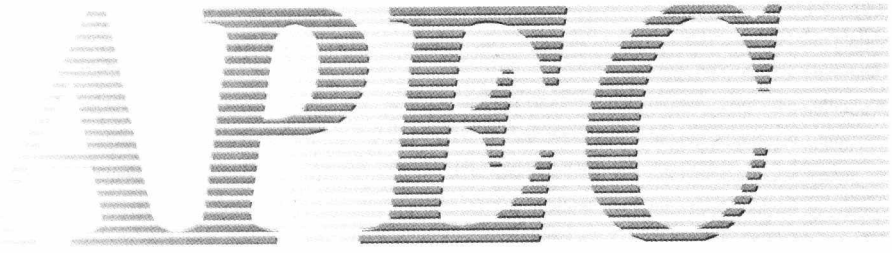
APEC地区粮食生产能力与粮食安全研究

陈佑启　何英彬　余强毅　主编

中国农业科学技术出版社

APEC地区粮食生产能力与粮食安全研究

陈佑启 何英彬 余强毅 主编



中国农业科学技术出版社

图书在版编目（CIP）数据

APEC 地区粮食生产能力与粮食安全研究 / 陈佑启，何英彬，余强毅主编 . —北京：中国农业科学技术出版社，2011. 12
ISBN 978 - 7 - 5116 - 0365 - 4

Ⅰ. ①A… Ⅱ. ①陈…②何…③余… Ⅲ. ①生产能力—研究—亚太地区 ②粮食—问题—研究—亚太地区 Ⅳ. ①F014. 6②F316. 11

中国版本图书馆 CIP 数据核字（2010）第 245092 号

责任编辑 闫庆健
责任校对 贾晓红

出 版 者 中国农业科学技术出版社
北京市中关村南大街 12 号 邮编：100081
电 话 (010)82106632(编辑室) (010)82109704(发行部)
(010)82109709(读者服务部)
传 真 (010)82106632
网 址 http://www. castp. cn
经 销 者 各地新华书店
印 刷 者 北京华忠兴业印刷有限公司
开 本 889mm ×1 194mm 1/16
印 张 7. 125
字 数 188 千字
版 次 2011 年 12 月第 1 版 2011 年 12 月第 1 次印刷
定 价 40. 00 元

《APEC地区粮食生产能力与粮食安全研究》

编　委　会

前　言

近几年，全球出现粮食危机，粮价上涨，小麦、玉米、稻米和其他基础粮食作物的价格飙涨两三倍，局部地区甚至出现了粮食骚乱，粮食生产能力及粮食安全问题成为人们关注焦点中的焦点。20世纪70年代至20世纪末，全球粮食需求不断增长，初始阶段由于粮食产量的增加，粮食价格稍有回落；但到2000年初粮食价格出现了逆转，由20世纪80年代与90年代的下跌转而不断上升，小麦、玉米与水稻等粮食储备出现了近30年的新低，这种由于粮食生产量严重滞后于消费量所带来的粮食储备下降极大地刺激了粮价的上涨，并且粮食价格上涨的幅度也越来越大，2006年为9%，2007年为23%，其中，2007年与2008年上半年均达到51%。迫于这种严峻的形势，粮食出口国如中国、印度、越南、俄罗斯、乌克兰、哈萨克斯坦、阿根廷、柬埔寨等均限制出口，以保护国内消费者；而粮食进口国如海地、埃及、摩洛哥、也门、沙特阿拉伯、约旦、布基纳法索、喀麦隆、印度尼西亚、象牙海岸、毛里塔尼亚、莫桑比克、塞内加尔等的粮食供应状况变得非常紧迫。联合国粮农组织（FAO）总干事雅克迪乌夫博士称：截至2008年初，由于粮食价格的上涨，全球受饥饿困扰人口从8.5亿增至9.25亿。综上所述可知，全球低粮价时代已近终结，将再次迎来高粮价的世纪，而未来几年的形势将极为严峻。如何维护粮食市场的正常运转，并有效调控粮价，将成为世界各国以及相关国际组织长期面临的课题。

APEC区域是世界发展最快的地区之一，在过去十多年内，这里已经成为世界经济的主要引擎。与此同时，APEC地区也是全球粮食贸易最活跃的地区之一，该区聚集了很多全球重要的粮食输出和粮食进口经济体，粮食生产和流通对于全球粮价的起伏有很大的影响。自20世纪60年代中期，亚太地区由于“绿色革命”大量采用了新的水稻与小麦品种，再加上肥料与水利灌溉的发展，农业产出获得了较大增加，粮食产量出现了惊人的增长。但是，由于人口的急剧增加，以及普通民众收入的增加所带来的消费水平的提高及消费结构的变化，致使该地区在粮食供给增加的同时，粮食需求也出现了较大幅度的增长。随着时间的推移，在粮食需求不断增加的同时，粮食生产能力却不能同步增长，这主要是因为一方面农业的投入没有受到足够的重视，另一方面，近年来极端的气候因素给该地区的农业与粮食生产带来了较大的影响。这一情形在未来可能更为严峻，粮食生产将会面临着一系列来自环境恶化、气候变化、土地退化等方面的威胁。近些年来，亚太地区损失了大量的耕地、草地与林地资源，而受到潜在威胁的地区范围更大。其中，土地退化对粮食生产能力的影响更为直接，在亚太地区土地退化的原因大多是因为土地的过度开垦与利用，很多地区为了满足基本的粮食需求，生态脆弱地区、水土流失风险极大的陡坡地等均在不断地被开发利用。此外，化肥的大量施用与严重的超载过牧也是造成该地区土地退化的重要原因。所有这些必将致使未来该地区的农业与粮食生产的可持续发展基础被削弱，从而对未来区域性的粮食安全构成严重威胁。2007年APEC领导人非正式会议上，粮食安全与气候变化一同被列为APEC成员体进行合作的优先领域。2008年5月，在秘鲁举行了APEC贸易部长会议，与会的APEC贸易部长针对目前粮食价格高

涨引发的亚太地区更多的经济和社会问题，发表了《APEC 贸易部长关于 WTO 多哈发展议程的单独声明》和《APEC 贸易部长主席声明》。声明指出，当前食品价格飞涨，全球农业贸易应大幅改善流通性，减少市场机制扭曲。

目前，对粮食价格飞涨大致有两种不同的解释：一是由于石油价格的上涨而导致的粮食生产成本上涨，而种植区恶劣的天气（如世界第二大小麦出口国澳大利亚遭遇大规模的旱灾）和粮食生产比较效益的低下而造成重要耕地流转，致使耕地数量不足，耕地质量下降，粮食减产；二是生物燃料需求旺盛导致粮价上涨。但是，在众多影响粮食安全的因素之中，以耕地为基础的粮食生产能力起着决定性的作用。综合来看，全球仍面临生物燃料、游资炒作、石油价格上涨、气候变化以及自然资源退化、减少和流失等重大挑战，粮食危机不仅仍然存在而且形势可能更为严峻，减贫和反饥饿仍然是国际社会的共同目标。

粮食安全始终是关系到中国国计民生、社会稳定和国家自立的全局性重大战略性问题。保障中国粮食安全，对实现全面建设小康社会的目标、构建和谐社会和推进社会主义新农村建设具有十分重要的意义。中国政府长期以来十分重视粮食安全问题，有力地保障了中国从总体来看相对较好的粮食安全形势，实现了中国粮食综合生产能力稳步提高、食物供给日益丰富、供需基本平衡的格局；从全球的角度看，中国成功解决了占世界近 1/5 人口的吃饭问题，农村贫困人口减少了 2.4 亿人，占发展中国家减贫人数的 75%，为促进世界粮食安全发挥了积极而不可替代的作用。然而，作为一个拥有 13 亿人口的大国，对粮食的需求巨大，粮食安全的基础较为脆弱，特别是从中国工业化、城镇化的发展以及人口增长、生活水平快速提高的趋势看，粮食消费需求将呈刚性增长；而与此同时，中国耕地资源的减少、水资源短缺、恶劣气候现象的频繁出现等因素对粮食生产能力与产量增加的瓶颈作用将更为突出，因此，中国粮食生产和供给的压力在短期内不可能轻易地完全消除，粮食供需将长期处于紧平衡状态，保障粮食安全面临严峻挑战，粮食问题仍然任重道远。为此，作为负责任大国，我们应同国际社会一道，重视粮食安全这一全球性挑战，在政策研究和农业科技等领域增加投入，更多资助召开相关领域研讨会，使工作成果具有针对性和连续性，在保障中国农业可持续发展的前提下，继续为全球的粮食安全做出贡献。

在此背景下，中国农业科学院农业资源与农业区划研究所于 2008 年成功申请了 APEC 基金项目“APEC 地区农业土地利用变化及其影响研讨会”，借助这一平台与 APEC 各成员体广泛地交流了农业土地利用变化的特点与问题，探讨了农业土地利用变化对粮食生产能力、粮食安全等的影响；另外还于 2009 年申请了财政部 APEC 产业基金项目“APEC 成员体粮食生产能力与粮食安全研究”，全面系统地开展了 APEC 各成员体粮食生产状况、水平与问题的调查研究，并于 2010 年 10 月在北京成功召开了“APEC 地区粮食生产能力与粮食安全国际研讨会”，全面总结了 APEC 各成员体所面临的粮食生产现状与未来的挑战，交流了提高粮食生产能力与应对粮食危机的成功经验，分享了粮食生产信息管理的先进方法与技术，探讨了气候变化、土地利用/覆盖变化以及农业信息技术等对粮食生产与安全的影响，会议对于加强 APEC 地区各成员体在粮食安全领域的合作、推动农业的可持续发展具有重要的意义。

本书是在前期相关研究的基础上总结而成。共五章：第一章为绪论，系统介绍了 APEC 的运作机制、APEC 农业领域合作的主要模式、中国参与 APEC 农业领域合作的主要优势与对策等；第二章主要介绍了 APEC 地区粮食生产、消费和贸易的情况；第三章阐明了粮食生产能力与粮食安全的基本内涵与测算方法；第四章对 APEC 地区的粮食生产能力与粮食安全开展了评价；第五章提出了

中国粮食生产与粮食安全基本战略。

在上述项目的执行过程中，得到了农业部国际合作司王鹰司长、谢建民副司长、卢肖平副司长、农业部机关服务局王志强副局长、农业部国际合作司综合处韦正林处长、吴昌学副处长、安全先生，外交部国际司国际处黄轶扬处长、佟宪国调研员、王忠宇先生及慕建峰先生、中国农业科学院唐华俊副院长、中国农业科学院国际合作局贡锡锋副局长、冯东昕副局长、APEC 农业技术合作工作组牵头人办公室金柯副处长及范肖丽女士的关心与支持，在此表示衷心的感谢。此外还要对农业部国际合作交流中心、农业部对外经济合作中心、农业部农业贸易促进中心、APEC 秘书处等单位提供参考数据及其有关领导的指导与大力支持，表示由衷的感谢。

粮食生产能力与粮食安全是涉及面十分广泛的命题，本书内容虽不全面，却自成体系；研究虽不是很深入，却具有较好的基础性。相信本书的出版将对相关领域的研究具有一定的参考与借鉴意义。

最后，由于时间仓促，书中错误之处在所难免，敬请广大读者与同仁批评指正。

编　者

2011 年 1 月于北京

Foreword

Food crisis sprawled in the recent years, accompanied by price escalation – price of wheat, maize, rice and other essential food crops have doubled or even tripled. Some areas are stricken by food riots, putting food productivity and food security issues under the limelight. Global food demand kept increasing from 1970s to late 1990s. Food price fell slightly in early stage due to output increase, but then reversed to an upward trend since early 2000. Food reserve for wheat, maize and rice plummeted to record low in the past 30 years. Significant gap between food production and consumption greatly induced price inflation, in an ever faster momentum – 9% in 2006, 23% in 2007 (51% on average in the first 6 months of 2007 and 2008). Given the gloomy situation, food exporting countries, such as China, India, Vietnam, Russia, Ukraine, Kazakhstan, Argentina and Cambodia, resorted to export restriction, in order to protect domestic consumers; consequently, food importing countries, such as Haiti, Egypt, Yemen, Saudi Arabia, Jordan, Burkina Faso, Cameroon, Indonesia, the Ivory Coast, Mauritania, Mozambique, Senegal, faced pressing moment for food supply. Dr. Diouf, Director General of FAO, noted that, global population harassed by hunger due to food price inflation, till early 2008, has increased from 850 million to 925 million. It is fair to say that low – price era for food has already gone, while the world once again encounters a century of high food price. Challenges in the following years are daunting. Maintaining sound operation of food market and effectively regulating food price will become a standing agenda faced by all countries and relevant international organizations.

APEC is the fastest growing community in the world, which has become a major powerhouse for the global economy in the past 10 years. At the same time, APEC hosts a number of major food exporting and food importing economies, witnessing the most dynamic food trade in the world. Food production and distribution in APEC contributes significantly to global price fluctuation. Blessed by new rice and wheat varieties massively introduced since mid 1960s during the Green Revolution, and advancement in fertilizer and irrigation, agricultural output in the Asia Pacific region has grown substantively, so has grain output. Strong growth also appeared in demand, not only because of explosion of population in the region, but also due to rising consumption level and changing consumption pattern resulting from income increase. Increase in food production failed to keep pace with growth in demand, as on the one hand, agriculture has been under spent; on the other hand, extreme weathers in the recent years registered harsh impact on agricultural and food production in the region. The situation is expected to get even worse in future, staging a series of threat to food production such as environmental deterioration, climate change and land degradation. The Asia Pacific region lost a great amount of farmland, graze land and forest land resources in the recent years, while areas under potential threat are even larger in scale. Among those, land degradation exerted more direct impact on food productivity, mostly due to excessive reclamation and use of land. In many ears, ecologically vulnerable land and slope land with major risks of water and soil erosion are developed and used to satisfy basic food demands. In addition, fertilizer abuse and over – grazing also contributed to land degradation in the region. All those factors will inevitably weaken the foundation for sustainable agricultural and food production in the region, and pose serious threat to regional food security. In the Informal APEC Leaders' Meetings in 2007,

food security and climate change were both identified as priority areas for cooperation among APEC member economies. In the APEC Trade Ministers Meeting held in Peru in May 2008, APEC trade ministers delivered the APEC MRT Statement on the Doha Development Agenda (DDA) Negotiations and the APEC MRT Statement of the Chair in face of emerging economic and social concerns due to food price escalation. The Statement noted that, global agricultural trade shall improve liquidity and reduce distortions in the market mechanism to rein in food price inflation.

There are two distinct arguments about food price inflation. One is that oil price is the evil to blame behind cost increase in food production, while extreme weathers in the producing region (such as the massive draught in Australia, the second largest wheat exporter in the world) and low comparative benefits of food production have encouraged the transfer of major cropland, leading to quantity shortage and quality reduction of cropland, and consequently reduction in food production. The other argument points the finger at resilient demand for bio – fuel. However, food productivity based on cropland, among all factors bearing on food security, plays a decisive role. In general, the world is still faced with a number of major challenges – bio – fuel, hot capital speculation, oil price inflation, climate change, as well as deterioration, reduction and lost of natural resources. Food crisis will remain and only aggregate, making poverty reduction and fight of hunger still the common goal of international community.

Food security is of paramount and strategic importance, bearing on national development and livelihood, social stability and national independence. Fostering food security is fundamental to attaining the goal of building all – rounded moderately prosperous society, advancing socialism and harmony, and contributing to the socialist new countryside. Given persistent commitment to food security, the Chinese Government has nurtured an enabling environment for food security, with steadily growing food productivity, diversifying food supply, and general balance between supply and demand. In the global context, China managed to feed nearly 1/5 of the world population, and lifted 240 million rural people out of poverty (75% of people lifted out of poverty in the developing countries), thus playing an active yet irreplaceable role in fostering global food security. China's 1.3 billion people have has sizeable demand for food. Given vulnerable foundation for food security, as well as other compounding factors such as industrialization and urbanization, population booming, rapid growth of livelihood, food demand will grow irreversibly. On the other hand, shrinking arable land resources, water scarcity, frequent occurrence of extreme climate will work together to limit food production and output growth. In that context, pressure for food production and supply in China will not be easily removed in the short term. Food demand and supply will remain a tight balance for a long time; food security is faced with mighty challenges, while food issues are far from being effectively addressed. As a responsible country, China shall join efforts with the international community to rise up to the global challenge of food security, invest more efforts in policy research and agricultural science and technology, and organize more workshops/seminars in relevant fields, to ensure specificity and consistency of the outcomes. In that case, China will continue its contribution to global food security while advancing sustainable development of domestic agriculture.

Against this backdrop, the Institute of Agricultural Resources and Regional Planning of the Chinese Academy of Agricultural Sciences won a bid in 2008 for an APEC funded project – Workshop on the Use of Agricultural Land and Its Impact in the APEC Region, in which the Institute had extensive exchange with APEC member economies on the use of agricultural land, and discussed upon the impact on food productivity and food security by changes to the use of agricultural land. In 2009, the Institute applied another project funded by APEC Industrial Fund under the Ministry of Finance – the Study on Food Productivity and Food

Security in APEC Member Economies, which took comprehensive investigation over food production and relevant issues among APEC member economies. Following the Study, the International Workshop on Food Productivity and Food Security in APEC Region was successfully held in Beijing in October 2010, which took an overview of current food production and future challenges of APEC member economies, exchanged experiences in improving food productivity and countering food crisis, shared advanced methodologies and technologies in food production information management, and deliberated upon impact on food production and food security by climate change, changes to land use and agricultural information technology. The Workshop is of great significance to bolstering cooperation among APEC member economies in food security, and advancing sustainable development of agriculture.

The book was developed on the basis of relevant studies, with 6 chapters. Chapter I is Introduction, which gives an overview of APEC operating mechanism, models of agricultural cooperation within APEC, main advantages and solutions of China's involvement in APEC agricultural cooperation; Chapter II presents the definition and calculation of food productivity and food security; Chapter III analyzes food production and consumption in the APEC region and the world at large; Chapter IV evaluates food productivity and food security in the APEC region; Chapter V summarizes current status, characteristics and trend of food trade in the APEC region; Chapter VI offers a basic strategy for China in food production and food security.

The above – mentioned project benefited from generous support of a number of persons, including Mr. Wang Ying, Director General of International Cooperation Department of Ministry of Agriculture, Mr. Xie Jianmin, Deputy Director General of International Cooperation Department, Mr. Lu Xiaoping, Deputy Director General of International Cooperation Department, Mr. Wang Zhiqiang, Deputy Director General of Bureau of General Services, Mr. Wei Zhenglin, Chief director of General Affairs Division of International Cooperation Department, Mr. Wu Changxue, Deputy director of General Affairs Division of International Cooperation Department, Mr. Anquan, staff of General Affairs Division of International Cooperation Department, Mr. Huang Yiyang and Mr. Tong Xianguo, Chief director and director of Division of International Affairs of Ministry of Foreign Affairs, Mr. Wang Zhongyu and Mr. Mu Jianfeng, from Division of International Affairs of Ministry of Foreign Affairs, Mr. Tang Huajun, Vice Principal of Chinese Academy of Agricultural Sciences, Mr. Gong Xifeng and Ms. Feng Dongxin, both Deputy Director of International Cooperation Bureau of China Academy of Agricultural Sciences, Mr. Jinke, Deputy Division Director and Ms. Fan Xiaoli, the Shepherd Office of APEC Agricultural Technical Cooperation Working Group. In addition, the author would also like to pay tribute to the Center of International Cooperation Services, Foreign Economic Cooperation Center, and Agricultural Trade Promotion Center of the Ministry of Agriculture, as well as APEC secretariat for providing reference information and rendering great support.

Food production and food security covers a wide scope. This book may not be comprehensive, but establish a system on its own; the research may not be intensive, but present fairly good fundamental knowledge. The author believes that the book will be of relevance to research in relevant fields.

Last but not least, comments and suggestion from the readers and peers are always appreciated.

By the Author, in Beijing

January 2011

目　录

CONTENT

图 目 录

Figure Content