

Multi-Scale Risk Mapping to Environmental Hazards in Coastal Bangladesh

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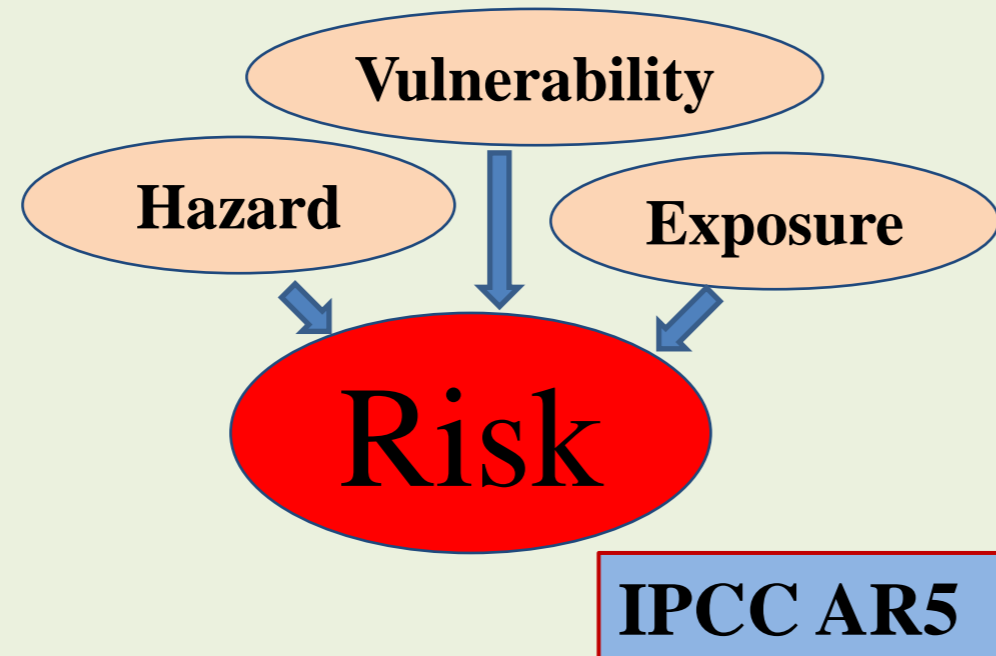
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Background

- Risk must be addressed at appropriate scale as the components that contribute to risk and vulnerability, the data availability and type, and the utility of an index approach vary with scale (there is no 'one size fits all' index).
- Vulnerability or risk indexing involves varying degrees of simplification and aggregation of information; with higher resolution usually being required at the local level as some important local variations in vulnerability are masked by simplifications at national or sub-national scale.
- At the local level, more detailed information is usually available, complexities are better captured, and certain methods to collect data (e.g. participatory approach) can be applied.

Methodology

	Hazard	Exposure
Regional (Coastal zone; 17 districts)	•Flood •Storm surge •Salinity •Erosion	•Population density •Cropped land •Number of household
Sub-regional (Upazila scale)	•Storm surge •Salinity	•Population density •Cropped land •Number of household
Local (Union scale)	•Storm surge •Salinity	•Population density •Cropped land •Number of household

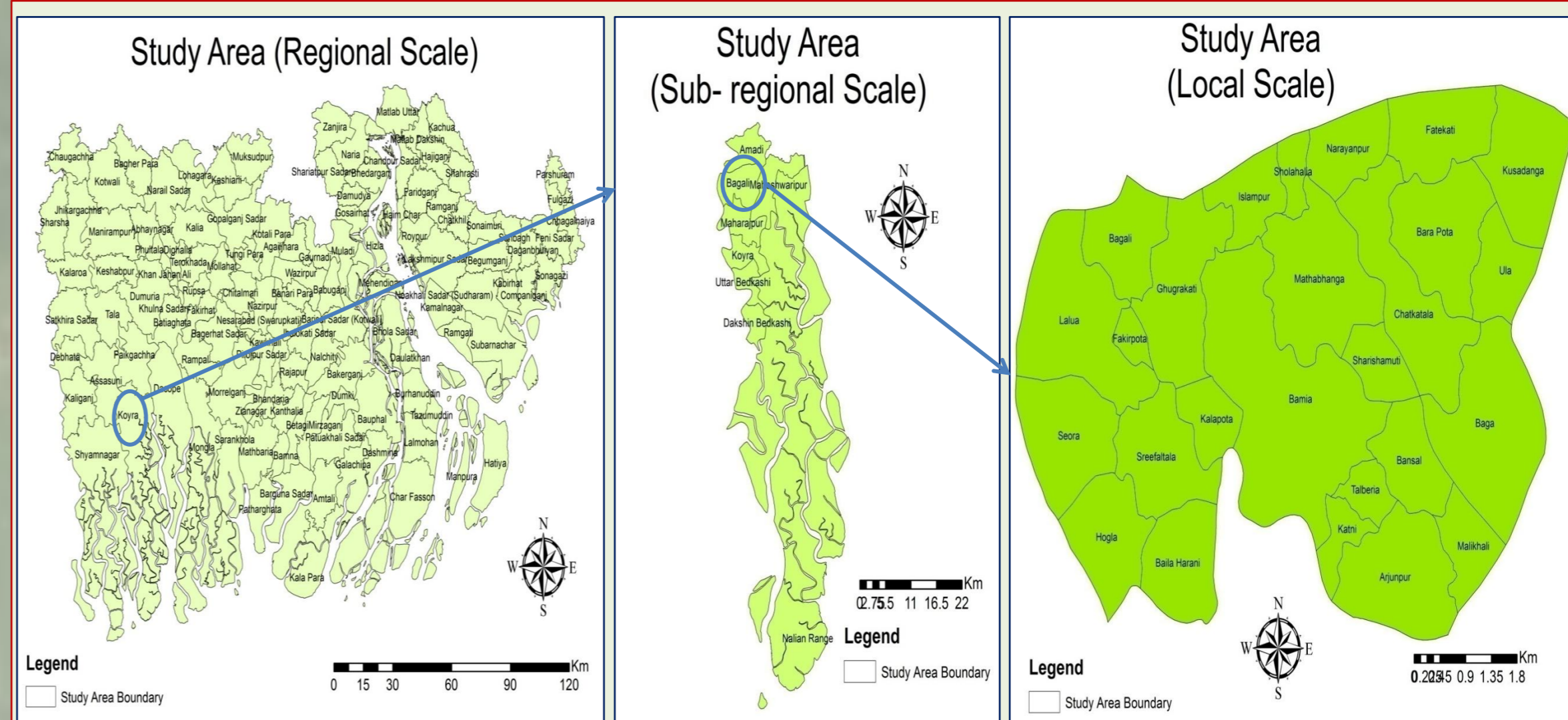


Vulnerability

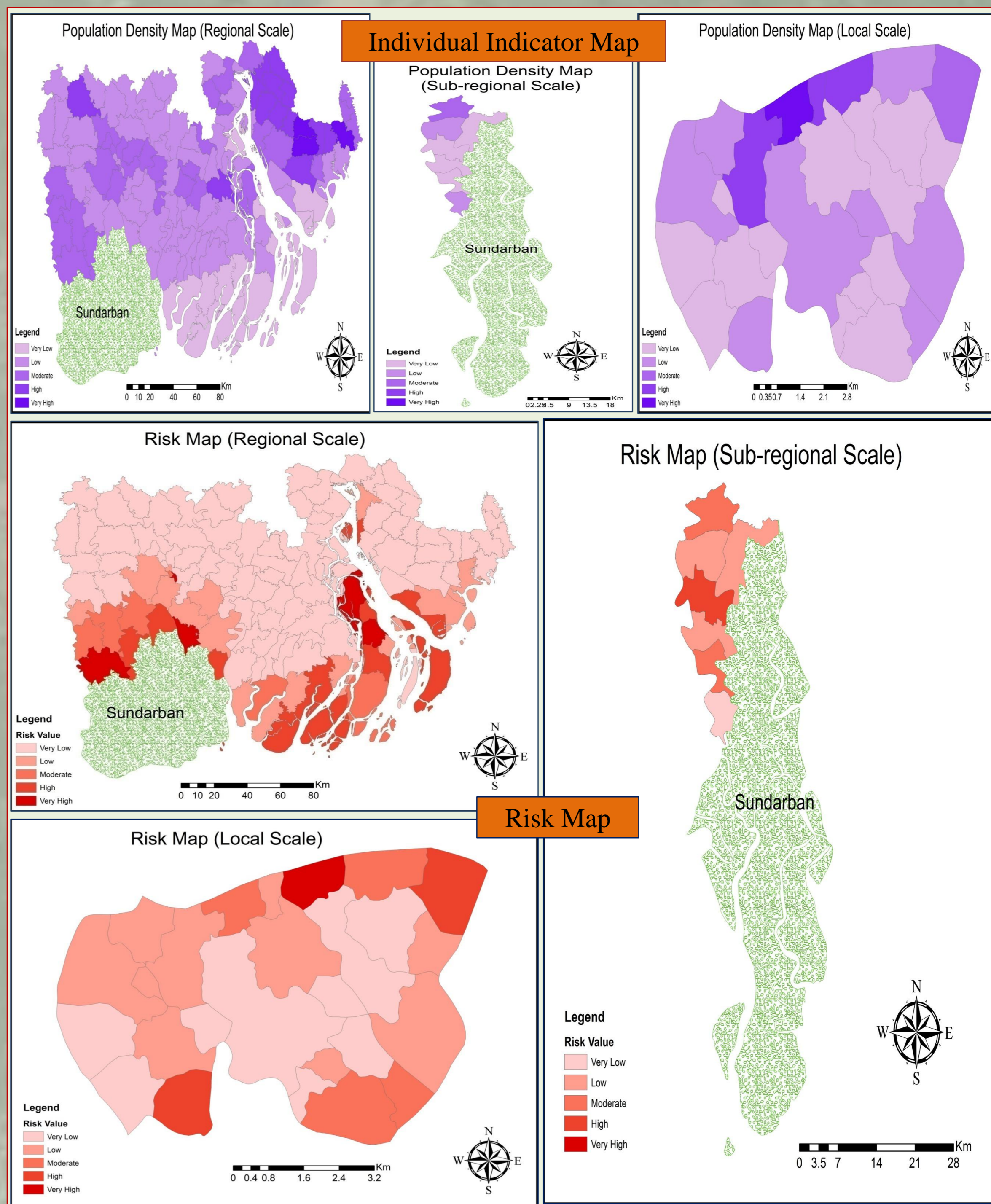
Domain	Indicator
Population	Social dependency
	Ratio of disable to able members
Gender	Female Literacy Rate
	Female male ratio
Education	Literacy rate
	School attendance rate
Livelihood and Poverty	People engaged in agriculture
	People engaged in industry
	People engaged in business
	People engaged in household works
	Number of unemployed people
Water and Sanitation	Poverty rate
	Households using tap water
	Households using tubewell water
Health	Sanitation facility
	Distance to nearest hospital
Housing Facility	Distance to nearest primary healthcare facilities
	Type of household
	Location of household
Road and Infrastructure	Duration of living in the resident area
	Road Network
	Market/Growth centre
	Railway/waterway
	Cyclone shelter
Environment	Flood shelter
	Co-operative Society
	Early warning system
Economic	Land use classification
	Water body
	Area under shrimp cultivation
Economic	Cropping Intensity
	Poverty rate
	Distance to nearest city
Economic	Number of bank branches
	Insurance company

- Choice of indicators for different scales are guided by three considerations: (i) what is the most appropriate type of data to quantify vulnerability and risk? (ii) what data are available or obtainable at the spatial scale of interest? (iii) are the data spatially explicit or can be made spatially explicit?
- For regional and sub-regional scale, indicators are chosen from literature review and expert opinions. A combination of participatory research methods and tools are used in selecting indicators and also obtaining data for local scale risk assessment.
- Some of the parameters relevant for regional scale may not be relevant at local scale. For example, flood and erosion are important hazard at regional scale while these hazards are not significant at local scale. Some parameters relevant for regional scale may not be relevant at local scale as data are of insignificant resolution e.g. poverty rate.

Study Area



Results and Discussion



Conclusion and Future Work

- A nested approach is of great value where national/ regional scale assessments are useful for formulation of policies and prioritization of resources, while local scale assessments help implement practical response to coastal hazards or help devise a local scale development and management plan.
- Assessing of risk and vulnerability at multiple spatial scales will provide improved understanding of the appropriateness of assessment scale for effective policy formulation, prioritization of resources and implementation of risk reduction measures.
- This is an ongoing work. Present study represents only preliminary findings. Future task will include refinement of indicators for different spatial scales, selection of appropriate weight for different indicators with stakeholder engagement for local scale.

Acknowledgement

