

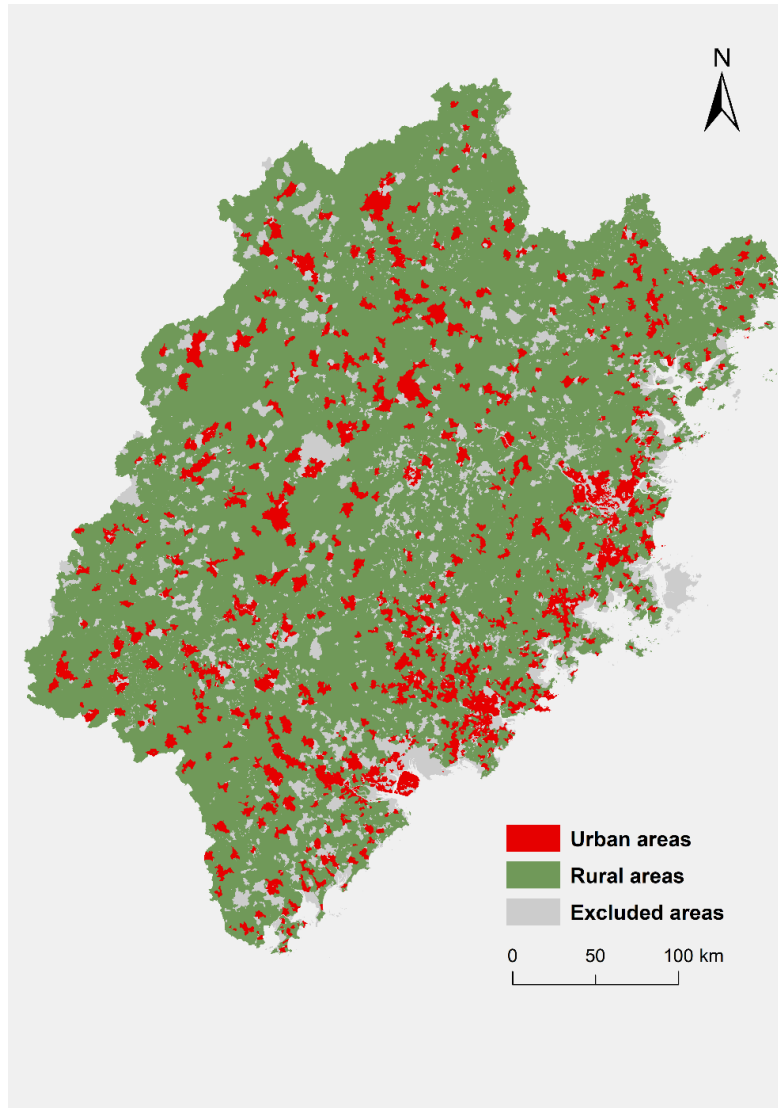
Supplementary Table 1 |The top 25 POI categories

POI category	Explanation	Socioeconomic characteristics
House number	A collection of information that labels a building or apartment.	Housing model
Residential quarter	A multi-storey residential building.	Housing model
Company	A legal entity made up of an association of people for carrying on a commercial or industrial enterprise.	Non-agriculturalization
Shop of clothing and accessories	A retail shop which provides clothing, footwears, hats, and other accessories.	Non-agriculturalization
Chinese restaurant	A restaurant serves Chinese cuisine.	Non-agriculturalization
Other shop	Unclassified shop	Non-agriculturalization
Shop of home decoration and building materials	A shop which provides windows, doors, cabinets, tile, concrete, and so on.	Non-agriculturalization
Exclusive shop	A shop that sells the products only from one manufacturer.	Non-agriculturalization
Convenience shop	A small retail business that provides a range of everyday items.	Non-agriculturalization
Shop of hair and beauty services	A shop provides hair-dress and beauty services like a nail salon, tanning salon, massage and other spa services.	Non-agriculturalization
Shop of living services	A collection of shops that provides various living services, such as repair, print, car rent, and so on.	Non-agriculturalization
Supermarket	A self-service shop that offers a wide variety of food, beverages and household products.	Non-agriculturalization
Home appliances shop	A shop which provides a series of household electrical/mechanical machines, such as air conditioners, computers, fans, washing machines, and so on.	Non-agriculturalization
Lottery shop	A licensed shop which sells lottery tickets.	Non-agriculturalization
Hardware shop	A shop which provides chains, keys, locks, generators, electrical wire and other hardware.	Non-agriculturalization
Training school	An organization which provides training courses, such as dancing class, language class, computer class, and so on.	Non-agriculturalization
Factory	An industrial site.	Non-agriculturalization
Other restaurant	Unclassified restaurant.	Non-agriculturalization
Fast-food restaurant	A restaurant that serves cheap and short-wait-time food regardless of cooking way.	Non-agriculturalization

Street name	A name that labels a street or road.	Transportation
Bus station	A designated place where buses stop for passengers to board or alight from a bus.	Transportation
Bridge name	A bridge which is built for transportation.	Transportation
Intersection name	A junction where two or more roads or streets meet or cross.	Transportation
Township hospital	A public health center that is established at the township level.	Medical service
Clinic	A private health facility that covers the primary care needs of populations in local communities.	Medical service
Pharmacy	A shop which provides drugs.	Medical service
Place name at the village level	A name which indicates a particular location or region amongst a village.	Other
Mountain	A landform.	Other
River	A landform.	Other
Buddhist and Taoist temple	A place of worship for Buddhists or Taoists.	Other
Public toilet	A room or small building with toilets and sinks.	Other
Kindergarten	A preschool educational facility.	Other
Government agency under the township level	Governmental agency below the township level.	Other
Government agency at the township level	Governmental agency at the township level.	Other
Other government agency	Unclassified government agency.	Other
Petrol station	A facility that sells fuel.	Other
Primary school	A state-run school which provides compulsory basic education.	Other
Other place name	Unclassified place name.	Other

Supplementary Table 2 | The population and GDP from the raster data and the statistical yearbook

	GDP (100 million RMB)			Population (10,000 people)		
	1995	2005	2015	1995	2005	2015
Statistical yearbook	2094.9	6554.69	25979.82	3227	3557	3839
Raster data	2001.58	6350.93	25848.43	2544	3490	3839
Difference	-4.66%	-3.21%	-0.51%	-26.87%	-1.92%	0.01%



Supplementary Fig.1 | Urban and rural division. Excluded areas are the disputed areas among the village-level administrative units, the areas which we cannot find the urban-rural continuum code, and pseudo village-level administrative units (e.g., state-owned forest areas, state-owned farming areas).