

# Managing road infrastructure: *Promoting the use of selected approaches and tools*

***Presentation prepared for the  
Annual General Assembly of the  
SSATP, held in Bamako, Mali  
14 to 18 November 2005***

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# Purpose of presentation

***To update participants on the content, findings and recommendations so far of this study – this may impact on the work program for 2006.***

# Structure of presentation

- **TOR and study context**
- “Overview document”
- “Issues document”
- Questionnaire
- Where are we now?
- Way forward

# TOR and study context

- **Overall objective:**
  - To promote the use of selected approaches and tools in the region that can assist in managing road infrastructure
- **Study context:**
  - This study is one of the activities aimed at addressing the “demand for support” (see next slide)

**Thematic areas in 2005  
Work Program (WP) of  
SSATP program**

**Road Management  
and Financing  
(RMF)**

**Transport  
Services**

**Transport and  
Regional Integration**

**Initiative 1:  
Road Network  
Management  
(Inst & fins arrmnts)**

**Initiative 2:  
Road Fund  
Enhancement**

**Initiative 3:  
Road Agency  
Improvements**

**Initiative 4:  
Capacity building  
and training**

**Overarching Initiative 1:  
Transport Strategy Development**

**Overarching Initiative 2:  
Establishment of Transport Sector Performance Indicators  
(linked to Millennium Development Goals (MDGs))**

***Implementation of activities addressing demands for support:  
(E.g.) Preparation of Road Management Tools Guide***

**Study context**

# TOR and study context (continued)

- **Specific objectives (based on initial discussions and “Inception Report”):**
  - To prepare an “overview document” for the SSATP-supported approaches and tools, as well as five “new” approaches and tools
    - **Target audience: Users of approaches/tools**
  - To prepare a stand-alone “issues document”, focusing on aspects such as constraints for better uptake and ways to exploit the market
    - **Target audience: World Bank**

# Structure of paper

- TOR and study context
- **“Overview document”**
- “Issues document”
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# “Overview document”: Contents

- **Chapter 1: Introduction**
  - Purpose of document and target audience
  - Scope of the document
  - Description of key concepts
  - Structure of the document
- **Chapter 2: Overview of road management systems**
- **Chapters 3 to 16: Overview of 14 approaches and tools**
- **Chapter 17: Comparative analysis of approaches and tools**
- **Chapter 18: Contact details (web sites)**
- **Chapter 19: References**
- **Appendix A: Key success factors for road management systems**
- **Appendix B: Example of best practice: DROMAS**



# “Overview document”: Chapter 1: Introduction

- **Purpose of document:**
  - To give overview of selected approaches and tools, in order to promote their use
- **Target audience:**
  - Politicians and high-level decision makers, as well as 1<sup>st</sup> time technical readers
- **Scope of the document:**
  - I.t.o. type of road: whole spectrum from *social* roads to *main* (economic) roads (see next slide)
  - I.t.o. approaches/tools: 9 SSATP-supported approaches/tools plus 5 “new” approaches/tools
- **Description of key concepts:**
  - “Approach” vs “tool”: see slide

# **“Overview document” (cont): Contents of Chapters 3 to 16**

*For each of the approaches and tools, the following aspects are discussed:*

- ***Background and problem statement***
- ***Purpose and description***
- ***Expected results***
- ***Linkage to road management system***
- ***Limitations***
- ***Data requirements***
- ***Customizing to local needs***
- ***Examples of recent applications***
- ***Cost***

# **“Overview document” (cont):**

## **Chapter 17: Approaches and tools considered**

### **SSATP supported approaches and tools**

- **Highway Development and Management (HDM-4) model.**
- **Roads Economic Decision (RED) model.**
- **Road User Charges (RUC) model.**
- **Rapid Rural Road Appraisal (RRRA).**
- **Performance Assessment Model (PAM).**
- **Standard Overall Ultralite Road Care Estimate (SOURCE).**
- **Basic Access Approach (BAA).**
- **Participatory Rural Appraisal (PRA) technique.**
- **Integrated Rural Accessibility Planning (IRAP).**

# **“Overview document” (cont):**

## **Chapter 17: Approaches and tools considered (cont)**

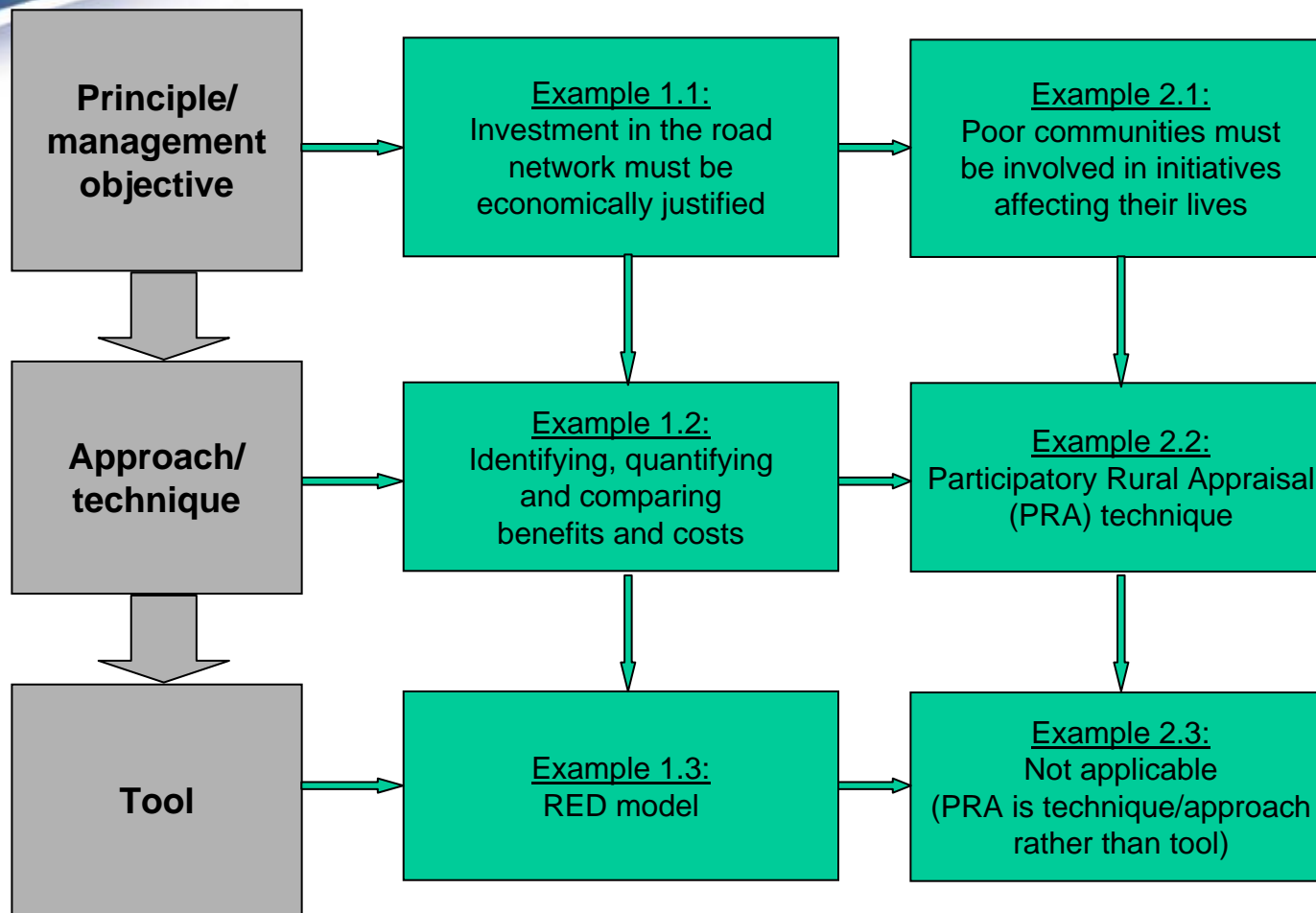
### **“New” approaches and tools**

- **Logical Framework Analysis (LFA)**
- **New Approach to Transport Appraisal (NATA)**
- **Decisions on a FINITE set of alternatives (DEFINITE)**
- **Balanced Score Card (BCA) method**

# “Overview document” (cont): Chapter 17: Road Management System defined

- **“Narrow” sense:** *“... any system that is used to store and process road and/or bridge inventory, condition, traffic and related data, for highway planning and programming”* (from recent World Bank report).
- **“Broad” sense:** As defined above plus relevant approaches and tools.

## Linkage between key concepts



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# “Overview document” (cont): Chapter 17: Features of social and economic roads

	Farm	Household/ Sub-village	Village	Market Center	District Headquarters	Regional Headquarters	Capital/ Port
<b>Typical Transport Infrastructure</b>	Path	Path/Track	Track/ Earth Road	Earth Road/ Gravel Road	1-2 lane Gravel / SD* Road	2 lane AC** Road	
<b>Typical Traffic</b>	Porterage	NMT 0-5VPD	NMT 5-50VPD	NMT 20-200VPD	>100VPD	>1500VPD	
<b>Typical Distance</b>	1-5 km	1-10 km	5-20 km	10-50 km	20-100 km	50-200 km	
<b>Share of Asset Value</b>							
<b>Share of Network Length</b>							
<b>Typical Ownership/ Responsibility</b>		Community	Local Government		Provincial/Central Government		
<b>Type of Network</b>	Rural Transport Infrastructure			***	National and/or Provincial Road Network		

- \* Surface
- \*\* Asphalt Concrete
- \*\*\* Part of either RTI or the Provincial Network

**“Overview document” (cont):  
Chapter 17: Summary of  
approaches and tools**

**See next slide  
for example**



## Summary of approaches and tools

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Tool	Short description	Developed by:	When:
RMS	Any system that is used to store and process road and/or bridge inventory, condition, traffic and related data, for highway planning and programming. Associated with the RMS are appropriate business processes to use the RMS to support the business needs of the highway agency.	Various road agencies, also commercially available	Not applicable
RRRA (Rapid Rural Road Appraisal)	By providing information on the extent and condition of the non-main road network, using low-cost methods utilising state-of-the-art IT. Information on the entire road network under the jurisdiction of the authority, enabling it to properly manage it.	World Bank	??
SOURCE (Standard Overall Ultralite Road Care Estimate)	By producing an overall indicator of the physical performance of the road network. Information on the physical performance of the road network and changes in the level of service resulting from recent interventions.	RMI (Road Maintenance Initiative) (World Bank)	1998
HDM-4 (Highway Development and Management Model)	By determining the funding level for defined network standard, and by determining the resulting network standard for a given funding level. The road authority will be able to plan for sufficient funding, alternatively, to indicate the consequences of insufficient funding.	Initiated by the World Bank	1968

# “Overview document” (cont): Chapter 17: Comparative assessment of approaches and tools

**See next slide  
for example**

## Comparative assessment of approaches and tools

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Tool	Management objective	Resulting need to be addressed	How does the tool address this need?	Intended outcome of use of this tool
HDM-4 model: Strategy level	The trade-off between network standard and funding level must be managed in a justifiable manner	The funding implication of a given network standard must be known; alternatively, the resulting network standard for a given funding level must be determined	By determining the funding level for defined network standard, and by determining the resulting network standard for a given funding level	The road authority will be able to plan for sufficient funding, alternatively, to indicate the consequences of insufficient funding
HDM-4 model: Programme level	Correct investment decisions must be made when additional funding becomes available	The optimal combination of sections of the road network must be identified for periodic maintenance and improvement	By identifying the "correct" combination of sections of the road network to be maintained and improved	Investment in the road network that is economically justified and that will reduce total transport cost
HDM-4 model: Project level	Investment in the road network at the project level must be economically justified	Benefits and costs over the economic life of the project, resulting from the investment, must be calculated	By ensuring that discounted benefits exceed (or at least are equal to) discounted costs over the economic life of the project	Total transport cost will be minimised as the investment option that minimises total transport cost will be indicated
RED model	Investment in the road network at the project level must be economically justified	Benefits and costs over the economic life of the project, resulting from the investment, must be calculated in cases where relevant data are not available at the same level of detail as in the case of HDM-4	By ensuring that discounted benefits exceed (or at least are equal to) discounted costs over the economic life of the project	Total transport cost will be minimised as the investment option that minimises total transport cost will be indicated

**“Overview document” (cont):  
Chapter 17: Linkage of approaches and  
tools to road management**

**This was done by linking approaches  
and tools to the 7 KRAs (Key Result  
Areas) of road agencies**

# **“Overview document” (cont):**

## **Chapter 17: KRAs of road agencies**

- ***Monitoring and evaluation (knowing what's going on)***
- ***Network standard at a strategy level***
- ***Asset preservation (keep (look after) what you have)***
- ***Needs assessment (focusing on the role of road network in poverty alleviation)***
- ***Appraisal and ranking of investment options***
- ***Funding of road network***
- ***Organizational functioning of the road agency***

**“Overview document” (cont):  
Chapter 17: Linkage of  
approaches and tools to road  
management**

**See next slides  
for example**

### Linkage of tools to road management

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Road agency KRA (= aspects in terms of which agency will be judged)	Principle/management objective		Item			
	(Overall) objective	(Specific) objective	Social roads		Economic roads	
			Approach	Tools	Approach	Tools
Monitoring and evaluation (knowing what's going on)	The performance of the road network must be monitored, and evaluated against set performance criteria	"Overall objective" as applied to the formal network			RMS	
		"Overall objective" as applied to the non-main road network	RRRA			
		Evidence is needed of positive changes that took place since the inception of the RMI (given lack of reliable data)	SOURCE			
Network standard at a strategy level	Appropriate standards must be set - the trade-off between network standard / funding requirement must be managed in a justifiable manner				HDM-4 (Strategy level)	
Asset preservation (keep (look after) what you have)	The existing road network must be optimally maintained in order to maximise net benefits to society		HDM-4 PAM			
Needs assessment (focusing on the role of road network in poverty alleviation)	The role of rural transport infrastructure (especially social roads) as a critical element of poverty alleviation initiatives must be recognised	The analysis, presentation and management of interventions at all levels (project, programme and strategy) must be based on appropriate techniques	LFA		LFA	
		The "right" balance between investment in the main road network and in basic access interventions must be sought in order to maximise poverty reduction initiatives	BAA			
		The concept of a "sustainable livelihood" must be understood in the context of broader development debates	SLA			
		The accessibility needs of rural households in terms of basic social and economic services must be addressed, as "roads are not enough"	IRAP			
		(Poor) communities must be involved in initiatives affecting their lives	PRA			
Appraisal and ranking of investment options	Investment in the road network must be <i>economically</i> justified	Investment at the <i>partial network level</i> must be economically justified			HDM-4 (Programme level)	
		Investment at the <i>project level</i> must be economically justified	RED model		HDM-4 (Project level)	
	All <i>project impacts</i> must be considered in project appraisal and ranking	Project appraisal must occur in terms of a logical framework	NATA		NATA	
		"Project worth" must be expressed as a single numerical figure, based on all impacts	DEFINITE			
Funding of road network	Road users and beneficiaries must bear the full cost incidental to operating, maintaining and improving the road network		RUC			
Organisational functioning of the road agency	The authority responsible for managing the road network must be functioning optimally		BSC		BSC	



### Linkage of approaches and tools to road management

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Road agency KRA (= aspects in terms of which agency will be judged)	Principle/management objective		Item			
	(Overall) objective	(Specific) objective	Social roads		Economic roads	
			Approach	Tools	Approach	Tools
Monitoring and evaluation (knowing what's going on)	The performance of the road network must be monitored, and evaluated against set performance criteria	"Overall objective" as applied to the formal network.			RMS	
		"Overall objective" as applied to the non-main road network.	RRRA			
		Evidence is needed of positive changes that took place since the inception of the RMI (given lack of reliable data).	SOURCE			
Network standard at a strategy level	Appropriate standards must be set - the trade-off between network standard / funding requirement must be managed in a justifiable manner.				HDM-4 (Strategy level)	
Asset preservation (keep (look after) what you have)	The existing road network must be optimally maintained in order to maximise net benefits to society.		HDM-4			
			PAM			



### Linkage of approaches and tools to road management

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Road agency KRA (= aspects in terms of which agency will be judged)	Principle/management objective		Item			
	(Overall) objective	(Specific) objective	Social roads		Economic roads	
			Approach	Tools	Approach	Tools
Needs assessment (with specific focus on the role of road network in poverty alleviation)	The role of rural transport infrastructure (especially social roads) as a critical element of poverty alleviation initiatives must be recognised	The analysis,	LFA		LFA	
		The "right" balance between investment in the main road network and in basic access interventions must be sought in order to maximise poverty reduction initiatives.	BAA			
		The concept of a "sustainable livelihood" must be understood in the context of broader development debates.	SLA			
		The accessibility needs of rural households in terms of basic social and economic services must be addressed, as "roads are not enough".	IRAP			
		(Poor) communities must be involved in initiatives affecting their lives.	PRA			

### Linkage of approaches and tools to road management

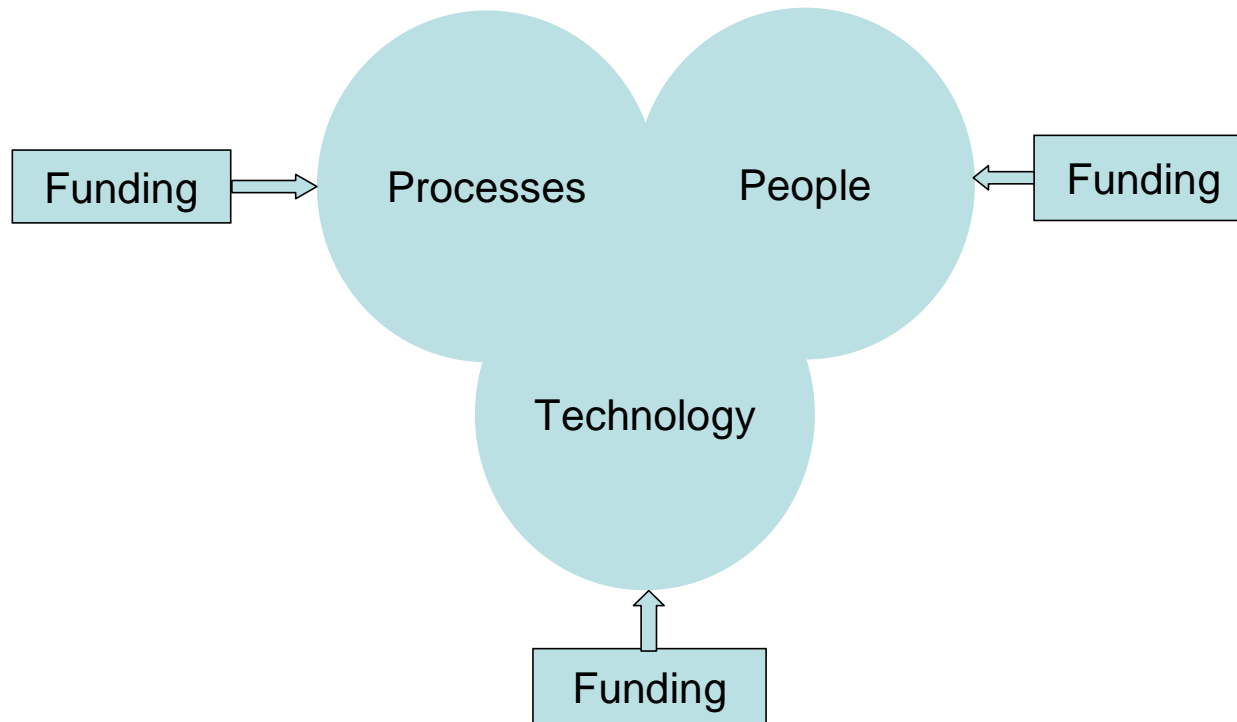
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Appraisal and ranking of investment options	Investment in the road network must be <i>economically</i> justified	Investment at the <i>partial network level</i> must be economically justified.			HDM-4 (Programme level)	
		Investment at the <i>project level</i> must be economically justified.	RED model	HDM-4 (Project level)		
	All <i>project impacts</i> must be considered in project appraisal and ranking	Project appraisal must occur in terms of a logical framework.	NATA		NATA	
		"Project worth" must be expressed as a single numerical figure, based on all impacts.	DEFINITE			
Funding of road network	Road users and beneficiaries must bear the full cost incidental to operating, maintaining and improving the road network.		RUC			
Organisational functioning of the road agency	The authority responsible for managing the road network must be functioning optimally.		BSC		BSC	

## **“Overview document”: Appendix A: Key success factors for RMS**

- **Key factors were identified in recent World Bank report: “Success factors for Road Management Systems (East Asia Pacific Transport Unit)”**
- **See next slide**

## Processes, people, technology and funding



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## **“Overview document”: Appendix A: Key success factors for RMS**

- ***Processes: The road management system must have an active role in the road agency***
- ***People: The road management system must be fully institutionalized and supported***
- ***Information technology: The IT components must be appropriate***
- ***Data collection: Data collection must be appropriate and sustainable:***

# "Overview document": Appendix B: Example of best practice

***DROMAS***

# Structure of paper

- TOR and study context
- “Overview document”
- **“Issues document”**
- Questionnaire
- Where are we now?
- Way forward

# “Issues document”

- **Target audience: World Bank (initially)**
- **Contents: Aspects such as:**
  - **Details of survey:**
    - Questionnaire used
    - Organizations interviewed
  - **Results obtained:**
    - Examples of best practice
    - Utilization of tools
    - Constraints in the use of tools
    - Options for fast-tracking use of tools
  - **Recommendations (based on results obtained)**



# Structure of paper

- TOR and study context
- “Overview document”
- “Issues document”
- **Questionnaire**
- Where are we now?
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# Questionnaire

## Objectives:

- The identification of examples of best practice in respect of road management systems;
- The extent to which available tools for facilitating road management are currently being used;
- Constraints (e.g. human resources, financial and technical constraints) in cases where this does not happen;
- The identification of strategies and an action plan to fast-track the use of available tools

# Questionnaire (cont)

## Contents:

- **Table 1: General information (e.g. country, agency name)**
- **Table 2: RMS: Information on subsystems used in your organization**
- **Table 3: RMS: Constraints/challenges regarding implementation and use, and suggested solutions**
- **Table 4: Approaches and tools: Information on approaches and tools used in your organisation**
- **Table 5: Approaches and tools: Constraints / challenges regarding implementation and use, and suggested solutions**

# Questionnaire (cont): Details

- **14 countries**
- **23 road agencies**

# Structure of paper

- TOR and study context
- “Overview document”
- “Issues document”
- Questionnaire
- **Where are we now?**
- Way forward

# Where are we now?

- **“Overview document”:**
  - Draft report has been completed, and comments received
  - Comments are being incorporated in Draft “User Guide”
  - Will then be re-submitted for internal peer review
- **“Issues document”:**
  - Awaiting final responses to questionnaire

# Structure of paper

- TOR and study context
- “Overview document”
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- Where are we now?
- **Way forward**

## Way forward: Conclusions

- **Inclusion of more approaches and tools:** The need has been identified to expand the study to also include other/more approaches and tools
- **Certain patterns are already emerging:** Although the response rate has been low (+- 33%), certain patterns are already emerging



## Way forward: Conclusions (cont)

- **Low usage of RMS:** Generally, there is a low use of RMS (in a narrow sense)
- **Approaches and tools mostly not known in the region:** “Approaches and tools” listed in the questionnaire is mostly not known (and therefore not used), even by “industry leaders”

# Way forward: Recommendations

- **Importance of training:** Training constitutes a critical component of promoting the use of approaches and tools

# Way forward: Recommendations (cont)

## Some suggestions by respondents:

- **Importance of user group: “A mini-forum for the region must be organized”**
- **Virtual interest group: This could be supplemented by a virtual discussion group**