

MEMORIA DEL TRABAJO FIN DE GRADO

THE SUSTAINABLE DEVELOPMENT PLAN OF EL HIERRO AND ITS IMPACT ON THE TOURISM INDUSTRY

El Plan de Desarrollo Sostenible de El Hierro y su impacto en el turismo.

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ABSTRACT

El Hierro is a small island in the Canarian Archipelago that managed to power itself by means of renewable energy sources. The goal of this project is to analyze whether the Sustainable Development Plan implemented in the island has had any influence on its tourism industry. In order to achieve such goal I have carried out a research in relation to the bases of the above mentioned Plan, the tourism offer in El Hierro and I have likewise conducted interviews with people involved in the Plan. After performing an analysis of the information obtained, I detail a number of conclusions that address the goals pursued in this work.

Keywords: El Hierro, renewable energy, sustainable development, tourism.

RESUMEN

El Hierro es una pequeña isla situada en el Archipiélago Canario que ha conseguido cubrir la demanda de energía de la isla mediante fuentes de energía renovables. El objetivo de este proyecto es analizar si el Plan de Desarrollo Sostenible que se ha implementado en la isla tiene alguna influencia sobre su industria turística, pasando por una investigación de las bases del mencionado Plan, la oferta turística de El Hierro y entrevistas con personajes implicados en el mismo. Tras realizar un análisis de la información obtenida mediante las acciones anteriormente mencionadas, finalizo exponiendo conclusiones precisas que responden a los objetivos de este trabajo.

Palabras clave: El Hierro, energía renovable, desarrollo sostenible, turismo.

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1. INTRODUCTION

The island of El Hierro, Canary Islands is the smallest and most western island in the Archipelago with less than 50km from side to side and a 268,71km² area. Furthermore, it is the least populated island in the Archipelago and it has only three municipalities: *Valverde*, *La Frontera* and *El Pinar* with their respective city councils.

The island was declared Biosphere Reserve by the Unesco in 2000 and Geopark in 2014. The latter came as a result of El Hierro becoming the first island completely powered by renewable energy sources, thanks to a sustainability plan carried out by the Ministry of Industry, Energy and Tourism since 1997. The most important goal of the plan was achieved in 2014 with the setting up of the wind-hydro-pumped station Gorona del Viento. The purpose of El Hierro goes beyond this famous wind-hydro-pumped station and it is becoming a world reference in terms of sustainability, thus constituting an example for other isolated regions of the planet to demonstrate that renewable energies are a perfectly viable solution energy-wise. The project arose more than 25 years ago and its main focus was the wind-hydro-pumped station.

However nowadays there is a whole policy line in the island about waste reduction and recycling; ecological product elaboration, and the development of a tourism sector responsible with the social, economic and environmental conditions of the region (Pinto, 2016). After all, controlling how energy is provided means controlling the future of the island, and doing so in a sustainable way is the only way we have to ensure a future. El Hierro constitutes a clear example of how a small territory could achieve great sustainable practices that certainly should be expanded and improved until they become part of our society in order to ensure sustainability linked to economic development. The island has recently become a famous tourist destination given that it is home to more than 800 volcanos and high landscape diversity as well as a large offer of natural resources linked to agriculture and farming (Tourism of Spain). Moreover, El Hierro is well communicated in terms of infrastructure. In its airport, located a few kilometres away from the capital city *Valverde*, there are daily flights connecting the island with Tenerife and Gran Canaria. Likewise, it is connected to Tenerife through *La Estaca* Seaport.

El Hierro aims to link sustainability, nature and tourism through the conservation of its cultural and natural heritage in order to guarantee a better future for our society and ensure further tourist arrivals to the island. That is why it is extremely important to take care of the

resources that once attracted tourists and preserve them so the island can keep having that income and increasing the life quality of the local citizens as well. We should take into account that tourism actions are destructive by nature –ranging from getting a flight, which is a very polluting procedure per se, to consuming resources and energy at the destination along with all the intermediate consumption process.

A feasible option to conserve the natural resources of the island is creating a special development method which is suitable to ecosystems and local needs while remaining open to change and renovation. El Hierro has created its own Sustainable Development Plan in order to minimize the effect of human action on the natural environment so they can protect it, given that it represents the main tourist attraction and hence a crucial source of income to the island.

2. OBJECTIVES

The main objective of this project is to prove if the Sustainable Development Plan of El Hierro has influenced the tourism industry of the island, for example the type of tourists that travel to the island or the type of activities offered. I have therefore established the following goals:

- To clarify which aspects of El Hierro attract tourists.
- To analyse which type of tourists travel to the island.
- To analyse if there is kind of a sustainability culture in the island that attracts alternative tourists.
- To prove if accommodation establishments follow a sustainability line.
- To study if the Sustainable Development Plan is being carried out properly.

With the purpose of proving if the tourism industry in El Hierro complies with sustainability, I have analysed the Sustainable Development Plan in order to identify its criteria and thus study the tourism and sustainability aspects of elements such as the tourist activities offered, the distribution of accommodation establishments and whether they follow sustainable practices, and the level of commitment of the local population.

3. METHODOLOGY AND SOURCES OF INFORMATION

As for the methodology followed, it was fundamentally based on reading articles and books with information of the island of El Hierro, visiting online newspapers and blogs to find some relevant news that could be of interest to the topic and looking for information in the official webpage of the *Cabildo*¹ of El Hierro and official documents elaborated by this entity. Tourism official websites were also consulted and a research was carried out to obtain graphics and statistics in the webpage of the Canarian Institute of Statistics (ISTAC). I also conducted personal interviews with experts on sustainability and tourism associated to the sustainability project of the island. All the information was searched in Spanish and English, but it is worth mentioning that the vast majority of it was found in Spanish as El Hierro is a small island that has not been the object of major international studies yet. It is important to highlight a review paper made by the *Cabildo* about the Sustainable Development Plan of El Hierro in 2006, which evaluates the improvements made in sustainability from 1997 to 2006 and considers all the objectives to achieve from 2007 to 2010.

A major source of information was an interview with Javier Morales, agricultural engineer and politician in the *Cabildo* of El Hierro and a key figure for the wind-hydro-pumped station *Gorona del Viento* (El Día, 2014). Mr. Morales provided me with information about the tourism industry in the island: how the wind-hydro-pumped station works and how much energy it generates as well as the importance of sustainability in the leisure activities offered and the relevance of sustainability in the educational system.

I have also followed certain necessary action guidelines: study of pertinent scientific literature combined with other methods such as consulting previous research reports, performing a statistical analysis and the consequent interpretation of the results and data obtained.

¹ *Cabildo*: exclusive administrative identity that operates as Government in the Canary Islands. There is one *Cabildo* for each island.

4. CONCEPTS

It is necessary to clarify some concepts so as to have a better understanding of the research I intend to carry out: what is sustainability, how sustainable tourism is defined and which are the actions that identify a responsible tourist.

Sustainability can be defined on the basis of what sustainable development is. The WTO describes sustainability as a set of principles that refers to the environmental, economic and socio-cultural aspects of tourism development based in a suitable balance that must be established between these three dimensions to guarantee its long-term sustainability (Klemmer, 2017, p. 123). On the other hand, the United Nations Organisation defines Sustainable Development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (General Assembly of United Nations). These two definitions are instrumental to understand how sustainability must be linked to the economy just as much as to society and the environment. Apart from that, it is crucial to clarify what responsible tourists are and which are their commitments. The UNWTO defines Sustainable Tourism as “Tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities” (UNEP and UNWTO, 2005, p. 11- 12). Thus, sustainable tourists should stick to the following principles:

- I. Make optimal use of environmental resources that constitute a key element in tourism development, maintaining essential ecological processes and helping to conserve natural resources and biodiversity.
- II. Respect the socio-cultural authenticity of host communities, conserve their built and living cultural heritage and traditional values, and contribute to inter-cultural understanding and tolerance.
- III. Ensure viable, long-term economic operations that are fairly distributed, providing socio-economic benefits to all stakeholders, including stable employment and income-earning opportunities and social services to host communities, and contributing to poverty alleviation.

Sustainable tourism development requires the active participation of all stakeholders, as well as strong political leadership to ensure wide participation. Achieving sustainable tourism is a

continuous process and it entails constant monitoring of impacts, introducing the necessary preventive or corrective measures whenever necessary (UNEP & UNWTO, 2005, p. 11). Once all definitions and commitments are clear; the next step of this research is to explain the Sustainable Development Plan of El Hierro, its commitment to renewable energy, how that renewable energy is obtained and point out the plan's most important criteria.

5. SUSTAINABLE DEVELOPMENT IN EL HIERRO

5.1. THE WIND-HYDRO-PUMPED STATION *GORONA DEL VIENTO*

El Hierro is becoming the first island fully self-sustained on the basis of renewable energy. In fact, Endesa, the leading electric company in Spain, defines El Hierro as “an example of sustainability”. The island has carried out a project called “El Hierro 100% Renewable”², managed by the company *Gorona del Viento* El Hierro S.A., funded by the *Cabildo* of El Hierro (65.82%), Endesa (23.21%), Technological Institute of the Canary Islands (7.74%) and the Government of the Canary Islands (3.23%). However nowadays the property belongs to the *Cabildo* and the shareholders contributions are now divided in the following way: Endesa (25%), Canary Islands Government (7%) and the *Cabildo* of El Hierro (68%) (Morales, 2018). The objective of this Sustainability Plan is developing a new energetic model as way of fighting against climate change. The wind-hydro-pumped station called *Gorona del Viento* has with a wind farm, a Pump Station and a Central Turbine as can be seen in the following image.

² “Proyecto El Hierro 100% Renovable” (my translation).



Image 1

The wind farm provides electrical power simultaneously to the electricity grid of the island and to the Pump Station, while the Pump Station pumps the seawater from a small interior deposit to a larger one (the so called superior deposit), and the Central Turbine generates the electricity needed with the help of the Pump Station.

According to information given by Javier Morales³ in a private interview the energy needed for the whole island are 5MW⁴ and the wind turbines produce in its best days 11MW. In particularly windy days, the turbines generate extra energy that activates the Pump Station and it pumps water from the lower deposit to the superior one, storing it so in the days with no or little wind the Pump Station makes the water fall in the lower deposit from a height of 655 meters, switching on the turbines and generating electricity.

³ Javier Morales is an agricultural engineer and active counsellor of the Sustainable Development Plan of El Hierro.

⁴ MW: mega watts.



Image 2

The wind farm has 5 wind turbines that supply energy to 5.000 inhabitants and in the near future it will be possible to supply energy to all the inhabitants of the island taking into account that every home consumes 4.000 KW⁵/hour each year approximately. Nowadays, this wind-hydro-pumped station makes up more than half of the total amount of energy needed in a year in the island and they are working to get to 100% as the goal of the project is to supply electric energy to the entire island on the basis of renewable energy sources as well as guaranteeing the stability of the electric grid (Endesa S.A.).

Apart from El Hierro there is an island in the Pacific Ocean called Ta'u, located in the American Samoa, that only uses renewable energy from solar panels that supplies electricity to the whole population but it barely has more than 1.000 inhabitants (Wildlife Company, 2018). As this new system in El Hierro is providing energy to 11.000 people approximately, it is a fact that this Plan is enormously relevant in the sustainability industry (Paniagua, 2015). “The main key of this project lies in the fact that we have a battery that is able to store the renewable energy collected”⁶, said Gonzalo Piernavieja, the director of I+D+i in the Technological Institute of the Canary Islands (Paniagua, 2015).

It is important to mention that in July 2016, El Hierro achieved to supply electrical power from renewable fuel to the whole island during 55 hours saving 83 tons of fossil fuels and avoiding 240 tons of CO₂ emissions. But the island beat its record the past January 2018

⁵ KW: kilowatts

⁶ “La clave de este proyecto es que contamos con una batería natural que permite almacenar la energía renovable que se acumula” (my translation).

producing the total demand of electricity completely from renewable energy sources during 18 days (Morales, J. 2018). Moreover, every hour of the renewable electrical supply implies saving 1.5 tons of fossil fuels and not generating 3.2 tons of CO2 emissions. From the first time it achieved the total supply of electrical power with renewable resources in 2015, it has saved more than 4.500 tons of fossil fuels and 13.000 tons of CO2 emissions in total (Endesa S.A.).

5.2. SUSTAINABLE DEVELOPMENT PLAN OF EL HIERRO

The Sustainable Development Plan of El Hierro consists of a program that considers aspects related to the development of the island and its population, and exposes actions that help to design a development model that builds a community with autonomy, self-sufficiency, natural balance and cultural, social and economic development (*Cabildo* of El Hierro, 2006, p. 6). These sustaining principles can be broadly summarized as follows in these five strategic principles:

- Taking care and empowering the island's nature.
- Taking care and developing the local culture.
- Securing self-sufficiency.
- Ensuring the quality of the products offered.
- Making a reasonable social distribution of the benefits obtained through this Plan.

In order to successfully achieve these strategic principles the Plan establishes a set of fields of action:

- Economic development of the island in specific sectors such as agriculture, farming, fishing, rural tourism, handicrafts and commercialization of local products.
- Development of a Cultural Program that improves education, increases the leisure offer, promotes traditions and improves information systems.
- Pay attention to the "key elements" for the island's production such as water, energy and raw materials.
- Create an "Insular Promotion and Development Society Plan" that focuses on the improvement of corporate training, technical support services related to business and financial management, as well as economic and support for infrastructure.
- Ensure the regular evaluation and management of the whole Plan.

The PDS-97⁷ focuses its principles and fields of action specifically in 15 areas that are considered the key elements of the sustainability line of El Hierro: agriculture, farming, fishing, commercial structure, agro tourism, handicraft and industry, architecture, water, energy, computing, materials control, culture, human resources, businesses, and management systems (*Cabildo* of El Hierro, 2006, p. 7-8). Apart from those main principles of the PDS-97, Javier Morales assures that this Plan is in line with the Special Territorial Plan of Tourism Management⁸ since its approval in 2006 by the Canary Islands Government, meaning that Tourism and Sustainability are strongly linked in every action carried out by the governance of the island. Furthermore, the citizen's engagement is an important part of the Plan and their proposals are taken into account when establishing further actions.

To that extent, can we assume that the PDS-97 is being carried out properly? To answer this question I have checked the strategic goals exposed in a review of the PDS-97 from 2006⁹ and I have collected the most relevant questions related to the objectives of my research:

1. Progress towards self- sufficiency.
2. Reasonable social distribution of the benefits obtained through this Plan.
3. Implementation of a Sustainable Actions Decalogue for schools and high schools.
4. Materialization of a Sustainable Tourism Model.

First of all, we can assert that the self-sufficiency progress is a reality even though El Hierro has not achieved yet the 100% renewable goal, because through the past years it has beaten new records every time regarding renewable energy supply. As part of the interview I conducted with Javier Morales, and regarding the second point, there is an initiative related to the Special Territorial Plan of Tourism Management that consists of distributing evenly hotels within the island with the purpose of also distributing the economic benefits. However, the social distribution of the benefits generated by the PDS-97 is still an ongoing process that needs to be addressed by experts.

⁷ PDS-97: Sustainable Development Plan of 1997 (*Plan de Desarrollo Sostenible* in Spanish).

⁸ "Plan Territorial Especial de ordenación Turística" (my translation).

⁹ This review of the PDS-97 was made in 2006 in order to set several goals to achieve between 2007 and 2010.

Moreover, the PDS-97 considers the island as a system in which waste is just an unexploited resource and every action is performed in a way that waste from one activity can be turned into raw material for the following activity. This is something they are so strongly working on, that agriculture professionals have designed a system called “Methane Biodigester”, which converts waste into energy and bio-fertilizer so as save money and promoting sustainable agriculture as well. There are several benefits that come along with this innovating mechanism such as reducing smell as well as energy consumption and production; saving money and at the same time obtaining free and natural fertilizer; reducing wildlife damage, and implying low investment and simple management (Morales, 2018). As the ecological production is an essential priority of the PDS-97 we can consider that great improvements are becoming a reality although there is a lot of work to be done in order to achieve a complete sustainable production.

On the other hand, even though the PDS-97 review of 2006 does not include any specific section about educational measures, it talks about the implementation of the so called Sustainable Actions Decalogue in schools and high schools. Considering the educational area as a key aspect for perpetuating a sustainable culture in the future generations, I consider it was clearly necessary to include a well elaborated Didactic Plan in the teaching guide so the teachers can work with in order to raise awareness about sustainability from an early age. Then I found out that in 2010 the Education Counselling of El Hierro, in collaboration with the Government of the Canary Islands, developed an educational project whose objective is the improvement of academic success, the sociocultural and economic progress of the island, and the sustainable human development (*El Diario*, 2010). The implementation of this educational measure strongly related to the strategic objectives of the PDS-97 leads us to conclude that there was really a need to materialize a strategy that helps to guarantee a perpetual sustainable future by making new generations aware of the practices and benefits of the Sustainable Development Plan of the island.

The Review of the PDS-97 made in 2006 includes a Revitalization Plan¹⁰. Its purpose is, on the one hand, to boost the growth capacity of the insular economy and, on the other, to incorporate gradually resources, infrastructures and sustainable activities. This section includes economic-financial tables specifying the field of action and their respective strategic goals, a specific program to adhere to, and a very detailed budget.

¹⁰ “Plan de Dinamización (my translation).

The following chart is an example of the economic-financial tables mentioned gathering actions that were supposed to be carried out from 2007 to 2010 and some other actions that are planned to be performed until 2020. This one explains environmental resources management actions to perform in key sustainability sector such as waste management and the wind-hydro-pump station.

FICHA NUM. 2 COBERTURAS SOSTENIBLES	PLAN DE DESARROLLO SOSTENIBLE (2007 – 2020)																	
	2007 – 2010						2011 – 2020											
OBJETIVOS ESTRATEGICOS	<ul style="list-style-type: none"> ✓ Creación de la OFICINA DE GESTION DE LA RESERVA. ✓ Completar los despliegues de protección, conservación y gestión de los ecosistemas y biodiversidad insular 						<ul style="list-style-type: none"> ✓ Disponer, en 2010, de Ciclo Integral Hídrico y entre 2007-2008 del Plan de Tratamiento de Residuos. ✓ Gestión y puesta en valor sostenible, bajo criterios estrictos, de los Recursos ambientales para uso social y turístico. 											
METAS ESTRATEGICAS	<ul style="list-style-type: none"> ✓ Avanzar en los objetivos del Protocolo de Kyoto. ✓ Creación del sistema de "contabilidad ambiental" familiar. ✓ Dotación financiera de los Planes-Programas de los ENPs. ✓ Plan de Cheque sobre Residuos y Movilidad sostenible 						<ul style="list-style-type: none"> ✓ Incremento promedio anual del 2% en uso del transporte público. ✓ Completar al 100% el Plan de Saneamiento, depuración y reutilización. ✓ Plan Especial de Medianías, asociado al Programa anti-desertización. ✓ Plan "Productos Biosfera" incorporados a la MARCA INSULAR. 											
PROGRAMAS	PROGRAMA RESERVA DE LA BIOSFERA. PROGRAMA DE GESTIÓN DE SECTORES CLAVES AMBIENTALES (todos los Programas se iniciarán en 2007-2010 y dispondrán de una segunda fase 2011-2020)						PROGRAMA DE CONTROL DE IMPACTOS DEL DESPLIEGUE TURISTICO PROGRAMA SOCIAL "100 x 100 AMBIENTALES". PROGRAMA INFRAESTRUCTURAS SOSTENIBLES (estos Programas dispondrán su fase inicial en el periodo 2007-2010)											
ACCIONES	<ol style="list-style-type: none"> 1. Creación en 2007 del FORO POR LA SOSTENIBILIDAD. 2. Constitución en 2007 de la OFICINA DE GESTION DE CONSEJO DE LA RESERVA. 3. Gestionar el Programa de la MARCA INSULAR. 						<ol style="list-style-type: none"> 4. Negociar con el resto de las A.A.P.P. y sector privado la 2ª Fase del Ciclo Hídrico, Plan de Ahorro Energético, Plan de Residuos y Protocolos ambientales del Desarrollo Turístico (Pulos Turísticos). 5. Desplegar el PLAN MOVILIDAD MERIDIANA 											
FICHAS FINANCIERAS 10' euros		2007	2008	2009	2010	TOTAL	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	TOTAL	
	UE	0.3	0.4	0.4	0.4	1.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	7.5	
	ESTADO	10.0	10.0	10.0	1.5	31.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.7	1.7	1.7	1.7	15.8
	CAC	3.5	3.5	6.5	6.5	20.0	4.5	4.5	4.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	38.0
	CABILDO	3.5	3.5	4.5	4.5	16.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	45.0
	AYUNTAMIENTOS	0.5	0.5	0.5	0.5	2.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	6.0
	SECTOR PRIVADO	0.4	0.4	0.4	0.6	1.8	1.1	1.1	1.1	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	13.8

Chart 1

Admittedly, it should be noticed there is a high commitment towards the PDS-97 and a high level of organization, which could be the reason for the gradual progression that the island has experienced in a positive way as a sustainable territory. Although El Hierro has not achieved all the goals established from 2007 to 2020, it is a fact that it is making great advances since, for example, the Pump Station was only a project in 2014 and nowadays it became a reality. The usage and storing of renewable energy sources in the island is an opportunity to reduce environmental damages, but there is another crucial goal to achieve through the PDS-97, which is making economic resources available in the future as well as improving the social life quality of the citizens (El Diario, 2014; Morales, 2014).

6. TOURISM INDUSTRY IN EL HIERRO

The following point lies in analysing the tourism industry of El Hierro, clarifying which aspects of the island attract tourists and what kind of tourists travel to El Hierro, as well as verifying if the activities offered follow a sustainability line according to the principles exposed in the already mentioned Sustainable Development Plan.

Tourism has always been an underpinning of the economy in the Canary Islands but El Hierro was an isolated territory until its airport was built. Prior to that, it only had one ship that connected the island with Tenerife occasionally. Although the airport was opened in 1972, according to Aena.es, it was in the 1990's when the *Cabildo* of El Hierro saw tourism as a means to improve the economic situation as the primary sector was no longer the base of the island's income. Therefore a tourist strategy was created based on complementing the tourism sector with traditional activities such as agriculture and fishing, considering El Hierro a model of singularity as a tourism product, and seizing the opportunity for reactivating the primary sector.

In 1997, the *Cabildo* approved the so called Sustainable Development Plan as a manual to carry out actions to achieve the development of the socioeconomic system. This Plan brought several advantages for the tourism industry given that one of its main purposes was creating a Sustainable Tourism Model which, as mentioned before, would go together with the social and economic development of the island. However, in the early 2000s a conflict arose as to how tourism ought to be articulated in El Hierro. It was held that tourism needed to be fostered and turned into the main underpinning of the island's economy. Other voices though believed that non-regulated tourism would lead to overcrowding and destructive activities, ultimately harming the island's environment (Martín Fernández, 2009).

For that reason in 2006 the *Cabildo* set up a Special Territorial Plan of Tourism Management in El Hierro for regulating the construction of accommodation establishments and making sure that the island's landscapes kept being the base of any tourist activity. All these measures were adopted taking into account the dimensions of the island (270 m² approximately) where the concentration of the tourism offer would affect negatively the social life (Martín Fernández, 2009). Obviously the tourism development of El Hierro must follow a special strategy that makes use of its social and natural singularities. A strong focus on sustainable tourism (an

increasingly popular form of tourism) seems to be the most sensible option for El Hierro, instead of a standardized offer such as the ones developed in other areas of the archipelago.

With all this information we can assume it was always difficult for the island to develop tourism activity as an important source of income due to its economic backwardness mostly in the 1980's and its lack of infrastructure and financial resources for expansion. Back then, the island was kind of isolated and its economy was basically based on agriculture, farming and fishing. (Martín Fernández C., 2009). Thus, it was impossible to establish a mode of massive tourism as it was done in other locations of the Canaries. Hence, tourists that began to visit El Hierro were allocentric,¹¹ meaning they travel individually attracted by an exotic destination looking for adventure and barely known territories (Martín Fernández, 2009). Furthermore, in the same period there was some institutional scepticism on the part of public administrations about tourism. They did not consider this area as a potential source of income as tourist arrivals were scarce back then. But finally, the *Cabildo* ended up assuming that tourism would be a profitable industry for the island and appeared the term “four legs for the economy of El Hierro: agriculture, farming, fishing and the new tourism”¹², as a way to materialize the *touristification* of the island (Martín Fernández, 2009). Since then, the tourism industry in El Hierro experienced a development bringing more tourist arrivals and forcing the *Cabildo* to establish companies that could address the tourists' demand in terms of leisure and rural activities as well as accommodation (always following the sustainability guidelines established in the PDS-97 and in the Special Territorial Plan of Tourism Management).

El Hierro is different from the rest of the islands in the Canarian Archipelago. It is considered a virgin territory, barely industrialized, which avoids massive tourism and works for promoting quality tourism instead, respecting the environment and contact with nature (Sánchez, 2016). So the island focuses its tourist offer on activities that allow visiting the island without infringing sustainable practices, such as trekking, diving, gastronomic tourism, visiting beaches and natural pools, and guided visits to the most important places of the island. According to information in the social network Twitter of the *Cabildo* of El Hierro, there are also paragliding and hiking activities. Taking into account this information, in my view the island follows a good sustainable strategy just by offering activities that barely harm the environment and society, or at

¹¹ Allocentric: a tourist which tends to be self-confident and adventurous (also known as: drifter).

¹² “Cuatro patas para la economía herreña: agricultura, ganadería, pesca y el nuevo turismo” (my translation).

least, permits the sustainable development of the island avoiding aggressive infrastructures and the overcrowding that is seen in other islands. All the activities mentioned before have a common goal which is the conservation of the natural environment because that is the main motto: to see the beauty in nature that El Hierro offers. For that reason, the duty of protecting it becomes an inevitable commitment both for the tourists and the population in order to preserve the resources of the island and to keep promoting sustainability as the tourism form. Moreover, the fact that diving includes photography contests and not fishing is also an aspect that facilitates the conservation of the marine flora and fauna.

In order to know whether locals and tourists are involved in this kind of activities, I called one of the 10 diving centres in *La Restinga*, which is considered the best place in the island for diving, to get some information about the warnings given before an immersion. The owner of the business stated that they warn the clients in every immersion to be careful in order not to damage the marine species; that they must take into account that they are in a protected marine area belonging to the Biosphere Reserve. However that is not a difficult task. Diving tourists, according to the owner of La Restinga Diving Centre, tend to be aware of the importance of preserving marine flora and fauna. In addition, divers fall within the type of sustainable tourist due to their concern for the natural environment, which they know will disappear if they do not take care of it (Enrique Vargas: owner of La Restinga Diving Centre). Nevertheless, the efforts of the population and the *Cabildo* are not enough to preserve the environment. Thus tourists' behaviour also plays a crucial role on this regard. If their practices during the trip are not sustainable and they waste water and energy, throw trash around or take things such as plants or shells, it will be impossible to maintain the balance between human actions and El Hierro's wildlife.

As to transportation in the island, even though El Hierro is well communicated nowadays by air and sea, it is also important to know how to travel within the island. Is it feasible to use public transport or is it more comfortable to have a car? In order to answer this question, I made a research in the webpage of *TransHierro*, the company that operates passengers' transportation within the island, so as to review the buses' regular timetable. I found out that there are not routes available on Sundays and holidays and the buses run on the basis of a poorly distributed timetable, with long stretches of time between one bus and the next one. So it is arguable to state that travelling within the island is quite difficult since having a car is very much required to comfortably move around instead of deciding on using public transport. It is fair to say that using public transport is objectively more sustainable than using a private car. However, we should

factor in that El Hierro is a very small territory with few tourist arrivals. Therefore, the impact of private cars in El Hierro is not as severe as it would be in a larger island with far more tourists using the islands' resources every day.

On the other hand, as the island's airport is not directly connected to international destinations and a stopover is necessary to connect to national flights, the tourist arrivals are low compared to islands such as Tenerife or Gran Canaria. The same happens with marine transport, it is necessary to get a ship from other islands' ports to get to El Hierro.

Hereafter there are some charts included showing tourist information about El Hierro and Tenerife with the purpose of comparing data to show how different is tourism in El Hierro in respect to other islands, basing my criteria in a reliable source which is the ISTAC (Canarian Institute of Statistics).¹³

The following chart shows the passenger arrivals to *La Estaca* Seaport (El Hierro) and the Port of *Santa Cruz de Tenerife* with the purpose of comparing the tourist arrivals by sea transport to the different islands.

	Pasajeros en línea regular	
	Puerto de Santa Cruz de Tenerife	Puerto de La Estaca
2018 Marzo (p)	126.014	12.533
2018 Febrero (p)	87.195	9.199
2018 Enero (p)	83.484	7.977
2017 TOTAL (p)	1.461.603	156.384
2016 TOTAL	1.319.165	125.157
2015 TOTAL	1.286.200	108.568
2014 TOTAL	1.222.540	89.218

Chart 2

The following chart shows the regular passenger arrivals to the airport of El Hierro and the airports of Tenerife with the purpose of comparing the tourist arrivals by air transport to the different island.

¹³ ISTAC (Instituto Canario de Estadísticas).

	Aeropuerto de Tenerife Norte	Aeropuerto de Tenerife Sur	El Hierro
	TOTAL	TOTAL	TOTAL
Regular			
2018 Marzo (p)	430.332	830.772	19.225
2018 Febrero (p)	357.461	732.128	15.758
2018 Enero (p)	374.428	768.706	17.015
2017 Diciembre (p)	422.223	783.710	19.666
2017 Septiembre (p)	428.237	773.126	20.954
2017 Junio (p)	379.506	724.412	14.579
2017 Marzo (p)	352.594	794.743	12.611
2017 Enero (p)	313.059	731.560	11.835
2016 TOTAL (p)	4.160.417	8.228.120	155.259
2015 TOTAL (p)	3.796.517	6.971.951	145.675
2014 TOTAL (p)	3.603.415	6.722.001	147.543

Chart 3

Taking into account the huge difference between these two islands, we assume that due to the low number of tourist arrivals to El Hierro, the damage caused by transit of cars is not critical but the best way to maintain a sustainable balance within all the factors considered in the PDS-97 would be improving the availability and timetable of public transport.

Besides, this reduced number of tourist arrivals implies a minor impact on the environment and the society because the carrying capacity of the territory is not exceeded. On the other hand, it makes the consumption of water and energy marginal at the destination. As the ships are a threat to marine species, a reduced arrival of maritime transportation means a minor impact on the marine environment. In addition, getting a flight is the most polluting action of a trip (Zeiss, 2017). As El Hierro does not have an international airport, the number of flights is quite reduced, meaning fewer emissions of greenhouse gases. Ultimately, the fact that El Hierro has largely avoided overcrowding makes it easier to conserve natural lands, which will not be turned into tourism-related infrastructures (e.g. large hotels and airports and similar constructions).

In order to get a visual idea of the quantity of tourists that stay in El Hierro, I researched the ISTAC (Canarian Institute of Statistics). This first chart shows the occupancy rate by occupied room in El Hierro and Tenerife so we can compare them and have a clearer conception of the data of El Hierro:

Tasa de ocupación por plazas	
El Hierro	
2018 Abril	26,45
2018 Marzo	24,74
2018 Febrero	39,86
2018 Enero	23,08
2017	30,87
2016	26,15
2015	20,95

Chart 4

Tasa de ocupación por plazas		
	Tenerife	El Hierro
2018 Abril	66,58	26,45
2018 Marzo	72,51	24,74
2018 Febrero	75,39	39,86
2018 Enero	72,79	23,08
2017	74,76	30,87
2016	75,35	26,15
2015	68,49	20,95

Chart 5

As we can see, the occupancy rate in El Hierro is not as high in Tenerife; first of all because the dimensions of each island are very different and secondly because Tenerife promotes mass tourism in the vast majority of its territory whereas El Hierro promotes tourism as another sustainable activity in all its areas.

Thereupon, I decided to reflect in some way the economic impact that tourist activity produces in El Hierro since I have no information from public administrations about this and I consider it an important aspect of how the tourism industry influences the territory. Thus I gathered some charts from the ISTAC showing the average daily income obtained by room/apartment occupied (ADR)¹⁴ and the average daily income obtained by room/apartment available (RevPar)¹⁵.

¹⁴ ADR: Average Daily Rate.

¹⁵ RevPar: Revenue Per Available Room.

	Frontera	Valverde	El Pinar de El Hierro
Ingresos por habitación disponible (RevPAR)			
2018 Abril	19,80	32,08	19,22
2018 Marzo	10,91	41,20	19,06
2018 Febrero	13,72	46,60	22,49
2018 Enero	9,60	33,85	21,08
2017	15,74	36,76	15,32
2016	12,24	30,18	13,43
2015	11,05	26,28	13,65
Ingresos totales			
2018 Abril	91.492,78	95.266,29	25.365,00
2018 Marzo	52.062,98	126.430,63	25.992,00
2018 Febrero	59.154,60	129.186,95	27.713,01
2018 Enero	45.847,28	103.884,27	28.752,00
2017	884.750,98	1.328.345,09	311.921,74
2016	689.945,29	1.093.619,06	314.652,57
2015	620.848,33	949.741,88	318.765,51
Tarifa media por habitación mensual (ADR)			
2018 Abril	44,60	60,45	39,85
2018 Marzo	38,17	68,33	38,82
2018 Febrero	39,24	65,89	39,87
2018 Enero	36,14	65,03	40,35
2017	42,69	66,32	37,30
2016	42,05	63,96	35,82
2015	41,32	63,00	37,51

Chart 6

As we can see in the chart the income is distributed within municipalities. More income is generated in *Valverde*. This can be explained on the basis of what Javier Molina claimed in the interview; that every week groups of experts come to visit the wind-hydro-pumped station located here in *Valverde*. Another reason that could explain this income difference is that the airport of the island is located also in this municipality so it is easier for tourists to stay here rather than in *La Frontera* or *El Pinar del Hierro*.

Javier Molina talked in the interview about the distribution of hotels and apartments in El Hierro and he said they are strategically distributed within the island in order to avoid concentration and to distribute benefits within all the population. This information seems to be reflected in the previous chart and demonstrates that several objectives established in the PDS-97 to accomplish from 2007 to 2020 are being carried out properly.

Among the several positive impacts that the PDS-97 have brought to El Hierro, there is one major element that needs to be pointed out: the development of Scientific Tourism. This type

of tourism came as a result of the building of the hydro-pump station, which is a world reference in the industry of renewable energies (Morales, 2018). Javier Morales declared that every week scientists and agents from all over the world come to visit the wind-hydro-pump station *Gorona del Viento* and have a look at its system in order to get inspiration for their country. This stimulates international cooperation and recognition as well as further institutional support, and, of course, the direct economic benefits of tourists (in this case scientists) visiting the island.

Tourism is far from being a sustainable activity itself but El Hierro is making an effort in turning it into a more respectful domain by including the tourism industry as a crucial pillar of the Sustainable Development Plan. Sustainable tourism must preserve natural and rural values as the main quality of a tourism product. The island is following several sustainable measures in order to achieve the goals related to tourism already mentioned. It is likewise doing so by respecting the carrying capacity of the territory and the society so far.

7. ACCOMMODATION ESTABLISHMENTS IN EL HIERRO

One of the most important things by the time we plan a trip is where we are going to stay. A logical following question may ensue: do the accommodation establishments in the island of El Hierro stick to the sustainability plan already mentioned? By addressing this question, we may be able to figure out if the sustainability plan under scrutiny is contributing positively by making the tourists stay a more responsible activity or, on the contrary, if this plan is mere a marketing strategy that does not really comply with sustainability as an overall principle. In order to find that out, I have carried out exhaustive research through several online booking portals for accommodation such as Booking.com, Airbnb, etc. and I have figured out that the vast majority of the accommodation establishments in the island are private rural houses, apartments or holiday homes.

The first step in this research was looking for accommodation in El Hierro without specifying the municipality or type of accommodation in Bookin.com, one of the most popular online portals for accommodation, and I followed the same steps with the rest online portals. The result of this first search was that, out of 43 accommodation establishments found in

Booking.com, 8 are non-conventional apartments (meaning private buildings for renting to tourists), 4 are conventional apartment resorts and 3 hotels. The rest of the total amount is rural houses or private holiday homes. Besides, in Airbnb.es, I found 94 accommodation establishments. Taking into account that Airbnb solely offers private houses to be rented, I assumed that the offer is constituted mostly by private properties that are rented temporary to tourists. Moreover, 44 out of these 94 accommodation offers are rural houses. According to Trivago.es, in principle, we can find 32 accommodation offers classified as hotels but actually we find the very same establishments as in Booking. This is because Trivago is just a comparator of many different booking web pages, consequently I will just take into account the data collected from Booking.com.

On the other hand, using Kayak.es as search reference, we can see that there are 38 accommodation offers classified as hotels. However we find a very similar situation to the previous one, so I will stick to the first piece of research. With regard to the official web page of Aena.es, there are 3 “official” hotels in the island: Boomerang Hotel, Villa El Mocanal Hotel and El Parador. Finally I have consulted the most popular opinion webpage Tripadvisor.es for tourist accommodation offers through which we can also make a reservation. This one classifies the accommodation establishments in the following way: hotels (9), Bed & Breakfast/Hostels (8), and special accommodations (22). The last classification; special accommodation, includes a mix of apartments and private holiday homes as well as rural houses, just as in the previous researches. In addition, I have also checked platforms such as HolidayCheck.de and Expedia.es obtaining very similar results, as well as Logitravel.com, in which only three establishments are featured. With the information researched above, I have only managed to verify that there are only 5 officially recognized hotels in the whole island: El Parador***, Balneario Pozo de La Salud Hotel***, Ida Inés Hotel**, Boomerang Hotel** and Villa El Mocanal Hotel**.

Having collected all this information, it is clear that the majority of the accommodation offers are rural particular houses and private houses, which is an aspect that, in my opinion, complies with sustainability because of the following reasons:

- The energy obtained comes from renewable energy as these building are connected to the general electric grid.
- Large hotels buildings are not constructed, so natural areas are largely preserved.
- It avoids massive tourism as there is not a large number of rooms.

- It helps to avoid concentration of tourism offers in just one area.
- It helps to distribute the benefits evenly within the population avoiding having one large hotel monopolize all the revenue.

It is yet to be confirmed that hotels are also connected to this source of energy supply or if they obtain electrical power differently. However, according to a newsletter published in rtve.es¹⁶, El Hierro achieved a new record being supplied for 55 hours completely on the basis of renewable electrical power in 2016, July 10th. The wind-hydro-pumped station *Gorona del Viento* provided 100% of the electrical power of the island during this period of time. This definitely means that every establishment in the island is connected to this power plant getting the electrical power from its renewable energy sources automatically since its construction (rtve, 2016).

8. CONCLUSION:

Tourism is per se a wasteful activity. There is a way to illustrate the harm of human arrivals to the planet. Let us compress the last 20 million years (ranging from the moment when the first island emerged to nowadays) into just one year. The natural environment developed itself without human beings from January 1st until the emergence of humans at 22:30 on December 21st. In this context the *tourism boom* only lasted the last 60 seconds of the year. Thus we can picture how damaging the tourism industry has been to the natural environment (Aguilera et al., p. 125, 1994). Therefore we as human beings have a commitment to the environment.

In the Canary Islands there should be extreme commitment to sustainability as the tourism industry has experienced a huge expansion, disrupting the traditional distribution of the local population, creating overcrowded tourism areas in the shore, building infrastructures, and destroying the best ecosystems in the whole archipelago (Aguilera et al., 1994). El Hierro started the initiative of the Sustainable Development Plan with the idea of being clean, ecological and responsible with the environment. The *Cabildo* also wanted to invest public funds in something useful. This sustainability plan led to the building of the wind-hydro-pump station *Gorona del*

¹⁶ Rtve: Radio Televisión Española. It is a national webpage for news.

Viento for providing energy from renewable sources and finally, the PDS-97 ended up being a culture of its own within the local population. Nowadays *Gorona del Viento* produces 70% of the energy needed in the island daily and the remaining 30% of the energy needed is provided by diesel, which means an annual energy saving of 55% and the *Cabildo* has established the aim of being a 100% renewable island (Morales, 2018).

As an overall conclusion I would like to revise my original goals so as to individually check the extent to which each of them has been fulfilled. Regarding the first objective (to clarify which aspects of El Hierro attract tourists), El Hierro is considered a virgin territory for visitors given it is barely industrialized and permits a close contact with nature. The leisure offer of the island is based on activities that permit the tourist visit the island and its landscapes without causing an extreme damage to the environment such as trekking, diving, gastronomic tourism and so on. Through these activities tourists can enjoy the beauty of nature as well as experience the cultural singularities of the island. Moreover, the fact that El Hierro is the first island carrying out a project based on electric supply from renewable energy sources is a tourist attraction itself. On the other hand, the wind-hydro-pump station constitutes a special attraction for other countries' governments, which regularly send representatives and scientists. As for the second objective (to analyse which type of tourists travel to the island), the visitors of El Hierro are strongly linked to the natural environment and they travel to the island looking for tranquillity and to avoid massive tourism so the commitment of preserving the natural resources of the island becomes, inevitably, a duty for public authorities. The fact that diving is one of the most popular activities of the island (due to *La Restinga* being a marine reserve itself) has attracted large numbers of tourists particularly interested in diving. The owner of La Restinga Diving Centre affirmed that this kind of visitors tend to be aware of the importance of preserving the marine flora and fauna as well as its entire environment, which makes them fall within the type of responsible tourists. Regarding the third objective (to analyse if there is kind of a sustainability culture in the island that attracts alternative tourists), and as I mentioned before, the establishment of the Sustainable Development Plan was premised on the idea of being an ecological island. However, it ended up becoming kind of a culture of its own within the population of El Hierro. The citizens respect their traditional activities and keep improving their economy and society following the sustainability guidelines established in the PDS-97. The strong support of both locals and authorities to the renewable energy programs paved the way for the construction of the wind-hydro-pump station *Gorona del Viento*, which nowadays is visited by many scientists. Scientific Tourism has thus become a pillar of the tourism industry of the island.

As regards the fourth objective (to prove if accommodation establishments follow a sustainability line), after revising the kind of accommodation offers of El Hierro, the vast majority consisted of rural particular houses and private houses that belong to locals. The way accommodation is run complies with sustainability principles. It helps to avoid overcrowded tourist areas, it does not destroy natural protected areas by building large hotels, it obtains renewable energy (as these houses are connected to the general electric grid) and it distributes benefits within the population. Moreover, the fact that the energy consumption by tourists is covered by renewable energy sources mitigates the negative impacts that energy waste could cause to the environment. As for the fifth objective (to study if the Sustainable Development Plan is being carried out properly or it is just a marketing image), there is still a lot to do in this area, but all the information considered demonstrates that both the *Cabildo* of El Hierro and the local population have adequately carried out their duties so far so as to guarantee the sustainable future of the island. They are implementing sustainable practices in schools from an early age; they are even developing forms of getting recycled fertilizers, and they improve every year the distribution of energy from renewable sources. Above all, they are improving every year not only the energy supply from renewable energies in order to achieve a cleaner environment, but they are also working to achieve a sustainable human development (El Diario, 2010). All in all, the Sustainable Development Plan is, in my opinion, a reality rather a marketing image even though all the objectives have not been materialized yet.

After all, I figured out that surprisingly the Sustainable Development Plan is strongly related to the control of tourism development with the purpose of making it more responsible and ensure further economic incomes. The *Cabildo* even implemented the Special Plan of Tourism Management in order to achieve the main goals of the PDS-97, which are improving the quality of life of local citizens and securing a better world for the future generations. Ultimately, the goals pursued by El Hierro's authorities and locals can be boiled to former US president Barack Obama's line: "we only get one planet. There is no Plan B".

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