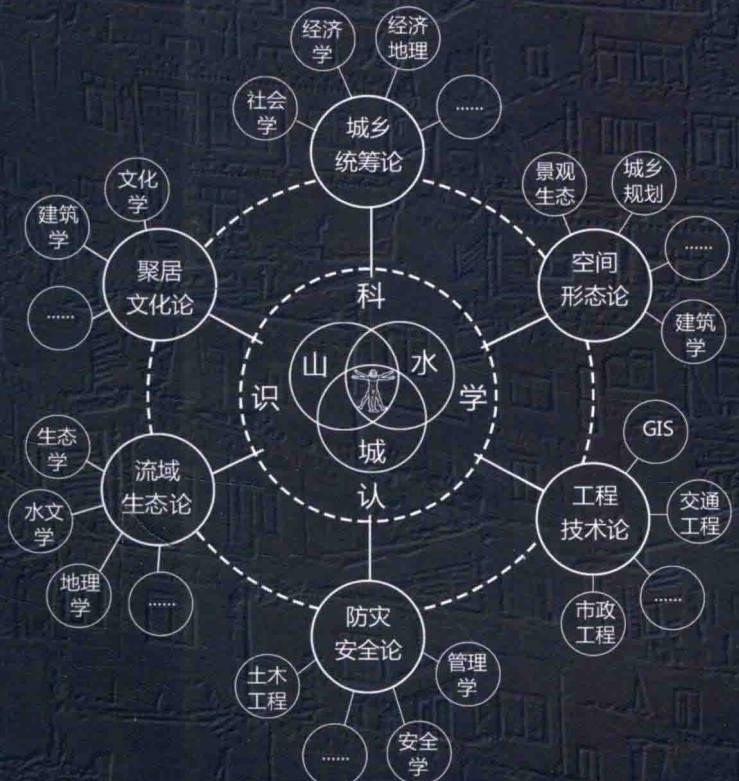
山地人居环境七论

Theories of Human Settlements in Mountainous Regions

赵万民 等著



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前 言

近年来，“山地人居环境科学”[1]研究团队一直想写一本关于理论认识方面的著作，其思维推动有三：其一，2008~2012年间，团队承担了国家自然科学基金重点项目“西南山地城市（镇）规划设计适应性理论与方法研究”的工作，对于相关理论探索的成果总结，团队希望以论文和书著的形式面世，达到与同行专家交流的目的，也是对基金研究工作结果要求的交代。其二，团队近20年的建设[2]，从弱小逐步成长，从三峡的研究逐步扩展到山地的研究，从实践案例到理论的认识，林林总总发表过一些论文并出版了一些著作，但总体而言，案例研究多、实践工作的总结多、博士生个体论文的探索多，而理论总结和认识方面的成果少。所以，团队（包括我自己）总觉得应该在山地人居环境建设的理论方面有突破性的思考，建立探索性的认识。即或未必完整，或未必能达成理论高度，但面对当前我国山地人居环境建设工作的理论需要，有正确的引导和理论观念明辨的认识，应该是紧迫而有益的事[3]。其三，中国30年的城镇化高速发展期，在城市建设方面，成绩斐然。总体而言，量的积累大于质的提高；对西方的模仿和拷贝，多于对自己国家和地区地域文化的发掘、继承和创新。对山地城乡建设而言，以平原的理论概论山地，或无视山地环境的生态性、安全性、地域文化特性和工程复杂性，千篇一律，带来山地城市、城镇的生态隐患，或者将造成经济工程等的巨大浪费，此种现象不为个例。近些年来，吴良镛、周干峙等老一辈学者一再呼吁并身体力行，中国应该产生自己的城市规划和建筑学理论，来探索和引导中国自己的城镇化道路的正确发展，来解决广大中国土地上的城乡建设问题。我们不断看到，在全国范围内，关于地域文化、生态实际、社会经济调查和分析、学科综合交叉和技术创新等方面的好的理论探索文章和高质量的理论著述，不断问世。其中，中青年学者的锐意见解，往往将中外理

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[1] 2014年6月，重庆大学为了培育人才队伍，凝聚和突出有特色的科学理论与工程技术研究方向，在学校30余个国家和地区有影响力的学科间，进行了“创新团队”的遴选。由于配有政策扶持和经济条件的持续资助，竞争是十分激烈的。赵万民教授牵头的“山地人居环境科学”创新团队，因其鲜明的学科地域特色和基础积累，被遴选为首批10个创新团队之一。在略早的2012年，中国城市规划学会也曾推荐赵万民教授牵头的“山地人居环境学科团队”去争取中国科协国家层面的创新团队遴选，参加了北京答辩，未成，但为团队的发展和建设积累了一些经验和教训。

[2] 1996年6月，赵万民从清华大学博士毕业，回到重庆大学，以三峡和山地研究为起步，培养研究生和青年教师，逐步凝练学术方向，形成团队雏形，后得以成长，不断发展。

[3] 当前，我国城市规划和建设工作中，对理论认识的模糊，比较普遍。或远离地域的实际，或道听途说，或张冠李戴，等等，确是比较普遍的现象。经常看见地方政府、专业人员或不同层面的“专家”，将西方牵强的理论强与我国实际的山地城乡建设“联姻”；或以平原概论山地，将不同空间尺度、不同文化基因、不同环境制约条件、不同生态构成因素的一些古典和当代的“案例”，硬“拼贴”于山地起伏、环境优美的山水之间，假以理论高度，以赢得方案“中标”为目标或以规划设计合同“签订”为目的。不少“方案”或规划“理念”，转眼间真成了实施建设项目，对山地的破坏和误导可想而知，并且，此种情况不在少数。

论融于一炉，外师造化，中得心源，将海外理论与技术的新知识与中国的发展实际相结合，持之有故，言之成理，思想迭出，光芒耀眼，使人钦佩。

中国是一个多山国家。山地面积约有660万km^2，占国土陆域面积的70%左右，山区人口占全国总人口一半以上。600多个设市城市中，有300多个是山地城市；2300多个县级行政区中，有1500多个位于山区；19000多个建制镇中，有近10000个是山地镇。

山地建设发展问题，是国家重大战略需求和关键科技任务，在很大程度上决定了国家现代化进程和生态文明建设的成败。改革开放以来，自然条件相对优越的东南沿海和平原地区，经过多年建设与发展，社会经济建设取得长足进步，部分省市的城镇化率已经接近或达到发达国家平均水平。但广袤的中西部山地区域，历史上多是老少边穷地区，集中了我国大部分贫困人口和少数民族，发展基础较为薄弱，社会经济水平相对落后，城镇化进程仍然有着巨大的发展空间和潜力。推动山地城乡建设事业的发展，建设美好人居环境，让山地贫困区域的广大人民在城镇化过程中共享改革发展成果，事关国家社会稳定和现代化发展进程，是今后一段时间内，国家扩大内需、改善经济结构、转变发展模式的持续动力，是解决地域发展矛盾、应对国际和国内发展挑战的有效途径之一，也是对新型城镇化等国家战略的具体落实。

本书谓《山地人居环境七论》，从字面意思可知为“山地”、“人居环境”、“七论”三个关键词，试图讨论山地人居环境建设的七个方面的理论认识。（1）科学认识：关于山地聚居在科学技术层面的关联度，相关的科学内涵，学科生长和交叉的科学意义，团队在科学理论探索道路上的成长路径，以及山地人居环境科学发展的未来空间的认识。（2）聚居文化：地域和文化是人类聚居的基石，相辅相成，从理论上认识地域文化对于聚居的递进观、生态观和价值观，从而论及聚居文化的空间结构，对城市形态和生活的作用和影响，山地聚居文化的保护传承，以及相关的理论建议和案例分析等。（3）流域生态：山地的流域将生态格局和人类聚居活动紧密联系，流域环境是承载山地人居环境的典型自然单元，从山地流域聚居基本认知与协同，山地流域生态安全识别与评估，以及山地流域人居环境的规划干预等方面提出理论见解。（4）城乡统筹：统筹城乡发展是我国破解“二元结构”的重要战略思路，是解决“三农问题”的有效途径，以问题为导向，研究山地城乡人居环境统筹发展的理论与实践，立足我国山地区域城乡统筹发展的基本认识，构建山地城乡人居环境统筹发展的理论体系。（5）空间形态：空间形态是反映人居环境客观存在的物质形态。山地与平原空间构成的区别在于其地形和环境构成的三维性，因而山地空间具有其复杂性和趣味性，人与环境相互作用于山地空间，和谐共生的传统生态理念引导了山地城镇空间形态的基本构成和基本的演化路径，是山地人居环境理论的重要理论参照和基础。（6）防灾安全：由于山地用地的复杂性，生态脆弱和敏感性，山地建设引来对环境的占用和改造，加剧了山地灾害的发生频率和强度。山地人居环境建设的防灾与安全工作，是重要的理论研究和技术课题，讨论了山地人居环境建设的主要灾害问题，以及防灾减灾的理论认识。（7）工程技术：山地人居环境建设工程技术及其理论方法的研究，是十分重要的内容。山区建设与平原

建设比较，其工程难度高，综合性和协调性要复杂得多。长期以来，山地建设不被重视，或以平原方法概论山地，因此需要从科学研究的角度，得出有针对性的理论和方法，来指导和解决山地城乡建设的工程技术问题。

关于“山地人居环境”的研究，其理论基础来源于吴良镛院士的“人居环境科学”思想。“人居环境科学是一门以人类聚居（包括乡村、集镇和城市）为研究对象，着重讨论人与环境之间相互关系的科学。它强调把人类聚居作为一个整体加以研究，其目的是了解和掌握人类聚居现象发生、发展的客观规律，以更好地建设符合人类理想的聚居环境”❶。团队试图将吴先生的“人居”理论与我国西南山地人居环境建设的现实需求相结合，在国家城镇化逐步由平原迈向山区的过程中，揭示针对山地人居环境的适应性建设规律，建设较为理想的山地人居环境。

吴良镛先生指出：“对山地人居环境系统研究的积淀，以及我国当前山地人居环境发展问题，目前山地人居环境建设学术研究存在相当大的差距，应该在借鉴历史的前提下，顺应时代需要，做好科学理论上的储备，在大尺度上创造出新的山地人居环境建设模式，为城市有机分散式的发展形态带来新的创造可能，以避免宝贵的山地资源遭到滥用和破坏”❷。

“山地人居环境科学”研究团队20年的发展，基本上经历了三个阶段，总结为：初创期、发展期和提升期。不同的阶段，面对了不同的现实问题并提出相应的解决思路。在初创期，我们以三峡工程与人居环境建设研究为目标，进行了关于以库区移民安居和新城搬迁建设为主题的理论探索与实践。在发展期，以国家自然科学基金、科技部支撑计划等一批项目为支撑，开展关于西南山地人居环境建设的“适应性”理论与方法的研究，其研究思考和视野，较好地拓展到流域人居环境、山地生态安全与防灾减灾，以及人居环境信息图谱技术等方面，较多地涉及学科的交叉和融合。进入提升期，我们进一步认识到学科交叉融贯的重要性，理论凝练和成果集成的重要性。团队在集成成果、申报教育部奖等系列工作中，不断地进行凝练和总结，同时向其他领域专家请教学习；认识到不同的科学领域所体现出来的不同的事物判别习惯和学术路径；体会到理工科专业认识事物的客观和智慧，以及缜密思维和严谨逻辑，等等，这恰恰是我们所忽略和缺失的方面。在这之前，规划、建筑学科习惯于对事物的感性评判，以及学科内部的自我为范，长此以往，容易以传统的思维惯性故步自封，逐步偏离科学技术界的话语主流平台，渐行渐远，将自己引入到学术视野的盲点和误区中。

当前，团队的成长仍然在科学的道路上艰苦探索，不断学习和积累。总体而言，山地地区多是经济发展缓慢、建设困难、人才匮乏的地区，随着团队视野的拓宽和认识的深化，大家认为，今后的工作需要进一步结合国家和地区发展需求，在理论方法、工程技术、人才平台等三个方面持续攻关和跟踪研究，希望能在山地人居环境科学理论建树和关键技术问题的解决上，有所创新

❶ 见：吴良镛·人居环境科学导论[M]. 北京：中国建筑工业出版社，2001.

❷ 引自2012年5月，重庆大学建筑城规学院主持召开的“第三届山地人居科学国际论坛”，吴良镛院士的大会主题报告：“简论山地人居环境科学的发展”。

和突破。

本书以“七论”成文，是以山地人居环境建设七个相对独立的科学问题，缀串所成，用团队集体思维的方式，提出一些学术认识，用以促进和明晰团队的工作方向和目标。抑或，对我国山地人居环境建设工作的理论思考，有所深化和帮助。

赵万民

2015年2月8日，于重庆

Preface

In recent years,the "Science of Human Settlements in Mountainous Regions"[1] research team has been considering to write a book on theoretical understanding of human Settlements in mountainous regions by three major motivations: firstly, during 2008 to 2012, the team undertook the study of Adaptive Planning and Design Theories and Methodology in Southwest Mountainous Cities (towns)of National Natural Science Fund. Involved theoreticalexploration had been summarized, which was hoped to present by the form of theses and books to exchange ideas with other experts, as well as sum up the fund research.Secondly, after almost twenty years' building[2], the team has gradually grew from scratch and its research range has also enlarged from the Three Gorges to mountainous regions. In addition,a series of papers and books have been published, in which most of them are case studies, summaries of practical work and doctoral thesis, and there are relatively littletheoreticalunderstanding and conclusions involved. Therefore, the research team (including myself) is always planning to make breakthroughs on the theories of human settlements in mountainous regions to establish some explorative understanding, which may not be complete or deep enough, but still urgent and beneficial for proper guidance and clear discrimination of theoretical needs of current

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[1] In June 2014, aiming to cultivate talents and highlight distinctive scientific theories and engineering research orientations, Chongqing University held the selection competition of Innovation Team among more than 30 competitive national and regional teams. Supported by different government policies and various financial funds, the completion wasincredibly fierce. The creative team of "Science of Human Settlements in Mountainous Regions" led by Professor Zhao Wanmin had been selected as one of the first ten creative teams for its distinctive regional characteristics and fundamental accumulation. In the early time of 2012, China Urban Planning Society recommended Professor Zhao Wanmin's"Science of Human Settlements in Mountainous Regions" team to compete on the national level of the China Association for Science and Technology. The team participated the final debate in Beijing but failed. However from this precious experience valuable lesson has been gained for the future development and construction of the team.

[2] In June 1996, Professor Zhao Wanmin obtained his doctorate degree in Tsinghua University and came back to Chongqing University. Started with researches on the Three Gorges and mountainous regions, Professor Zhao Wanmin concentrated on cultivating postgraduates and young teachers and refining the research orientation gradually. Therefore the team was built and developed step by step.

human settlements in mountainous regions[1]. Thirdly, China has achieved great success in urban construction in the past 30 years' rapid development. In general, quantity accumulation is larger than the qualitative improvement: there are more imitation and copies of the West than the exploration, inheritance and innovation of Chinese and regional culture. As for urban and rural construction in mountainous regions, mostly they are guided by theories of plains. In other cases, ecology, safety, regional culture and engineering complexity of mountainous environment are ignored. The stereotype brings ecological hazard to mountainous cities and towns and huge waste in economical engineering, which is quite common in the current urban and rural construction.In recent years, many senior scholars such as Wu Liangyong, Zhou Ganshi, are repeatedly calling for China's own theories of urban planning and architecture, which aims to guide China's urbanization development and solve the urban and rural construction problems in vast China. It is seen that many great theory-exploring articles and high-quality writings are coming out from perspectives of regional culture, ecological practice, economical investigation, inter-discipline and technical innovation, in which young scholars' keen insights are mostly extraordinary with integration of foreign and Chinese culture. Moreover, those young scholars tend to learn from the nature and internal comprehension and combine overseas theories and advanced technologies with China's development practice. Their brilliant thoughts stand on their own, which are not only dazzling but also admiring.

China is a mountainous country, with a mountainous area of 6600000 square kilometers, which takes up 70% of national land area. In addition, population in mountainous regions accounts for more than 1/2 that of total population of China. Among more than 600 cities, more than 300 cities are mountainous. Among more than 2300 counties, more than 1500 counties are located in mountainous regions. Among more than 19000 towns, more than 10000 towns are mountainous towns.

Construction and development of mountainous regions is not only a major strategic need but also a key technological task for China, to a great extent, it will determine the results of national modernization and ecological civilization construction. Since the Reform and

[1] At present, the theoretical cognition of urban planning and construction of China is quite vague, in which the ignorance of regional reality, hearsays and confusions are common. It is often seen that local government, professionals, or "experts" of different levels try to combine western far-fetched theories with China's real urban and rural construction; Moreover in some cases the mountainous regions are generalized by theories of plain areas. However, aiming to win the bid or sign the contract, different space scales, cultural genes, restrictive conditions and ecological elements are assembled in some classic and modern cases, which are forced to collage with beautiful mountains and rivers. Many plans or ideas like that have been carried out into real construction project, thus the destruction and misguide of mountainous regions is beyond imagination and this phenomenon is quite common nowadays.

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Opening-up, the social and economic construction in the northeast areas and plain areas with relatively superior natural conditions have achieved significant progress after years of construction and development, in which the urbanization rates in some provinces and cities are close to or even higher than that of developed countries. However in the vast middle and western mountainous regions where are mostly revolutionary base areas, minority inhabited areas, border areas and poverty-stricken areas, the development foundation is relatively weak with backward social economical level, which leaves great development space and potential for urbanization. To promote the development of urban and rural construction and build better living environment in mountainous regions is a task that will eventually influence social stability and modernization process. In addition, it is not only a continuous motivation of domestic demand expansion, economical structure improvement, and development mode transformation but also an effective approach to solve regional development contradictions and implement national strategies such as new urbanization to face challenges home and abroad.

This book, named as *Theories of Human Settlements in Mountainous Regions*, it can be seen literally that there are three key words: mountains, human settlements and seven theories, which set out to explore seven theoretical cognitions on human settlements in mountainous regions. (1) Scientific cognition: it is the correlations between mountainous settlements on the technological level, related scientific connotation, scientific significance of discipline and inter-discipline development, team's growth path of scientific theoretical exploration and the cognition of future development of science of human settlements in mountainous regions. (2) Settlement culture: regions and culture are inseparably interrelated foundation of human settlements. From the perspective of theoretical cognition, regional culture's influence on settlements' progressive view, ecological view and value view are analyzed. Hence, the spatial structure of settlement culture and its influence on urban morphology and people's living are also discussed, along with relevant theoretical suggestions and case analysis. (3) Watershed Ecology: watershed of mountains is the link of ecological pattern and human settlements. Watershed environment is the typical natural unit of human settlements in mountainous regions. Thus, theoretical insight of the basic cognition and coordination of watershed settlements has been discussed, along with ecological safety identification and evaluation planning intervention of human settlements in mountainous area. (4) Urban and rural coordination: Urban and rural coordination development is not only an important strategic thinking to break dual structure, but also an effective approach to solve issues concerning agriculture, countryside and farmers. Guided by questions, it sets out to study the theories

and practice of urban and rural coordinationsettlement in mountainous regions and strives to construct theoretical system of urban and rural coordinationsettlement in mountainous regions. (5) Spatial morphology: Spatial morphology is the physical form that reflects the objective existence of human settlements. The difference between mountainous and plain space lies in the three-dimension of landform and environment that contains complexity and interestingness of other spaces. Human and environment interact together on mountainous space, in which the traditional co-existing ecological ideas guide the basic construction of spatial morphology of mountainous cities and towns. Therefore the basic evolutional path proves to be important reference and theoreticalfoundation of human settlements in mountainous regions. (6) Disaster prevention and safety: Due to the complexity, fragility and sensitiveness of mountainous lands and the occupation and renovation of environment caused by mountainous construction, the frequency and intensity of disasters in mountainous regions has been largely aggravated. Disaster prevention and safety of human settlement construction in mountainous regions is not only an important theoretical research but also a technical task to explore major disaster problems of environmental construction of human settlements in mountainous regions and the theoretical cognition of disaster prevention and alleviation. (7) Engineering Technology: research of engineering technology of human settlements in mountainous regions and its theoretical methods is of crucial importance. Compare to plain regions, the construction of mountainous regions is much more complicated in engineering difficulty, comprehension and coordination, which is ignored for a long time or simply generalized by theories of plain regions. Corresponding theories and methods of scientific viewpoint should be encouraged to guide and solve the engineering technological problems of urban and rural construction in mountainous regions.

As for research on human settlements in mountainous regions, the theoretical foundation was originated from the idea of "Science of Human Settlements"of Academician Wu Liangyong, which focuses on the correlation between human and environment and with human settlements (including villages, towns and cities) as research subject. It emphasizes the overall study of human settlements, with the aim to find and grasp the objective law of human settlements' occurrence and development. Therefore better settlement environment that meets human ideal can be built[1]. Correspondingly, the team is trying to combine Academician

[1] It is from Academician Wu Liangyong's *Introduction to Sciences of Human Settlements*,China Architecture & Building Press,Beijing, 2001.

Wu's"Human Settlements" theory with practical needs of human settlement construction in northwest mountainous regions of China. In addition, it sets out to reveal the adaptive construction law to build a relatively ideal human settlement environment in mountainous regions during the gradual urbanization transition from plain regions to mountainous regions.

Academician Wu Liangyong pointed out that there is a big gap between academic researches of human settlement construction in China for the systematic research on human settlements in mountainous regions and the current development problems of human settlements in mountainous regions are evidentiallyinsufficient. It is encouraged that new human settlement mode in mountainous regions should be created on a large scale by learning from the history and meeting the current needs, which can not only bring new creative possibility for the organic and distributed development mode of cities but also avoid the destruction and abuse of precious resources in mountainous cities[1].

The"Science of Human Settlements in Mountainous Regions" research team has experienced three periods during 20 years' growth, which can be concluded as "initial period", "development period" and "promotion period". In different periods, the team faced different realistic problems and brought out different solutions. During the initial period, we focused on the research of the Three Gorge Project and environment construction of human settlements and carried out theoretical exploration and practice with the theme of reservoir immigrant relocation and new city construction.During the development period, the team was supported by a series of projects such as National Natural Science Foundation of China and the Ministry of Science and Technology Support Plan, it carried out the research of adaptive theories and methods for environment construction of human settlements in southwest mountainous regions, in which the research thinking and vision had expanded to watershed human settlements, ecological safety in mountainous regions, disaster prevention and alleviation and information mapping technology of human settlements with more integration of disciplines. After entering the promotion period, the team further realized the importance of discipline integration, theory concision, and achievement conclusion. Therefore it summarized and polished research results by a series of work such as applying for the Ministry of Education Award and learning from experts of other fields. It is learnt that different science fields can present different identification habits and academic paths and what the team missed and

[1] It is quoted from Academician Wu Liangyong's theme report: *A brief Discussion on the Development of Science of Human Settlements in Mountainous Regions* at the Third International Forum of Human Settlements in Mountainous Regions, which is held by Faculty of Architecture and Urban Planning, Chongqing University.

ignored is the objectiveness and wisdom of engineering discipline, what's more, the prudent thinking and rigorous logic. Before that, scholars of planning and architecture discipline tended to make evaluations by emotion and were more willingly to learn from own discipline. In the long run, the discipline will stand still by stereotypes and gradually deviate from the mainstream platform of science and technology academia and finally lead to the blind spot of academic visions.

At present, the team is still exploring on the scientific path. In general, mountainous regions are usually with slow economy, construction difficulties, and talent shortage. Along with the expansion of team vision and cognition, we believe that the future work needs to combine with the development needs of countries and regions. Continuous research and follow-up studies on theoretical methods, engineering technology and talent platform should be carried out in the future. It is also hoped that some innovation and breakthrough will be made on the theories and key technological problems of human settlements in mountainous regions.

Named as "seven theories", this book is constituted of seven independent scientific questions. Some academic thoughts by group brainstorming are carried out to clarify work aims and objectives, furthermore to deepen and guide the theoretical thinking of human settlement construction in mountainous regions.

Zhao Wanmin

Feb. 8, 2015

At Chongqing

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