The Effective Application of Appropriate Standards and Specifications

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South East Asia Community Access Programme

Appropriate Standards & Specifications

1. The Requirement
2. Technical Issues
3. The SEACAP Contribution
4. Application
5. Next Steps

1 The Requirement

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Low Volume Rural Roads (LVRRs)

Upper Limits

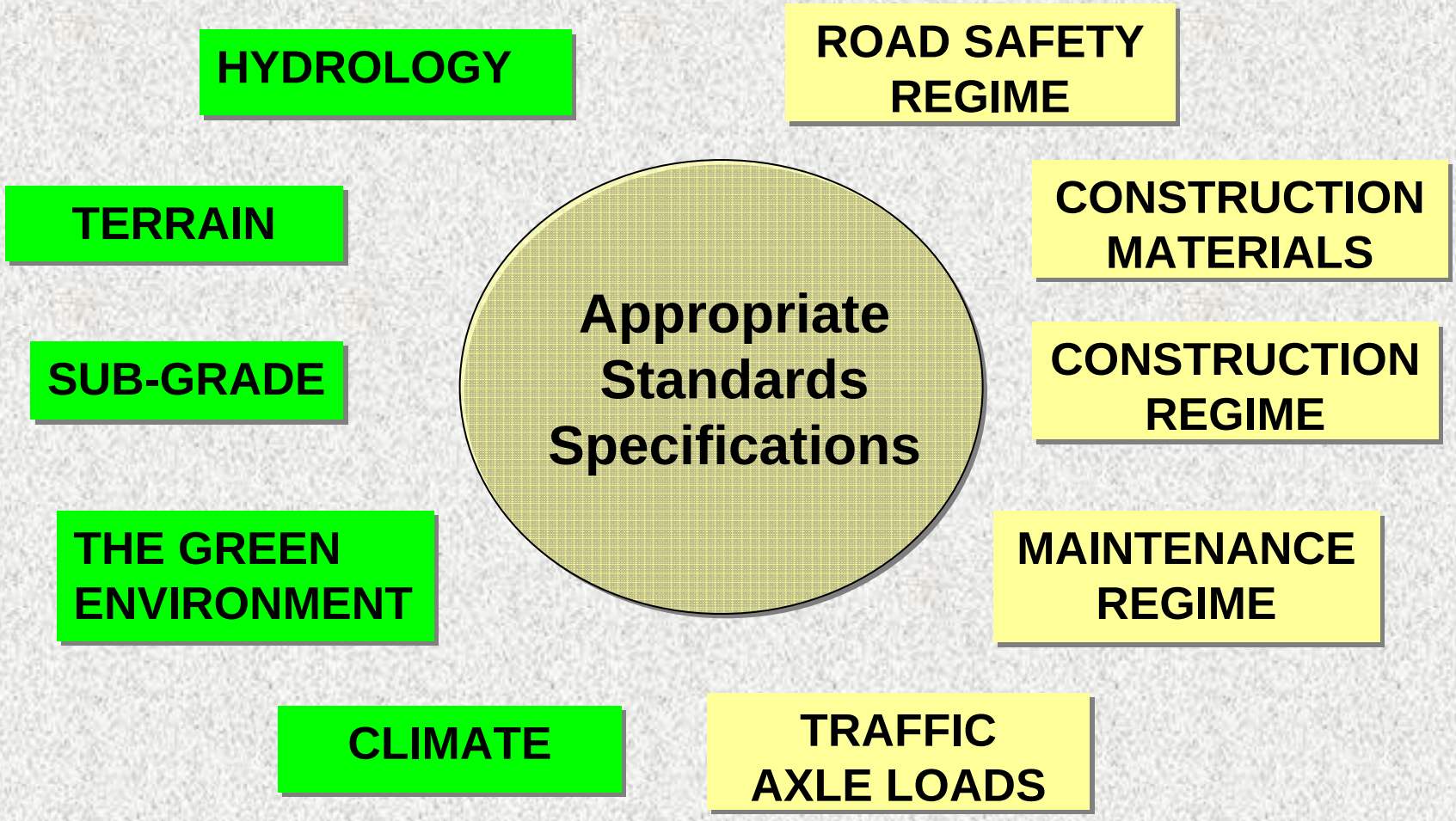
- **< 200 motor vehicles/day**
- **< 6 t axle loads**
- **< 150,000 esa**

An Alternative to Imported Standards-Specifications

Unsuitable:

- **Insensitive to local road environment**
- **High Factor of safety**
- **Wrong assumptions?**

THE ROAD ENVIRONMENT



Road Safety

LVRRs are very likely to carry mixed traffic; light trucks to pedestrians.

Reduce vehicle speed

Wide shoulders

Increased signing

Appropriate LVRR Standards & Specifications: Key Aspects

- **Task Based**

  Traffic; vehicles-people
- **Local Resource Based**

  Natural; Economic; Human
- **Flexibility**

  Regional Variation

2 Some Key Issues

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Local Materials as a Start Point

Key Question

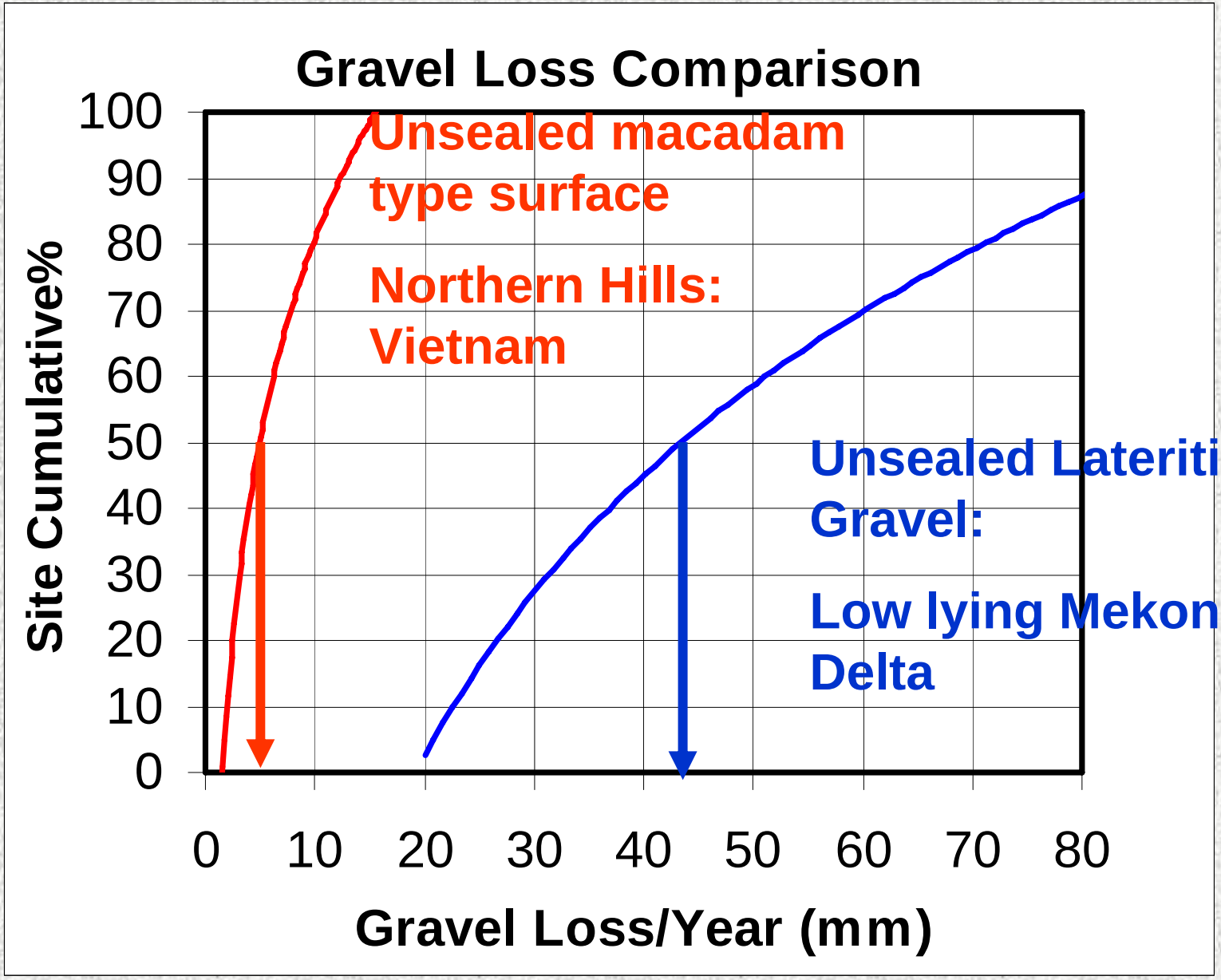
What appropriate road can I build with these local materials ?

NOT

Where can I find materials to meet these general specifications?

Locally available, but possibly non-standard, pavement construction materials should play a significant role within LVRR Standards and Specifcations

Must be Appropriate Use



Traffic (Vietnam)

	Vehicles Per Day		
	Motor Vehicles	Motor-Cycles	Cycles
Mekong Delta	0	1718	1085
	2	1110	646
Central Highlands	101	134	1064
	176	1150	106
	277	469	56
Northern Highlands	101	907	1025
	20	266	726
	148	1249	1304
	31	540	305
	67	572	776

Asset Management

Maintenance

Budget ?

Materials?

Road Shape?

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Ensuring the balance between the road task and its designed capability

Pavement Drainage- Poorly Done

Side drains

Run-off

3 The SEACAP Contribution

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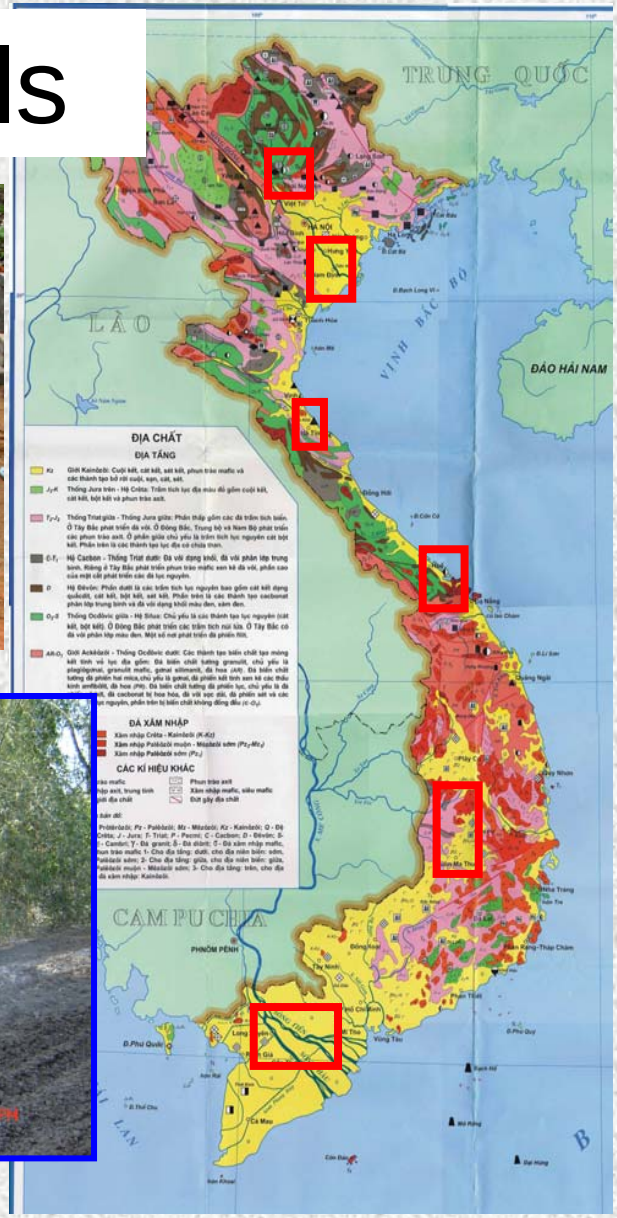
Key SEACAP (SC) Research on Standards & Specifications

- Pavement Trials (SC1,8,17,30)
- Performance Monitoring (SC 4, 1,19, 27)
- Costing (SC1, 19)
- Materials (SC19)
- Guidance Documents (SC1, 19)
- Slope Protection trials (SC 21)
- Drafting Standards and Specifications (SC3)
- Environmentally Optimised Design (SC31)

Vietnam Pavement Trials



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SC 21: Slope Protection

Cost-effective community-based & resource-based engineering techniques to reduce/eliminate land-slips.

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SEACAP 3 & 31- Lao PDR

Drafting of Low Volume Rural Road (LVRR) task-based Standards and Specifications.

Subsequent trialling

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SC3: LVRR Standards
Key Design Principles

1: Reduction in pavement thickness

2: Allow variation in material quality

3: Use of capping layer material

Whole-life Asset Costs

Typical Example - Hill region of N Lao with:

4% gradient; 2000mm rain/yr; 50-100 VPD sub-grade CBR 7%; 6T axle load

Costs US$/kilometre of pavement (3.5m)

	Construction	Construction + Maintenance	NPV Total Cost
Unsealed Gravel	$5,000.00	$52,869.00	$31,632.00
Sealed Dry-bound	$18,000.00	$30,826.00	$23,751.00

4. Application

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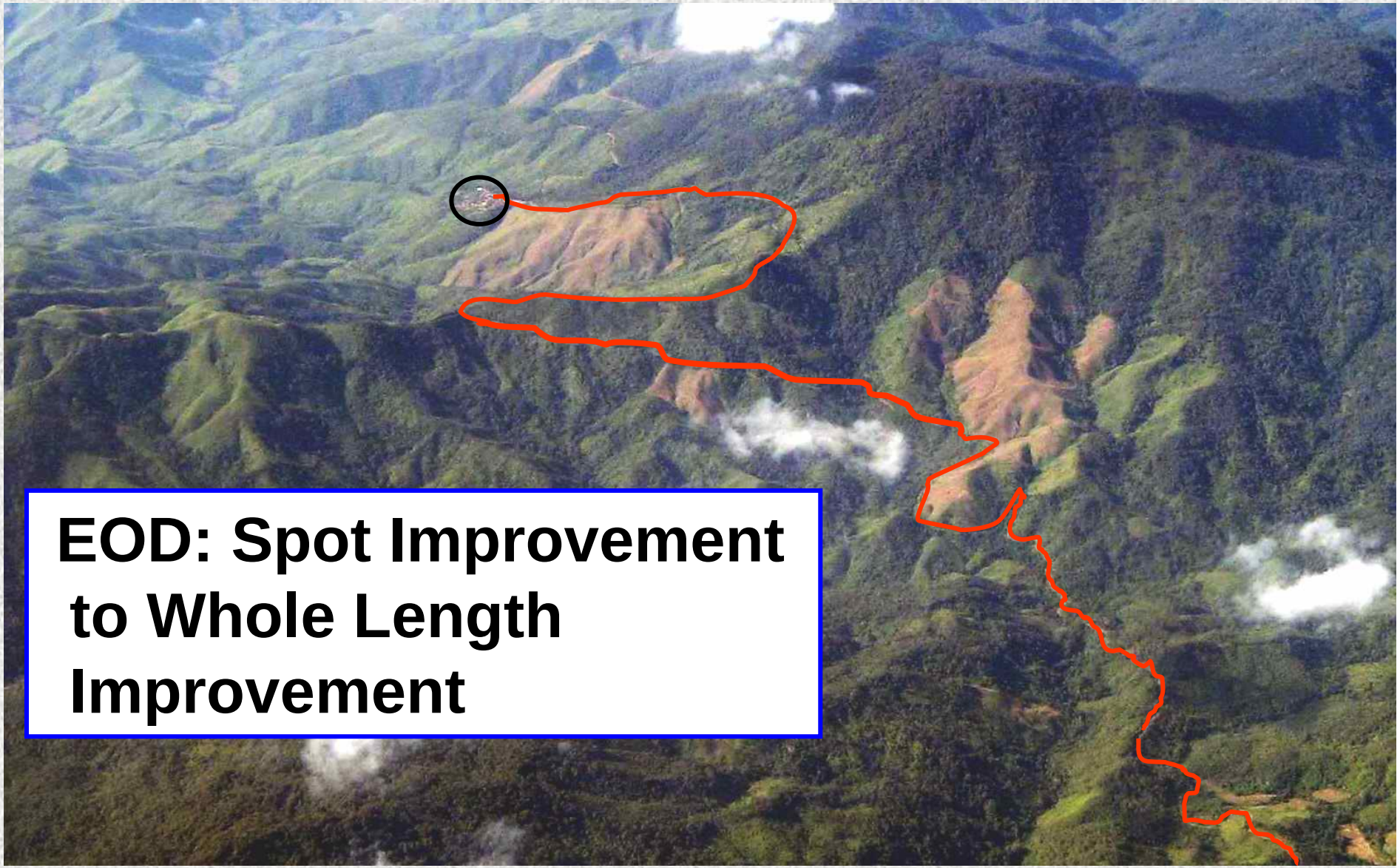
Key Elements for Sustainable Application

- Political
- Social
- Environmental
- Institutional
- Economic
- Financial
- Technical

Practical application framework; Whole-Life Costed & Environmentally Optimised Design (EOD)

Utilising the available resources of budget and materials in the most cost-effective manner.



EOD: Spot Improvement to Whole Length Improvement

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Improved Construction Quality Control Essential

Design compliance enforced.

Poor site procedures eliminated.

As-built inspections specified

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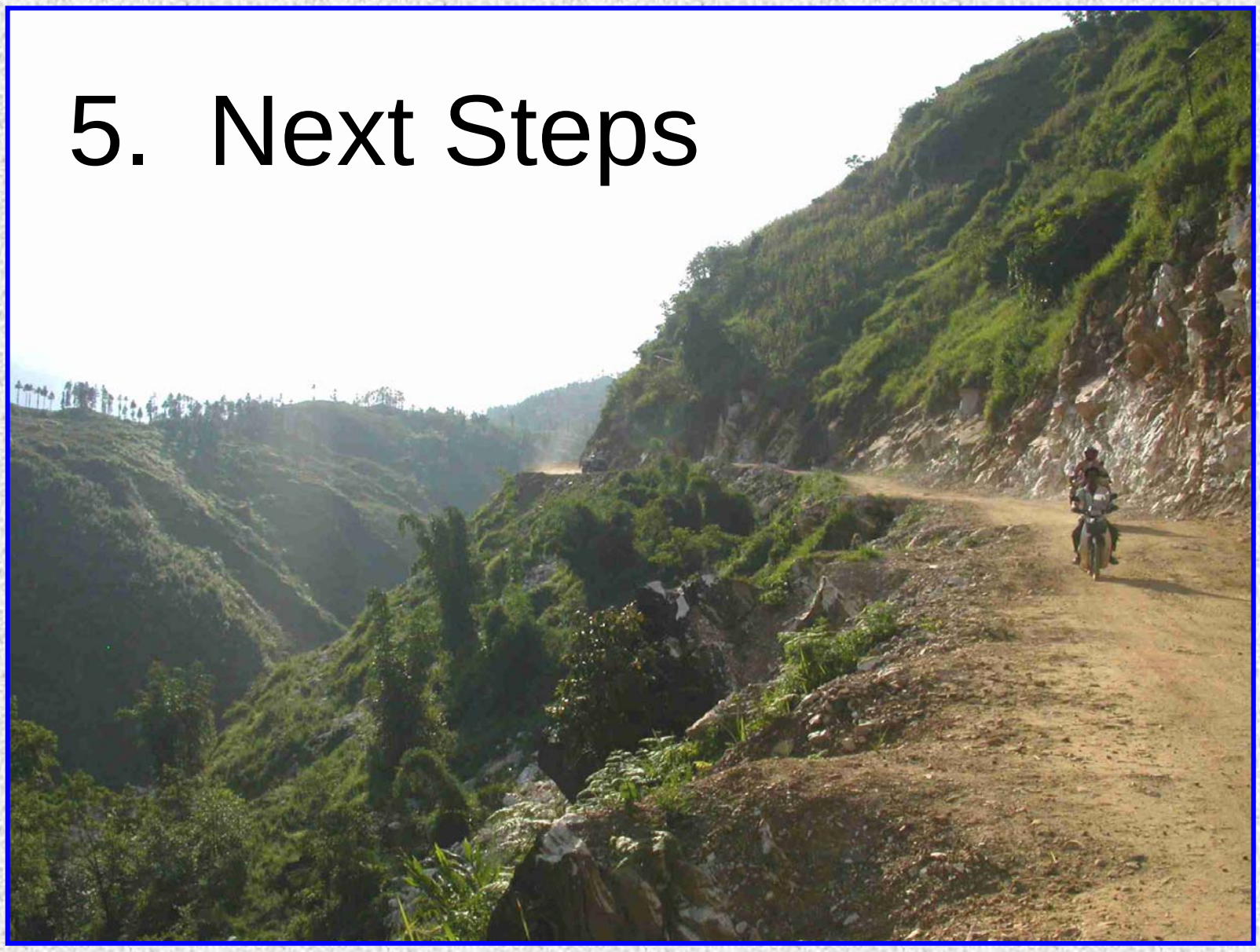
5. Next Steps



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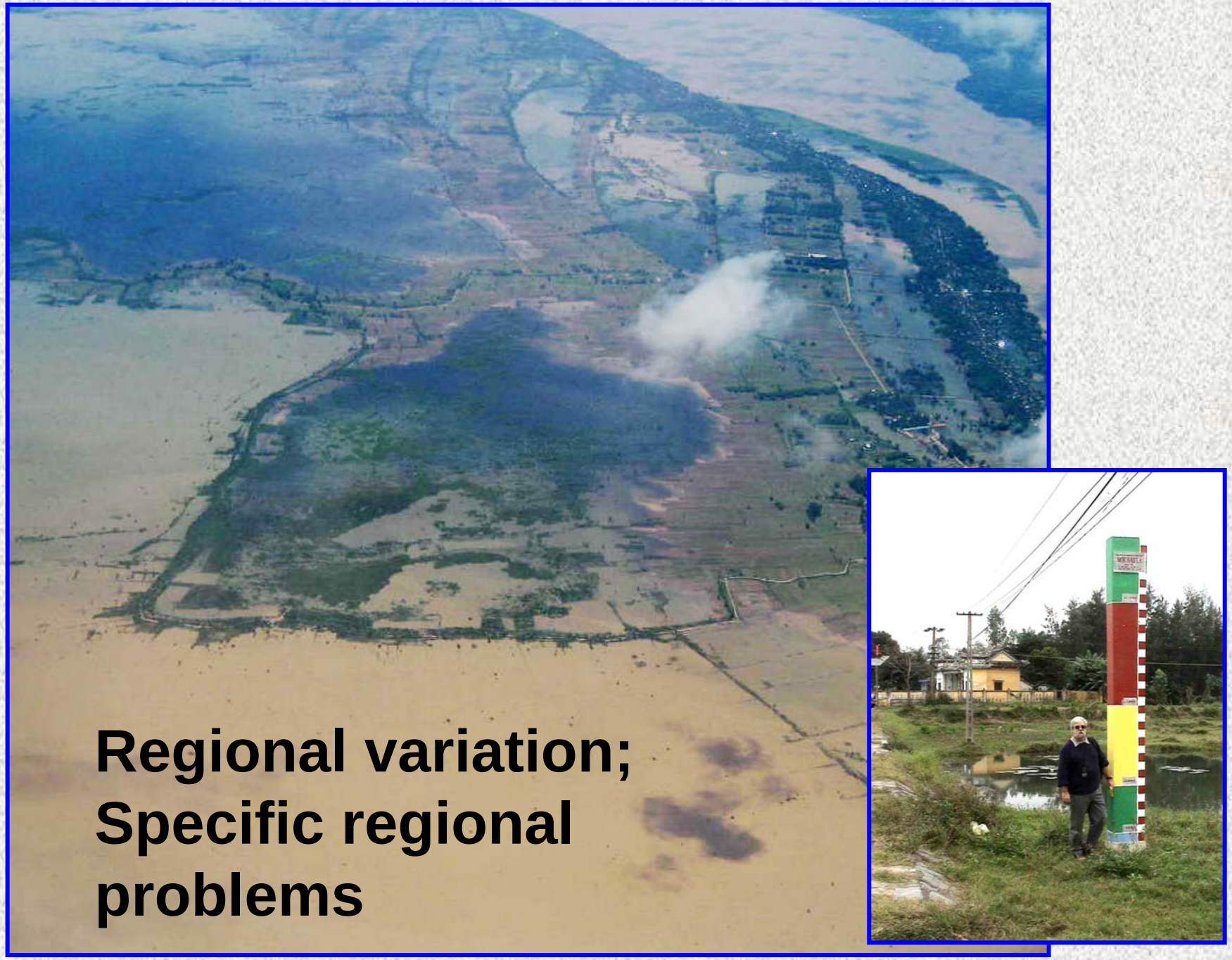
Administrative

- Lao – official acceptance and integration at province-district level.
- Vietnam – review of existing LVRR standards
- Cambodia – review following SC19 research outputs
- Regional – Local Institutions in Lead

Some Technical Issues

- Structures – a Low Cost Structures Manual
- Regional research – knowledge gaps
- Regional modification of Standards and Specifications
- Training and dissemination


Regional variation in
Standards &
Specifications –
Design Exceptions



Regional variation; Specific regional problems

Summary

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