

# SEI-PCS Colombia Coffee Version 1.0 documentation

SEI-PCS Colombia Coffee v1.0 uses production statistics, asset ownership, road network information and export records. The implementation relies on linear optimisation to minimise the “cost” (transport distance) in order to link points of production to ports of export. The asset ownership information is used to apply cost reductions to incentivise sourcing from areas of known trader operations.

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## Data

### Trade data

Customs data for 2012–2016 from SICEX, covering the commodities under the HS codes in Table 1.

HS Code	Product
090111	Coffee; not roasted or decaffeinated
090112	Coffee; decaffeinated, not roasted
090121	Coffee; roasted, not decaffeinated
090122	Coffee; roasted, decaffeinated
090190	Coffee; husks and skins, coffee substitutes containing coffee in any proportion
210111	Extracts, essences and concentrates of coffee, and preparations with a basis of these extracts, essences or concentrates or with a basis of coffee
210112	Preparations with a basis of extracts, essences or concentrates or with a basis of coffee

Table 1 Coffee product HS codes

### Domestic consumption

Department populations are used to determine relative domestic demand for coffee across the country, where total domestic demand is total production minus total exports (i.e. production = exports + domestic demand).

### Production data

Municipality level production data was obtained from the Ministry of Agriculture and Rural Development (MinAgricultura) through their Agronet website.

### Logistics / asset data

#### Ports

The customs data provides information on “City\_Departure”, not specifically the port. There are 11 unique points of export.

#### Assets

Information on the ownership and location of a number of assets types was collated. These assets include farms, points of purchase, processing facilities, storage facilities, wholesalers, offices, and a number of assets of unknown type.

No throughput or capacity information is known for any of these assets.

#### Road network

The main road shapefile was sourced from <http://www.diva-gis.org/gdata>. This was manually edited to bridge gaps using Google maps, and Colombia roads shapefile from <http://download.geofabrik.de/south-america/colombia.html>.

The road network did not extend to southern departments of Amazonas, Vaupés and Guainía. These are not coffee producing regions, and have low populations meaning they are insignificant from the perspective of domestic demand, and so are excluded from the model.

### Company data

Each trader has a unique identifying tax ID number (a “NIT” code) which is used to identify traders in the customs data and to link traders to owned assets.

### Boundaries

Department boundaries and geocodes used as defined by the National Department of Statistics <https://www.dane.gov.co/>.

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## SEI-PCS Implementation

A single linear program is used to link exports to departments of production. The model optimises, based on distance, the sourcing of coffee for both exports and domestic consumption from departments of production.

Using the road network, distances are computed between the centroids of departments of production and locations of ports (export demand) and the centroids of other departments (domestic demand). “Cost” discounts to routes are implemented within the linear program for the sourcing of exports by traders based on their asset ownership. Where traders have no asset information, the cost of all routes are scaled down to reduce the relative cost in the linear program and to shift emphasis to resolving for traders with known assets.

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## Limitations

- Production data is currently only available up to 2016. This limits the time-series.
- The cost matrix relies on a low-quality road network file that has required manual manipulation (e.g. adding bridges over rivers).
- Asset information is currently limited in terms of
  - Our understanding of the level of coverage of our existing asset information.
  - A breakdown of the function of processing facilities e.g. roasting and/or grinding that could constrain sourcing of specific export products.
  - No information on capacities or throughputs, nor data on non-export processing.