted items.

This world's largest mangrove ecosystem has been designated a "Ecologically Critical Area," providing coastal protection and tidal surge protection. The government is providing agro and fishing inputs, technical capacity building, health and education facilities, and skill development training to the community people in order to preserve this volatile Sundarban ecosystem. The government is also taking steps to ensure that the benefits of various projects initiated in Sundarban benefit the local community without disrupting natural life. These initiatives are diverting the attention of local community members away from their exploitative earning policy and reliance on the forest to some other logical lifework. Changes in the occupations of Sundarban residents directly contribute to the sustainability of natural resources.

### 7. Theoretical model & Proposed Methodology:

The author proposed seven principles that they believe are essential for developing sustainable ecosystems that are additionally resilient socio ecological processes. Their guidelines include: interconnection planning, inclusion and backup systems, slow changeable strategic planning as well as input, responsive transdisciplinary advancement, understanding affirmations, broadening involvement, as well as multi polar oversight framework endorsement.

The society is considered to be a structure in the sustainable community framework, associated with other inner reactionary factors as well as overlaid inside of complex networks, as well as exposed to continual impact from a variety of outside enablers. Strategy as well as ideology, heritage, finance, age distribution, innovation, and even organic ecological systems all exhibit of that kind truckers. The timeframe, regularity, amplitude, severity, as well as other relevant characteristics of these enablers diverge. According to the participatory concept, it has tackled an array of theoretical as well as methodical issues in asset populations in general as well as wilderness populations in particular.

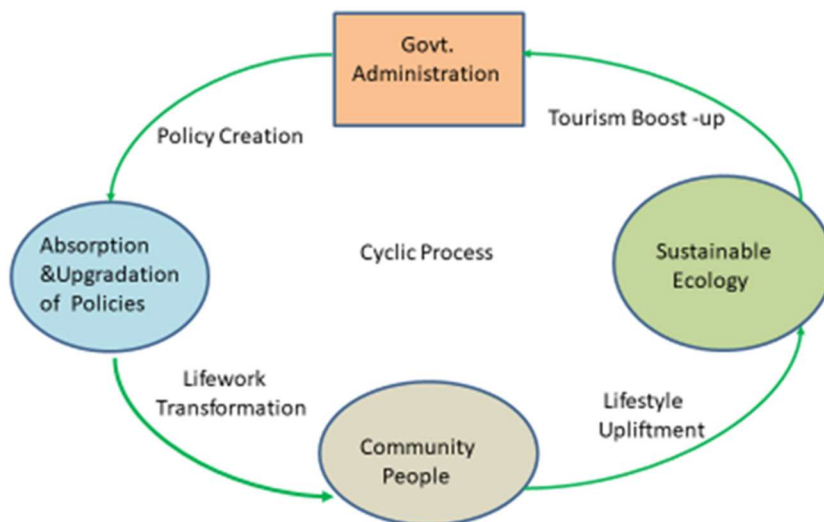


Figure \_Transformation of Community Lifestyle through Sustainable Eco Tourism

## Policy

This framework serves as an excellent reference to assess the effects of policy reforms on the sustainable practices of wilderness communities. For illustration, metrics developed were used quantitatively to evaluate and contrast the circumstances of residents before and after Ghana's cooperative sustainable forestry programme was implemented. The public reaction procedure to change is a cross phenomenon that occurs not only as a result of collective action at the community level but also as a result of self-governing reactions of families, persons, as well as collectives. The latest assessment call for the research of social sustainability is to comprehend and utilize the methodology.

## 7. Conclusion & Recommendations:

UNESCO-recognized Sundarban as the world heritage site with largest mangrove and wet woodland in midst of world's all the other mangrove forests. The transboundary land of this forest possess immense importance for local community in both the countries – India and Bangladesh from different aspects – economically, socially and also ecologically. Sundarbans forest and its rich biodiversity created a natural history in this mangrove environs, which considers as a treasure and the complete value cannot be monetized. In order to maintain their livelihood, the locals engaged in various activities such as timber harvesting, fishing, and food gathering. serious threat of natural disaster (cyclones, sea level rise) and human liveliness, i.e. - human intrusion, tourism industry, illegal logging, deforestation, commercial use of land and natural resources, etc., causing serious damage to the ecosystem of the Sundarbans. Conservation, maintenance and above all management of this heritage site is a massive ultimatum now. The government of Bangladesh has started to take initiatives to improve forest policy for a sustainable Sundarban that will help these forested communities economically. But tragically, depending on the recent decision of the coal plant, the formation of the coal plant in agreement with the Sundarbans demonstrates a deficiency in stable preservation of this UNESCO World Heritage Site. Being a secured area, and under the state property rights incumbency, Sundarban is presently nurtured by BFD. This study sets out the ideas of the sustainable policy of forest and management of the Sundarbans. In view of sustainability, a social-ecological system framework should be considered for wellunderstandingof processes of use, conservation, regeneration, and destruction of organic resources. Today, most of the developing countries are well acquainted with forest policy, but structures are lacking and forest policy implementation is very unsuitable for competing policies, lack of frame, inefficacies, and insufficient funding. India and Bangladesh have also come up with an ecosystem-based approach towards forest management, which needs to face future pros and cons. Even Bangladesh, faces greater challenges for their 'top-down' mangrove forest management policies leaving the community with no say in the case of Sundarbans management.

This study assumes that the socio-economic level of the local population around Sundarbans is at a very low level. Traditionally, local inhabitants harvest natural and organic resources from the mangrove land for their survival. Embodying management activities among dwellers into some form of shared stewardship is a possible step towards enhancing the management sustainability of

Sundarban's heritage. In such cases, to enforce better stability and a strong economy for local communities, both states take benefit from a commonly shared-benefit approach. Specific management approaches, based on community demands a strong stakeholder involvement, but at the same time met with some resistance, as it is noticed by some as a form of political control. To ensure consistent and continuous progress, recognition and a genuine participatory approach must take into account each individual's perspective, likewise participatory democracy. Equal admiration, participation, entrust within partners serves as the ways for Sundarban's improvement and sustainability.

**8. Declarations:** Following are the declarations for this manuscript –

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- **Consent for publication** – Not Applicable
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