Abstract

The aim of the study is to design a plastic waste supply chain network design for Pakistan which is cost effective and sustainable. This study showed a promising potential of producing liquid fuels from the abundant and feasible source of plastic waste by gasification technique. For the optimization of plastic waste supply chain (PWSC), mathematical integrated linear programming (MILP) is used, for cost andfuel production optimization Lingo coding was run on mathematical modelling. The results provided the potential locations of PW supply, gasification centers, distribution centers and carbonash customers, allocated with the help of GIS. The results of the proposed study showed that chosen 13 gasification plants has the ability to produced certain amount of fuel; Chechia can produce higher amount of fuel/day which is 71498.3 barrels, Harappa can produce 63180 barrels fuel/d, Makhdoom Rasheed and Hanna can produce 12636 barrels fuel/d and 37908 barrels fuel/d,38155.5 barrels fuel/d, 62932.5 barrels fuel/d, 67497.7 barrels fuel/d, 30204 barrels fuel/d, 25272barrels fuel/d, 45612 barrels fuel/d , 50544 barres/d and 25272 barres/d can be produced from Shahpur, Rawat, Muree, Mehmood booti, Bosti Khel, Swat, Jalala, Deh Jam Chakro and Hyderabad gasification plants respectively. The need to adopt PWSC is very crucial in Pakistan, as it will not only address the fuel fulfillment demand but also solve the accumulated waste for fuel production, will meet 7 and 12 SGDs will also provide job opportunities and environment and public health.