

Introduction

In the exercise of analyzing today's challenges being faced in Puerto Rico in order to explore solutions for the future and integrating cross-disciplinary framework the following pretends to combine Rehabilitation Counseling, Sociology, Engineering, Business Administration and other disciplines to take steps towards tackling two issues being faced in Puerto Rico: lack of recycling caused by poor waste management and unemployment among the functional diversity Population.

Problem One: Recycling

According to data in the European Parliament News Portal, plastic production in the world has grown from 1.5 million tones in 1950 to 322 million tones in 2015. In United States 39% of plastic waste is incinerated, while 31% is landfilled and only 30% is recycled. Authors like Agnelli (1996) explain that in countries like Brazil recycling of plastics has grown an average of 15% per year. Sobkowicz (2019) explains that in the US, after environmental activism and the passage of legislations banning activities like littering, waste recycling saw a substantial increment in the 1970s. However, the author points that recycling rates have stalled due to limited technological and logistical options for the materials collected from residential and industrial sites.

In terms of Puerto Rico, the latest data found is an Administrative Order dated from October 7th, 2019 revealing that only a 11-14% of the solid waste produced is recycled. According to data presented by AccuWeather in Puerto Rico, the average person produces approximately 6.5 pounds of waste daily.

This situation becomes more pressing in September 2017 when Hurricanes Irma and Maria made landfall in Puerto Rico. According to the National Hurricane Center, Hurricane Maria held winds of 155 mph producing major to catastrophic flooding and flash flooding. According to Puerto Rico's Solid Waste Authority, as cited by several national and international news outlets, before the landfall of both hurricanes the island landfills were filled beyond capacity. The Authority estimates that the hurricane produced 6.2 million cubic yards of waste and debris. According to measures used by FEMA this amount of trash is enough to fill 43 football stadiums. AccuWeather website reports that in places like in Villas del Sol, Toa Baja took six for authorities to remove accumulated waste.

Problem Two: Unemployment Among the Functional Diversity Population

According to the latest Report for Persons With Disability by The Bureau of Labor Statistics, out of the proportion of the population that is employed, 19.1% has a disability. It is important to contrast that the population without a disability takes for the 65.9% of the employed population. They also explain that across all age groups, the employment-population ratios were much lower for persons with disabilities. Additionally, the summary presents that from those workers with a disability who had a job, 31% had a part time job, versus 17% for those without a disability.

Comparably, in Puerto Rico the unemployment rate for the month of September 2019 is at 7.6%, according to the Department of Work and Human Resources of Puerto Rico. In the "Out of Work Group" 13.5% were identified as incapacitated. Furthermore, for 2017 about 4,393 reported having a hearing difficulty, 5,789 related to vision, 8,121 cognitive impairment, 6,268 ambulatory difficulty, 1,424 with a self-care difficulty and 2,721 with an independent living difficulty.

In the light of these statistics, it is important to reflect upon the challenges being faced by individuals with functional diversity. Palmer (2011) explains that the minimum needs required for basic level of well-being are higher for people with disabilities, and therefore are more likely to experience poverty of basic needs, when compared to people without disabilities. Moreover, people with disabilities experience needs that require additional efforts to meet, and in many cases induces high costs. Disability cannot only be linked to poverty, it also has a relationship to chronic poverty (Pinilla, 2015).

In addition of being at higher risk for developing chronic poverty, people with disabilities are victims of stigmatization, which leads to social exclusion. In the same way, employers have a series of reasons for not hiring people with disabilities. It's important to point out that while many of these motives have valid foundation, others are founded in stereotypes and prejudices that have endured through the pass of time.

Proposed Solution

Considering how to solve both problems rises the Re-Writing Puerto Rico Pen Company, a facility whose labor force is composed by qualified individuals who are part of the functional diversity population. The resulting product will be pens made from recycled plastic. Through the promotion of recycling, the creation of employment for a stigmatized part of society and moving towards a circular economy, the Re-Writing Puerto Rico Pen Company aims to enter the market in three fases: (1) becoming the principal supplier of pens for the Puertorrican Government, (2) selling pens in the national market, and (3) selling pens internationally.

The proposed facility would be responsible for collecting plastic bottles through three means: (1) receiving waste at the site where a weigh fare will be established to pay for the material, (2) placing plastic recycling stations on strategic points where people can drop off the plastic and (3) renting areas in food-courts to place plastic bins to collect the material. After the plastic collection begins a process of recycling composed of Identification, separation and classification of plastics (Fig. 1). After the materials are granulated begins the production of the of the material for the outer part of the pen followed by the placing of the ink cartridges and caps. The final steps would be the packaging of the product followed by the delivery.

Mitigation of Social and Environmental Problems

Climate change and the different repercussions that comes with it, such as extreme weather, must be considered when thinking about the development of a country. Taking steps towards improving waste management in Puerto Rico may be a solution for assuring a quick response towards future weather events and avoiding public health crisis. By making sure waste is being managed properly and fostering recycling, the landfill issues PR is facing can be mitigated and the re-use of plastic can help into achieving a sustainable country.

This solution can also help with the unemployment problem in Puerto Rico, particularly in the group of people with disabilities. Given the homogeneity of the population of people with disabilities, there is no single strategy for mitigating the raising problems of this group. When talking specifically about poverty, people with disabilities need to be fully and explicitly included in all strategies aiming to mitigate social and environmental problems given the bidirectional relationship between poverty and disability Pinilla, 2015). Puerto Rico already has the tools to help move our society into one more inclusive and to solve social problems like waste management and unemployment. Federal Legislations like The Wagner-O 'Day of 1938 mandate Federal government to purchase products produced in workshops by persons with blindness. And The Article 9 of Act for the Reduction and Recicling of solid Waste in Puerto Rico of September 18th 1992 mandates the Promotion of establishing installations for the gathering, processing and market of recyclable materials through the development of the adequate infrastructure and strengthening of the recycled material. Taking advantage of existing mandates It is important to assure that future research evaluates and considers ways of implementing

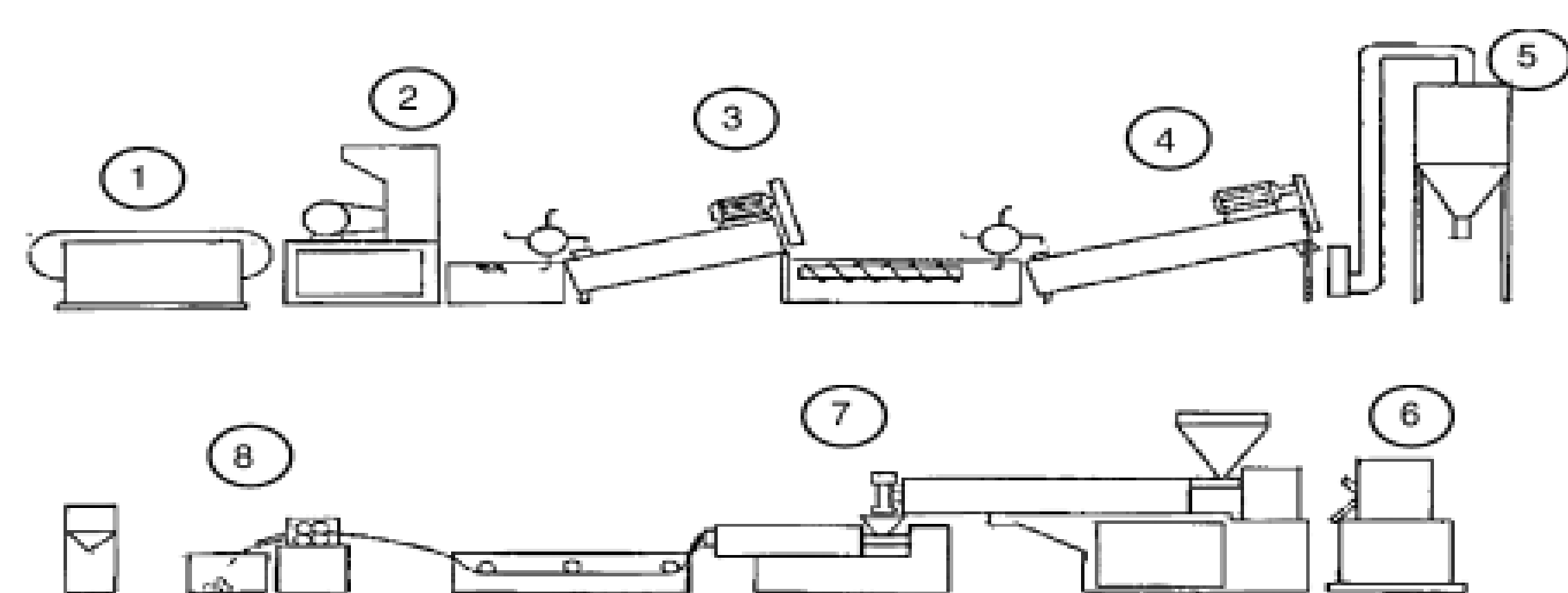


Fig. 1. Complete recycling scheme (identification, separation and classification of different types of plastics (1); grinding (2); washing with or without addition of cleaning agents (3); drying (4); silos (5); agglutination (films and products with fine thickness) (6); extrusion (7); granulation (8)).

References

Agnelli J. Polymer Recycling: Brazil Situation. Pol'meros Ciência e Tecnologia; 1996 p. 9-18