



OBJETIVE

The main goals of this study are: i) to estimate the vehicle fleet GHG emission of four intermediate Argentine cities: Córdoba capital (CBA), La Plata (LP), La Rioja (LR), Villa Carlos Paz (VCP); ii) to evaluate the Human Development Index (HDI) for each city; iii) establish a relationship between the HDI and pollutants.

INTRODUCTION

Study Area: the study sites correspond to four Argentine cities

Population:

- VCP: 75.315 inhabitants
- CBA: 1.391 millions inhabitants
- LR: 146.411 inhabitants
- LP: 787.294 inhabitants

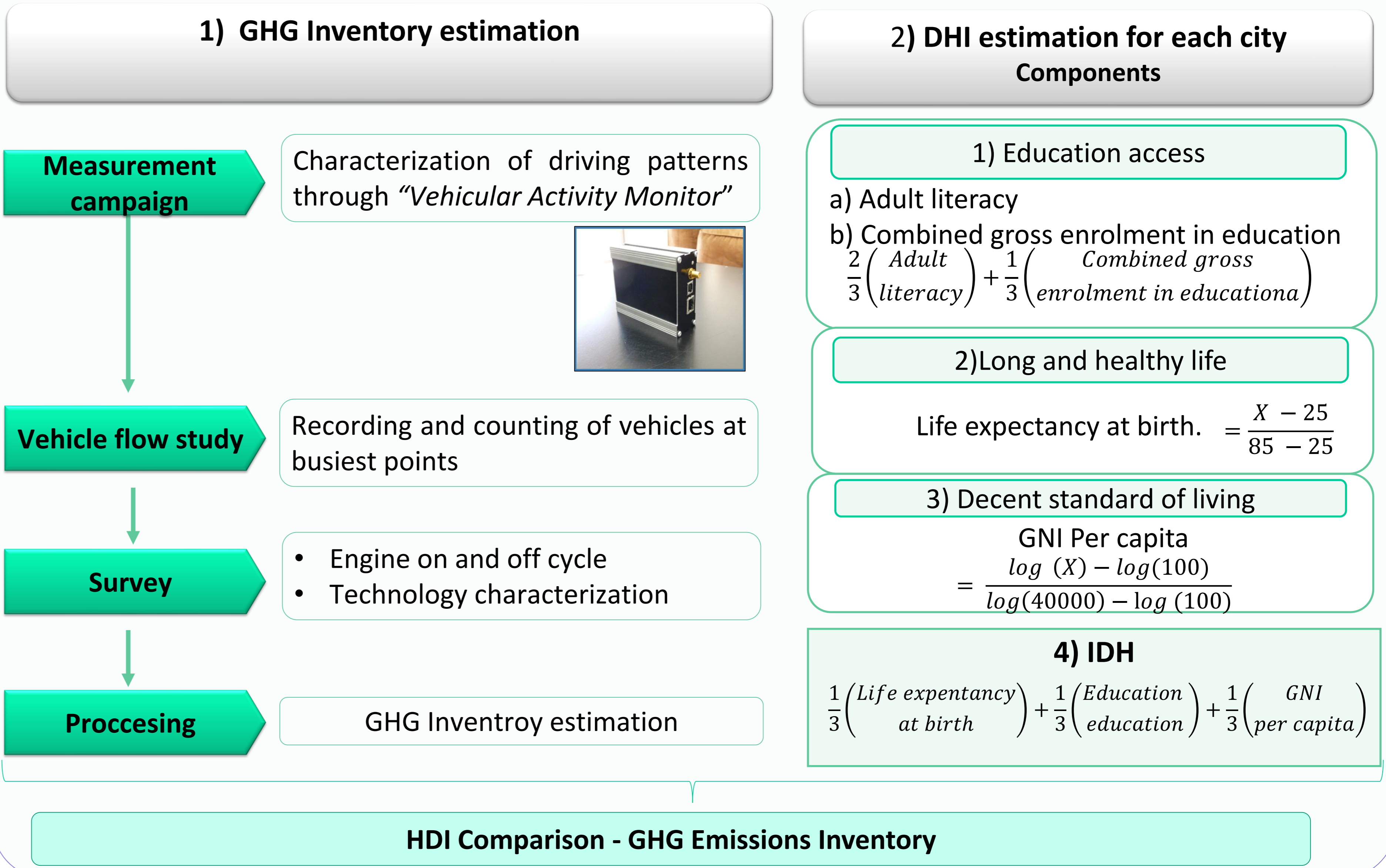
Introduction: Many authors (Mazzeo et al., 2010; Puliafito, 2005; Schifter et al., 2005; Ghose et al., 2004) have described that the transport is the main sector responsible for the increase in GHG emissions. Actually, the four cities do not have emission inventories, so these are the first results for intermediate cities in the country.

Vehicle fleet: cars, motorcycle, buses, trucks and taxis. In LR autos, motos, buses, camiones y taxis y remises. In LR only the inventory for the car fleet was estimated

Emission: Carbon dioxide (CO₂), Methane (CH₄), Nitrogen dioxide (NO₂)

MATERIALS AND METHODS

- 1) **GHG Inventory:** The International Vehicle Emissions Model (IVE) has been used for this work. It is a quick tool estimation of air pollutants emitted by mobile sources created by the EPA for developing countries
- 2) **DHI:** the methodology specified by "United Nations Development Program" has been used
- 3) Relation between GHG emission and DHI,



RESULTS

GREENHOUSE GASE INVENTORY

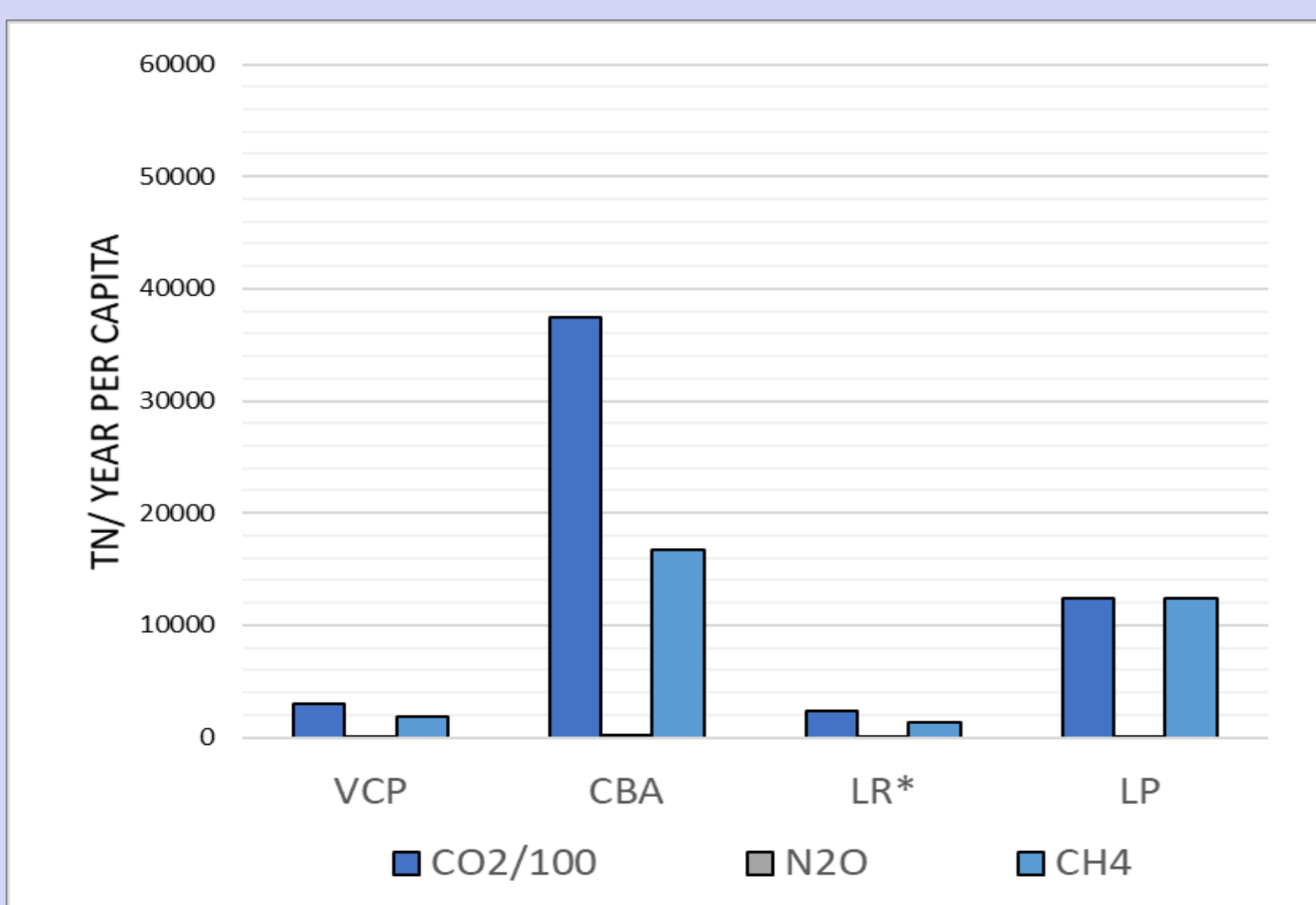


Fig. 1 Greenhouse gas inventory estimation

*LR only cars

Fig. 1 show the emission per capita for each city. CBA city has generated higher emissions per capita followed by LP.

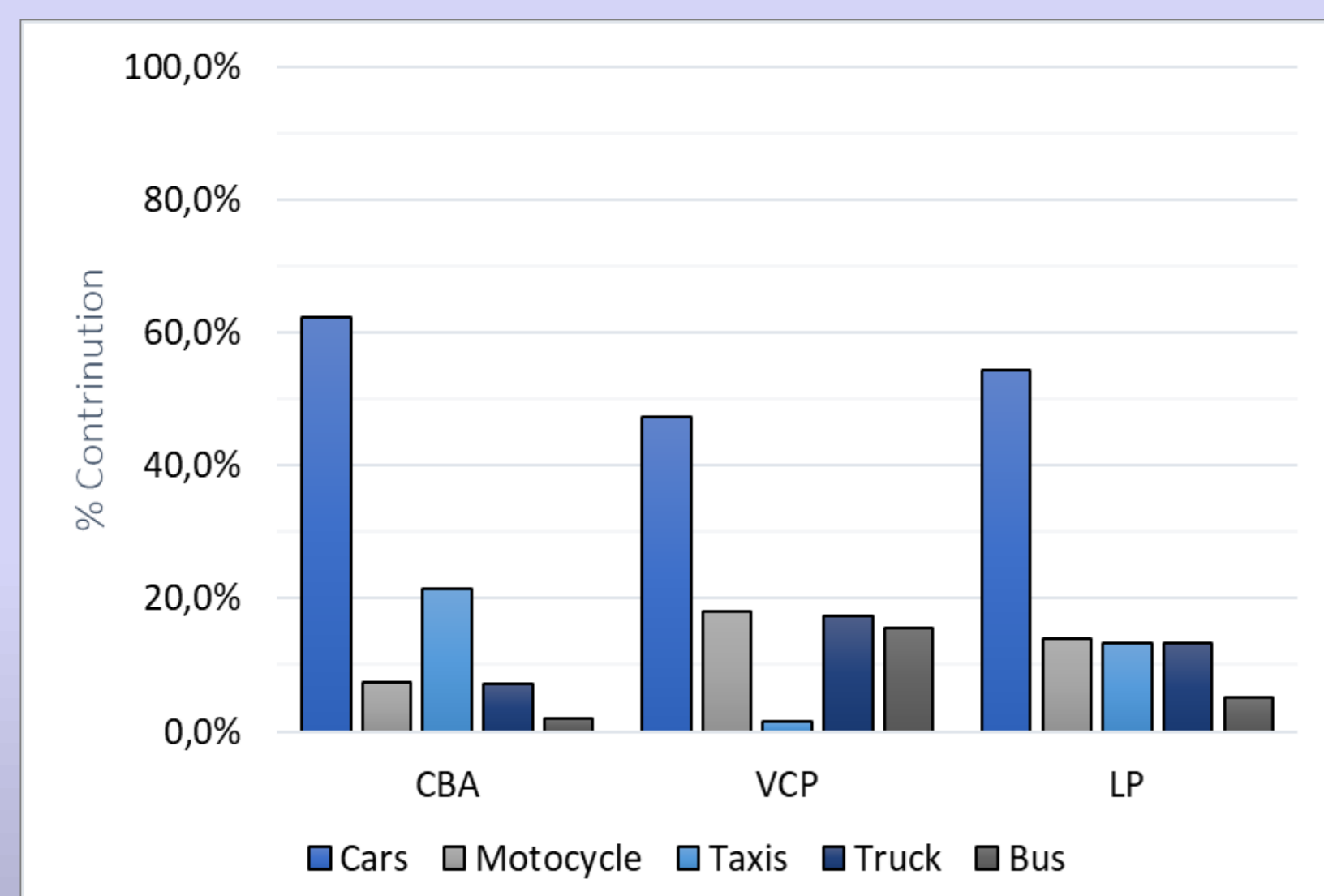


Fig. 2 Contribution percentage by vehicle type

Fig. 2 shows the contribution of GHG for each category considered. The main category in all cities is private cars.

Results

Human Development Index

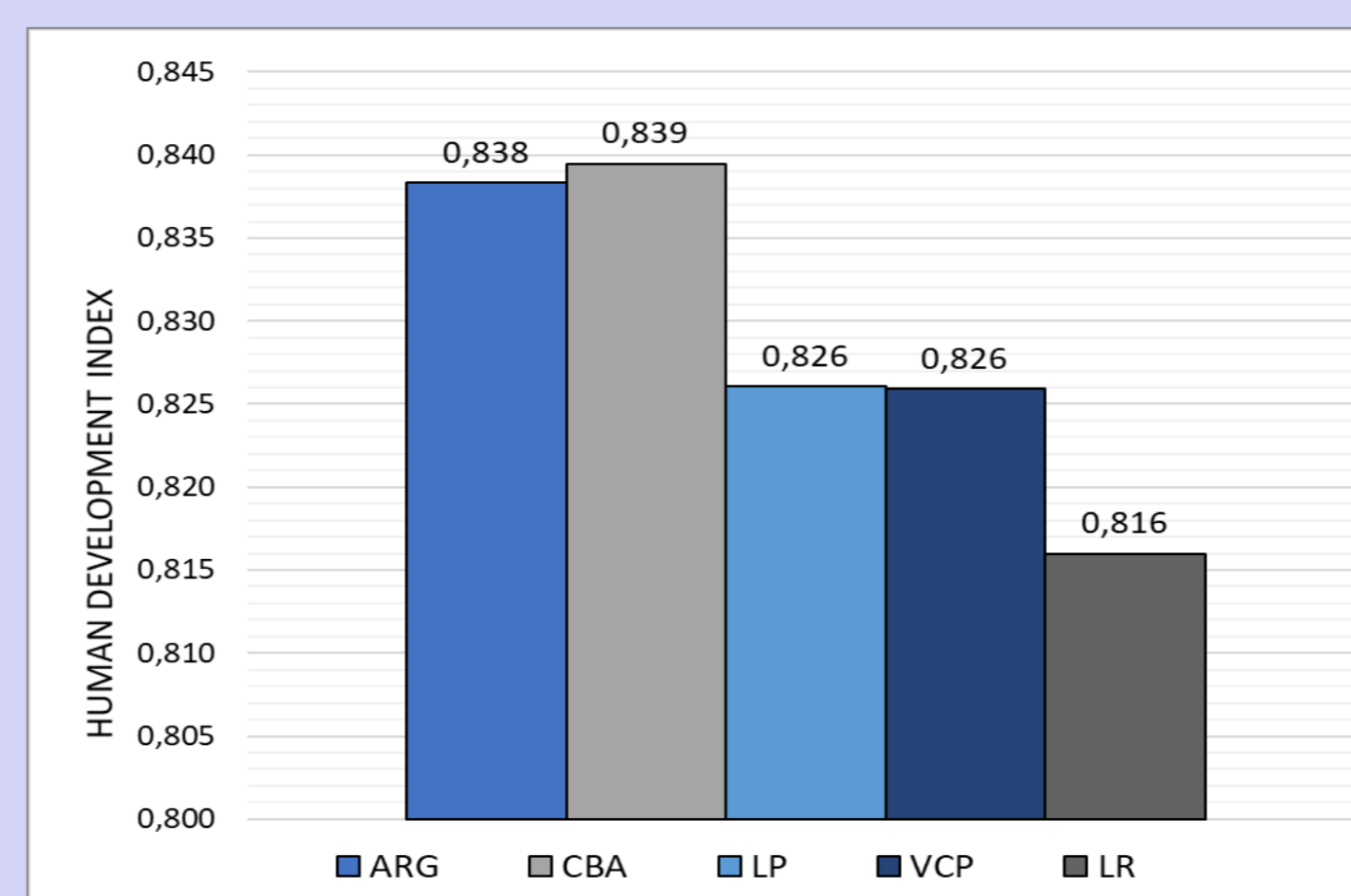


Fig. 3 Human Development Index

Table 1 contribution of each component index

Data (2017)	ARG	CBA	VCP	LR	LP
Education	0,977	0,921	0,882	0,899	0,929
Health	0,848	0,846	0,846	0,839	0,839
PBI	0,690	0,752	0,749	0,710	0,710
Total HDI	0,838	0,839	0,826	0,816	0,826

The results of the estimation of each HDI dimension for the base year 2017 are shown in Fig 3 and Table 1. LP, CBA, VCP are above the national average, as opposed to LR

Comparative

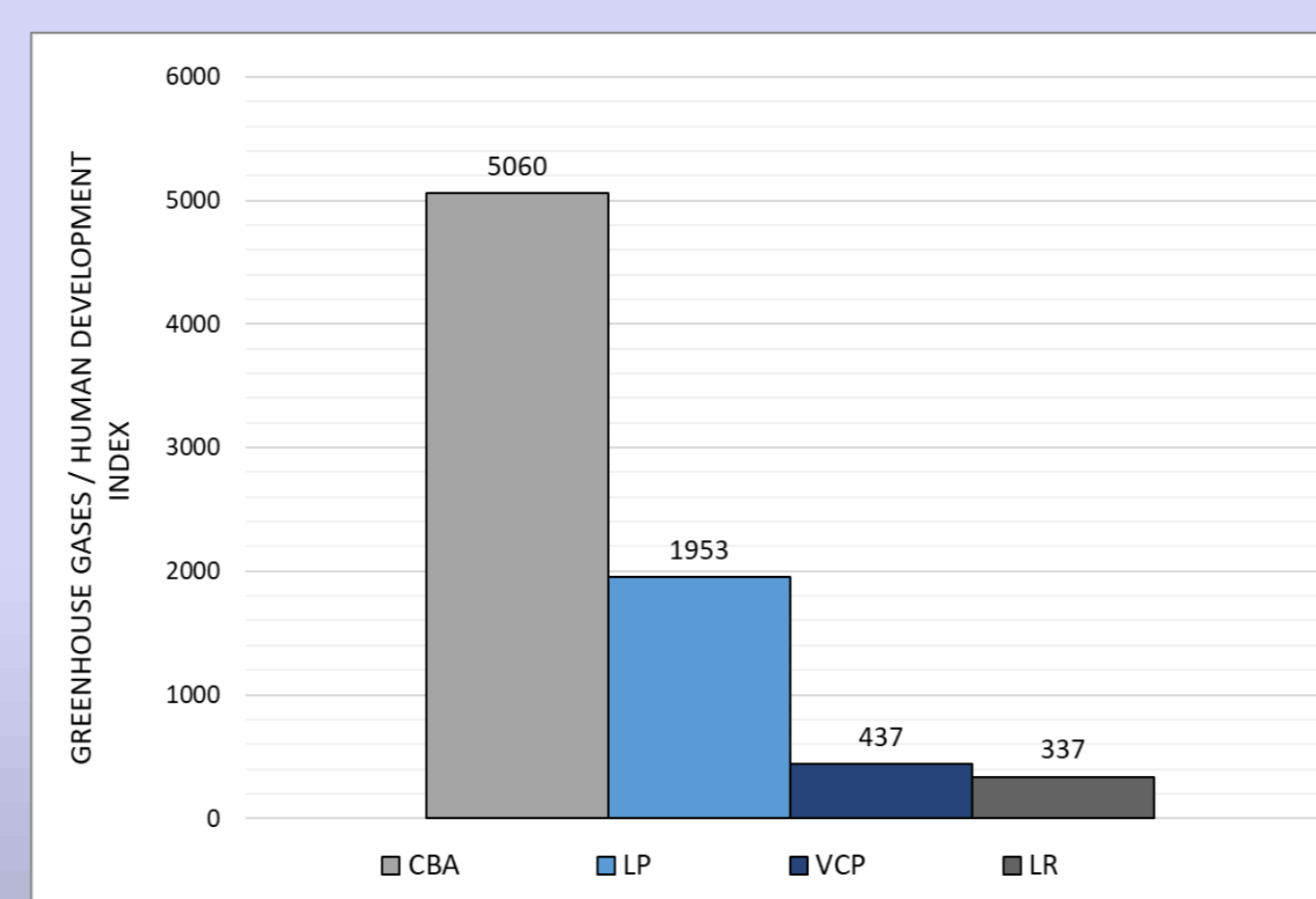


Fig. 4 Relation between CO_{2eq} y HDI

The relationship between total CO_{2eq} emissions and HDI has been plotted in Fig. 4. Which shows a greater relationship for the city of VCP and CBA

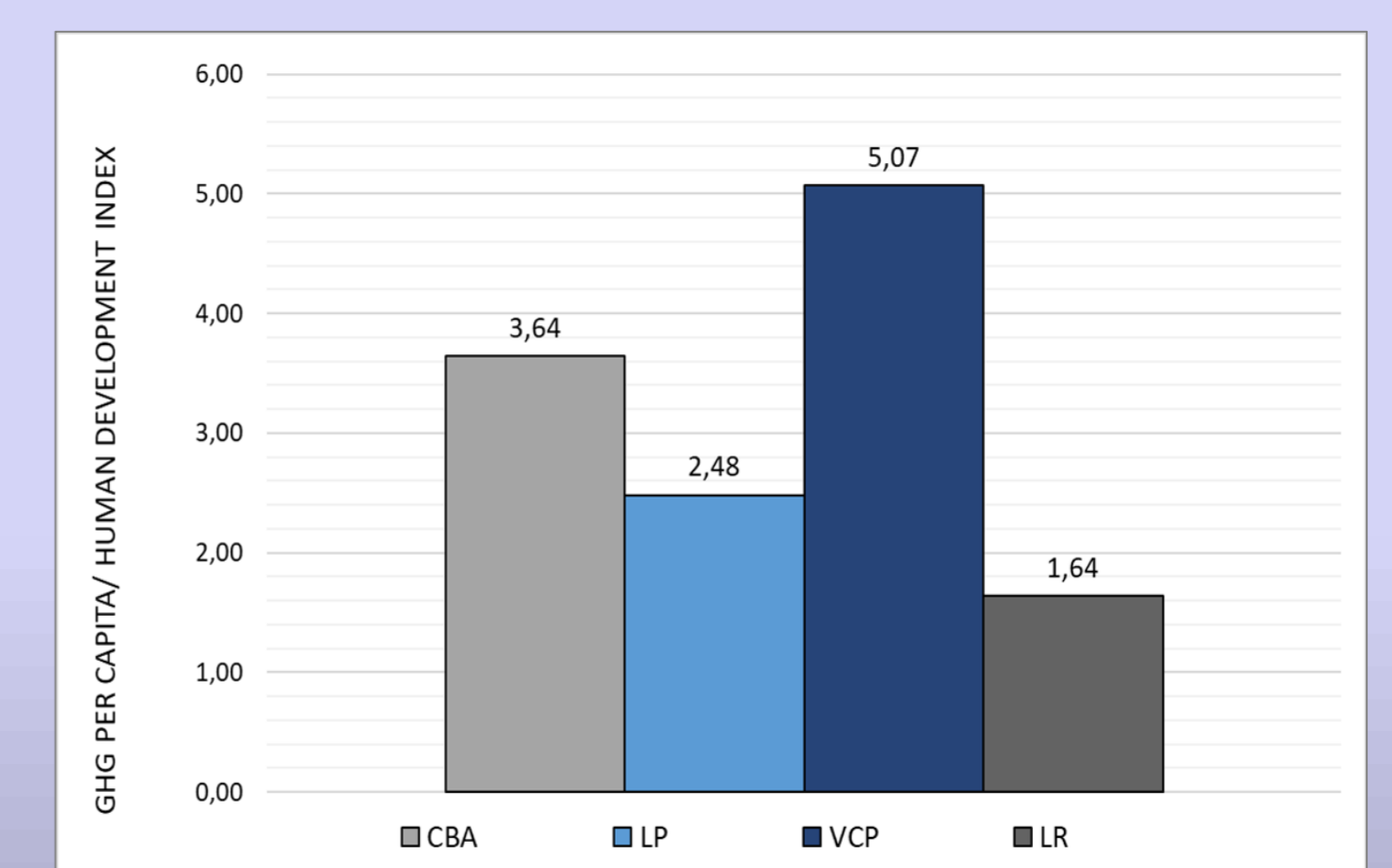


Fig. 5 Relation between CO_{2eq} per capita y HDI

The relationship between CO_{2eq} emissions per capita and HDI is shown in Fig. 5.

REFERENCE

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CONCLUSIONS

The preliminary results conclude:

- The largest intermediate cities emit higher CO_{2eq} emissions per capita generating greater contributions to climate change. Being that cars are the main GHG contributors.
- The main HDI differences between cities were: access to education and the per capita income of each city
- The cities with the highest HDI generate higher greenhouse gas emissions per capita (VCP and CBA), while in the case of a lower HDI, the emissions are much lower (LR)