

## Application of Landslide Stabilisation Methods in Mauritius.

C. K. Bhuckory<sup>1\*</sup>, S.B. Mickovski<sup>2</sup>, R.K. Dreepaul<sup>3</sup>

<sup>1</sup>Department of Civil Engineering, Universite des Mascareignes, Mauritius

<sup>2</sup>Department of Civil Eng. & Environmental Mgt., Glasgow Caledonian University, Scotland

<sup>3</sup>Department of Electro-Mechanical Engineering, Universite des Mascareignes, Mauritius

\*Author for correspondence e-mail: [keshav.bhuckory@gmail.com](mailto:keshav.bhuckory@gmail.com)

### Abstract

Mauritius, like other Small Island Developing State (SIDS), is subjected to naturally-induced and human-induced calamities, including geotechnical disasters such-as: landslide, rockfall, slope failure, and debris flow among others. Soil stabilisation (mechanical, chemical or biological) is the solution to such calamities which may cause loss of life, damage of properties and mass displacement. Another issue Mauritius is facing is the increasing scarcity of landfills to dispose waste with limited recycling capacity. Combining the two disciplines of Soil Stabilisation and Municipal Solid Waste (MSW) management could be the most economically, socially and environmentally viable solution to tackle both problems at once as depicted in Figure 1<sup>[1]</sup>. Waste products from landfills could be used as fillers, combined with binders to stabilise landslide-prone areas. MSW in Mauritius is collected in the proportions mentioned in Table 1<sup>[2]</sup> with great capacity potential for such fillers.

Table 1: Proportions of MSW in Mauritius <sup>[1,2]</sup>

MSW	Proportion (%)
Food Wastes	27
Yard Wastes	27
Paper	14
Plastics	14
Textile wastes	6
Glass	3
Metals	3
Others	6



Figure 1: Sustainability triangle for soil stabilisation using MSW<sup>[1]</sup>

A case-study involving two major landslide regions in Mauritius, namely La Butte and Grande Riviere Noire were investigated in accordance with British Standards BS 1377 to understand the soil characteristics and thus design the most adequate method of stabilisation for the said sites. It was found that soils from both sites comprise of fat clay, but have different slippage surface depths. Both sites are suitable for piling method stabilisation, but only Grande Riviere Noire is suitable for chemical stabilisation due to the slippage depth. Of the 17 Sustainable Development Goals (SDGs) of the United Nations, applying the use of MSW in landslide stabilisation is in line with SDG9- by building resilient infrastructure, SDG 11- by making cities safe and sustainable and SDG 13- by adapting and rehabilitating the lands against climate change-induced rainfalls.

**Keywords:** Landslides, Soil Stabilisation, Sustainability, Landfill Scarcity, MSW, Sustainable Materials.

### References

1. Bhuckory, C.K., Mickovski, S.B. and Dreepaul, R.K. (2022) 'Scope for Sustainable Soil Stabilisation in SIDS: Mauritius Case Study', in 2022 7th International Conference on Environment Friendly Energies and Applications (EFEA). 2022 7th International Conference on Environment Friendly Energies and Applications (EFEA), pp. 1–6. Available at: <https://doi.org/10.1109/EFEA56675.2022.10063826>.
2. Ministère de l'Environnement, de la Gestion des déchets et du Changement climatique, "La Gestion Des Dechets" Les assises de l'environnement, 2019.