The challenge of Géotourism potential in the face of climate change

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ABSTRACT

Madagascar is developing sustainable management approaches that contribute to the monitoring of sustainable development in the framework of the conservation, protection and enhancement of biodiversity. If this approach has been the leitmotiv of the State in the management of ecosystems and their resources. Its development strategies must therefore reflect the ways and means to achieve the objectives and steps of the dynamization of links between the State, the private sector and individuals at the scale of sustainable management of biodiversity in the context of climate change. In fact, the concept is accepted but requires planning involving a facilitating policy, legislative and normative framework. Knowing that Geotourism represents one of the tourism sectors of Madagascar. The challenge is thus to ensure that institutions and research groups define common policy frameworks where geotourism strategies will have their management mode in the response to climate change.

Keyword*:* Madagascar, Tourism, Géotourisme, Climatic change

1. INTRODUCTION

The basis of the vitality of tourism is formed by a set of attractions, facilities, infrastructures, businesses, resources and local communities linked by these development potentials, cultural, human, natural and physical wealth. Hence, the issues arising from the development of this sector are ambiguous both from the point of view of the structures to be offered on the market, as well as at the level of the entities responsible for the implementation of its development and, as a result of a monitoring analysis of economic, social and environmental policies in the issue of climate change. Geotourism is one of the tourism sectors that can help to reach this stage.

This article discusses the importance of this context to the tourism sector. In this case, the challenge is posed by a major issue: "What strategies and policies for Geotourism development for Madagascar is it really in the preconditions for responding to climate change?", and whose methodology of approach is the tool of Project Planning by Objective. The objective is to ensure that the State and the private sector define together the frameworks of common orientations where the geotourism strategies will have their management mode in the vivification of its activity. It will be in fact a contribution to the reflections for the continuation of the indispensable works for the identification and the experimentation of the criteria that can be adapted by the sector to the context of the climate change.

2. METHODS

Madagascar is facing a number of strategic issues that are defined as the challenges that the country must take up as a priority for its evolution by developing its ability to seize certain opportunities in development, to resist certain external constraints or to capitalize on its assets, to correct its weaknesses, and must integrate the three related aspects of the economy, the environment and the socio-cultural for a performance of the destination. And, although the specificities of the island require an increased accountability of tourism to remain a strong resource-generating activity, the choice of Geotourism can be a way for Madagascar to better integrate into the global economy. This raises a verification that can be summarized as follows: the development of geotourism structures will meet the challenge of climate change

This statement thus translates the main elements of the content of this research paper. Within this framework, the methodology of approach is a borrowing of tool in the strategy of development carried out following the approach of the Planning of Project by Objective (PPO). The fundamental objective is to improve the planning process through an in-depth analysis of the important actors, the problems, their causes and their effects. This methodology consists of four steps:

- analysis of all important actors: people, groups, organizations;
- the analysis of all factors and the logical links between them through the problem tree;
- analysis of possible solutions through the objective tree;
- analysis of alternatives through the logical framework, stating objectives, expected results, objectively verifiable indicators, assumptions, etc.

The analysis of the actors (step 1) consists of making an inventory of all the parties involved and grouping them according to their relationship to the central issues to be discussed. Then, they are characterized and their interests, motivations and potentialities are listed. Finally, the implications of this are discussed.

The second step is the construction of the problem tree. All participants write down all the problems they perceive in relation to the theme of the discussion. They will be discussed one by one to choose the central problem.

And thirdly, all problems are converted into objectives: all negative conditions in the problem tree are reformulated into positive conditions and clearly impossible statements are discarded.

Finally, the last step is to determine the strategy. One or more objectives are selected that are supposed to be achievable. A project planning matrix is filled in to identify the overall objective, the project goal, the expected results and the activities.

For each of these, the matrix shows how to check to what extent the plans have been realized and what assumptions were made during the planning process. It also shows the prerequisites that must be met in order to begin the project and the direct inputs (and their costs) that are needed to begin the activities.

Strengths of the ODP: It is a good process for getting input from all those involved. By highlighting the cause-and-effect relationship between all the problems, the problem tree forces people to think in an integrated way about finding solutions. It makes people realize that it doesn't make sense to solve one small problem in the huge problem tree without also working on other problems.

The risks of the PPO: Only the ideas of those present are taken into account. But the difficulty is to know if a problem is a real problem and not the absence of a possible solution. This aspect can lead to a lot of discussion. But, however, the OPP methodology is applicable in every situation. Although, in general, one should not underestimate the difficulties most people have with the formal logic of the method.

2.1 Promote the functional characteristic of Geotourism

The Geotourism product has specific characteristics that distinguish it from other commercial products. It is a product that cannot be stocked and that evolves perpetually according to market expectations. It is also localized, i.e. strongly linked to a geographical place and its non-market elements such as the climate, the landscape or the population. And the main characteristic of Geotourism is its seasonality, conditioned by a set of factors but more particularly by the climate.

Table 1: Aspects of Geotourism Performance

Benefit	Host	Visitor
Economic	- Job creation and economic diversification. - High return and revenue	- Competitive tourism and businesses - Quality product (optimal quality/price ratio)
Ecological	Conservation, enhancement and protection of natural, cultural and environmental resources	- Natural sites: access/non-access - Activities compatible with nature, landscape, fauna and flora.
Social	Social cohesion and justice (inclusion and equal opportunities)	Intercultural exchanges (sources of knowledge)

Nature is generous in offering us a place to live, work and spends his free time. Madagascar has a coastline of significant length and marked character can be considered privileged, insofar as it has a valuable space for tourism development, and has a negative impact on the social, economic and cultural fabrics of geotourism destinations. Although the trend is still on the rise, investors and tourism managers are increasingly aware that the sustainability of tourism in the regions depends heavily on the quality of their environment, which is particularly fragile. Today's tourists are looking for a variety of experiences including cultural and natural attractions, gastronomy, sports, etc., all in a well preserved and unique environment. At the same time, people living in traditional tourist destinations are increasingly aware of and concerned about their natural, historical and cultural heritage.

Geotourism performance has impacts that require policies and strategies. These reflect the options and means to achieve the objectives and milestones of sustainability. These policies often refer to the institutional frameworks that enable the proper management of Geotourism development. However, policies may not be site-specific and may be applied to an entire country. Rather, strategies are action-based and linked to a specific site or region. Examples: Tourism policies, inter-operator and inter-ministerial cooperation mechanisms, retention schemes, economic, financial and market-based instruments. They may include:

- Concessions for Geotourism operations in parks.
- Incentives for sustainable Geotourism (such as incentive taxes)
- The implementation of modified taxes, charges, and fees to redirect Geotourism inflow
- The provision of management infrastructure designed for visitors
- The certification of sustainable Geotourism
- The awards and marketing support for the forerunners
- Voluntary communication, guidelines/codes of conduct

However, the growth of tourism in general, and Geotourism in particular, is related to three main factors: increased income and leisure time of individuals, improvements in transportation systems, and better public information about Geotourism sites through improved communications. The latter, which has reached its peak in recent decades, puts pressure on the environmental and cultural resources of Geotourism regions. Tourism activity and Geotourism destinations are particularly exposed to natural disasters such as earthquakes, tsunamis, cyclones, floods, landslides, avalanches and other similar phenomena. Global warming increases the frequency of these natural disasters, often with dramatic consequences. Recent examples are the Indian Ocean tsunami in 2004 and Hurricane Katrina in 2005. In this context, limiting the growth of tourism, enhancing the Geotourism product, attracting a diversified clientele and improving the quality of the offer and services, are perceived as priorities allowing a Geotourism that satisfies both the visitors and those who live from it. This is the true essence of the definition of "sustainable tourism development" proposed by the UNWTO

2.2 Include Geotourism impacts in development

All forms of tourism and all tourism activities rely on the use of environmental resources. Even if it is considered "soft", tourism has major environmental impacts in many Geotourism sites, which are particularly vulnerable to the pressures associated with its growth. The relationship between Geotourism and the environment can be described as mutually dependent: on the one hand, Geotourism is very dependent on the quality of the environment, but on the other hand, the quality of the environment is also very vulnerable to Geotourism development.

Geotourism is a large consumer of natural resources, which are used to provide tourists with a variety of goods and services: drinking water (an extremely scarce resource in many Geotourism sites); food, which sometimes causes pressure on local production, such as seafood, and leads to overexploitation of fisheries; electrical energy and heating/air conditioning systems; which make Geotourism a massive energy consumer. In addition, the environmental impact of Geotourism extends to the pollution of sea water and fresh water, through sewage discharges often directly into the water without any form of treatment, and the dumping of considerable amounts of waste produced by tourist establishments.

Table 2: Geotourism evaluation criteria.

Type of value	Assessment criteria
Scientific value: Representativeness; Rarity; Paleogeographic value	Integrity
Aesthetic value: Vertical development, color contrast, space structuring	Viewpoints
Ecological value: Protected site	Ecological influence
Cultural value: Historical importance; Literary and artistic importance; Geohistorical importance;	Religious and symbolic importance
Economic value	Economic products

Geotourism is an export and distribution tourism sector that ensures a major contribution to Madagascar's gross domestic product. It is in a sector of activity that knows the most vigorous growth in the development activities of the country, conditioned by local factors such as standardized facilities, authentic local culture and friendly populations. Geotourism is thus dependent on the goodwill of local hosts. However, according to available information, almost 80% of the country's original forest cover has disappeared, or has been seriously damaged. The area covered by natural primary forests decreased to about 25% of the total area in 1950, to 20% in 1972 and to at least 15% today. This degradation threatens not only biological diversity, but also the stability of water supplies and soils vital to the agrarian economy. Similarly, climate change will threaten the sustainability of basic natural resources, and rural people need more alternatives to use available natural resources in a sustainable way. Similarly, the socio-economic problems that have hit the country have had a considerable negative impact on the tourism industry. Two major cases can be highlighted as examples: the political crisis and its cyclical form (1991, 2002, 2009 and 2019), and the poverty that is rampant in the country. More specifically, the rural population has no alternative to subsistence farming and occasional livestock raising, which has resulted in low purchasing power and a low standard of living. These negative social aspects may include an increase in prostitution, including its worst form, child prostitution.

In addition to the ecological damage, tourism can have negative impacts on local society. The impact of tourism on traditional ways of life and local customs, the deterioration of traditional socio-cultural values and the loss of identity of the local population, or the devaluation of properties generated by excessive construction, are some examples of these negative impacts. Finally, although Geotourism is usually concentrated in a narrow tourist site, its impacts can be felt in a much wider area. The infrastructure required for Geotourism can extend far and wide as it includes road and rail networks, airports, construction of employee housing, large shopping centers, etc.

The major challenges for sustainable Geotourism in tourism sites are: migration of Geotourism development from the narrow site to the hinterland to reduce the current imbalance with respect to populations living in neighboring areas; reduction of the seasonality of demand; more rational use of resources, especially water and energy; and reduction of pollution in coastal and marine environments, as well as threats to fauna, flora, and habitats. However, Geotourism can make a significant contribution to the protection of natural resources. This contribution can be funding for biodiversity conservation, especially in already established protected areas; providing economic justification for the concept of protected areas; offering economic alternatives for local people to reduce the exploitation of natural resources; and supporting biodiversity protection efforts on a case-by-case basis.

To ensure that tourism development does not harm nature and at the same time contributes to the development of local populations and the enjoyment of visitors, the (concept of) Sustainable Geotourism has been created. The principles of Geotourism can be applied to all sectors of the tourism and travel industry. But it remains to be seen how and to what extent these principles can transform the tourism industry to become a more positive force for biodiversity conservation.

3. THE RANDOM EVENT SOCIO-POLITICAL-ECONOMIC ANALYSIS OF GEOTOURISM IN RESPONSE TO CLIMATE CHANGE

The role of Madagascar's tourism administration is to encourage, facilitate and strengthen the creation of competitive advantages. And, the elaboration of a tourism policy is a responsibility of primary importance for Madagascar which wishes to develop tourism as an integral part of its economy. In this regard, it is important to note that the government's policy can be manifested in financial projects, and incentive policies for Geotourism. Thus, the impact of Geotourism is not only manifested in terms of foreign exchange inflows.

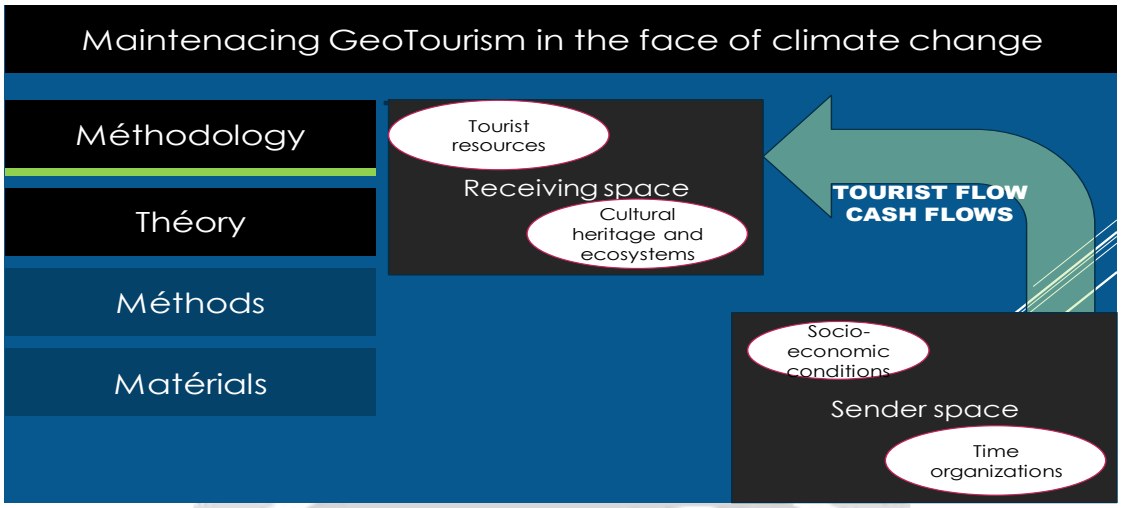
Besides the additional source of income that it can constitute for the State, it is a factor of development for other sectors of the economy and an important means for the reabsorption of underemployment. Geotourism is thus presented as a fundamental element in the dynamics of economic and social growth of Madagascar, whose private sector plays an increasingly important role in the field of tourism, particularly in terms of promotion and marketing.

3.1 Analysis of Geotourism in relation to the natural environment

Geotourism is defined as a form of tourism inspired by its natural beauties, its geological, botanical or archaeological curiosities, landscapes, caves, habitat, vegetation, ocean views, valley outlets, relics. Now, Madagascar has a huge potential to strengthen the slice of the concept of Geotourism, while combining these activities with natural assets. The Capricorn Coast; with a relief which is the second in length worldwide (from Tulear, Ifaty, Isalo, Morondava to Majunga). The northwestern zone of Madagascar gathers a great diversity of habitats and ecosystems (reefs, mangrove, sea grass, sea bed, islets...) representative of the biographic region of the Western Indian Ocean. These environments are home to threatened, rare and endemic species such as Haliaaetus vociferoides (world population estimated at a hundred pairs), Zoonosaurus tsingy, Eulemur macaco flavifrons (endemic to the north-western zone of Madagascar), important marine species such as marine turtles, whale sharks, Dugon dugon ... as well as important nursery areas of fishery resources of high commercial and social value (penaeid shrimp, fish) The presence of unique karst islands for their nature and beauty, and cultural sites adds to the area an exceptional value. The Blue Triangle, which includes the Bay of Antongil, the Masoala Marine Park complex, the Mananara Marine Park (both part of the Mananara Nord Biosphere Reserve, but created as an extension in the marine domain of the terrestrial national parks to which they are attached), and Sainte Marie Island, gathers a diversity of ecosystems, and the existing marine parks harbor terrestrial endemic species. It is a whale sanctuary, one of the most important breeding grounds for humpback whales in the southwest Indian Ocean. It also has nurseries of marine species (shrimps, fish). The southwest of Madagascar also has a great diversity of habitats and marine and coastal ecosystems, among which stands out the largest barrier reef in the southwest of the Indian Ocean, the second largest reef in the world (the Great Reef Complex of Toliara), whose importance and interest for the Region are no longer to be demonstrated, as its reef diversity can represent that of the Region. It also has hotspots of marine biodiversity still intact. The area is home to rare, threatened marine species (Murex pecten, Charonia tritonis), important species including the coelacanth Latimeria Chalumnae, marine mammals (dolphins, humpback whales), marine turtles ... To preserve these ecosystems and their biodiversity, 47 Protected Areas and several marine parks have been established for the sake of preservation, and classified into three categories: Integral National Reserves, National Parks and Special Reserves.

In consideration of the ecological assets of Geotourism. The ecological diversity of Madagascar, and its unique flora and fauna are among the main attractions of the island. Each part of the island is associated with a different type of vegetation and contains a variety of endemic species (palms, bamboos, ferns, orchids, baobabs, cacti and other succulent plants). About 80% of Madagascar's plants are endemic. This percentage is even higher for the fauna. The best known example is that of lemurs, of which almost 90% are naturally propagated only in Madagascar. The big island contains more or less 250 species of birds of which about 106 species are endemic; 85% of the flora, 39% of birds, 91% of reptiles, 99% of endemic amphibians.

Figure 1: Protection of Geotourism assets



In consideration of the faunistic and floristic attractions. From the floristic point of view, the primary forests contain many species of precious wood and of great commercial value such as the rosewood (Dalbergia), the ebony (Diospyros with its numerous species), the *Varongy* (Ocotea), the *Nato* (Fauchera or Nimusopos) and many others, but also shelter many medicinal species belonging to different families. Of the 12,000 species of vascular plants, 18% of which are endemic, there are several species of orchids and palm trees. Of the eight species of Baobabs (Andansonia) that exist on our planet, seven are typically Malagasy. From the faunistic point of view, they constitute the habitats of numerous endemic animal species: out of the 179 terrestrial amphibians counted, only three species of the Ranidae family are not endemic, that is to say an endemicity rate of 98%. And, the endemism of aquatic amphibian species (frogs) reaches 98%. Similarly, there are 363 species of terrestrial reptiles, of which more than 90% are endemic. On the terrestrial mammals: 140 species and subspecies listed, only four are introduced, hence an endemicity rate of 97.14% among wild mammals. For primates, 48 species and subspecies of lemurs live in Madagascar. And, the endemism of terrestrial insects is: Coleoptera 100%, Lepidoptera 95 to 98%, Arachnids 60 to 65%.

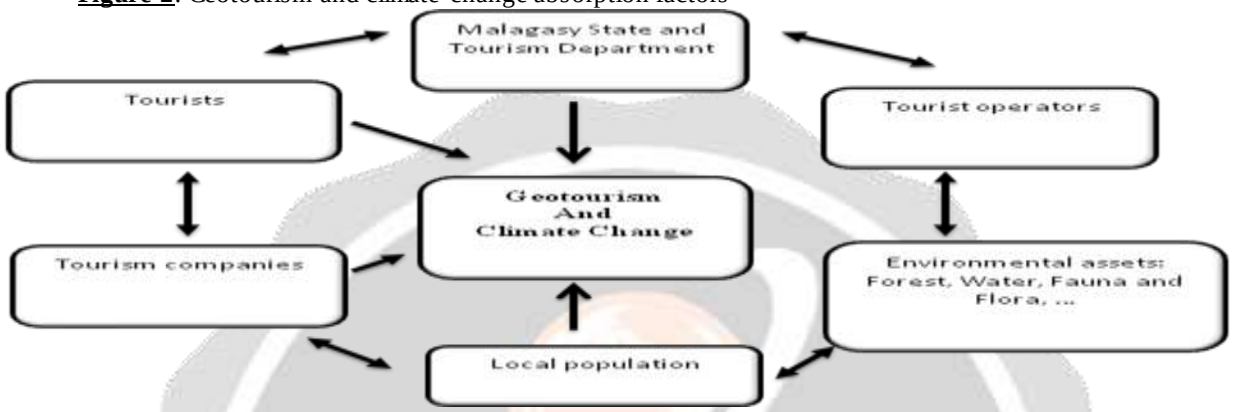
3.2 Analysis of Geotourism in relation to the socio-cultural plan

In fact, Madagascar has many tourist potentialities. The country's tourism activities are very promising. They constitute one of the main factors of sustainable development of the sector. Prospects and elements of solution for a revitalization of the country's tourism potential can be proposed having many impacts resulting from thes e tourism activities, and observed at different levels. On the economic level, Geotourism is an activity that enhances the other economic sectors, thus promoting rural development. On the social level, it is a job-creating activity, and it gives the population a possibility to access the different infrastructures of development. Hence, incentives for serious investments respecting the environment can be undertaken, and a national reorganization must be put in place. Therefore, it is necessary to promote cooperation between the private sector and the administration in the tourism sector. Thus, tourism allows to study the necessity of the integration of the economy, the environment and the social, through the reinforcement of the geotouristic attractiveness; since the latter constitutes a concern in any reflection on the problematic in the context of the climate change in Madagascar.

Madagascar is first and foremost a geographical territory that presents a certain unity both on the physical and human levels. It is not a region in the sense of the 23 institutional regions. Moreover, each of the provinces and regions could host several tourist areas. Therefore, the limits of these tourist zones do not correspond to administrative criteria, but to criteria of tourist offer since what determines the existence of this territory is the coherence of its tourist basin which can become a receptive home thanks to specific potentialities through a network of sites and products connected by homogeneous programs and animated by a tourist chief town which can also contribute greatly to a strategic planning in the aim of the response to the climate changes.

Geotourism supports the benefits of the community, as it represents an important part of private consumption; it is an engine that drives other sectors of economic activity, and it is also a source of revenue and employment. On the other hand, Geotourism promotes the development of natural heritage. It is a sector that fights for the redistribution of income, because efforts of the State have been observed to inform the population on the issues concerning tourism, among others on the need to provide most communities with much more complete information than they receive from the media. And, both initial and ongoing training actions and, in particular, decentralized training throughout the island in the tourism sector has already been undertaken. Training in the public tourism sector has as its backbone the National Institute of Tourism and Hospitality of Madagascar.

Figure 2: Geotourism and climate change absorption factors



Geotourism is a factor in promoting community participation, as 75% of the Malagasy population live in rural areas and depend directly on biological diversity for their well-being and survival. Forests provide wood for construction and combustion, climate regulation, water purification, and are home to genetic resources. Rivers provide fresh water, recreation, electricity and food. Coastal wetlands help control flooding, and serve as nurseries for fish farms. And, with development and environmental programs, there is increasing integration of the local population in their own development, as in the case of natural resource management transfers, whose management may include the local community, but also other partners such as tourism operators. In Madagascar, although population, potentialities and geotourism attractions coexist. This situation of coexistence could be followed by a reciprocally unsatisfactory relationship if a master plan is not established that aims at the management, protection and valorization of Geotourism resources in order to allow the population to take advantage of them in the response to climate change

4. CONCLUSIONS

Tourism, as a global business, is confronted with global issues. Poverty reduction, climate change, natural disasters and biodiversity loss are among the most important. With careful planning, Geotourism can be a factor in preserving the environment for Madagascar in response to climate change. The country, which today seeks a revival of economic, political and socio-environmental dynamism through the development of tourism activity throughout the national territory, can fully comply with the statement that defines that: "the development of Geo-tourism structures will respond to the challenge of climate change. For, whatever the type of development, it is essential to maintain the sense of historical, cultural and community identity that is attached to each place. Considering more the participation of local populations in its activity, Geotourism is a factor of exchange between visitors and visited in the reinforcement of tourist attractions facing this dilemma. So, Madagascar is favorable to the development of tourism whose main resources are: the natural environment, the historical and cultural heritage, and the attractions of biological diversity or the diversity of life on earth. However, for Madagascar, a clear strategy on sustainable tourism development seems to be quite distant for the moment. Some basic problems are first and foremost to be solved if the country wants to develop in a cohesive and functional way a sustainable and viable tourism development project in the future of a climate change; also do we not risk to witness the implementation of additional costs by the population so that the response to the climate change is embedded in the General Budget of the State?

5. REFERENCES

[1] CROMPTON E., (2003). «*Etude du Secteur Tourisme*». Washington: n.e. République de Madagascar 151p..

[2] Institut National de la Statistique (INSTAT), (2017). «La Démographie et la Statistique Sociale: Résolutions Finales». Antananarivo, Madagascar. 53p.

[3] Ministry of Tourisme (MT). (2021), «*Présentation sommaire de la politique et stratégie de développement touristique, Géographie Touristique de Madagascar*» Antananarivo, Madagascar. 15p.

[4] RAHARISON R.. (1991), «*Contexte institutionnel de la conservation des forêts à Madagascar, Série d'études sur la politique de conservation des ressources forestières à Madagascar»*, Antananarivo, Conservation International & Direction Générale des Eaux et Forêts. Madagascar. 175p.