Workflow of Plastic Leakage Mapping in GIS
Working environment: GIS Software - ArcGIS Pro

Pre-Data

List of the required processing to provide data, if any.

Data

The following items are delivered for the data requirement.

Spatial Processing

Required spatial processing wich delivered fro the spatial toolbox analyst.

Data	Processing
Population Density format: raster	→ Fuzzy Membership

LULC format: raster → Conditional Raster → Extracted urban area → Fuzzy Membership

Building Dataset format: vector → Conversion: feature to point → Points (centroid) of buildings → Density calculation: kernel density → Buildings density → Fuzzy Membership

Global Gridded Relative Deprivation Index (GRDI) format: raster → Upscalling: Resampling pixel → Finer resolution image → Clip raster to settlement area → Level of slum → Fuzzy Membership

Road networks format: vector → Conversion: feature to point → Points (centroid) road networks → Distance calculation: Euclidean distance → Pixel-based road distance → Fuzzy Membership

Infrastructure Locations format: vector → Density calculation: kernel density → PoI density → Fuzzy Membership

Nighttime Image format: raster → Fuzzy Membership

Clip raster: population extend: building dataset → Settlement area (for **waste management**) format: raster → Conversion: raster to point → Points (centroid) road networks → Field calculation: ((!grid_code!*(0.5))*0.2) → Intersect with building → Waste generation per building → Density calculation: kernel density value: result from cal → Waste generation density → Fuzzy Membership

Intersect with road ← Waste collection coverage format: vector

Waste collection road

Intersect with traffic

Merge → Waste collection route → Spatial Join → Waste collection → Density calculation: kernel density → Waste collection density → Fuzzy Membership

Waste collection traffic

Traffic data format: vector → Conversion: feature to point → Points (centroid) traffic → Distance calculation: Euclidean distance → Pixel-based traffic distance → Fuzzy Membership

Mobile app: artificial barrier format: vector → Density calculation: kernel density → Artificial barrier density → Fuzzy Membership

Mobile app: littering spot format: vector → Density calculation: kernel density → Littering spot density → Fuzzy Membership

Mobile app: uncontrolled dump format: vector → Density calculation: kernel density → Uncontrolled dump density → Fuzzy Membership

River network format: vector → Distance calculation: Euclidean distance → Pixel-based waterway distance → Fuzzy Membership

DEM format: raster → Slope generation → Slope → Fuzzy Membership

note: prosessing in GEE → Annual rainfall rate format: raster → Fuzzy Membership

Rainfall erosivity format: raster → Fuzzy Membership

Flood decade record format: raster → Conversion: raster to polygon → Flood coverage → Union → Flood compare → Conversion: polygon to raster → Flood coverage decade record

Flood post format: vector → Union

note: prosessing in Morphometry notebook → Drainage morphometry format: raster → Fuzzy Membership