

# **Low Volume Roads Design Manuals for Ethiopia and the Universal Rural Roads Access Programme**

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# **AFCAP**

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## 1. Background

- Country Profile
- The RSDP
- URRAP

## 2. LVRs and LVR Manuals in Ethiopia

- Definition
- Rationale
- Approach and Methodology
- Outputs and achievements
- Potential for wider use

## 3. Concluding Remark

# Background



## 1.1 COUNTRY PROFILE

**Name – Ethiopia (FDRE)**

**Location - East Africa (SSA)**

**Area – 1.1 mil sq.km**

**Population Size - > 85 mil**

**Gov't Structure – Federal State**

**Economy**

- **GDP - > USD 43 bil**
- **Predominantly agricultural**
- **Last 11 yrs av. growth rate – 11%**

**Road Network**

- **Classified road network - 85,966 k.m**

# The RSDP

Program	Physical Plan Vs. Accomplishment, km		
	Plan	Actual	% age
RSDP I	8908	8709	98
RSDP II	8486	12006	141
RSDP III	20686	19250	93
RSDP IV (three years)	54747	41664	76
Total RSDP (16 yrs)	92828	81629	88

All Weather Road Network [in Km] – 2010/11	RSDP IV (2010/11 – 2015) [in Km]				All Weather road Network by 2014/15 [in Km]
	(URRAP) Roads	Regional Roads	Federal Roads	Total Five Year Plan	
48,793	71,523	11,212.00	4,332.00	87,067	135,861

# Trigger for URRAP

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- Only 48,793 km of all weather roads
- Limited Rural Accessibility, RAI value was only 27%
- 64.2% of areas further than 5km of all-weather roads
- Average distance to all-weather road - 11.3 km (>3.5 hrs)
- Only 42% of kebeles (villages) connected by all weather roads
- Rural communities were often left isolated and without access
- Limited/no Technical Capacity among Weredas/Districts and lack of Design Standards, Lack of Ownership of Community roads
- Inadequacy of capital and maintenance budget for rural roads.

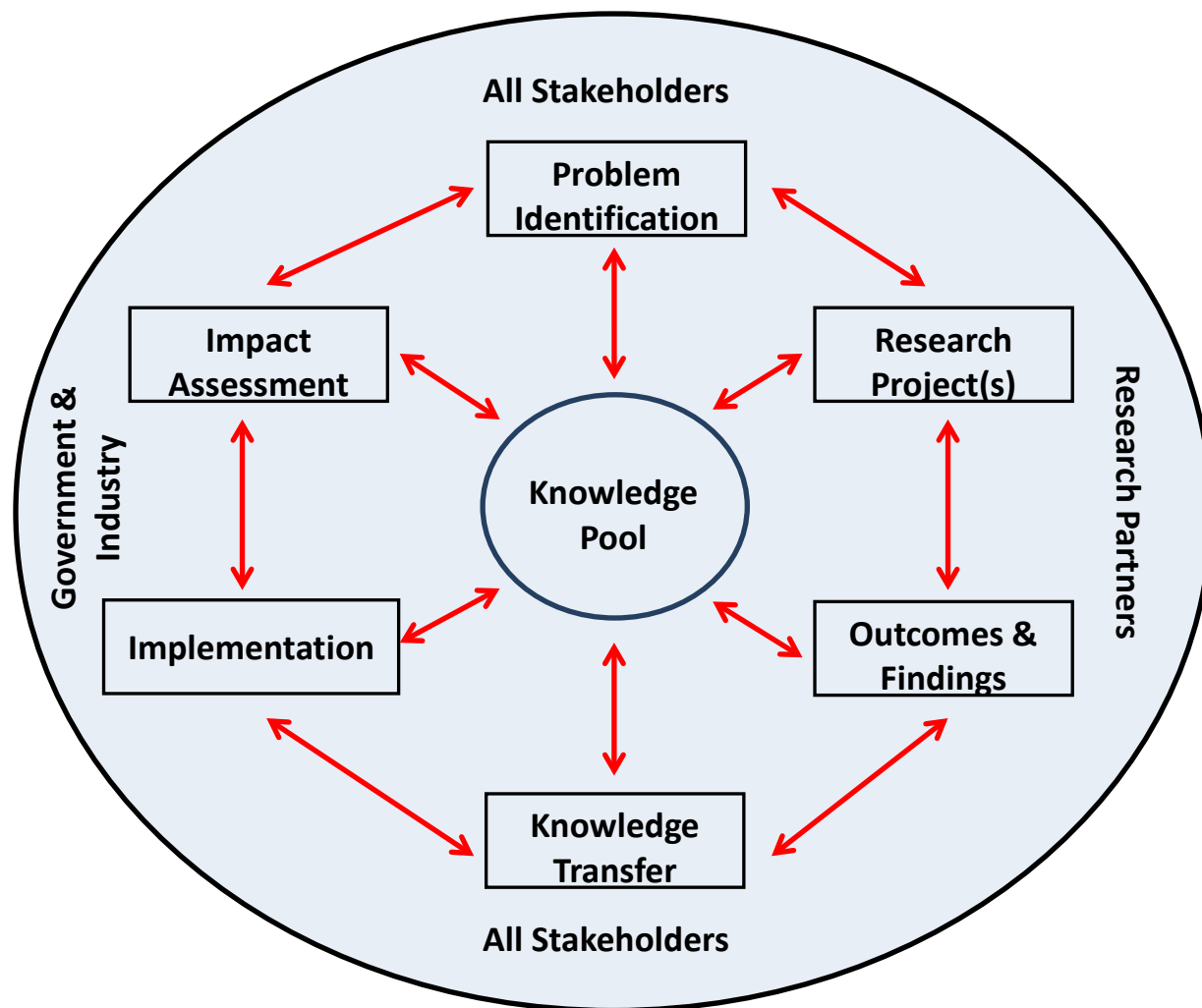
## 5 years implementation, the program targets:

- Construction of 71,523 Km of all weather access roads,
- Introduction of sustainable road maintenance regimes on improved road networks,
- Developing and strengthening small and medium scale private enterprises working in support of the sector,
- Creating massive employment opportunities for community and middle-level professionals, and
- Instituting and strengthening an appropriate and affordable institutional set-up at Wereda level that can administer and manage roads under its jurisdiction.

# Why LVR Manuals in Ethiopia?

- Majority of the total road network are LVRs
- The Standard Approach remain overly conservative, inappropriate and far too costly for application on much of the country's rural road network.
- Design manuals only appropriate for HVRs
- Opportunities that would provide better and lower cost engineering solutions were missed:
  - Application of appropriate design standards
  - Better understanding and use of locally available materials
  - Alternative options for road surfacing
  - Application of innovative construction techniques
  - Greater use of local labour

# 3.3 Approach and Methodology



Knowledge Development and Transfer Model

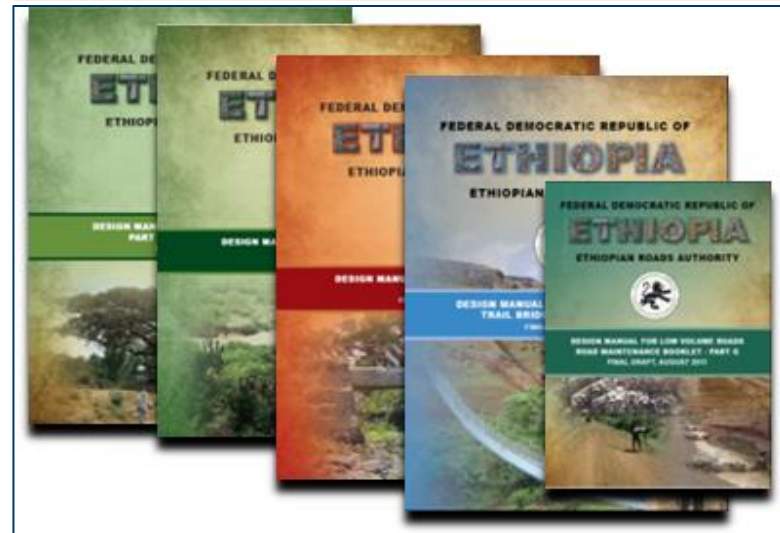
- The manuals were based on **30 years of LVR experience from Africa** and other relevant source, especially the SADC LVR manual and SEACAP
- This is the first manual that **actually** defined **design standards** for LVRs. Others were generally guidelines.
- **Joint funding** between AFCAP and ERA

# Project Outputs

## Design Manual for Low Volume Roads

- **Part A:** Introduction to Low Volume Road Design
- **Part B:** Design Standards for Low Volume Roads
- **Part C:** Complementary Interventions
- **Part D:** Explanatory Notes for Low Volume Roads Design
- **Part E:** Explanatory Notes and Design Standards for Small Structures
- **Part F:** Trail Bridge Manual
- **Part G:** Road maintenance Booklet

- Standard specification and method of measurement
- Standard Bidding Documents & their respective guidelines for works contracts &;
- RFPs for design and supervision services



# Achievements so far

In the last three years of implementation well over 27,600 km of all weather roads are constructed. The impact of this is:

Indicator	2010/11	2013	
		Without URRAP	With URRAP
Total Classified road network	48,793	58,338	85,966
Areas farther than 5 km from all weather road (%)	64	59	46
Areas farther than 2 km from all weather road (%)	84	81	73
Average distance to all-weather road (in km)	11.3	9.4	6.4
Average distance to all-weather road (in hrs)	3.8	3.1	2.1
RAI	25	35	43

## More than:

- 7,000 copies of LVR Design Manuals are distributed to all Regions, Woredas, and consultants involving in URRAP.
- 4,400 technicians and middle level professionals are trained in ERA training centers on material quality, labour based construction, surveying, equipment operator, etc.
- 1,200 medium enterprises, consultants and contractors, are developed, trained, and are involving in the program.
- 500 Woreda (District) Road Offices capacity is built.
- 300 000 permanent and temporary job opportunities have been created every year

# Achievements...continued



More than 8 000 small and medium capacity equipments; including tractors, trailers, towed rollers, towed graders, water tankers, fuel tankers, and pick-ups, are manufactured/assembled locally.



## Enhancing local manufacturing capacity

# Achievements...continued



Community involvement + sample roads

- The LVR manuals are currently used:
  - **Widely** by
    - URRAP, and
  - In **limited scope** on:
    - Small towns paving projects
    - Demonstration projects for Otta seals

**BUT**

- The Manuals are applicable to all roads carrying less than 300 vehicles per day (roads in classes DC1 to DC4)

# Concluding Remark

- URRAP is significantly improving rural accessibility in Ethiopia.
- Strengthen the technical assistance and capacity building to wereda /district/ road offices.
- Partnership between AFCAP and ERA critical
- The Process and Methodology for LVR manual development can be used as successful framework for other similar projects
- The LVR Manuals are having a major impact:
  - Established **uniform standards** based on sound technical principles.
  - contributed to capacity building and **knowledge transfer**.
  - Maintained **sustainability**.
- Use needs to be extended to all LVRs

**Thank you!**