ABSTRACT

This study is designed to provide the baseline economic, social and environmental SWOT data for common fiberglass reinforced polymer (FRP) products. A general survey of the industry was carried out to critically analyze the FRP waste disposal issue, which is now affecting the performance of the industry and the environment. The matrix of FRP fabrication systems and waste generation mechanisms has also been carefully studied, as most of the FRP waste ends-up in landfills therefore simulation of plant growth have been experimented and analyzed to discover the adverse impacts, however despite of the attributed negative impacts on plant growth there are optimistic signs that plant can still survive and grow in FRP waste mixed soils and FRP waste particles remain inert in soil. An important and crucial aspect of these FRP systems is that all of them have permanent thermoset properties; once manufactured and cured, cannot be converted back to their liquid state, like the ordinary thermoplastics, therefore the true recycling and reshaping of fiberglass composites is not possible, however the mechanical recycling is possible which thus involve certain capital expenditure. On the other hand the best and most efficient and effective way of treating the end of life or end of use FRP composites is their reuse after necessary repairs and rehabilitation which is not only an economical but also a socially responsible and an environmental friendly solution. To overcome the limitation of FRP recycling at the local industries a small scale mechanical recycler has also been experimentally designed and developed in collaboration of a local company, the cost and benefit analysis shows that such solutions may payback their capital costs if effective design, production, fabrication and marketing strategies are designed keeping in-view the recyclate material. A general conclusion is that the fiberglass composites has tremendous economic, socially beneficial as well as many positive environmental attributes based on their worthy structural and engineering characteristics, the adverse environmental impacts however can be negated with regards to considering waste as an opportunity; a resource and not as a threat; a liability. Best waste management practices i.e. 3RS (reduce, recycle & recycle) are significant to the productivity and economic, social and environmental performance of the industry.