

Use of Waste Plastic in Rural Roads in Tamil Nadu

Introduction:

The implementation of plastics in roads opens a new option for recycling post-consumer plastics. Plastic roads are made entirely of plastic or of composites of plastic with other materials. The types of plastic that can be used for construction of roads are Polystyrene (PS) (Hard packaging, cartons, plates, vending cups etc.); Polypropylene (PP) (ketchup bottles, yogurt cups etc.); Polyethylene (PE) (both high and low density) (plastic bags, water bottle, shampoo bottle etc.).

Background:

The use of waste plastics in development of roads has been an important subject for the government of Tamil Nadu. It was first introduced by the state government in the year 2001 based on experimental laboratory research conducted by Professor R. Vasudevan from the Thiagarajar College of Engineering (TCE) in Madurai.

In order to mitigate the environmental risk of plastics and enhance the quality of roads, use of waste plastics in the development of roads is being promoted by the Tamil Nadu state government. The state government through city corporations and rural road development agencies has undertaken the construction of plastic roads.

Details of the Intervention:

For implementation Tamil Nadu undertook some new practices which include creation of women SHGs for collection, segregation and shredding of solid waste and plastics. The SHGs collect waste plastics from everywhere, dump yard, wasteland and segregate during the waste collection. The formation of SHGs for plastic processing was implemented in a phased manner in Tamil Nadu, initially, 10 districts were chosen and then 10 more districts were added in the next phase. In the year 2014 around 25 districts were involved in this initiative.

Training and awareness programmes for the use of plastics are conducted by the engineering staffs who are constructing the plastic mixed roads. A size less than 60 Microns is used for shredding waste plastics while the waste plastic with size more than 60 Microns is used for recycling also instructing not to use PET bottles, Flux boards, PVC articles as specified by the standard. Tamil Nadu Corporation for Development of Women takes care of the daily wages of the plastic collection workers, any support activities required and the training and monitoring of the entire process right from collection to selling shredded waste to the contractors.

In order to motivate the stakeholders, the state government has instituted three State level awards. The awards provide recognition for the best plastic free village panchayat, best plastic free School and Self Help Groups. Cash is awarded as incentive amounting to Rs 5 Lakh for the first prize, Rs 3 lakh for the second prize and Rs 2 lakh for the third prize.

Impact:

The use of plastic provides an added strength to the roads. The roads built are waterproof and provide considerably increased durability. The roads also resist the permeation of water. This is a very simple technology which does not involve any special machines deployment or other advanced skilled professionals. Tamil Nadu has excelled at implementing plastic roads for rural connectivity. The state government and institutions developed over the last ten years have developed capacity across the majority of districts for wide scale implementation in partnership with women self-help groups. Nearly 16,000 kilometres of rural roads have been paved with waste plastic.

As per a general estimation, to lay one km of plastic road 3.75 m wide, 9 tonnes of bitumen and 1 tonne of waste plastic are required for coating whereas a normal road requires 10 tonnes bitumen for each kilometre so a plastic road saves 1 tonne bitumen for every kilometre laid. This is an approximate saving of Rs. 50,000 to Rs. 60,000 per kilometre.

Source: Ministry of Housing & Urban Affairs Government of India. (2019). Plastic Waste Management Issues, Solutions & Case Studies; Centre for Innovations in Public Systems; an Autonomous body of the Government of India. (2014). Use of Plastics in Road Construction: Implementation of Technology and Roll out.