# **Monograph Series on Sustainable and Inclusive Transport**

# Enhancing rural transport connectivity to regional and international transport networks in Asia and the Pacific







The shaded areas of the map indicate ESCAP members and associate members.\*

The Economic and Social Commission for Asia and the Pacific (ESCAP) serves as the United Nations' regional hub promoting cooperation among countries to achieve inclusive and sustainable development. The largest regional intergovernmental platform with 53 Member States and 9 associate members, ESCAP has emerged as a strong regional think-tank offering countries sound analytical products that shed insight into the evolving economic, social and environmental dynamics of the region. The Commission's strategic focus is to deliver on the 2030 Agenda for Sustainable Development, which is reinforced and deepened by promoting regional cooperation and integration to advance responses to shared vulnerabilities, connectivity, financial cooperation and market integration. ESCAP's research and analysis coupled with its policy advisory services, capacity building and technical assistance to governments aims to support countries' sustainable and inclusive development ambitions.

### Cover Photograph: David Pham. Reproduced with permission from the photographer

<sup>\*</sup>The designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Monograph Series on Sustainable and Inclusive Transport

Enhancing rural transport connectivity to regional and international transport networks in Asia and the Pacific



### © 2019 United Nations

The views expressed in this report are those of the author and do not necessarily reflect the views of the United Nations Secretariat. The opinions, figures, tables, estimates and recommendations depicted in this report are those of the author and should not necessarily be considered as reflecting the views or carrying the endorsement of the United Nations.

The designations employed and the presentation of the material including maps in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Mention of firm names and commercial products does not imply the endorsement of the United Nations.

This document has been issued without formal editing.

This publication may be reproduced in whole or in part for educational or non-profit purposes without special permission from the copyright holder, provided that the source is acknowledged.

The ESCAP Publications Office would appreciate receiving a copy of any publication that uses this publication as a source. No use may be made of this publication for resale or any other commercial purpose whatsoever without prior permission. Applications for such permission, with a statement of the purpose and extent or reproduction, should be addressed to the Secretary of the Publications Board, United Nations, New York.

United Nations publication issued by the Sustainable Transport Section, Transport Division, ESCAP.

United Nations publication Copyright © United Nations 2019
All rights reserved
Published in Thailand
e-ISBN: 978-92-1-004833-0

ST/ESCAP/2886

### Acknowledgements

Under the overall direction of Mr. Weimin Ren, Director of the Transport Division, and Ms. Jo Yee Yung Fung, Chief of the Sustainable Transport Section, the study was coordinated and led by Mr. Ishtiaque Ahmed, PhD, Economic Affairs Officer, Transport Division of ESCAP. The text was prepared by Ms. Fuyo Jenny Yamamoto, consultant and a doctoral candidate, Taoyaka Program, Hiroshima University, Japan and informally edited by Mr. Selim Denoux, Research Assistant, Sustainable Transport Section, Transport Division, ESCAP.

Special thanks are due to the following four peer reviewers for their technical comments:
a) Mr. Michael Anyala, PhD, Senior Road Asset Management Specialist, Asian Development Bank,
b) Mr. A.S.M. Abdul Quium, PhD, retired staff of ESCAP and an international consultant, c) Mr.
Jayant K Routray, PhD, Professor Emeritus, Regional and Rural Development Planning & Disaster
Preparedness, Mitigation and Management, Department of Development and Sustainability, Asian
Institute of Technology, Thailand and d) Ms. Annabel Bradbury, PhD, Deputy Team Leader,
Transport Services, Research for Community Access Partnership (ReCAP).

The report benefited from extensive discussions and suggestions from the following experts at the ESCAP Expert Group Meeting on Enhancing Rural Transport Connectivity to Regional and International Transport Networks, Bangkok, July 2019.

Country representatives: Mr. Md. Ali Akhtar Hossain, Director (Additional Chief Engineer), CReLIC, Local Government Engineering Department, Bangladesh; Mr. Sophal Kong, Deputy Director General, General Department of Land Transport, Ministry of Public Works and Transport, Cambodia; Mr. Yang Yong, Deputy Division Director, Rural Transport Division of Highway Department, Ministry of Transport, China; Mr. Sun Zhentian, Associate Research Professor, Research Institute of Highway, Ministry of Transport, China; Mr. Rajeev Lochan, Joint Director, National Rural Infrastructure Development Agency, Ministry of Rural Development, India; Ms. Zhainar Assilbekova, Expert, Transit and Transport Logistics Development Department, Ministry of Industry and Infrastructural Development, Kazakhstan; Mr. Rajendra Prasad Das, Senior Divisional Engineer, Department of Roads, Ministry of Physical Infrastructure and Transport, Nepal; Ms. Ornuma Pisitsak, Plan and Policy Analyst, Office of Transport and Traffic Policy and Planning, Ministry of Transport, Thailand; Ms. Jintawadee Suksri, Plan and Policy Anlyst, Practitioner Level, Office of Transport and Traffic Policy and Planning, Ministry of Transport, Thailand; Mr. Kitti Manokhoon, Director, Maintenance System Division, Department of Rural Roads (DRR), Thailand; Mr. Thitikorn Posribink, Civil Engineer (Professional Level), DRR, Thailand; Mr. Preecha Soparat, Director, Internationl Cooperation Division, DRR, Thailand; Mr. Thanwa Wiboonsarun, Civil Engineer, Practitioner Level, DRR, Thailand; Mr. Sucheep Tantiwutthipong, Computer Technician, DRR, Thailand; Mr. Dittapon Sanitin, Computer Technician, DRR, Thailand; Mr. Nguyen Khanh Toan, Official, Department of Road Maintenance and Management, Directorate for Roads, Viet Nam

International organisations and resource persons: Mr. Michael Anyala, Senior Road Asset Management Specialist, Sustainable Development and Climate Change Department, Asian Development Bank (ADB); Ms. Annabel Bradbury, Deputy Team Leader – Transport Services, Research for Community Access Partnership (ReCAP), United Kingdom; Mr. Bjørn Johannessen, International Labour Organisation; Ms. Kyoko Kusakabe, Professor, Gender and Development Studies, School of Environment, Resources and Development, Asian Institute of Technology (AIT); Mr. Jayant K. Routray, Professor Emeritus and Adjunct Professor of Regional and Rural Development Planning & Disaster Preparedness, Mitigation and Management, AIT; Mr. Hiroyuki Miyazaki, Visiting Assistant Professor, School of Engineering and Technology, AIT; Mr. Dhan Prakash Gupta, Director, Roads and Highways, Asian Institute of Transport Development (AITD), New Delhi; Mr. Ashoke Kumar Sarkar, Senior Professor, Department of Civil Engineering, Birla Institute of Technology and Science (BITS), Pilani, India; Mr. Danaitun Pongpatcharatorntep, Head of China Intelligence Center, College of Arts Media and Technology, Chiangmai University; Mr. Keola Souknilanh, Research Fellow, Bangkok Research Center, IDE-JETRO, Thailand; Mr. Ashok Kumar, Senior Highway Engineer, World Bank; Mr. Nuthapong Dumrongrat, Business Development Manager, Content Distribution & Development Department, Toyota Tsusho Nexty Electronics (Thailand), Thailand; Mr. A.S.M. Abdul Quium, Independent Consultant, Thailand.

# **Contents**

Ack	xnowledgements	iv
Execu	tive Summary	1
Defini	tions and Concepts	3
1 In	ntroduction	4
1.1	Linking rural transport to the wider context	5
1.2	Objectives of this monograph	6
2 V	Why is rural transport connectivity to higher level networks important?	9
2.1	Changing patterns of agricultural production and distribution	10
2.2	Food security, food loss and food waste	12
2.3	Mobility and access to diversifying rural livelihoods	14
2.4	The growing potential of rural tourism	15
2.5	Strengthening health supply chains and distribution systems	15
2.6	Enhancing resilience against natural disasters	16
2.7	Key observations	16
3 C	Conceptual framework for rural transport connectivity	17
3.1	Conceptualizing "vertical" connectivity	18
3.2	Rural transport connectivity within planning and policy frameworks	21
3.3	Targets, goals and indicators	22
4 R	Cural Infrastructure Connectivity Policies	26
4.1	Institutional arrangements for road administrations	27
4.2	Integrating connectivity into the investment prioritization process	28
4.3	Road maintenance	36
4.4	Mitigating negative effects while enhancing positive benefits	37
4.5	Financing by the development partners	37
5 R	Cural Transport Service Connectivity and Nodes	39
5.1	Rural passenger services	40
5.2	Rural logistics and agricultural value chains	43
5.3	Role of transport nodes	46
6 N	Measuring and monitoring rural transport connectivity	51
6.1	Rural Access Index (RAI)	52
6.2	"Mapping" rural connectivity in Geographic Information Systems	55
6.3	Innovative approaches for collecting rural transport data	60
6.4	Key observations	62
7 C	Conclusions: Next steps towards rural transport connectivity	64
8 R	deferences	68

# **Tables**

Table 1. distribution of rural and urban population in asian countries (% of total population)	. 10
Table 2. Relationship between type of agricultural practice, equipment and transport requirements .	.11
Table 3. Components of transport connectivity, at different scalar levels	.20
Table 4. Types of targets featured in rural transport programmes	.22
Table 5. Bangladesh's road classification system	.27
Table 6. Types of roads and assigned scores under bangladesh's road prioritization system	.30
Table 7. Selected ride-hailing companies active in asia and the pacific	.42
Figures	
Figure 1. A rural transport system	.18
Figure 2. Components of transport systems	.18
Figure 3. Relationship between different types of national planning frameworks	.21
Figure 4. Hierarchy from "Growth Point" to "Rural Hub"	. 25
Figure 5. Policy framework based on rural transport infrastructure project cycle	.28
Figure 6. Approval process of PMGSY roads	.33
Figure 7. Screenshot from Sri Lanka's Online Bus Information System	.41
Figure 8. Rural logistics Distribution Vehicle in Rui An, Zhejiang Province, China	.47
Figure 9. Stalls at the entrance of Talad Dan Sing Khon Border Market, Thai-Myanmar border	.50
Figure 10. Measurement of the Rural Access Index	.52
Figure 11. Comparison of RAI using two different approaches (2006 and 2016)	.53
Figure 12. Geospatial approach to estimating the RAI	. 54
Figure 13. Map of South East Asia showing travel time to cities as an indicator of accessibility	.58
Figure 14. Trace-mapping of Kusumi, Odisha, India	.59

## **Boxes**

Box 1. Rural Transport Systems and the SDGs	8
Box 2. How infrastructural Improvements and e-commerce can expand opportunities for rural producers: the case of the north south economic corridor	13
Box 3: Defining Connectivity	19
Box 4. Republic of Korea's "Access to the highway in 30 minutes" policy target	23
Box 5. Bangladesh's Network Plan	30
Box 6. PMGSY II: Linking Growth Centres to the Rural Road Network	34
Box 7. ADB's Strategy 2030 more investment in rural transport connectivity?	38
Box 8. Different Load Consolidation Models and Implications for rural road planning	44
Box 9. E-Taobao Villages and the development of Rural Logistics in China	45
Box 10. Multi-purpose Roadside Stations in Japan	49
Box 11. Rural Inaccessibility Score (RIS): An Alternative Measure to the Rural Access Index	56
Box 12. Development of East Timor's Rural Roads Master Plan and Investment Strategy	61
Box 13. Measuring Connectivity using Probe Data	63

预览已结束,完整报告链接和二维码如下:

https://www.yunbaogao.cn/report/index/report?reportId=5\_818

