

国家自然科学基金资助项目

乌鲁木齐区域开发与整治

——乌鲁木齐区域环境容量与经济开发区优化模型研究

谢香方等编著

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前 言

乌鲁木齐市是中国新疆维吾尔自治区的首府,是我国向西开放的重要窗口,是近 40 年来在亚欧大陆中部干旱区崛起的一个大城市。由于城市经济的加速发展,乌鲁木齐与毗邻的昌吉、米泉已突破行政界线的束缚,在经济上基本联成一体,共同组成了乌鲁木齐区域,即新疆乌鲁木齐经济小区。

乌鲁木齐区域位居天山东西段结合部的北坡与准噶尔盆地南缘之间,在只占新疆 1.4% 的土地面积上,居住着 11.5% 的人口,聚集着 1/3 以上的工业(按产值),综合经济实力居新疆榜首,是新疆的一颗明珠。因此,区域经济的发展,不仅关系到新疆的全局,也关系到我国沿丝绸之路向西开放的未来。

然而,以往对乌鲁木齐区域资源开发、经济发展与环境整治,缺乏综合、系统地研究与统筹规划,特别是在水资源相对不足的情况下,区域经济面临着环境容量如何控制?产业如何集聚?经济结构如何优化调整?城镇体系如何健全发展?生态环境如何整治等许多问题。对此,我们提出了“乌鲁木齐区域环境容量与经济发展优化模型研究”课题,并得到了中国自然科学基金委员会的资助。

《乌鲁木齐区域开发与整治》,就是上述研究课题的最终成果。全书由中国科学院新疆地理研究所有关人员集体完成,谢香方主编,执笔人员及其负责部分有:谢香方——前言、总论、第七章、第八章、第九章,并负责全书的协调和修改统稿工作;仇家琪、丁培毅——第一章、第十六章;陈曦、杨川德——第二章;倪天奇——第三章;陈正江——第四章;海热提——第五章;杨德刚——第六章;崔晓林——第十章、第十三章;孙荣章——第十一章;宋迎昌——第十二章、第十五章;周政一——第十四章。

在调查研究过程中,得到了乌鲁木齐市县、昌吉市、米泉县和新疆生产建设兵团农六师、乌管局等的大力支持。在本书提出初稿后,承蒙中国科学院学部委员、中国科学院地理研究所吴传钧教授和程潞(华东师范大学地理系)、李振泉(东北师范大学地理系)、胡序威(中国科学院地理研究所)、杨树珍(中国人民大学区域经济发展研究所)、余之祥(中国科学院南京分院)、郭来喜(中国科学院地理研究所、云南省地理研究所)、崔功豪(南京大学大地海洋系)、以及周聿超(新疆水文总站)、周崇经(新疆大学地理系)、钱寿昆(新疆经济委员会)、刘甲金(新疆社会科学院经济研究所)、李锡纯(新疆国土整治与农业区划局)、白跃(新疆计划委员会)等专家教授进行了审阅,提出了宝贵的修改意见,《干旱区地理》编辑部李志远编审负责编辑出版,王淑萍、常青同志清绘图件,在此一并致谢。

谢香方

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中国科学院新疆地理研究所

“乌鲁木齐区域环境容量与经济开发区优化模型研究”

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Urumqi Regional Development and Management
—Study on Optimal Models of Regional Environment
Capacity and Economic Development

Edited by Xie Xiangfang

Press of University of Science and Technology of China

Introduction

This book deals with study and evaluation of the following aspects for Urumqi region: resource combination conditions, environment quality, water resource use, economic structure regulation, population development control, city and town construction distribution, economic development strategy and subregional development management, with developing the optimal models to determine future development direction and management ways for this region.

This book, consisting of 330,000 Chinese Characters, is divided into 16 chapters, which can be utilized for reference by geographic works, related colleges and universities, economical and planning divisions, and design and production sections.

Preface

Urumqi, the capital of Xinjiang Uygur Autonomous Region and an important window for China's Opening to the West, has been grown up to be a big city in the middle arid regions of Eurasia over the recently past 40 years. Because of the rapid growth of city economy, this city and its neighbouring Changji and Miqan have overcome the confines of administrative boundaries and basically turned into an economy union, i. e., Urumqi economy region.

Located between the north slope of the east-west neighbouring joint part of the northern Tianshan Mountains and southern edge of Zhungeer Basin, Urumqi region, which only takes up 1.4% area of Xinjiang, supplies a 11.5% population of Xinjiang, 31% of its industry being concentrated here. Urumqi occupies first place for comprehensive economy force, being a bright pearl in Xinjiang. The development of this region's economy is important not only to whole Xinjiang, but also to the future of some places along the Silk Road, which are opening to the West.

The region economy, however, is facing a lot of problems, such as environmental capacity control, industry concentration, economic structure optimalization and regulation, reasonable development of urban system and ecologic-environmental control, which is due to lacking of comprehensive and systematic study and overall planning for regional resources development, economic development and environmental control in the past, especially under the condition of inadequate water resources. We put forward the theme named as "Study on Optimal Models of Regional Environment Capacity and Economic Development", which was supported by China Natural Science Fund Committee.

"Urumqi Region Development and management" is the final result of mentioned above theme. This book was collectively completed by the relevant staffs of Xinjiang Institute of Geography, Chinese Academy of Sciences, Chief editor Xie Xiangfang.

The chapters and their authors are as follows, Preface, General Introduction and Chapter 7, 8 and 9 by Xie Xianfang

Chapter 1 and 16,	Qiu Jiaqi and Ding Peiyi
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In the course of investigation and study, we got much great support from Urumqi City,

Urumqi County, Changji City, Miqan County, Agricultural Division Six of Xinjiang Production and Construction Corps and Urumqi Administrative Bureau and so on.

The following professors went over the first manuscript of this book, and put forward valuable suggestions for revision:

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Prof. Li Xichun (Xinjiang Bureau of Territory Management and Agricultural Regional Planning).

Prof. Bai Yao (Xinjiang Planning Committee).

Mr. Li Zhiyuan, working in Edition Division of Arid Land Geography, is responsible for edition and publication of this book, Mrs. Wang Shuping and Mrs. Chang Qing draw figures for this book. We are very grateful to them for their help.

Dec, 1993

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0 总论 乌鲁木齐区域环境容量与开发整治总体构想

0.1 区域资源状况

0.1.1 农业自然资源较为丰富,适合多种农业部门发展

乌鲁木齐区域(以下简称区域)位于北天山东西段接合部的北坡和准噶尔盆地的南缘之间,土地面积 $2.3912 \times 10^4 \text{ km}^2$ 。境内地貌类型复杂多样,有多种农业自然资源,是新疆一块极为美丽的地方。早期游牧于本区的蒙古族牧民,称谓“乌鲁木齐”,即意为美丽的牧场。

区内有高大的山体,中位的山间盆地,广阔的冲积平原和浩瀚的沙漠,垂直地带谱较为完整,土壤、植被、光热条件都随着地形的重直变化而变化。据有关方面调查统计,在区域 $2.3912 \times 10^6 \text{ hm}^2$ 土地面积中,宜农地 $4.584 \times 10^5 \text{ hm}^2$,占 19.2%。1990 年有耕地 $1.484 \times 10^5 \text{ hm}^2$,占全疆总耕地的 4.81%,是新疆的重要农业区之一。宜牧地 $1.164 \times 10^6 \text{ hm}^2$,占 48.7%。优良草场主要分布于山区中上部,现放牧牲畜 1.1×10^6 头,是本区肉、毛的主要产区。有宜林地 $8.3 \times 10^4 \text{ hm}^2$,占 3.5%。天然林主要分布海拔 1900~2500 m 的中山带,以雪岭云杉为主,是本区天然林木主要富集区。此外,尚有水域 6800 hm^2 ,大部分适宜养殖利用。

光热条件以平原区最优,适宜多种农作物和部分果木生长。在乌鲁木齐的下部和昌吉、米泉的广大平原区, $\geq 10^\circ\text{C}$ 积温多在 3300~3500 $^\circ\text{C}$ 之间,无霜期 150~170 天,麦收后可复播蔬菜、绿肥等作物。乌鲁木齐前山河谷与达坂城中位山间盆地地区, $\geq 10^\circ\text{C}$ 积温降至 2700~3100 $^\circ\text{C}$ 之间,无霜期也相应缩短,麦收后已不具备复播条件。而山区热量资源更低,从乌鲁木齐和小渠子两站计算可知,海拔每上升 100 m, $\geq 10^\circ\text{C}$ 积温降低 100 $^\circ\text{C}$ (小渠子 $\geq 10^\circ\text{C}$ 积温是 1188.6 $^\circ\text{C}$)。因此,山区普遍不具备农业种植的热量条件。但山区冬季逆温层发育,且持续时间长达半年。同样以乌鲁木齐和小渠子为例,1 月两站平均气温相差 5 $^\circ\text{C}$ 左右。在逆温带的中下部部分河谷地区果木树可安全越冬,也可适当开辟保护地发展冬春蔬菜生产。因此逆温是本区的一种潜在资源。

山区与西来湿气流多呈斜角相交,降水量远远小于伊犁河谷与阿尔泰山西部迎风坡,河流短、径流量小。区域地表水资源 $1.3579 \times 10^9 \text{ m}^3$,其中达坂城水系经白杨河出境(托克逊) $1.45 \times 10^8 \text{ m}^3$ 的水量除外,实际可利用地表水资源 $1.2129 \times 10^9 \text{ m}^3$ (不包括南山矿区,下同);其中由地表水转化补给量 $8.142 \times 10^8 \text{ m}^3$ 的水量除外,地下水资源量仅 $1.934 \times 10^8 \text{ m}^3$ 。可见本区实际水资源总量只有 $1.4063 \times 10^9 \text{ m}^3$,平均每 km^2 仅 $5.88 \times 10^4 \text{ m}^3$,水资源较为短缺。1987 年总引用水量达 $1.583 \times 10^9 \text{ m}^3$,其中地表水 $1.104 \times 10^9 \text{ m}^3$,占本区可利用地表水资源的 91.0%;地下水 $4.79 \times 10^8 \text{ m}^3$,占地下水资源的 247.7%,占地下水补给量的 47.6%。由此可见,本区地表水的引用率与地下水的开采率、重复利用率都处于全疆先进行列。