Chapter-5

Techno Economical Demand Based Analysis in End-of-Life Management

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The one environmental downside to solar technology is that it contains many of the same hazardous materials as electronics. The problem of disposing the hazardous waste becomes an additional challenge. Here it was so much cheaper to make new solar panels from raw materials than to recycle them.

In this chapter, a balanced material demand-based plastic waste management optimization model is discussed, and the model results of the economic parameters on different stages of recycling are observed. The model primarily depends on the demand of By-products of each step and the rate of recycling and dumping. Cuckoo search algorithm and vibration particle optimization algorithm used to evaluate the dependency of economic parameter values and the effective minimal cost of each stage in waste management of Plastic.

In this, we will deal with Cuckoo search algorithm and vibration particle optimization algorithm, Ray optimization algorithm used to evaluate the dependency of economic parameter values and the effective minimal cost of each stage in waste management of PV.

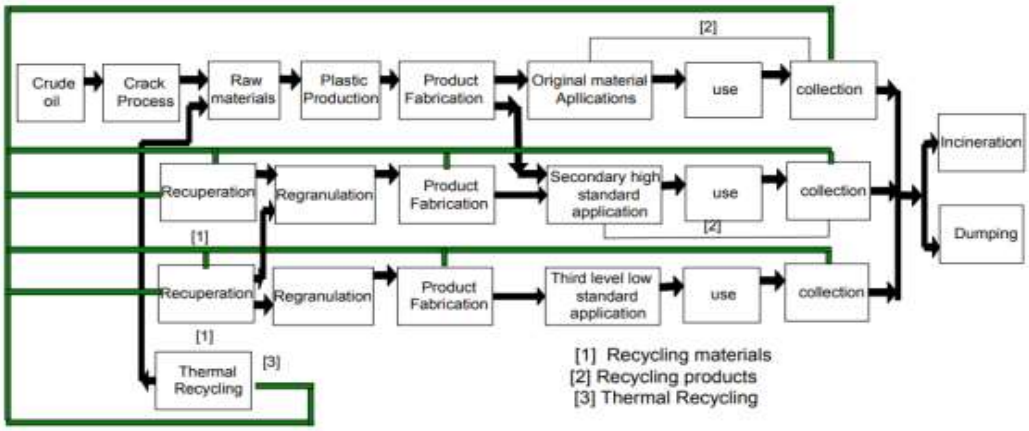


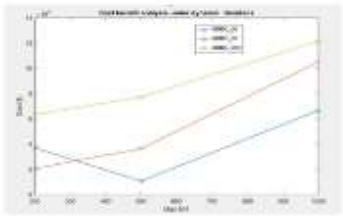
Fig 1: Plastic Waste Handling model.

High-quality applications need high-quality recycled products. At the manufacturing level of plastic, using crude oil and origin materials, plastic material manufactured and the recycled residues collected at the industry level used for product recycling in second-level high-grade applications. The high-quality by-products obtained from the residues of the primary manufacturing level used for secondary products. After usage, the products could be recycled. Recuperation units clean the waste material coming from stage 1, which contains useful materials with some unwanted vibration Particle Algorithm n materials.

Thus, in the recuperation unit, the residues washed and sent to the degranulated section. Low-level material production Unit, contains the materials mixed with polluted waste material, which would be used for low-grade applications. An alternate and final path of processing waste material having low quality is the thermal process, which is complicated and costly. But the obtained raw material can again be reused in other manufacturing units and product fabrication units. The final model gives a direct way to recycle products.

It is evident that Table 1, Dynamic Cost Benefit Analysis Using BBBC Method, explains the dynamic analysis connected to costs utilising BBBC.

Npop	NIT=200		500		1000	
	Nit	cost	Nit	cost	Nit	cost
30	7	20703	17	36867	34	65490
40	5	36340	13	10757	25	76998
50	4	104864	10	66540	20	121385



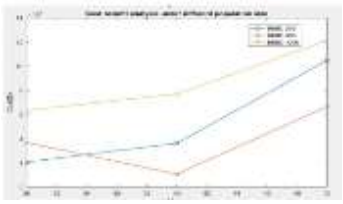


Table1: Dynamic cost benefit analysis using BBBC Method

From the above, figure 1 shows that cost benefit analysis under different population size, that cost benefit analysis under dynamic iterations.

Npop	NIT=200		500		1000	
	Nit	cost	Nit	cost	Nit	cost
30	7	74689	17	85740	34	85812
40	5	56671	13	82118	25	85905
50	4	61848	10	76851	20	83785

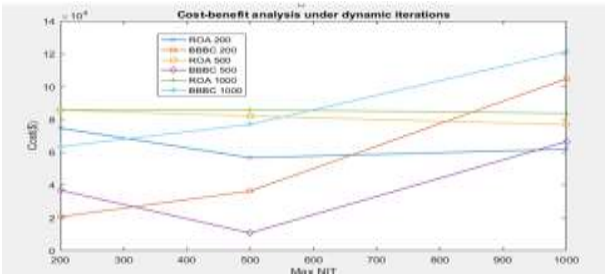


Table 2: Dynamic cost benefit analysis:

Dynamic cost benefit analysis using the ROA Method is explained in Table 2. Which compares the computations of the BBBC and ROA methods based on dynamic iterations and dynamic population size. According to the analysis, employing ROA would result in less cost variation than utilising BBBC.

Plastic material has technological and economic requirements to apply recycling solutions at the earliest possible stage. Using less plastic has little impact because it depends on personal sustainability drive. Reusing plastic with modest modifications in accordance with customer demand may provide an opportunity to lower the recycling/dumping rate. The work utilised new metaheuristic optimization approaches, including the Big Bang big crunch and the ray optimization algorithm, in accordance with the techno-economic material-based model of plastic EOL.

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