

Limitations of Project-Based Environmental Impact Assessment (EIA) and the Need for Cumulative Effects Assessment (CEA) in the Assaluyeh Coastal Industrial Zone, Iran

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INTRODUCTION & AIM

The coastal industrial zone of **Assaluyeh**, located along the **Persian Gulf**, is one of the largest petrochemical hubs in the region, facing multi-source pollution pressures.

♦ INTRODUCTION

- Rapid industrial expansion
- Multi-source pollution (heavy metals, PAHs, BTEX, PM₁₀)
- Project-based EIAs dominate decision-making
- Cumulative impacts largely ignored

🎯 Aim:

To evaluate limitations of project-based EIAs and demonstrate the need for integrating CEA into SEA.

METHOD

❖ Approach

- Mixed-method cumulative assessment
- Based on published EIA/ESHIA reports
- No new field sampling
- Data period: 2015–2024

❖ Data

- Heavy metals (Pb, Cd, Ni, V)
- ΣPAHs, BTEX
- Soil, sediment, air

❖ Tools

- Contamination indices (CF, PLI, CPI)
- GIS spatial interpolation (IDW/Kriging)
- Multivariate statistics
- EPA health risk assessment

FUTURE WORK

- ▣ Long-term integrated monitoring
- ▣ Full CEA integration into SEA
- ▣ Advanced GIS hotspot & source apportionment

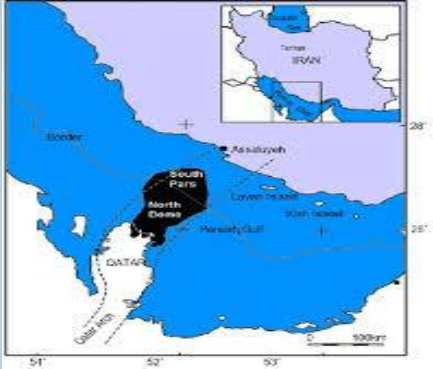
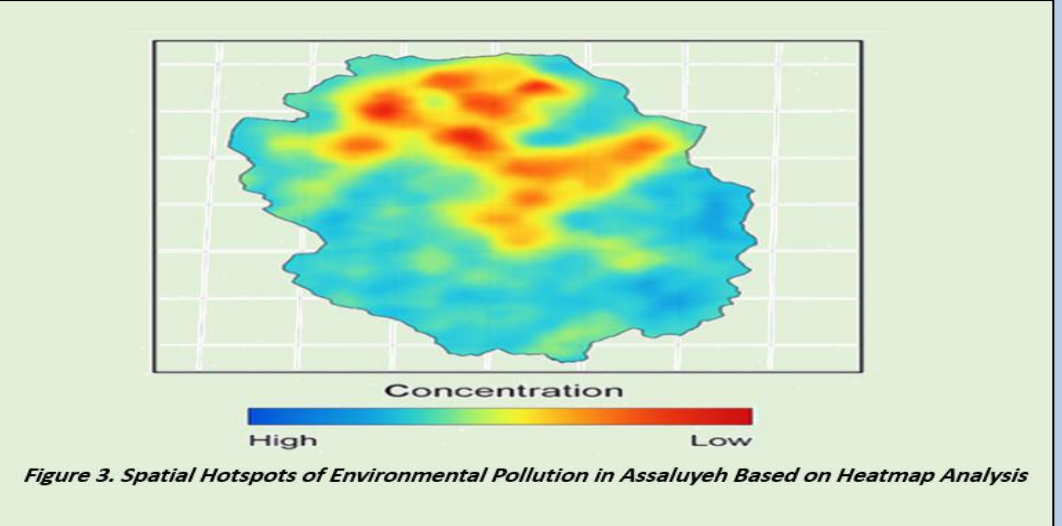
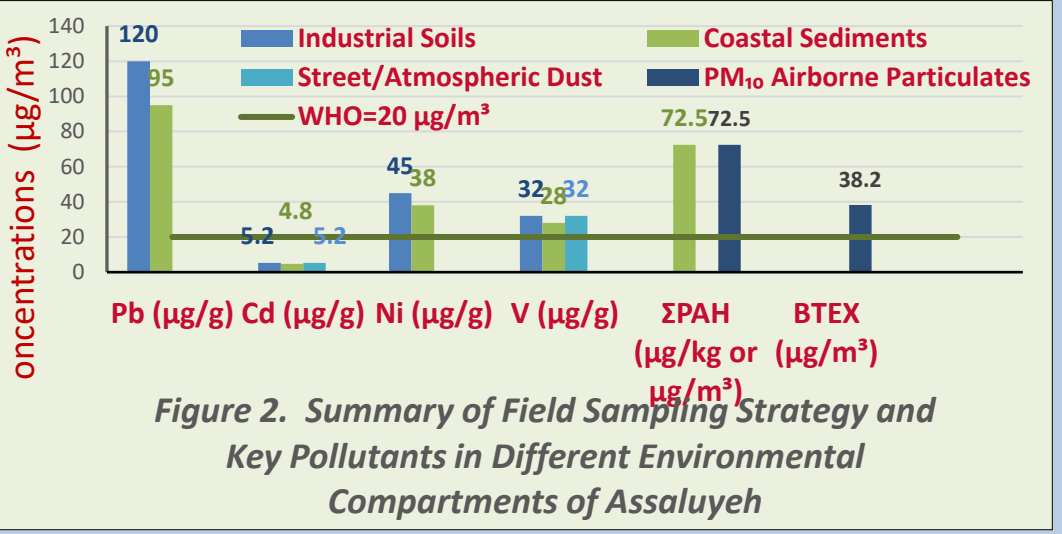
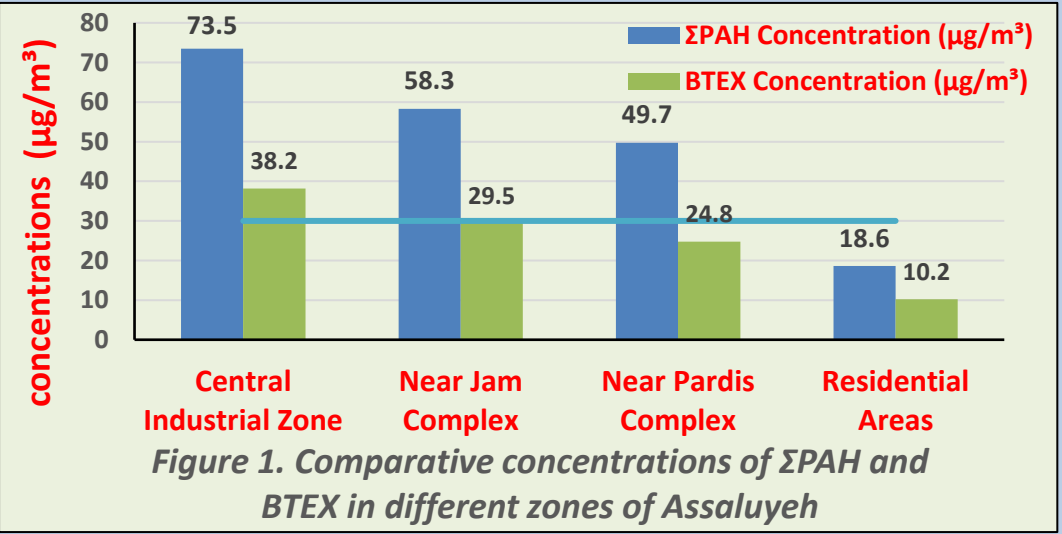


Table 1. Review of EIA/ESHIA reports and data quality					
Project	Report	Cumulative	Effects	Environmental	Data
	Accessibility	Section		Methodology	Transparency
JICA (2013)	Public	Not included		Limited	Moderate
Total	Restricted	Not included		Low	Low
Jam	Restricted	Not included		Low	Low
Pardis	Not accessible	–		–	–
Marjan	Not accessible	–		–	–



CONCLUSION

- Pollution is cumulative and multi-media
- EIAs fail to address long-term interactions
- Hotspot clustering confirms systemic pressure
- CEA integration improves regional governance

RESULTS & DISCUSSION

1 EIA Review

- Cumulative impact assessment mostly absent
- Baseline data inconsistent
- Long-term impacts overlooked

2 Heavy Metals

- Elevated concentrations in sediments & soil
- Evidence of bioaccumulation
- Ecological & health risks detected

3 Organic Pollutants

- Higher ΣPAHs & BTEX in industrial zones
- Strong correlation ($r \approx 0.8$)
- Common combustion & petrochemical sources

4 Spatial Analysis

- Clear pollution hotspots near industrial cores
- Radial decrease pattern
- Multi-media contamination

REFERENCES

- Tashakor, M. et al. (2022). Heavy metals and PAHs in Assaluyeh industrial and residential environments.
- JICA (2014). Environmental Assessment Report for Pars Special Economic Energy Zone (PSEEZ).
- Sun, Y. et al. (2021). Multi-source industrial pollution and cumulative environmental impacts.