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Brazil
ÁGUA-DF

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Sources and dynamics of sediments in the Lago Paranoá

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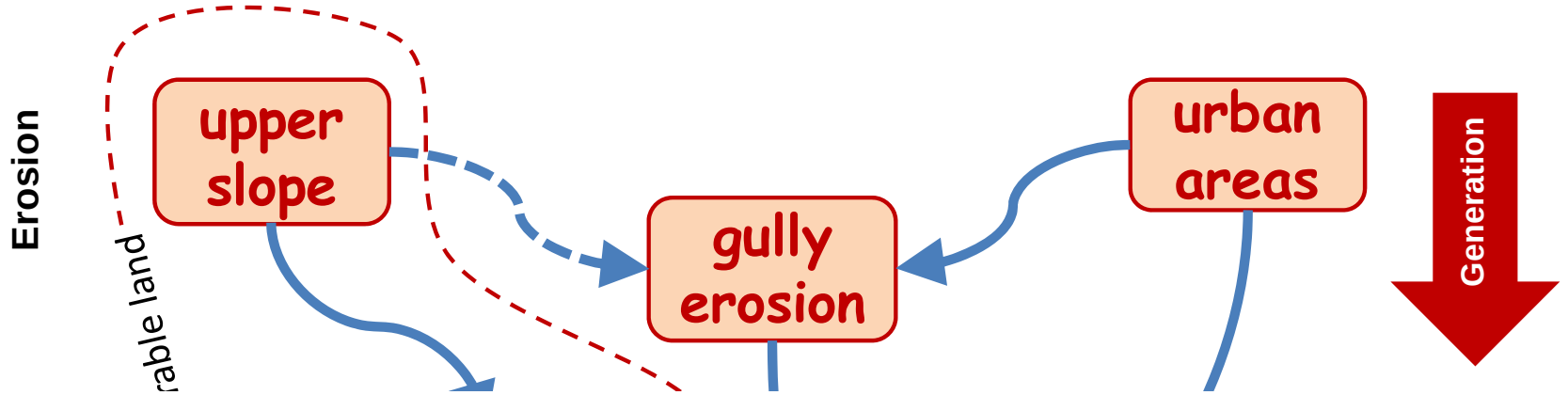
1 Motivation and Objectives

- **Silting of reservoirs**
  ⇒ sediment management

- **Sediment dynamic**
  ⇒ sedimentation rates

- **Sediment sources**
  ⇒ fingerprints

Sediment Cascade



2 Results

- Sedimentation rates
- Sediment sources

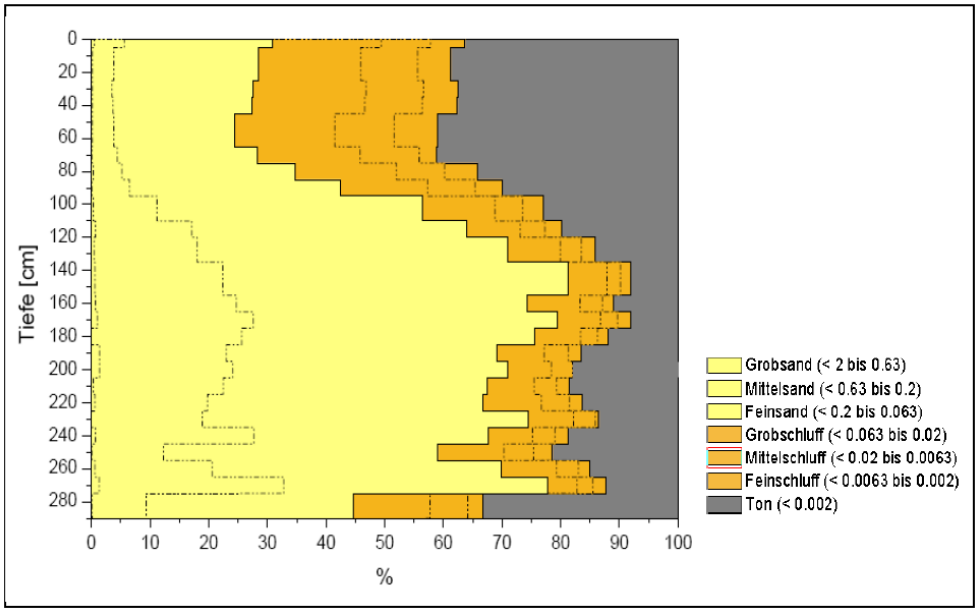
Site 2

Charcoal
KIA 41658
4405 ±25 BP

Charcoal
KIA 41659
5285 ±40 BP

Charcoal
KIA 41657
5954 ±40 BP

Charcoal
KIA 41656
6470 ±70 BP

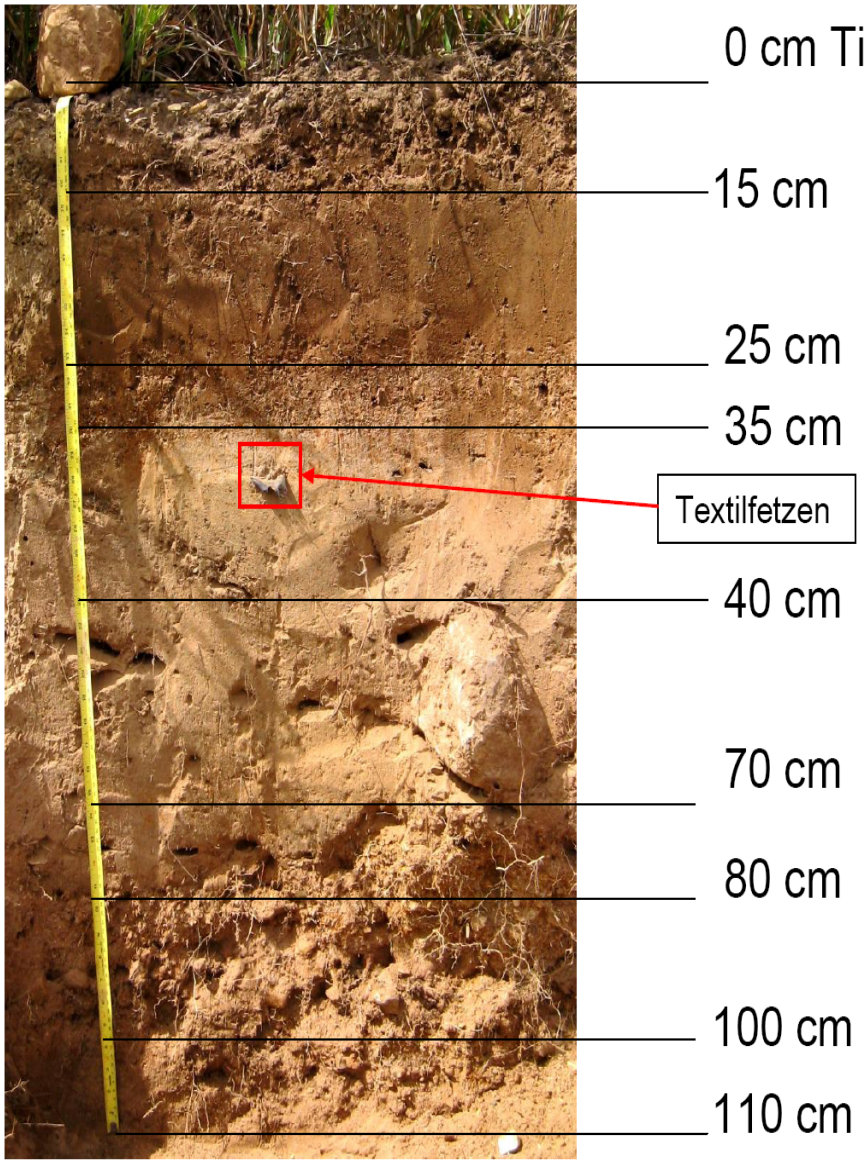


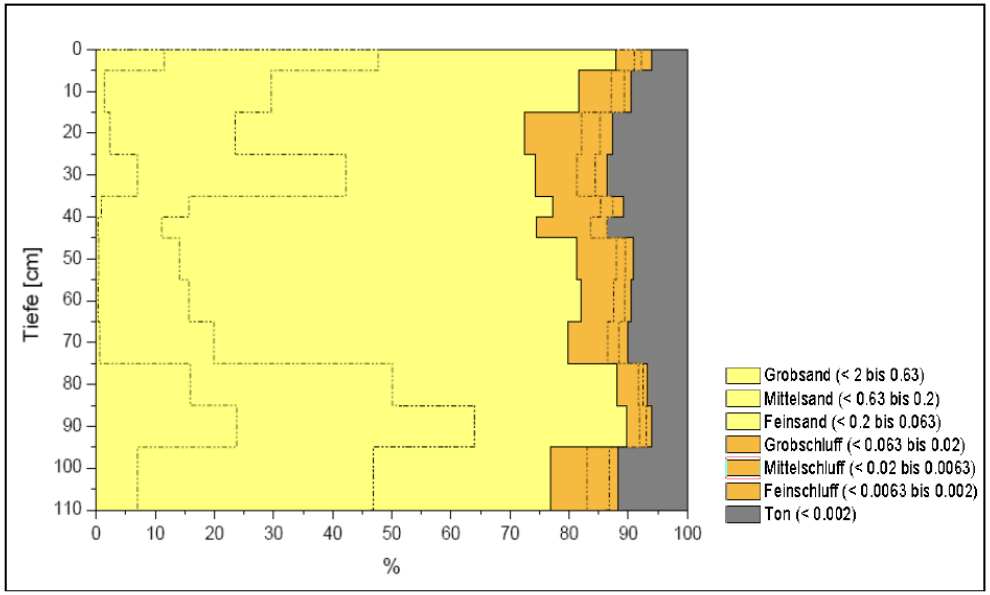
Sedimentation rates

^{14}C (5285-4405): **0,05 cm a^{-1}**
^{14}C (5954-5285): **0,13 cm a^{-1}**
^{14}C (6470-5954): **0,03 cm a^{-1}**

Franz 2010

Site 3





Sedimentation rates

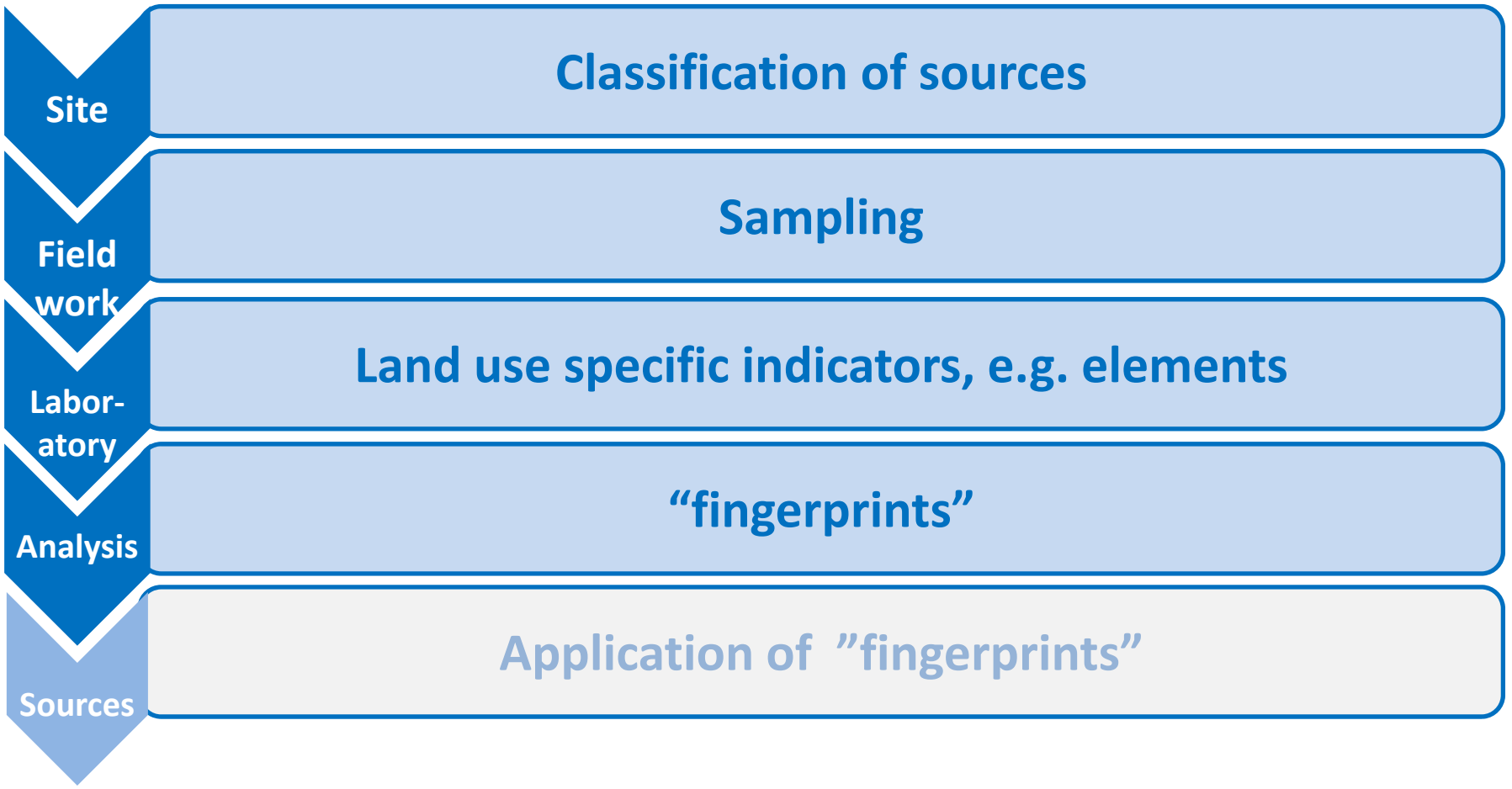
Textile (ca. 1952-2009): **0,7 cm a^{-1}**

Franz 2010

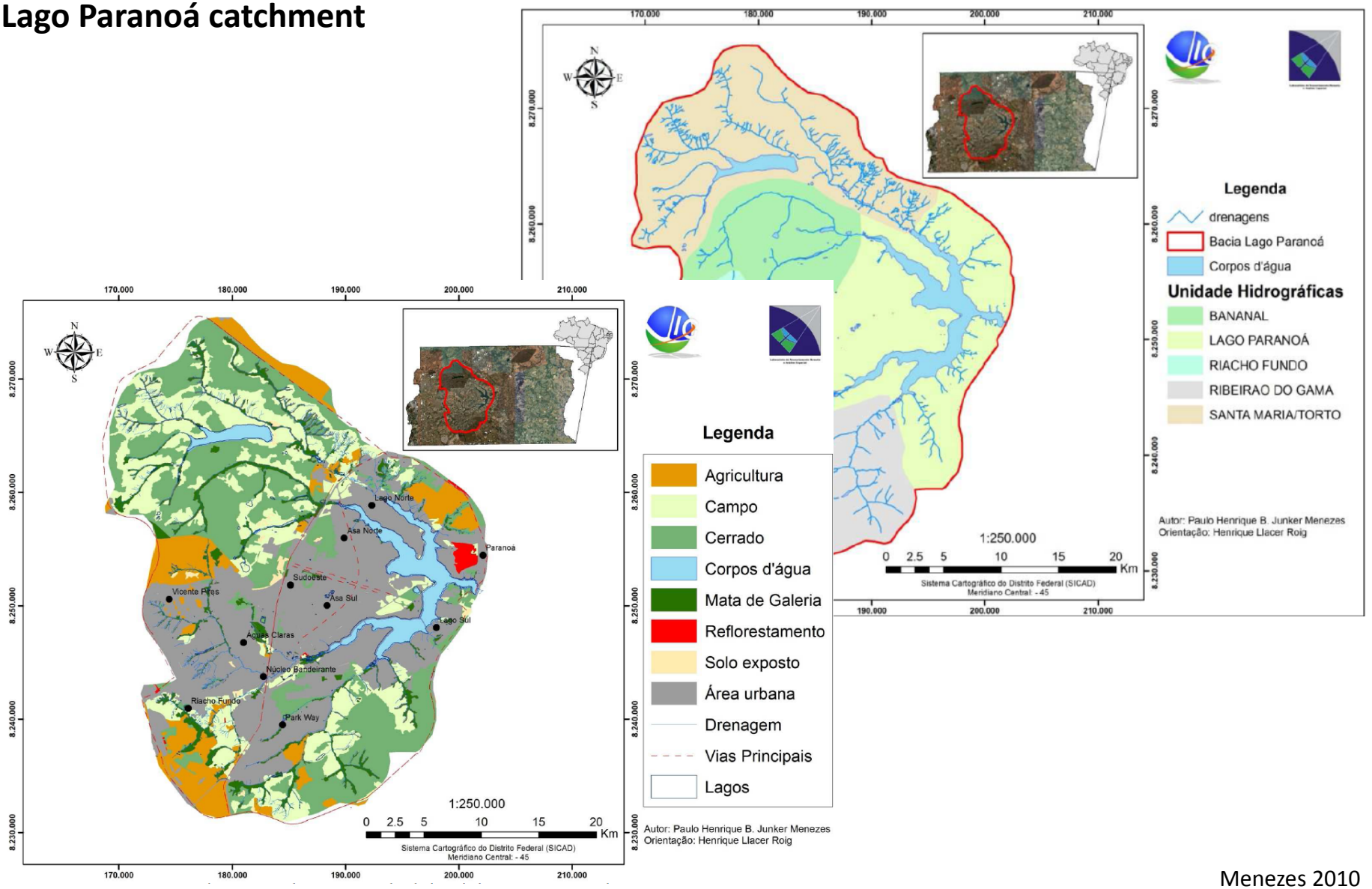
Site	Sediment thickness [cm]	Sedimentation rate [cm yr^{-1}]	period [yr]
Site 1	85*	3,86*	1987-2009*
Site 2	15	0,0286	6470± 70 BP - 5945 ± 40 BP
	87	0,13	5945 ± 40 – 5285 ± 40 BP
	43	0,05	5285 ± 40 – 4405 ± 25 BP
Site 3	39 #	0,67 #	1952-2009 #
Site 4	55 #	0,93 #	1950-2009 #
	100*	4,35*	1964-1987*

*** based on 137 Cs signature**
 # based on alien materials

Franz 2010


Site
Classification of sources
Field work
Sampling
Labor-atory
Land use specific indicators, e.g. elements
Analysis
“fingerprints”
Sources
Application of ”fingerprints”

Lago Paranoá catchment



Menezes 2010

Land use category	Sub types	n[a]
Urban	Construction sites	5
	Highway	3
	Paved road	3
	Unpaved road	3
	Ditches	3
	Residential area	5
	Detached/semi-detached houses	4
	High-density block development	4
	Rural residential area/nucleo rural	3
Agricultural	Farm track	3
	Crop land	4
	Pasture	3
Natural	Campo/cerrado	4
	Gully	3

[a] Number of observations.

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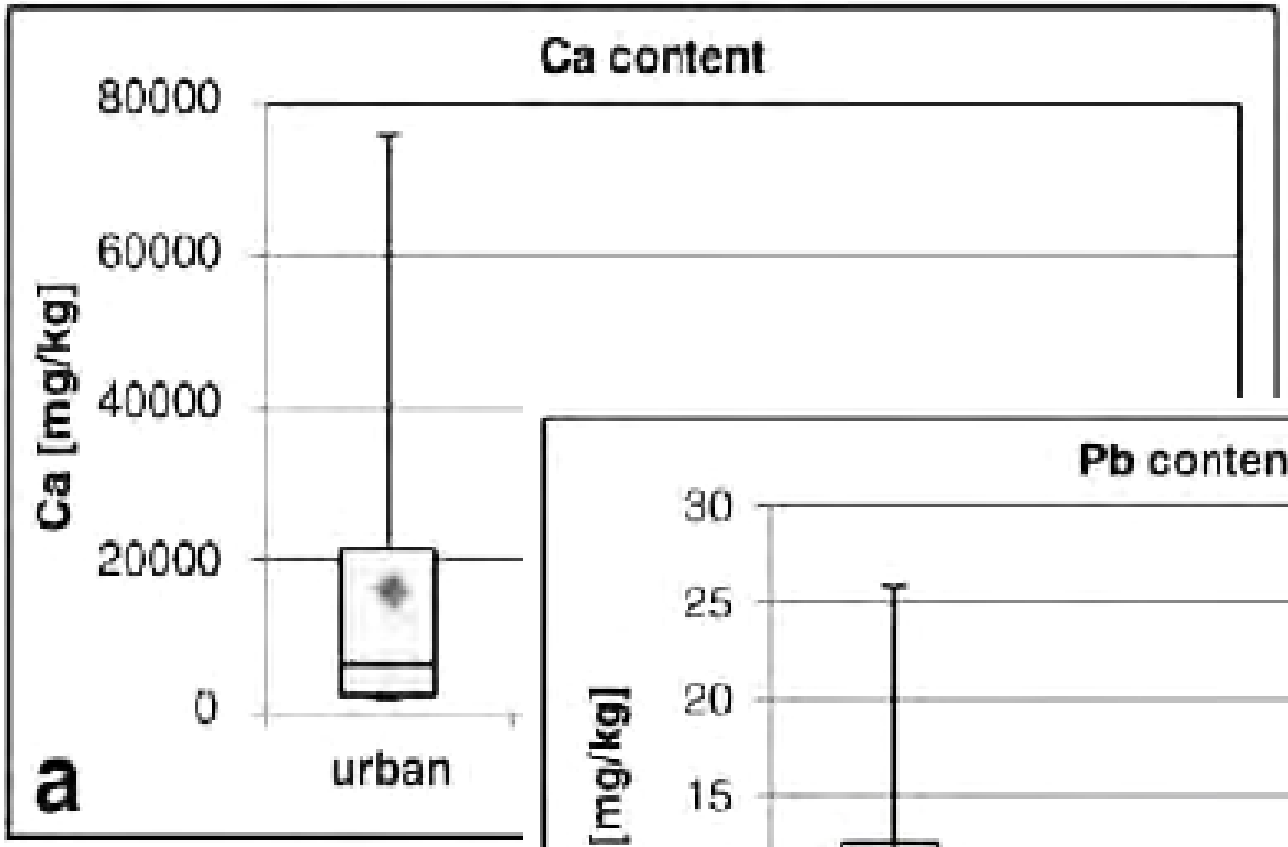

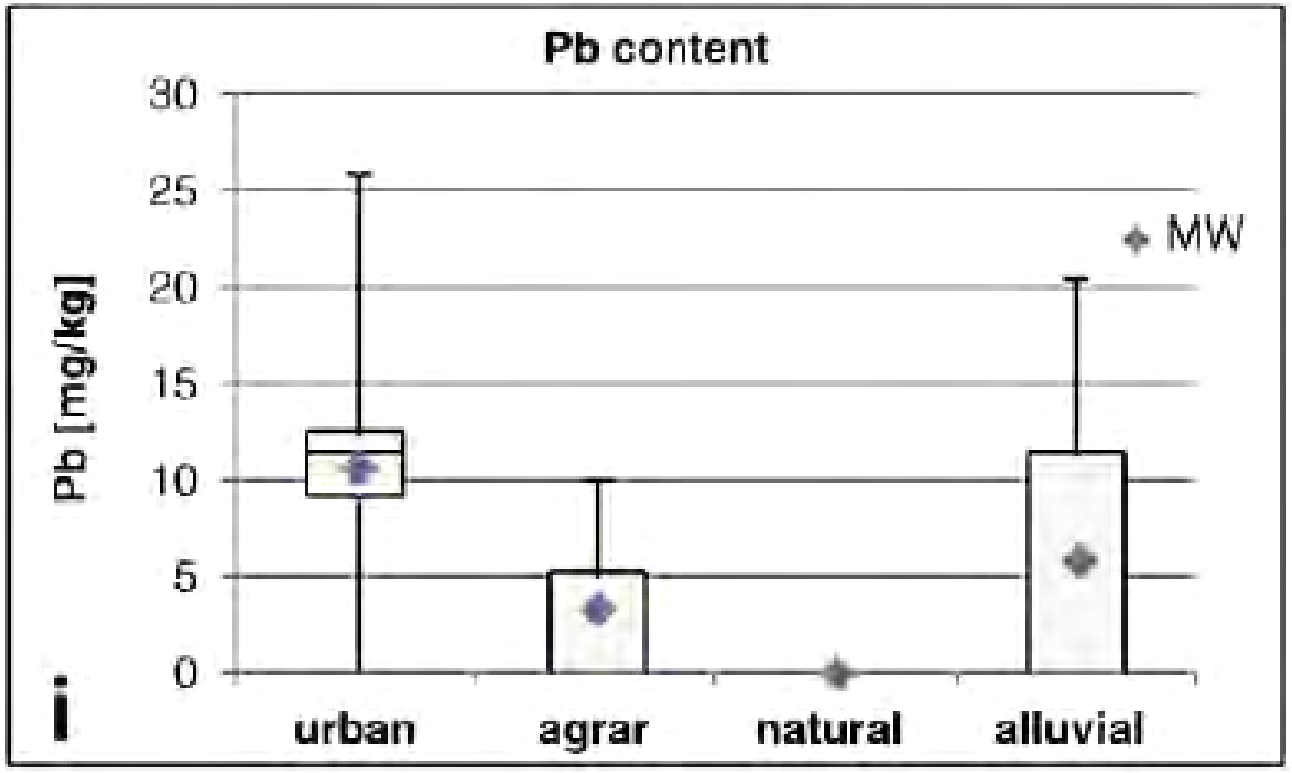

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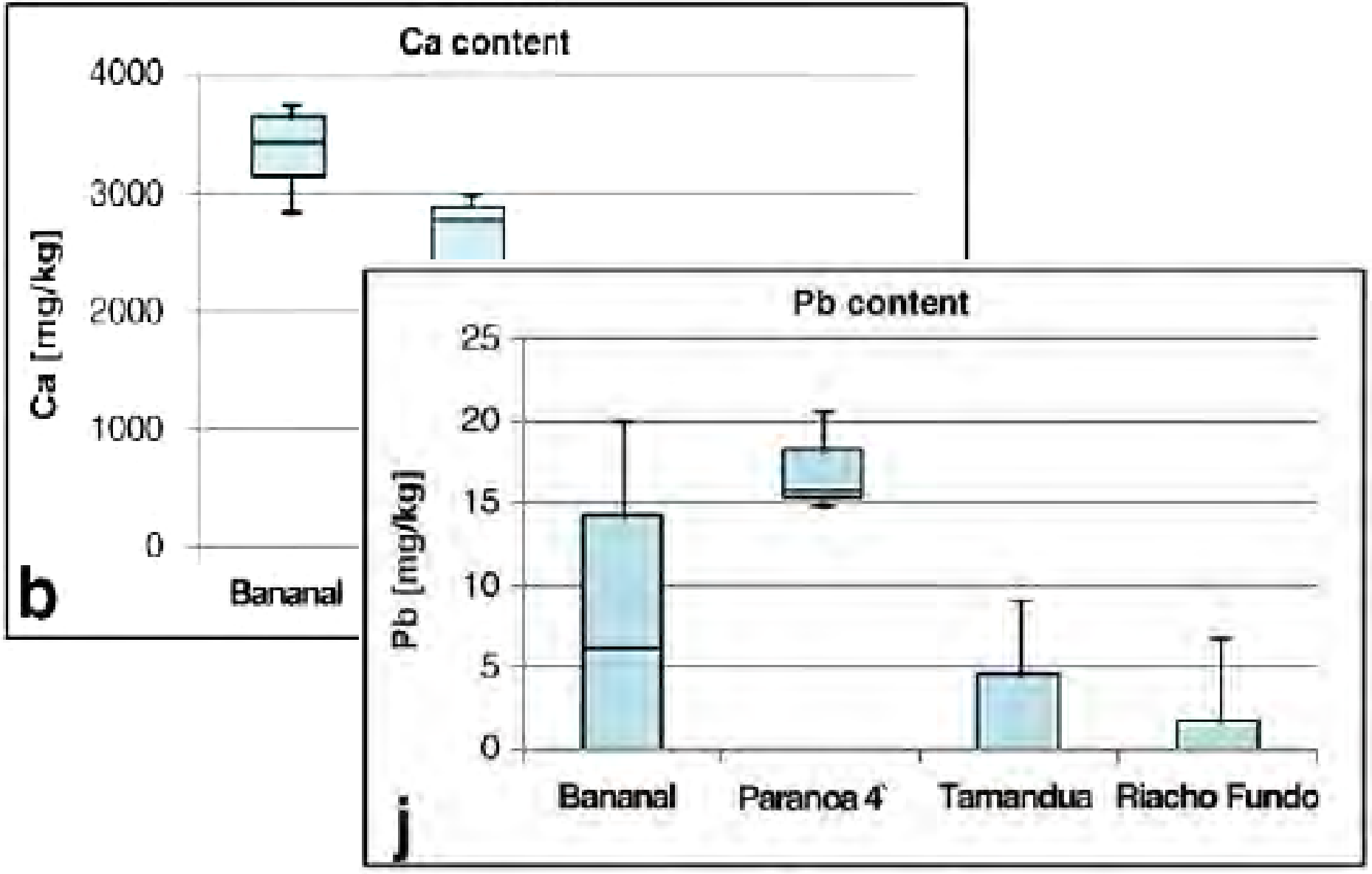

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Table 2
Mean and standard deviation of elements indicative for agricultural land use.

Land use category	n[a]	Cr	Zn	Cu	Ni
		mg/kg dw	mg/kg dw	mg/kg dw	mg/kg dw
Agricultural	10	167.66 ± 8.71	39.27 ± 3.78	43.79 ± 3.76	10.25 ± 1.90
Natural	7	68.13 ± 0.91	17.99 ± 1.01	18.15 ± 0.45	4.63 ± 0.05

[a] Number of observations.

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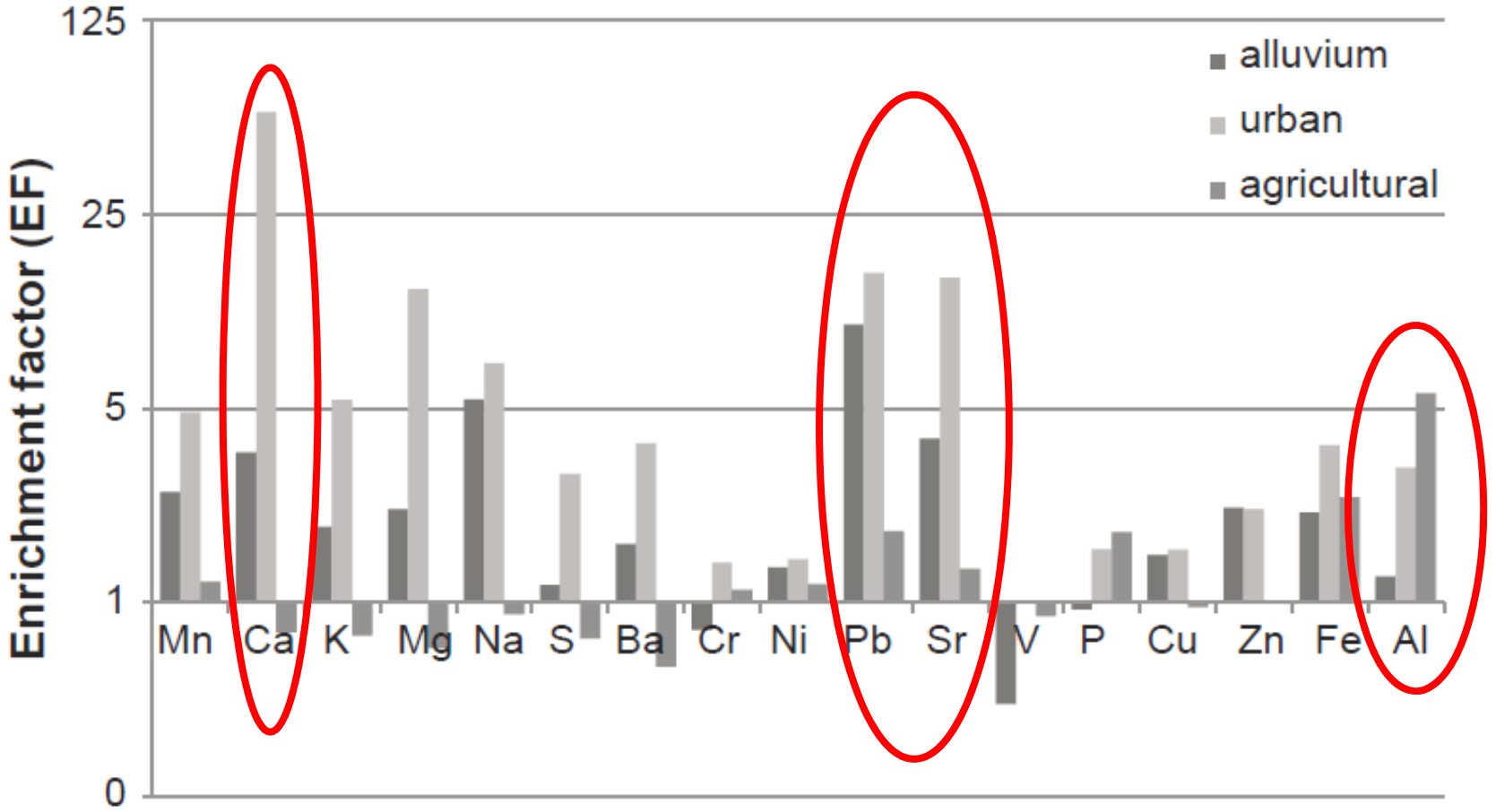

Fig. 4. Enrichment factors (EFs) for sediments from urban and agricultural areas and alluvial sediments of the Lago Paranoá catchment based on the geological background.

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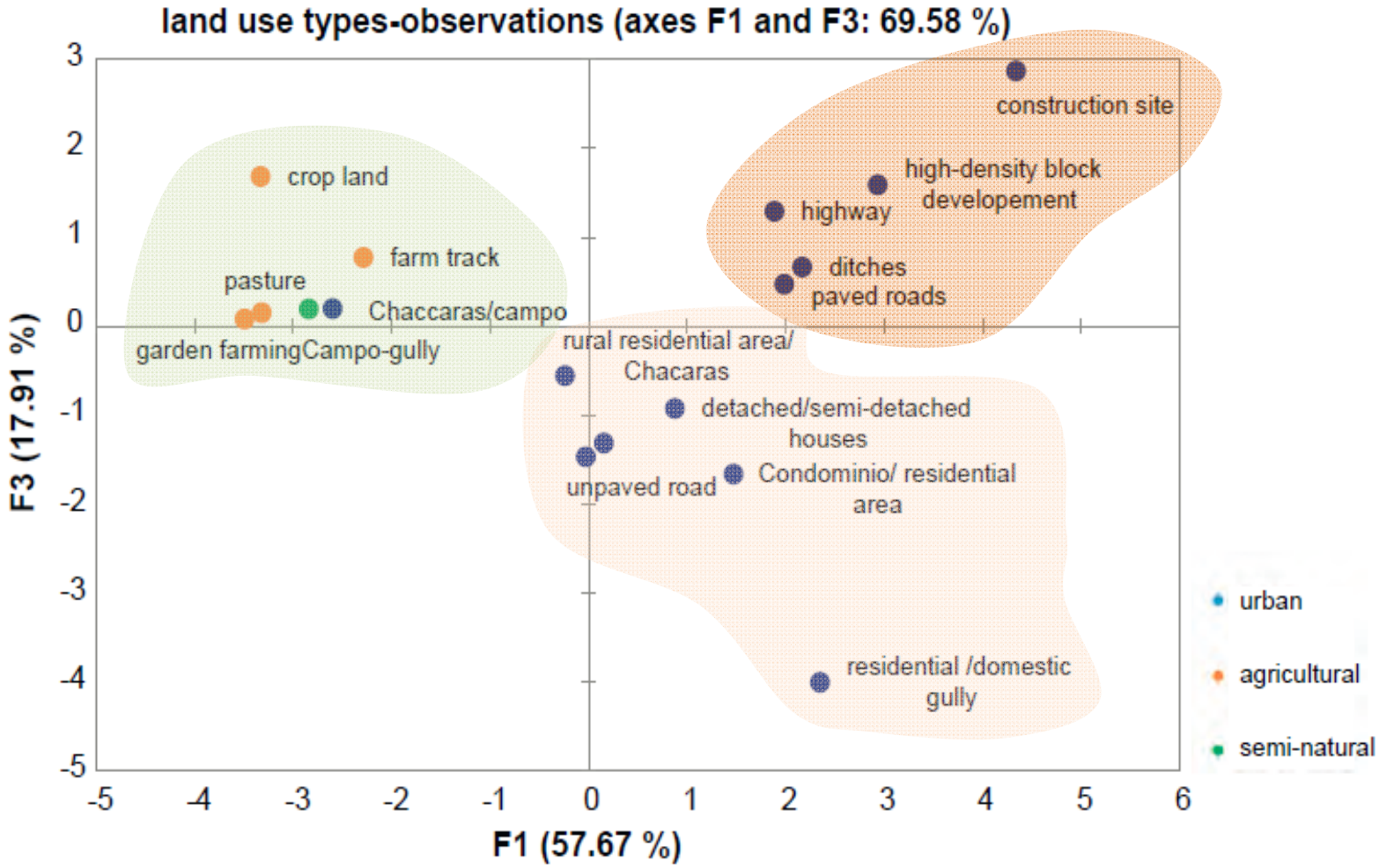

Fig. 7. Correlation circle of factor 1 (F1) and factor 3 (F3) and factor loading with respect to the landuse types and – categories.

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3 Conclusions

- Sedimentation rates in modern times, i.e. after 1960, are 10-100 times higher
- Sediments from urban, agricultural and natural areas have distinct geochemical fingerprints
- Implementation, sediment management plan
  ⇒ **quantification, measures**