

# **The Spatial Organization of New Land Settlement in Latin America**

**Jacob O. Maos**

# The Spatial Organization of New Land Settlement in Latin America

---



**Taylor & Francis**

Taylor & Francis Group

<http://taylorandfrancis.com>

## Dellplain Latin American Studies

### *The Spatial Organization of New Land Settlement in Latin America*

Jacob O. Maos

Land settlement in Latin America has become a subject of growing concern as governments renew efforts to develop agrarian potential and to relieve the pressure on overpopulated rural and urban areas. In this book, land settlement is viewed as the development of resources, both human and natural. The spatial organization of land settlement is examined in light of social and spatial patterns that may complement economic activities, lead to viable communities, and facilitate the provision of social and cultural amenities. The farm family is seen as the basic socioeconomic unit, and the family farmstead as the basic spatial nucleus.

Dr. Maos is associate professor in the Department of Geography, University of Haifa. He has served as a consultant to various United Nations agencies and is on the board of directors of the International Rural Housing Association.

DELLPLAIN LATIN AMERICAN STUDIES

PUBLISHED IN COOPERATION  
WITH THE DEPARTMENT OF GEOGRAPHY  
SYRACUSE UNIVERSITY

EDITOR

David J. Robinson  
Syracuse University

EDITORIAL ADVISORY COMMITTEE

David A. Brading  
University of Cambridge

Daniel Raposo Cordeiro  
Syracuse University

William M. Denevan  
University of Wisconsin

John H. Galloway  
University of Toronto

John Lynch  
University of London

William Mangin  
Syracuse University

EDITORIAL ASSISTANT

Jane E. McGraw

# The Spatial Organization of New Land Settlement in Latin America

Jacob O. Maos

---

Dellplain Latin American Studies, No. 15

 **Routledge**  
Taylor & Francis Group  
LONDON AND NEW YORK

First published 1984 by Westview Press

Published 2019 by Routledge

52 Vanderbilt Avenue, New York, NY 10017

2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN

*Routledge is an imprint of the Taylor & Francis Group,  
an informa business*

Copyright © 1984 by the Department of Geography, Syracuse University

All rights reserved. No part of this book may be reprinted or reproduced or utilised in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without permission in writing from the publishers.

**Notice:**

Product or corporate names may be trademarks or registered trademarks, and are used only for identification and explanation without intent to infringe.

**Library of Congress Catalog Card Number 83-51156**

ISBN 13: 978-0-367-29623-0 (hbk)

# Contents

List of Tables . . . . .	ix
List of Figures . . . . .	xi
Preface and Acknowledgments . . . . .	xv
Chapter 1 INTRODUCTION . . . . .	1
Chapter 2 THE CONCEPTUAL FRAMEWORK . . . . .	7
Land Settlement . . . . .	7
Generic Development Areas . . . . .	9
Objectives and Approaches . . . . .	11
Methodology . . . . .	17
Chapter 3 SPATIAL AND SOCIAL PATTERNS OF RURAL SETTLEMENT . . . . .	21
Dispersed and Concentrated Settlement . . . . .	21
Farming Stages and Their Spatial Requirements . . . . .	23
Human and Social Organizational Factors . . . . .	25
Chapter 4 RECENT EXPERIENCES IN RURAL DEVELOPMENT . . . . .	29
European Settlement as a Real-World Model . . . . .	29
Israel: Comprehensive Rural Development . . . . .	32
Italy: Rural Development in the Mezzogiorno . . . . .	45
Spain: Land Settlement in the Badajoz Region . . . . .	64
Conclusion . . . . .	73
Chapter 5 THE LATIN AMERICAN CONTEXT . . . . .	77
The Historical Background of Spatial Organization . . . . .	77
Urban Versus Rural Growth in Latin America . . . . .	78
Agrarian Reform and Settlement . . . . .	80
Chapter 6 CASE STUDIES OF LAND SETTLEMENT IN LATIN AMERICA . . . . .	87
Venezuela . . . . .	87
The Dominican Republic . . . . .	100



Mexico . . . . .	106
Peru . . . . .	110
An Appraisal of Settlement Models . . . . .	122
Chapter 7 THE SPATIAL ORGANIZATION OF RURAL SERVICES . . . . .	129
Hierarchical Structures . . . . .	129
Chapter 8 DEVELOPMENT OF A SETTLEMENT MODEL . . . .	139
Assumptions and Criteria . . . . .	139
The Family Farm as Basic Spatial Unit . . . . .	147
The Size of Family Holdings . . . . .	149
Distance Criteria . . . . .	151
Community Size and Pattern . . . . .	153
Analysis of Graphical Layout Models . . . . .	154
Conclusions . . . . .	160
Bibliography . . . . .	167
Index . . . . .	177
List of Dellplain Latin American Studies . . . . .	180

# Tables

2.1	Distinguishing characteristics of the three phases of farm evolution . . . . .	16
3.1	Family labor capacity in the lower Mayo River area in Peru . . . . .	27
6.1	Functional distribution of services and activities in the El Sisal settlement area . . . . .	103
6.2	Number of colonists and area according to size of lot, San Lorenzo Project, as of 1 May 1968 .	113
6.3	Summary of spatial factors in agglomerated smallholders' settlement projects . . . . .	123



**Taylor & Francis**

Taylor & Francis Group

<http://taylorandfrancis.com>

# Figures

4.1	Schematic layout of dense nucleated villages in Israel . . . . .	34
4.2	Schematic layout of the Moshav . . . . .	36
4.3	Schematic layout of collective settlements, the Kibbutz (A), and the Collective Moshav or Moshav Shitufi (B) . . . . .	39
4.4	Structure of services of rural settlements in Israel . . . . .	42
4.5	The Maagalim group . . . . .	44
4.6	Multiunit Moshav Bekhora . . . . .	46
4.7	Multiunit Moshav Yael . . . . .	47
4.8	Multiunit Moshav Omen . . . . .	48
4.9	Typical scattered settlement in the Mezzogiorno region, showing parceled land around Policoro . .	51
4.10	Centuriated landscape near Padua . . . . .	52
4.11	Actual layout of Borgo Perrone in the Ionian coastal plain near Taranto . . . . .	54
4.12	Alternative layout of Borgo Perrone, patterned as a gathered nuclear settlement . . . . .	55
4.13	La Murgetta, near Gravina in Apulia . . . . .	58
4.14	Borgo Venusio in the Matera region . . . . .	59
4.15	Borgo Gromola in the Sele River plain in Campania . . . . .	61
4.16	Land consolidation in Salamanca, Spain, showing parcellation of holdings before and after redistribution . . . . .	66
4.17	Layout and dimensions of "static" and "dynamic" farmsteads . . . . .	68
4.18	Valdecalzada--a planned nucleated village in the Badajoz settlement scheme . . . . .	69

4.19	Palazuelo--a nucleated village in the Upper Vegas area of the Badajoz settlement scheme . . .	70
5.1	Ribbon development of family farms land settlement in Capitanejo, Barinas . . . . .	83
6.1	General layout of settlements and service centers in the Las Majaguas Irrigation Project, Portuguesa, Venezuela . . . . .	89
6.2	Plan of village in the Majaguas Irrigation Project . . . . .	91
6.3	General layout of settlements and service centers in the Boconó Irrigation Project, Venezuela . . . . .	92
6.4	Plan of village no. 1 in the Boconó Irrigation Project . . . . .	93
6.5	Layout of "Modulo I"--a nuclear settlement in the western llanos of Venezuela . . . . .	99
6.6	Layout of El Sisal multiunit settlement in the Azua Valley . . . . .	102
6.7	Schematic map of the Azua Valley, showing alternative locations of subregional service center in El Sisal settlement area . . . . .	105
6.8	Typical layout of settlement in the Chontalpa Project . . . . .	109
6.9	Schematic plan of the Tingo Maria-Tocache Project, showing changes in settlement patterns and distribution of services . . . . .	115
6.10	Structure of settlements and service centers in the Central Huallaga Land Settlement Project .	120
6.11	Scheme of distances and settlement capacity in the Central Huallaga Project . . . . .	121
7.1	Dendritic structure of rural services . . . . .	131
7.2	Planned and existing structure of central places in Israel . . . . .	133
8.1	Model layout for agricultural village with 0.4 ha farmsteads . . . . .	140
8.2	Model layout of a single-unit village for 168 farm families and 24 service families, with allotted holdings . . . . .	141
8.3	Model layout of four villages comprising 400 families grouped around a common service center . . . . .	142
8.4	Variation of preceding model layout, with holdings divided into two blocks . . . . .	143
8.5	Variation of preceding model layout, with	

	divided holdings gathered around the common service center . . . . .	144
8.6	Schematic layout of dispersed settlement of pasture farms . . . . .	145
8.7	Concentrated version of layout for pasture farms . . . . .	146
8.8	Proposed layout for Campo Alegre multiunit set- tlement in the Cojedes Project, Venezuela . . .	157
8.9	Drainage study of planned site for the Campo Alegre village in the Cojedes Project, Vene- zuela . . . . .	158
8.10	Detailed layout for the first two village units of the Campo Alegre settlement in the Cojedes Project, adapted to surface drainage conditions	159
8.11	Regional scheme of agricultural settlements and their pertinent service centers . . . . .	161
8.12	Spatial organization of land settlement in the Huallaga River Basin . . . . .	162



**Taylor & Francis**

Taylor & Francis Group

<http://taylorandfrancis.com>

## Preface and Acknowledgments

The problems surrounding rural development have been amply described in professional literature; however, most of these studies have remained on a descriptive level. While several normative models, which purport predicting the outcome of alternative courses of action, have been developed in economic theory, many physical planning aspects, especially in rural areas, still have not been treated. The arbitrary separation between the spatial organization of settlements and their subsequent economic behavior has diverted the attention of planners from the potential inherent in spatial and social patterns of rural settlements. Even in new land settlement, the spatial rationale sometimes remains unquestioned while almost every other aspect is critically examined.

Some examples aptly demonstrate this point. In a treatise by an interdisciplinary group of experts from the M.I.T. Center for International Studies, the main ingredients for successful agricultural development were identified.<sup>1</sup> A detailed list was formulated which included physical, economic, organizational, cultural and motivational, and knowledge factors. Surprisingly, the interrelationships among these factors and their arrangement in space and time were left unmentioned. The fact that new land settlement accounts for only a small part of the total agricultural production could explain the absence of spatial aspects from those factors considered to affect agricultural development; however, the opening of new lands occupies an increasingly prominent place in the policies and allocation of resources in many developing countries.

Current planning theories regard the marketplace as the crucial element in lending viability to rural settlements. The notion of market, however, is understood primarily in terms of the local peasant market. Mosher, in line with this concept, proposes the construction of a grid of farm-to-market feeder roads which, in combination with other inputs (i.e., fertilizers, credits, agricultural extension services, etc.), is expected to modernize



agriculture.<sup>2</sup> Although the incentive of the market need not be underrated, especially in traditional rural structures,<sup>3</sup> it is difficult to perceive of the peasant in the triple role of tiller, hauler, and peddler as a dynamic factor affecting agricultural development. In new land settlement the provincial marketplace may even become an obstacle which would best be by-passed.<sup>4</sup>

Johnson also regards the market system as a primary motivating force, but within a broader context of centralized locations which could serve as bases for development of the region's human resources.<sup>5</sup> Nelson, who addresses himself specifically to new land settlement, cites the factors crucial to the success of settlement as selection of site; selection of settlers; preparation of infrastructure; provision of capital by settlers and authorities; organization of central services and project administration; land allotment and farm size per family; and tenure conditions.<sup>6</sup> He admittedly concentrates on economic feasibility, but the physical planning related to these inputs is barely mentioned. As an inevitable conclusion of short-term economic objectives, Nelson advocates spontaneous settlement--a solution which is contradicted by the principles and criteria expounded in this thesis.

The student of rural spatial organization will be hard pressed to find updated normative material on land settlement. Among the few studies and writings on the subject are the publications by the Settlement Study Center in Rehovot, Israel, which are applicable to some situations in developing countries, and others that direct themselves to specific areas, such as the comparative study of land settlement in Ceylon.<sup>7</sup> The writings by Weitz on the transition from subsistence to specialized farming include important insights into the spatial aspects.<sup>8</sup> Various studies by Yalan and co-workers define useful criteria and principles of rural physical planning.<sup>9</sup> The structuring of rural services has received scant attention although it stands out as a key factor of rural development, second only to the economic basis of settlement. Contributions in this area include, among others, studies by Prion and Maos. The U.N. Economic and Social Commission for Asia and the Pacific has published guidelines for the planning of rural centers with a view to developing pertinent methodologies based on the experience of recent land settlement.<sup>10</sup>

A combination of descriptive matter and conceptual analysis, which is indispensable in formulating planning strategies, is offered by Dorner, Dozier, L. Smith, Thiesenhusen, and Warriner.<sup>11</sup> Many other authors delve especially into the intricacies of subsistence farming. The bulk of studies on Latin America, however, concentrate on urban problems. Several studies concerned with specific variables of land settlement emanate from diverse countries engaged in rural development (e.g., the Polders scheme in Holland, or rural development of the Mezzogiorno).

A good deal of information can be found in nonconventional publications most often available in the countries themselves. Most of this material, however, is mimeographed and tends to become extinct after several years. Some international cooperative programs operating in the area of agricultural development and land settlement have sparked the elaboration of a conceptual and technical framework for land settlement which is widely disseminated in Latin America and several Caribbean countries. Regional and international entities, such as the Organization of American States and United Nations' specialized agencies, are also collaborating in the field of land settlement and have published on the progress of their activities.

This book is an attempt to clarify the significant spatial aspects of land settlement, with the hope of formulating planning criteria which are compatible with the generic characteristics of development areas in Latin America. The argument put forward is that the failure of planned settlement can often be traced to its spatial organization--a repeatedly overlooked factor. How important is the component of spatial organization in new land development? The adequate organization of rural settlement enables the provision of health and education, as well as production along modern lines which may improve the economic status of the involved population. A crucial condition, however, is the need to preserve flexibility since physical plans, once incorporated into the landscape, are difficult to modify. The reviewed case studies and models suggest that social and spatial patterns that complement economic activities are conducive to the formation of viable communities. Viability is, in the long run, the most important criterion of successful settlement.

The data used in this dissertation stem from studies and planning work by the author in Israel during 1958-1965; consulting work in rural housing and physical planning for the Pan American Health Organization, Regional Office of the World Health Organization in Latin America, during 1964-1975; information compiled during brief study tours to the Netherlands, Italy, and Spain; project reports and plans collected from governmental, regional, and international institutions; and general literature on the subject. In this work I have drawn heavily upon the conceptual framework developed by Professor Raanan Weitz in his numerous writings. In the spatial and physical sphere, I owe much to the late Professor Emmanuel Yalan, who was my tutor and long-time co-worker.

During my stay at the Johns Hopkins University, I profited immensely from discussions with fellow students and professors in the Department of Geography and Environmental Engineering and cherished many a conversation with Dr. Abel Wolman who let me share some of his insight and experience. This work would not have been finished without the constant encouragement of my friends and colleagues, Lipa Kam, Donald Davidson, and Luis Dorich T. I

would also like to express my sincere thanks to David Harvey and M. G. Wolman, whose challenge and guidance greatly assisted me in developing this manuscript.

Finally, to my wife and companion of always and to my children, who bore the full brunt of my struggle with this book with patience and understanding, I extend my thanks and love.

#### NOTES

1. Max F. Millikan and David Hapgood, No Easy Harvest; The Dilemma of Agriculture in Underdeveloped Countries (Boston, 1967).
2. Arthur Theodore Mosher, Creating a Progressive Rural Structure to Serve a Modern Agriculture (New York, 1969).
3. Sidney W. Mintz, "Peasant Market Places and Economic Development in Latin America," The Graduate Center for Latin American Studies, No. 4, Vanderbilt University, Nashville, Tenn., 1964.
4. Gunder A. Frank, Capitalism and Underdevelopment in Latin America, Historical Studies of Chile and Brazil (London, 1971).
5. E. A. J. Johnson, The Organization of Space in Developing Countries (Cambridge, 1970).
6. Michael Nelson, The Development of Tropical Lands: Policy Issues in Latin America (Baltimore, 1973).
7. UDA Walawe Project, A Comparative Study of Two Regional Planning Alternatives, Settlement Study Centre, Rehovot, Israel, 1971.
8. Raanan Weitz, From Peasant to Farmer: A Revolutionary Strategy for Development (New York, 1971); also, Integrated Rural Development: The Rehovot Approach, Publications on Problems of Regional Development, No. 28, Settlement Study Centre, Rehovot, Israel, 1979; and R. Weitz (ed.), Rural Development in a Changing World (Cambridge, 1971).
9. Emmanuel Yalan, The Design of Agricultural Settlements: Technological Aspects of Rural Community Development (Jerusalem, 1975); Emmanuel Yalan, J. Maos, and L. Kam, Land Planning of the Agricultural Co-operative Village, The Rural Building Research Centre, Haifa, Israel, 1963; Emmanuel Yalan, J. Maos, and L. Kam, The Influence of Farming Rationalization on the Planning of Scattered and Gathered Settlements, The Rural Building Research Centre, Haifa, Israel, 1964; Emmanuel Yalan, H. Finkel, L. Guttman, and Ch. Jacobsen, The Modernization of the Traditional Agricultural Village, Publications on Problems of Regional Development, No. 11, Settlement Study Centre, Rehovot, Israel, 1972.
10. I. Prion, Development Trends of Spatial Rural Cooperation in Israel, Publications on Problems of Regional Development, No. 3, Settlement Study Centre, Rehovot, Israel, 1968; and Líneas Generales de la Planificación Integrada Rural Regional en las Zonas de la Reforma Agraria, Ministry of Agriculture, Israel, 1973 (mimeo). See also, J. Maos, "The Spatial Organization of New Land Settlement: Experiences and Trends," GeoJournal, Vol. 1.4 (1977), pp. 29-35; and "The Efficiency of Rural Services in Dispersed and Concentrated Land Settlement: A Comparison," Geographical Research Forum, No. 2, Occasional

Papers, 1980, pp. 33-43; and United Nations Economic and Social Commission for Asia and the Pacific, Guidelines for rural centre planning (New York, 1979).

11. Peter Dorner (ed.), Land Reform in Latin America: Issues and Cases, Land Economics Monograph Series, No. 3, University of Wisconsin, Madison, 1971; Craig L. Dozier, Land Development in Latin America: Case Studies of Peru, Bolivia and Mexico (New York, 1969); T. Lynn Smith, Studies of Latin American Societies (New York, 1970); William C. Thiesenhusen, "Technological Change and Income Distribution in Latin American Agriculture," Paper presented to the VI Interamerican Conference on Agriculture, OAS, Lima, Peru, May 27-June 2, 1971; Doreen Warriner, Land Reform in Principle and Practice (Oxford, 1969).



**Taylor & Francis**

Taylor & Francis Group

<http://taylorandfrancis.com>