Less Waste & better World

While the plastic worldwide is being produced at a frighteningly-increasing speed, our poor nature fails to adapt to the prosperous plastic-favored society. The price of enjoying the convenience of plastic bag is to add insult to the existing environmental injuries. The severe impact of excess plastic is coming to the surface: destruction of land, ingestion of poisonous fragments by marine organism and decline in human living standards. Hence, the efficient plastic-recycling problems has received our attention.

First, two basic model are established for better analysis. One is the model of maximum level, built on the basis of different ways of recycling plastics: industrial recycling, incineration and discarded into the environment. Another is the policy-driven plastic impact index (PII) model in which all basic factors are spilt into three aspects: Ecosystem Degree (ED_1), Economy Degree (ED_2) and Society Degree (SD).

Second, we apply the first model in Task 1. Taking the recovering ability of soil, ocean and industrial-process in account, the maximum plastic production level with no more environmental damage is calculated to be **96.77 million tons** annually.

Third, the second model (PII) is applied in Task 2. Through utilizing data from global, East-Asia and Europe, we obtain the current PII of each to be **58, 32, 78**. Furthermore, stimulation is done to find the most ideal plastic production of them to be **32.45, 37.09, 78.91 kg per capita annually**. Eventually, we test the two policies on the above two continents and get distinct results.

Fourth, for Task 3, we modify the initial model by taking time into account and generate a new index **CICI** accordingly. Through trial and error, the optimal solution is calculated to be **28.1 kg per capital annually** and **40% recycling rate** where CICI has a minimum value of **45**. Further discussion is carried out into the potential impacts.

Fifth, for Task 4, with the combination of **GE matrix** and CICI, the waste conditions in 6 continents are separately measured. Then the interventions are put forward to raise the overall global level and minimize variance.

Sixth, we write a memo to the ICM describing the achievable minimum level, the timeline to reach it and the accelerating or obstructive circumstances in the progress to achieve the target.

Sensitivity analysis is made at the end. Our models are more sensitive to AP (the first one) and the conditions of packaging industry (the second one).

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