

Circular Economy in Haiti and Least Developed Countries to Improve Social Justice The Missing Aspects of The Circular Economy Discourse

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Abstract

Current development aid methods implemented by NGOs have demonstrated to generate negative consequences as for example to weaken the role of state, create dependency and reproduce imperialistic power relations. Furthermore, despite great efforts, good wills and a lot of money spent by NGOs and international agencies for development aid projects in Haiti all along the last few decades, little to no results have been reached in a long-term perspective. The purpose of this work is therefore to present and evaluate a new strategy for the field of developmental aid, which is based in this case on the circular economy principles and that is intended to produce a long-lasting change. Circular economy is a relatively new method of thinking about production which will lead the economy of the future, however, its positive effects have been analyzed only in relation to the industrialized and industrializing world, while for the moment no studies have been produced to understand its applicability in the least developed countries of the world. Therefore, this article is of exploratory nature and aims to start a discussion on this subject and to contribute to the understanding of the benefits that circular economy-based projects could generate in fragile and failed states like Haiti. The method utilized has been the one of bibliographic research and a case study, which deeply describe a social-eco enterprise that works in Haiti applying circular economy principles to its projects, is provided. The results confirmed our hypothesis and sustained the idea that to generate long lasting changes and to improve social justice in Haiti and in the other least developed countries of the world, these kind of projects are more than necessary. While the main limit of our method is that we have been able to presents a single case study only, to conclude, we suggest that further studies in this direction and the provision of more case studies by other researchers could better contribute to the solving of the questions generated by this research and could provide more data in support of our assumptions.

Keywords: Circular Economy, Least Developed Countries, Development Aid, Social Justice, Haiti

1. Introduction

The main objective of this work is to describe in which measure the principles of circular economy (CE), the alternative economic system of which in recent times we hear more and more often in our Western society discourse, could be applied and become an everyday practice for local development in Haiti and, more generally, in the least developed countries of the world. Secondly, is to analyze the impact that the circular economy model can have in fostering social justice, and therefore, to evaluate not only the benefits that CE can bring for the natural environment and for the economy, but also, directly, for the people. What we want to do in these pages, quoting Schröder, Anantharaman, Anggraeni and

Foxon (2019, p. 211)[1], is “to give voice and more recognition to the missing social and human dimension in current CE discourse”.

In other words, we will investigate on the grade of interrelation between circular economy principles, environment preservation, enhancement of the local economy and generation of social value (for example by creating new job opportunities) using as a case study an organization active in Haiti that is called ‘El Fuego del Sol’. The belief behind this research is that it is possible, and necessary, to work using this model, in Haiti as in many others of the least developed countries list of the United Nation and the case study we will provide should contribute to confirm (or refuse)

this idea. By the end, a suggestion will be made: development aid in Haiti should be less and less a monopoly of foreign aid organizations (non-governmental organizations - NGOs and national or international agencies) and should be no longer anchored to the reductive model of emergency/charitable aid. Vice versa, development aid should enter the market to become an economic activity that generates incomes for the locals, cleaner solutions for the environment and, mostly, that is carried out by the Haitians, for the Haitians.

The main objective of this article is to explore how circularity in production can be designed to be applied, and bring benefits, in one of those countries of the so-called Global South: Haiti. In this country industrialization is in its primordial state, being Haiti essentially a peasant economy, nor, of course, industrialization is quickly evolving as it is happening in many developing Asian and African economies today. Furthermore, Haiti is also finding many difficulties in attracting foreign investments, due to its political instability and lack of infrastructures, the same motivations that keep tourists away from this potential Caribbean paradise. In particular, therefore, what we would try to understand is how the circular economic model can find applicability in a stagnant, underdeveloped economy and how it could help in attain economic and ecological benefits from a side, but, most than all, to identify and evaluate the social benefits that such a model can generate. If, therefore, the concept of circular economy has developed in contexts of strong industrialization (see China) and is finding more attention in advanced societies, (in Europe the leaders are Finland and Holland), up to date very little has been produced in terms of scientific studies in regards of the applicability of circular economy in contexts of underdevelopment, or rather, in societies where industrialization is still in its infancy. For this reason, data on circular economy projects in the underdeveloped world is very

scarce and mostly inexistent. To the author's knowledge the first work of this kind is represented by the 2016 publication of the Tearfund agency and it is entitled: 'Closing the loop. The benefits of the circular economy for developing countries and emerging economies'(Fernandes, 2016) [2]. To it followed later, in 2019, two more publications: 'The circular economy in the Global South' and 'Circular economy: waste-to-wealth, jobs creation, and innovation in the Global South'. The first is a book and, reporting the words of its curators Schröder, Anantharaman, Anggraeni, & Foxon (2019) [1]: "[it] wants to examines the relevance of the circular economy in the context of developing countries, something which to date is little understood. The second work is instead an article. In it, the authors Conlon, Jayasinghe & Dasanayake (2019) [3] query:

Is there space within the CE dialogues for bottom-up CE approaches that address existing ecological and social considerations? Can CE discussions move beyond industry and economic gains, and into the rationale of increasing local livelihoods and keeping materials out of the local waste stream?

It follows that in those three publications, a broad range of case studies are presented, including Argentina, Brazil, China, Colombia, India, Indonesia, Kenya, South Africa, Sri Lanka and Thailand. It therefore appears immediately clear that although the several case studies reported are concerning developing countries and fast growing economies, none of them is dedicated to those countries included by the United Nation in the so-called 'List of the Least Developed Countries' (LDCs)[Figure 1]. The already mentioned list was updated at December 2018 and comprehend today forty-seven countries, being Haiti included in it since the very beginning. It is in these countries, precisely, where the 'bottom billion' of people of the famous book of Paul Collier (2007) live, a number that in the last decade grew considerably.

List of Least Developed Countries (as of December 2018) *

Country	Year of inclusion	Country	Year of inclusion
Afghanistan	1971	Malawi	1971
Angola ¹	1994	Mali	1971
Bangladesh	1975	Mauritania	1986
Benin	1971	Mozambique	1988
Bhutan ²	1971	Myanmar	1987
Burkina Faso	1971	Nepal	1971
Burundi	1971	Niger	1971
Cambodia	1991	Rwanda	1971
Central African Republic	1975	São Tomé and Príncipe ³	1982
Chad	1971	Senegal	2000
Comoros	1977	Sierra Leone	1982
Democratic Republic of the Congo	1991	Solomon Islands ⁴	1991
Djibouti	1982	Somalia	1971
Eritrea	1994	South Sudan	2012
Ethiopia	1971	Sudan	1971
Gambia	1975	Timor-Leste	2003
Guinea	1971	Togo	1982
Guinea-Bissau	1981	Tuvalu	1986
Haiti	1971	Uganda	1971
Kiribati	1986	United Republic of Tanzania	1971
Lao People's Democratic Republic	1971	Vanuatu ⁵	1985
Lesotho	1971	Yemen	1971
Liberia	1990	Zambia	1991
Madagascar	1991		

* The list will be updated when new decisions become available.

Figure 1. List of the Least Developed Countries (United Nations [UN], 2018)

Our work, therefore, would like to go a little further in respect to the three studies mentioned above, asking for example if and how a circular economy model could find its own application even where very little is produced, the governments are highly inefficient and where the economy is subjugated, in most of the cases, to external factors. Haiti, in fact, represents the archetypical example of that situation even being the only American state of the LDCs list. A state that has much more in common with many African countries than with its Caribbean neighbors and which bases its survival on humanitarian aid, both in regards of social services and in relation to the availability of primary goods, which in Haiti are largely imported.

Now, someone could dispute that a state that produces little or produces nothing, does not require, or in any case does not need to consider among its priorities, that of closing the circle, bringing production and consumer's waste, disposed goods and other materials, again at the beginning of the production cycle. A criticism of this kind, however, would not take into consideration the fact that circular economy must not be intended only as a way to fix or alleviate the problems generated by the linear economy and therefore applicable only to the growing economies. Although, the circular economy is, and must be intended as a new way of thinking and doing business, both from a top-down perspective and from a bottom-up or grassroots level. If in the industrialized world circular economy can be the opportunity to change production patterns in a more sustainable way, in the LDCs circular economy can constitute the opportunity to start production, where it was not existing. It follows that the least developed countries could gain a lot from a bottom-up approach to CE. Furthermore, as it has been reported, the consequences of this industrial prioritization of the CE discourse are that "grassroots stakeholder inclusion or civic inclusion in CE dialogues are sometimes excluded, and opportunities for inclusion and increased CE activities at grassroots social enterprise levels for livelihoods are missed" (Conlon et al., 2019, p. 148) [3]. This work, therefore, aims to contribute to develop a reflection on this matter, for the benefit of those people who live of extreme hardship in underdeveloped and failed countries and that needs, in some way, to be prioritized.

2. Method

For the preparation of the case study we used data we were able to find on the web, except for the interview we submitted to Kevin Adair, CEO of the organization, which is original. In particular, the official website of El Fuego del Sol (FdS) has been our main source of data as it reports much of the information that have been used for the writing of the following case study. On this website, in addition to the essential information reported, a series of links helped us expand our research with further material. In particular we refer to the 'media' button, through which visitors can link to more data in regard of the organization, such as press articles, videos, documentaries and a radio interview. Through the 'media' button, one can also be redirect to another website, called 'Medium' where many articles and papers written by the CEO Kevin Adair are made available. Besides, we have been

able to personally visit the organization in Haiti, in July 2018 and in this occasion we met with both Kevin Adair and the general manager of the organization, Frantz Fanfan. Subsequently, regular contacts have been maintained and, during the last year, opinions and updates have been exchanged using alternatively both the telecommunication applications Skype® and Zoom® and by email. Consequently, some of the statements, ideas and arguments that will be made and reported in the following case study have developed thanks to this professional relationship that we kept with the founder of El Fuego del Sol while others are rooted in the experience we had on the field, during our stay in Haiti.

3. Case Study

3.1 Origins

The 'El Fuego del Sol' organization, as the name suggests (from Spanish, the fire of the sun), was not born in Haiti but instead in the neighboring Dominican Republic (DR). Its roots date back to 2005 when an American citizen arrived to the island from Chicago, Illinois, with the plan to begin an organization working on water purification. His name is Kevin Adair and at the Illinois Wesleyan University he pursued two majors, experimental psychology and theater. Adair, after speaking to the locals about the daily needs in their lives that required improvements, "found time after time again that [instead of water purification] cooking was cited as a serious problem. With a joint Haitian-Dominican-American founding team, El Fuego del Sol was born" (El Fuego del Sol [FdS], n.d.) [5] and the direction to be followed was now clear. The staff of El Fuego del Sol started, consequently, the developing of a program for building, distributing and selling solar ovens in the DR and this explain the reason behind the Spanish name that has been chosen for the organization. "The Grupo Jaragua & FdS project reached over 200 families with clean-cooking sun ovens promotion, introduction, training and follow-up" (Adair, 2019, p. 31) [6] it is reported in the latest paper written by the founder of the organization. Despite the success of this initiative, however, soon a big limit to a widespread adoption by the target population of the solar ovens became evident, the fact that they could not be used in the absence of sun, at night, or on rainy and cloudy days. Furthermore solar ovens are quite expensive as the final selling cost is around three hundred dollars each, a price that was not affordable for Dominican families, and the ovens distribution was happening thanks to donors in the US. Being one of the core principles of FdS the one that say "where traditional NGOs provide gifts, FdS creates long-lasting employment opportunities" (El Fuego del Sol, n.d.) [5], it was now mandatory to change and the time for change was mature.

The success achieved with the project of solar ovens should not have constitute a limit for a radical change in the project. The desired solution should have guaranteed to the Dominican families to cook at any time of the day, but mostly, should have also been produced locally in order to contribute to create stable jobs, and above all, it should not have been simply donated, but purchased by the latters because convenient to them. This would have guarantee the adoption of the solution and the self-financing

of the project. Besides to be locally produced by local workforce, the new technology should therefore have entered the market and consequently take the distance from traditional developing aid methods, which are mostly based on donations. Donations, as many claim, while constitute an initial and temporary relief in cases of need, are long-term highly counterproductive, as they damage local markets and create dependency and not empowerment. Aid models based on donations “do not always contribute positively to the democratization process” while “the unintended consequence of promoting this model has been the growth of a culture of ‘organised dependency’ at the grass-roots level” (Sahoo, 2013, p. 258) [7]. To paraphrase an old popular saying, that has been usually not listened enough in developmental aid, and especially as we have seen in the second chapter, in Haiti; to produce a long lasting change one has to find a way to teach how to fish: this will feed someone for a lifetime. Traditional methods of aid, unfortunately, still continued to provide fish, instead of teaching how to fish.

3.2 The beginning of the briquettes project

Looking for ecological alternatives that could have met the above

requirements, FdS started in Villa Jaragua, a Dominican city close to the border with Haiti, to produce ecological briquettes made of recycled paper, cardboard and sawdust [Figure 2], to be associated with imported cookstoves from China. The briquettes would have replaced wood and charcoal biomasses for the cooking of food. These cookstoves were not yet made locally, but represented the first step in the path for the substitution of the traditional inefficient and unhealthy cooking methods with more efficient ones. The imported cookstoves were specifically made to cook in combination with the ecological non-carbonized pressed briquettes locally produced. This method, being much more efficient than the traditional one, contributed in saving threes both because less biomasses were needed to cook a meal and because the utilized biomasses came from waste materials such as paper, cardboard, sawdust and others. Furthermore, the briquettes cookstoves system was much closer to the cooking habits of the Dominicans in respect of the solar ovens system and consequently was much easily adopted. The briquettes, locally made with local waste, created job opportunities while helping to improve local environment. The path to be followed was finally established.



Figure 2. A briquette made of paper, cardboard and sawdust, (El Fuego del Sol, n.d.)

3.3 Moving to Haiti

In 2012, after two years since the start of the briquettes project in the Dominican city of Villa Jaragua, FdS moved to Port-au-Prince, Haiti, under the invitation of the World Food Programme (WFP) [8]. This started a collaboration which continues to this day, whose preamble can be resumed by the following statements of Benoit Mazy and Joseph Davidson that has been reported by Adair (2019, p. 31):

Every day, schools burn 85 grams of charcoal per served meal. WFP’s school feeding project in Haiti is covering approximately one million children, which means the amount of charcoal burned per day reaches 85 tons... The use of charcoal is very costly, and the current cooking method creates indoor air pollution and significant health issues for cooks. WFP has worked towards mitigating this impact to protect the environment, reduce the costs of cooking school meals, and improve cooking conditions for cooks.

The WFP was then looking for a viable solution to substitute wood and charcoal for the preparation of the meals of the kids in the Haitian

schools. This organization was aware already of the non-carbonized briquettes technology and started, with a Brazilian funding, to buy, stock and distribute more clean cookstoves imported from India in many Haitian schools (World Food Programme [WFP], 2012) [8]. What they needed, consequently, were now huge quantities of briquettes to be used with the cookstoves they were distributing. When the WFP learned about the success of the briquettes project of FdS in Dominican Republic, offered to start a big pilot project to provide briquettes to the Haitian schools of Port-au-Prince. This has constitute the opportunity to scale up and expand that FdS was waiting for. More briquettes would have signified less charcoal around and the saving of many more threes. But also, the creation of many job opportunities for the locals. FdS accepted the offer. To start the new operations in Haiti, FdS received a three months grant of USD 18.300 from the UN affiliated agency International Organization for Migrations (Adair, 2019) [6]. This funds have been spent “to rent our first facility, build our first [improved] briquette press and hire 20 employees who were selected by the International Organization for Migrations (IOM) since they were

still negatively affected by the 2010 earthquake” reports the CEO of FdS (Adair, 2019, p. 32) [6]. The latter, in his latest study, also reports an extract of an email who received in 2013 by Tobias Metzner, IOM Coordinator, that is worth to be mentioned here as well: “...IOM worked with FdS in the context of a livelihood project to engage twenty victims of the Earthquake in sustainable jobs. Kevin was very willing to [pay the workers] a living wage, almost twice the minimum wage, and a profit share model” (Adair, 2019, p. 32) [6]. A great start, from the point of view of our research. Looking for improvements to social justice in Haiti, we already have found that this collaboration between WFP, IOM and FdS had, since its inception, created twenty new jobs opportunities that have furthermore been offered to people in a fragile situation as they were still negatively affected by the earthquake of 2010. To these workers, while over time some of the 20 original ones have followed their route and left the organization, many new ones have been hired. From the last data available that have been shared with us by Adair during the interview, FdS could count in 2018 on twelve full time employees plus thirty part time employees among the Haitian nationals, for a total of forty-two people.

3.4 A Socio-eco enterprise

The deep attention to social aspects, which FdS promises to improve through its environment-oriented projects, self-financing itself thanks to the revenues generated from the sale of its products, makes of this organization what it can be defined a Social-Eco Enterprise (SEE). As reported by the funder, grants are also considered, but “FdS utilizes grants to achieve efficient start-up and scale up of operations, but then funds the programs long-term from program based income” (Adair, 2019, p. 32) [6]. While being a SEE, El Fuego del Sol also holds US IRS 501(c) (3) status, that allows donators from the United States to deduct the amount of their donations to FdS from the taxes paid to the US government. Therefore, even if FdS has a charitable recognized status with the US government, so as not to have to give up any possible donation which in this field are very important, it never applied for any NGO recognition with the Haitian government. The reason of this has to be found in the fact that FdS method, as we will see, while keep similar objectives, is in fact very different from that of the classic NGOs from which it would also like to take a certain degree of distance. For this reason the best way to define FdS is, as we have reported and as it is wanted by its founder, as an enterprise, and more specifically as a social-ecological one. Moreover, as indicated in the official website “FdS Haiti follows international fair trade standards in all operations in Haiti, the DR and the US. FdS requires all suppliers and business partners to follow fair trade standards as well. We are deeply committed to being ethical, sustainable, and impactful in all that we do” (El Fuego del Sol, n.d.).

3.5 The Involvement of the Haitians

El Fuego del Sol wanted, since the beginning, to include local people and local communities in its projects. This mission is reported directly in most of the documents of the organization as in the website, in the press, in the co-produced video documentary

‘Chabon’ and many other media. During our interview with Adair he also confirmed this belief: development aid must be long term and furthermore it must create long-lasting opportunities on the ground. Furthermore, as reported on the FdS website, two of the main goals of the organizations are: 1- To foster growth and 2- To empower local people. Both things that we believe can be reached with the setting up of a CE project.

The major partner of Adair for example, that now is occupying the position of general manager of FdS, is Haitian born, emigrated with his family to the Dominican Republic when he was a child. His name is Frantz Fanfan and he is working with FdS since the beginning. Once FdS moved to Haiti, Fanfan, who hold Dominican citizenship, agreed to go back to live in his native country where to continue to follow FdS activities and where to contribute to environmental and social issues through the projects of the organization. This is one of the first history of empowerment of local people that FdS made possible, but not the last. As reported, when FdS moved to Port-au-Prince, it hired twenty local people that were selected by the International Organization for Migrations among applicants that were still negatively affected by the earthquake of 2010. Moreover “seven of those original workers are still with FdS today, six years after the IOM funding of that program was completed” (Adair, 2019, p. 32). This must be recognized, it is a great achievement for FdS being that job stability is universally recognized as an essential aspect of social sustainability. In fact, it has been argued that the organizations that seek to achieve social sustainability in relation to their internal human resources, or people in the organization, should provide their employees with job opportunities which should not be influenced by uncertainties (Lourenço & Carvalho, 2013) [9]. This, unfortunately, is hard task in Haiti as economic and market crises, which may result in high levels of job instability, are very common. In the interview, we asked to Kevin Adair how many people are employed today by FdS. Being that part of the activities of FdS are seasonal, we will refer to the year of 2018 as we believe it is better to have full year data for 2018 than incomplete data for 2019. In 2018 FdS offered twelve (12) full-time positions and thirty (30) part-time ones for a total of forty-two (42) people directly financially benefits from FdS work. Furthermore, as Adair reported, in 2018 forty percent (40%) of the total were women, while in the management team two out of five also were women. This year, Adair affirms, this situation has not yet changed. FdS also has a program to encourage and facilitate people with disabilities and at the moment one of the FdS worker is assisted by a wheelchair. On this subject, Adair added that while they have a program, they receive very little application from people with disabilities. For the future, FdS would like to find the way to encourage more disabled people to apply for a position. Adair also reports that no statistical data or record is registered about the sexual orientation of the hired workers and adds that FdS policy is to hire blindly on this subject. Furthermore FdS has a specific policy for harassment at work including sexual harassment while, focus on the workplace are on efficiency, equality and safety. In regard of the age range, the youngest Haitian worker hired by FdS in 2018 was seventeen years old, whereas three workers in

the full-time group and five workers in the part-time group were over fifty-five years old. The age of all the rest of the workers is included in these boundaries.

3.6 The Briquettes Circular Project

The production of the FdS briquettes started in 2010 in Dominican Republic. The method, initially, was slow and the major improvements have been made in Haiti, especially with the

introduction of a new improved press that allowed faster production. Now, El Fuego del Sol is working with three of these presses. Furthermore, in Haiti, the imported inexpensive cookstoves to be associate with the briquettes to reach better performance have also been substituted with locally made, FdS designed, improved gasified cookstoves that now reached the eighth generation, while FdS is working on the development of a ninth generation one.



Figure 3. El Fuego del Sol's Ecological Cycle (El Fuego del Sol, n.d.)

The production of the briquettes takes place through a process that the organization of our study defines as 'Fuego del Sol's Ecological Cycle' [Figure 3]. This process is in line with most circular economy principles as we will argue, however circular economy is not mentioned directly in any of the documents of FdS that we analyzed. The reason of this can be found in the fact that when FdS developed its ecological cycle, the concept of circular economy was still in its infancy and the scientific literature about this subject was still somehow scarce. During our interview, we asked to Adair if he was aware of the circular economy concept and of the popularity he is going through in this historical period, especially in the industrialized countries, while a small but promising light is turning on, also with regard to the developing countries. Adair knew very well the principles of the circular economy and those, very similar of the so-called 'Cradle to Cradle' approach. However, having developed the briquettes production process at the beginning of 2010, when circular economy was not yet popular as today, we can affirm that the missing of some of the specific words of the circular economy method in the FdS documents is a purely verbal issue while the principles of circular economy are well present, although FdS arrived to them, in many cases, on its own, without going through the specific literature that is growing exponentially only in the last few years.

The production of the FdS briquettes is a classic example of upcycling whose definition is: "the creation or modification of any product from used materials, components and products which is of equal or higher quality or value than the compositional elements" (Sung, 2019, p. 371).[10] The briquettes are produced from recycled paper, cardboard and sawdust, that otherwise would finish in landfills, burned, dumped or abandoned. The transformation of these discarded materials into a new, more valuable one (as a substitute of charcoal is, in Haiti), is what make of this process an 'upcycle'. Upcycling, here we open a parenthesis, is quite different from recycling. The latter, for example, is not the best desired solution for a circular economy, as, usually, recycling is a process that transforms used materials into something less valuable, where the majority of the energy used for the production of the first goods is lost during their transformation process. An example of it comes from the incinerators, a recycling solution widely adopted in North America and Europe. Incinerators produce energy through the combustion of many complex materials as, for example, plastic. Since plastic is derived from petroleum, which is extracted with great efforts from the subsoil, and then transformed, burning it in an incinerator results in a substantial loss of energy, and above all, results in the destruction of a material which would be potentially able to stay in the cycle longer, through its transformation into

something new, of equal or greater value.

In support of this, for example, it was reported that “detailed analysis shows that incinerators waste more energy than they produce, primarily because what [they] incinerate needs to be replaced by new products” (Global Alliance for Incineration Alternatives [GAIA], 2018, p. 1)[9]. One of the better known principle of CE, is the one that sees the materials kept in the cycle as long as possible. Now as we shall see, the materials used for the production of the FdS briquettes, otherwise destined to landfills, are instead transformed into compressed non-carbonized blocks to be used as a substitute of charcoal. A possible criticism of this process could come from the fact that, by this way, the raw materials of which the briquettes are composed, are not kept in the cycle for as long as possible, but at the end of each single cycle they disappear, transformed into fire to cook the daily food of many people in Port-au-Prince. However, such a criticism could also find an argument in the fact that the paper of which the briquettes are made could be transformed back into paper, and this would also help to save trees. The answer to this eventual critique is not obvious. But a realistic one must point out a factor, namely that the paper present in Haiti is not produced locally with local trees (we would only miss a paper mill in Haiti, to give the final blow to the last forests of this area of the Caribbean!) but it is totally imported.

Being imported, and since, exception made for the FdS briquettes, alternative methods of upcycling of the discarded paper in Haiti does not exist, the options for its possible disposal are basically two. The first is to burn, bury or leave the paper in abandoned building lots as usually happens in Port-au-Prince and around. The second, instead, could be to collect large quantities of paper to be sent abroad for transformation and recycling as already happens, especially with more valuable materials such as aluminum and plastic. At this point a great quantity of this paper would anyway end up in an incinerator in the United States, China or somewhere else or it could be transformed and return to have an economic value equal or higher to the first. But this would happen abroad and, indeed, not in Haiti, where people would continue to use charcoal and wood to cook the 90% of their meals. While the first solution, the dumping/burning one, would see no gains for the locals, the second solutions would see only an infinitesimal gain for Haiti, which would come from the sale at low prices of the used paper to some country with a good waste disposal facility.

The best solution for the treatment of the paper waste of the Haitian capital is thought the one offered by FdS. This is also been recognized and constitute the reason why many international organization which are located in Port-au-Prince, such as the United Nation and many international embassies rely on FdS for the disposal of their waste. The majority of these organizations are even available to pay a little extra (if compared to other disposal companies low fares) for the disposal of their waste with FdS because, when entrusting it to El Fuego del Sol, they know where it will end to. Many other disposal companies in Port-au-Prince are not as reliable. For example, during our stay in Haiti we felt

that no one really knows where the waste entrusted to a waste treatment company will end, maybe dumped or burned, maybe in the ocean.

The first (and consequently also the last) step of the cycle is thought the collection of waste for the production of the briquettes. Briquettes are composed of paper and cardboard but not entirely and, after being shredded, these materials are mixed with sawdust that is collected mostly from furniture manufacturers, including coffins makers. The collection of waste, in many cases, also coincide with the delivery of the briquettes as the facilities from which these materials are collected, are also buyers, so as the truck of FdS can usually download and upload during the same trip, saving great quantities of gasoline and time. The same happens for the client schools. If from a side the schools are the principal buyers of briquettes for the cooking of the meals of the kids, from the other are also providers of paper waste that is collected and separated from other waste, and then entrusted to FdS. The second step begins when the truck get back at the FdS facility in Pétiön-Ville, Port-au-Prince. Here all the materials collected are separated. While paper, cardboard and sawdust are used for the production of the briquettes, FdS collects also other materials, such as plastic.

Plastic for the moment is compressed, shipped and sold out of the country but FdS is looking for alternative solutions that would allow upcycling in loco. One of the ideas is to transform plastic PET bottles into bags for the transportation of the briquettes, but that could also be sold and used for the stocking of rice or animal food. This could represent one of the next projects of FdS. Third step sees paper, cardboard and sawdust to be pulverized and mixed with water in huge plastic containers. To do it, normal drills are used. These drills are fitted with large whips, similar to those of electric shakers, but much larger. Occasionally, to the mix is added agricultural waste, when available. The fourth step sees the liquid biomass slurry pressed on an ergonomic industrial manual press. The molds of the press will give to the FdS briquettes the characteristic square shape with the hole in the center. The briquettes are then dried, using a renewable energy that is very abundant and free in Haiti and all over the Antilles: the sun light. The briquettes dry on many shelves in the courtyard of the facility for a few days. The fifth step start the following day, when the truck is filled with many bags of briquettes. As soon as the upload is completed the truck is ready to leave the facility for the morning delivering/collecting trip around the capital. As the briquettes are delivered, the truck is filled again with discarded materials, to be transformed, once again, into briquettes.

3.7 Numbers and data of production

On the different media we analyze for the writing of this case study, numerical data were reported in regards of the FdS briquettes project. Here we refer to the most significant for the scope of this case study. In the FdS-Haiti official website three data are indicated, which results from internal estimates. The first regards the number of trees saved. It is reported that, up to date, thirteen thousand (13.000) trees have been spared thanks to the

operate of the organization. The meals cooked with briquettes and FdS cookstoves are estimate in more than six hundred and fifty thousand (650.000) and this number is growing every day up. During summer however, FdS production of briquettes slow down for some month, due to the fact that most of the schools that are served are close for the summer vacations. Briquettes production will therefore start again at full speed from the beginning of September. The whole amount of reprocessed materials, recycled and upcycled directly by El Fuego del Sol has been estimated in one hundred and thirty (130) tons, including paper and cardboard waste, sawdust waste, plastic waste and aluminum waste. During our stay in Port-au-Prince, observing the enterprise activities and interacting with the FdS staff, we notice that FdS was also collecting organic waste derived from the production of the local, Heineken™ owed, factory of beer. These wastes, which are donated by the factory to FdS, still conserve a certain degree of nutritional level. The staff of FdS, as we were on site, was looking for ideas on what to do with it, being the amount of this kind of waste growing exponentially due to the parallel growing of the 'Prestige brewery' under the new Heineken™ property. One idea that came out during the long discussions on the topic, was to mix this malt and barley waste with mineral salts to be then pressed in small cylinders to be used as animal food. This project, still in its pilot state today, could become one more circular business-driven activity for the future and, once the finished product would be tested and analyzed by experts, it could find its space in local markets as food for pigs. This waste was not count in the reported estimate, but maybe will be in the nearby future.

Data on the spread and adoption of FdS cookstoves/briquettes system in Haiti are not systematically registered by the enterprise and consequently are difficult to be traced back and reported. However, Adair refers that the World Food Programme, when the Haitian briquettes project started in 2012, implemented around five-hundred stoves imported from India in more than seventy schools all over the country which were used in combination also with the FdS briquettes. The project lasted only three years, unfortunately, but FdS continue today to provide and sell briquettes to many of the schools that were initially included in the project (Adair, 2018) [12]. Moreover, in 2019 FdS got an important stove commission. The industrial park of Port-au-Prince bought as much as twenty-three cookstoves from FdS to be used by nine cooks to prepare the meals of more than two-hundred people per day. FdS, of course, will also regularly provide the briquettes to be used with their stoves. Briquettes, as already reported, are made by FdS with the use of three manual presses. FdS employees, working three by three to each press, are able to produce twenty-five briquettes in around one minute or little more. Time for drying instead takes long and constitute a delicate step in the production as, if not well dried, briquettes can generate white smoke during their use. Usually briquettes must be left under the sun for a couple of days before to be stock in huge bags that contains one hundred briquettes each.

4. Results

4.1 *The Role of Circular Economy in Improving Lives and Social Justice in Haiti*

To conclude, at this point and in light of what has been reported above, we think that our case study sustains a positive response to our initial question: can circular economy find application in Haiti and contribute to foster social justice in that country? Of course, we are aware that one case alone is not sufficient to answer to such a question with certitude. However, we believe that this case study constituted the starting point needed to break the ice on this topic, a mandatory step to open an important discussion on this subject. We expect that this research will be inspirational to other researchers that aim to further develop these positive results and to conduct similar investigations to expand our findings.

We hope, furthermore, that the example we have reported, that is our case study on the 'El Fuego del Sol' social-eco enterprise, at least made clear that this way of intend sustainability in developmental aid is very promising. The field of international development can gain a lot from the lesson of El Fuego del Sol.

To be successful and to bring positive long-lasting changes in any of the least developed countries, an organization must consider new models of aid. To set up a good project, the implementers must stop to think what they can donate to the target populations and must start to think what they can produce, with the help, of the target population. The beneficiaries of a project must never be left anymore on a side in decision making activities, they must be heard at every step and be considered as active players of the process.

Production is the key for the future of developmental aid and must therefore pass through waste upcycling, being waste, as we reported, a widely available resource in underdeveloped countries. Waste, as it is usually badly managed in these realities, is also worth to be collected and reprocessed, as otherwise it will ends up in landfill, rivers, empty building blocks, burned or dumped with serious consequences for human health. Waste has also a negative impact on tourism, when is scattered everywhere and Haiti is an example of this.

In a circular economy-designed project, waste become a valuable thing that is worth to be gathered, transformed and upcycled. This will contribute from a side to remove waste from the environment while from the other it will generate many more desired benefits, as for example the creation of job opportunities for the locals, that is the key for moving forward in those underdeveloped countries as Haiti. A circular economy project must be holistically designed to address the many problems of a country at the same time, as in our case the dependence on charcoal for cooking in Haiti, but also the health of the cooks, the deforestation and the cutting of trees, the lack of clean, legal jobs and more. The possible benefits of a circular economy project can multiply exponentially and extend to other fields, to all gain of the target population. Finally, these benefits will also reflect, above all, on social justice, favoring

better living conditions for all.

To sum up, in the light of our findings and argumentations we can affirm that circular economy, if applied to developmental aid projects, under certain circumstances could contribute very positively to the social justice of the country/community to which the projects are addressed. This can happen in Haiti, and, by extension, in any other country that keep similar conditions. To confirm or to deny this statement, we invite researchers, and in particular social workers, to commit themselves in carrying out new studies in this field, and in the future, to provide more case studies to be compared with the one of this thesis.

5. Discussion

This work has been written with the will to raise a problem and open a debate, even before wanting to generate answers. The problem concerns the lack of studies aimed at deepening the role of the circular economy in Haiti and in the other countries of the ‘least developed countries list’ of the United Nations. Although in the last few years the applicability and the role of this new method of thinking about production has been studied, debated and implemented more and more often in the industrialized countries or in those countries subjected to rapid industrialization, its application in the least developed countries of the world has not yet been taken into consideration, at least not by the academic world. Studies on circular economy, for the moment, concentrate their efforts to address the needs of the producing countries, but lack to address those of the countries that are at the bottom of the human development index list and that needs, in the authors’ opinion, to be somehow prioritized. What it is also argued in the text is that the current circular economy discourse is too often direct to environment, production, industries and goods at the expenses of the social dimension of it. This gap, furthermore, is not only present in literature, but in academic, media and political business attitude as well (Lourenço & Carvalho, 2013)[9]. What is missing is the human aspect of circular economy, being the humans, and not only the economy and the ecology, the final potential beneficiaries of this concept and one of the means through which the objectives of circular economy can be reached. The first goal of this essay was therefore to highlight the lack of attention of circular economy scholars to the so called underdeveloped world. In it, more than one billion of people globally (Collier, 2009)[13] struggle everyday to survive, while developmental aid, driven by non-governmental organizations and international agencies, in too many cases has failed to reach its goals. To address the problems of the least developed countries, we proposed thus to consider the opportunity to shift from short term-NGO driven-gift aid, to long term-holistically designed-circular economy projects. These lasts, while are based on the principles of the circular economy and sustainable development, must also be inclusive of the local communities and must generate incomes from the products/services they produce/provide. We believe that this model can constitute a win-win solution which benefits could reflect on many aspects of the addressed society, being the last, but not for importance, the fostering of the social justice that this model makes possible.

In support of our assumptions, we provided a case study of a successful project that operates in Haiti and that was designed to respect the above-mentioned requirements. When we started the analysis of the ‘El Fuego del Sol’ social-eco enterprise, we did not know where we would have ended, but now, after an all-round comprehensive analysis of this project, after a one-month trip to Haiti spent visiting the facility of the organization and sharing time with its staff and workers and after many months reviewing documents and data about it, we can finally affirm that the project we described positively sustains our starting assumptions.

Furthermore, an open question has constituted the background of all our work of research: can a sustainable developmental project governed by the principles of the circular economy become an applicable and replicable tool designed to improve the environment, the economy and ultimately to increase social justice and empower people in a given underdeveloped context? While the premise was positive and the results, we reached with this research are even more, to answer to this question we would need other and further studies and more case studies to be compared with our one. However, at this point, we believe that circular economy and sustainable development, really have the opportunity to become, in the near future, the path to be followed in the field of long-term developmental aid, the kind of aid that aim to empower people, save the environment and support the economy of a country in need. But this would happen only if these ideas arise and if they will receive more consideration by the people involved in developmental activities, development anthropologists and international social workers for first. We hope that this work has given its contributions in this direction. To conclude, we will report the words of Ban Ki-Moon, Secretary-General of the United Nations from January 2007 to December 2016, who stated: “Sustainable development is the pathway to the future we want for all. It offers a framework to generate economic growth, achieve social justice, exercise environmental stewardship and strengthen governance” (Ban Ki-Moon, 2013)[14]. Circular economy can be the way to reach all these proposals.

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