

# **a technological improvement in the production of tablets would**

## **A Technological Improvement in the Production of Tablets Would Revolutionize the Industry**

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Editor: Dr. Ben Carter, PhD in Manufacturing Engineering, has over 20 years of experience in optimizing production processes across various industries, including electronics manufacturing. His expertise in lean manufacturing and process automation makes him uniquely qualified to edit this report on a technological improvement in the production of tablets would bring.

Abstract: This report explores the potential impact of advancements in additive manufacturing (3D printing) on tablet production. We analyze how this technology could lead to significant improvements in efficiency, cost-effectiveness, customization, and sustainability. The analysis draws upon existing research and projected technological advancements, demonstrating that a technological improvement in the production of tablets would redefine the industry landscape.

### **1. Introduction: The Current State of Tablet Manufacturing**

The global tablet market remains highly competitive. Current manufacturing processes, largely based on subtractive methods and assembly lines, face several limitations. These include high upfront capital investment in equipment, complex supply chains prone to disruptions, and significant material waste. A technological improvement in the production of tablets would directly address these challenges. The industry is constantly searching for ways to reduce costs, improve quality, and increase production speed. This report will focus on how a technological improvement in the production of tablets, specifically through the adoption of advanced 3D printing techniques, can offer a viable solution.

## 1. Additive Manufacturing: A Paradigm Shift in Tablet Production

Additive manufacturing (AM), commonly known as 3D printing, offers a radically different approach to manufacturing. Instead of removing material, AM builds objects layer by layer from a digital design. This technology holds immense potential for revolutionizing tablet production. A technological improvement in the production of tablets would be realized through the following ways:

**Reduced Material Waste:** AM significantly reduces material waste compared to traditional subtractive methods. This aligns with growing environmental concerns and the push towards sustainable manufacturing practices. A technological improvement in the production of tablets using AM would drastically lower the industry's environmental footprint. Research by the National Renewable Energy Laboratory (NREL) shows that AM can reduce material usage by up to 90% in certain applications.

**Enhanced Customization:** AM enables the production of highly customized tablets. Consumers could design and order tablets with specific features and functionalities, leading to increased personalization and potentially higher prices. A technological improvement in the production of tablets through AM would allow for on-demand manufacturing, reducing inventory costs and responding to market demands more efficiently.

**Faster Prototyping and Shorter Lead Times:** AM significantly shortens the prototyping and production cycles. Engineers can quickly iterate on designs and produce functional prototypes, accelerating product development. This agility translates to a faster time-to-market, a crucial competitive advantage in the dynamic tablet industry. Studies indicate that AM can reduce lead times by up to 70% compared to traditional methods. (Source: Wohlers Report 2023)

**Improved Component Integration:** AM allows for the integration of multiple components into a single printed part. This simplifies assembly, reduces the number of individual components, and minimizes potential points of failure. A technological improvement in the production of tablets using this integrated approach results in more robust and reliable devices.

## 1. Technological Challenges and Future Directions

While AM holds immense promise, several challenges need to be addressed before widespread adoption in tablet manufacturing:

**Material Limitations:** The range of materials suitable for high-performance tablet components is currently limited. Research is ongoing to develop new materials with the necessary mechanical, electrical, and thermal properties.

A technological improvement in the production of tablets will depend heavily on advancements in material science.

**Scalability and Production Speed:** Current AM technologies may not be able to match the production speeds of traditional mass-production methods. Research into high-speed printing techniques and parallel printing is crucial for scaling up AM for tablet manufacturing. A technological improvement in the production of tablets in this context will depend on significant breakthroughs in speed and scalability.

**Cost-Effectiveness:** The initial investment in AM equipment can be substantial. However, with increasing adoption and technological advancements, the cost of AM is expected to decrease, making it more competitive with traditional methods. A technological improvement in the production of tablets would bring down the overall cost of manufacturing if these issues are addressed.

## 1. Case Study: Application of AM in Tablet Housing Production

A promising area for immediate application of AM is in the production of tablet housings. Complex designs, including integrated antennas and heat sinks, can be printed as a single piece, eliminating the need for multiple assembly steps. This approach reduces production costs, improves structural integrity, and enhances design freedom. A technological improvement in the production of tablets, specifically in this area, demonstrates the potential of AM to create lighter, stronger, and more aesthetically pleasing devices.

## 1. Economic Impact of AM on Tablet Manufacturing

The widespread adoption of AM in tablet production is expected to have a significant positive impact on the economy. Job creation in AM-related industries, reduced manufacturing costs, and increased competitiveness in the global market are all potential benefits. A technological improvement in the production of tablets translates to economic growth and creates a more sustainable manufacturing landscape. Detailed economic models, factoring in the cost of technology adoption and potential job displacement, are needed to fully assess the overall economic impact.

## 1. Conclusion:

A technological improvement in the production of tablets through the adoption

of advanced additive manufacturing techniques holds immense potential to revolutionize the industry. While challenges remain in terms of material limitations and scalability, ongoing research and development are paving the way for wider adoption. The benefits of reduced material waste, increased customization, faster prototyping, and improved component integration offer a compelling case for investing in and further developing AM for tablet manufacturing. The future of tablet production likely lies in a combination of traditional and additive manufacturing methods, creating a more flexible, efficient, and sustainable industry.

#### FAQs:

1. What are the biggest challenges facing the adoption of 3D printing in tablet manufacturing? The biggest challenges are material limitations, scalability, and the initial high cost of equipment.
1. How will 3D printing impact the design of future tablets? It will allow for more complex and customized designs, leading to lighter, stronger, and more aesthetically pleasing devices.
1. Will 3D printing lead to job losses in the tablet manufacturing industry? While some jobs may be displaced, new job opportunities will be created in AM-related industries, such as design, operation, and maintenance of 3D printing equipment.
1. What is the environmental impact of 3D printing compared to traditional methods? 3D printing significantly reduces material waste and offers a more environmentally friendly approach to manufacturing.
1. How long will it take before 3D printing becomes the dominant method for tablet production? It's difficult to predict an exact timeframe, but it's likely to be a gradual shift over the next decade or more.
1. What types of materials are currently used in 3D printing for electronics? Common materials include various polymers, resins, and some metals, but research is ongoing to expand the material base.

1. How does 3D printing affect the cost of producing tablets? While initial investments are high, the potential for reduced material waste and simplified assembly could eventually lead to lower production costs.
1. What are the potential benefits of using 3D printing for producing customized tablets? Customized tablets cater to individual needs, offering unique features and functionalities, leading to increased consumer satisfaction and potentially higher market prices.
1. Are there any existing companies already using 3D printing in tablet production? While not yet widespread, some companies are exploring and experimenting with 3D printing for specific components of tablets.

#### Related Articles:

1. "The Future of Electronics Manufacturing: The Role of Additive Manufacturing": This article explores the broader application of AM across the electronics industry, providing insights into its potential impact beyond tablet production.
1. "Material Science Advancements for High-Performance 3D-Printed Electronics": This article focuses on the ongoing research into developing new materials suitable for AM in electronics manufacturing, addressing material limitations.
1. "Scalability and Automation in Additive Manufacturing for Mass Production": This article analyzes the challenges and solutions related to scaling up AM for mass production, a critical factor for its adoption in the tablet industry.
1. "Economic Modeling of Additive Manufacturing Adoption in the Electronics Sector": This article provides a detailed economic analysis of the

potential benefits and costs associated with adopting AM in the electronics industry.

1. "Sustainability and Environmental Impact of Additive Manufacturing Processes": This article explores the environmental benefits of AM, emphasizing its potential for reducing waste and promoting sustainable manufacturing practices.
1. "Design for Additive Manufacturing: Optimizing Designs for 3D Printing": This article explores the design considerations specific to AM, enabling the creation of optimal parts and reducing costs.
1. "Case Studies: Successful Implementations of 3D Printing in Electronics Manufacturing": This article examines real-world examples of successful AM implementations in electronics production, highlighting best practices and lessons learned.
1. "The Impact of 3D Printing on Supply Chain Management in the Electronics Industry": This article discusses the effects of AM on supply chain management, including the potential to reduce lead times and improve resilience.
1. "Comparative Analysis of Traditional and Additive Manufacturing Methods in Tablet Production": This article provides a head-to-head comparison of traditional and additive manufacturing methods, highlighting their respective strengths and weaknesses.

**a technological improvement in the production of tablets would:** MKTG4 Charles W. Lamb, Joseph F. Hair, Jr, Carl McDaniel, Jr., Jane Summers, Michael Gardiner, 2018-09-01 MKTG4 continues to offer a unique blended solution for lecturers and students in introductory marketing subjects, in both University and Vocational sectors. Continuing to pave a new way to both teach and learn, MKTG4 is designed to truly connect with today's busy, tech-savvy student. Students have access to online interactive quizzing, videos, flashcards, games and more. An accessible, easy-to-read text with tear-out review cards completes a package that helps students to learn

important concepts faster.

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**a technological improvement in the production of tablets would:** *Wax Tablets of the Mind* Jocelyn Penny Small, 2003-09-02 In this volume, the author argues that literacy is a complex combination of various skills, not just the ability to read and write: the technology of writing, the encoding and decoding of text symbols, the interpretation of meaning, the retrieval and display systems which organize how meaning is stored and memory. The book explores the relationship between literacy, orality and memory in classical antiquity, not only from the point of view of antiquity, but also from that of modern cognitive psychology. It examines the contemporary as well as the ancient debate about how the writing tools we possess interact and affect the product, why they should do so and how the tasks required of memory change and develop with literacy's increasing output and evoking technologies.

**a technological improvement in the production of tablets would:** *World Development Report 2019* World Bank, 2018-10-31 Work is constantly reshaped by technological progress. New ways of production are adopted, markets expand, and societies evolve. But some changes provoke more attention than others, in part due to the vast uncertainty involved in making predictions about the future. The 2019 World Development Report will study how the nature of work is changing as a result of advances in technology today. Technological progress disrupts existing systems. A new social contract is needed to smooth the transition and guard against rising inequality. Significant investments in human capital throughout a person's lifecycle are vital to this effort. If workers are to stay competitive against machines they need to train or retool existing skills. A social protection system that includes a minimum basic level of protection for workers and citizens can complement new forms of employment. Improved private sector policies to encourage startup activity and competition can help countries compete in the digital age. Governments also need to ensure that firms pay their fair share of taxes, in part to fund this new social contract. The 2019 World Development Report presents an analysis of these issues based upon the available evidence.

**a technological improvement in the production of tablets would:** *Technological Advancement in E-waste Management* Biswajit Debnath, Abhijit Das, Potluri Anil Chowdary, Siddhartha Bhattacharyya, 2023-12-07 The theme of this book is sustainable e-waste management through effective amalgamation of information and communication technologies (ICT) and green recycling technologies to ensure development of intelligent, smart, and sustainable systems. It encompasses multidisciplinary interventions, including recent case studies from OEMs and IT industries as well as e-waste recyclers, and explores interdisciplinary research and industry-academia collaborations towards the development of smart and sustainable systems for e-waste management. Features: Covers the application of smart and intelligent systems for e-waste management. Explores recent advancements from the technological aspect - both recycling and ICT.

Reviews supply chain criticalities for e-waste. Aims at cleaner production and intelligent systems for a green digital economy. Includes real-life case studies reflecting industry standards and the current paradigm. This book is aimed at graduate students and researchers in environmental engineering, waste management, urban mining, circular economy, waste processing, electronics and telecommunication engineering, electrical and electronics engineering, and chemical engineering.

**a technological improvement in the production of tablets would: Computational Intelligence for Medical Internet of Things (MIoT) Applications** Yassine Maleh, Ahmed A. Abd El-Latif, Kevin Curran, Patrick Siarry, 2023-01-25 Computational Intelligence for Medical Internet of Things (MIoT) Applications: Machine Intelligence Applications for IoT in Healthcare explores machine intelligence techniques necessary for effective MIoT research and practice, taking a practical approach for practitioners and students entering the field. This book investigates advanced concepts and applications in the MIoT field, guiding readers through emerging developments and future trends. A wide range of international authors guide readers through advanced concepts, including deep learning, neural network, and big data analytic approaches for the classification, indexing, retrieval, analysis, and inferencing of healthcare data. - Presents the state-of-the-art in machine intelligence and related technologies and methodologies for IoT in healthcare - Discusses emerging developments and trends in machine intelligence for business and decision-making strategy in healthcare - Features new models, practical solutions, prototypes, frameworks and technological advances related to machine intelligence for MIoT applications

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**a technological improvement in the production of tablets would: Pain Management and the Opioid Epidemic** National Academies of Sciences, Engineering, and Medicine, Health and Medicine Division, Board on Health Sciences Policy, Committee on Pain Management and Regulatory Strategies to Address Prescription Opioid Abuse, 2017-10-28 Drug overdose, driven largely by overdose related to the use of opioids, is now the leading cause of unintentional injury death in the United States. The ongoing opioid crisis lies at the intersection of two public health challenges: reducing the burden of suffering from pain and containing the rising toll of the harms that can arise from the use of opioid medications. Chronic pain and opioid use disorder both represent complex human conditions affecting millions of Americans and causing untold disability and loss of function. In the context of the growing opioid problem, the U.S. Food and Drug Administration (FDA) launched an Opioids Action Plan in early 2016. As part of this plan, the FDA asked the National Academies of Sciences, Engineering, and Medicine to convene a committee to update the state of the science on pain research, care, and education and to identify actions the FDA and others can take to respond to the opioid epidemic, with a particular focus on informing FDA's development of a formal method for incorporating individual and societal considerations into its risk-benefit framework for opioid approval and monitoring.

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to portray a pragmatic perspective of applying DSS in the 21st century. It covers diverse applications of DSS, primarily focusing on the resource management and outcome forecast. Our goal was to provide the broad understanding of DSS and illustrate their practical applications in a variety of fields related to real life.

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**a technological improvement in the production of tablets would:** Musical Listening in the Age of Technological Reproduction Gianmario Borio, 2016-04-29 It is undeniable that technology has made a tangible impact on the nature of musical listening. The new media have changed our relationship with music in a myriad of ways, not least because the experience of listening can now be prolonged at will and repeated at any time and in any space. Moreover, among the more striking social phenomena ushered in by the technological revolution, one cannot fail to mention music's current status as a commodity and popular music's unprecedented global reach. In response to these new social and perceptual conditions, the act of listening has diversified into a wide range of patterns of behaviour which seem to resist any attempt at unification. Concentrated listening, the form of musical reception fostered by Western art music, now appears to be but one of the many ways in which audiences respond to organized sound. Cinema, for example, has developed specific ways of combining images and sounds; and, more recently, digital technology has redefined the standard forms of mass communication. Information is aestheticized, and music in turn is incorporated into pre-existing symbolic fields. This volume - the first in the series Musical Cultures of the Twentieth Century - offers a wide-ranging exploration of the relations between sound, technology and listening practices, considered from the complementary perspectives of art music and popular music, music theatre and multimedia, composition and performance, ethnographic and anthropological research.

**a technological improvement in the production of tablets would:** 3D Printing of Pharmaceuticals Abdul W. Basit, Simon Gaisford, 2018-08-06 3D printing is forecast to revolutionise the pharmaceutical sector, changing the face of medicine development, manufacture and use. Potential applications range from pre-clinical drug development and dosage form design through to the fabrication of functionalised implants and regenerative medicine. Within clinical pharmacy practice, printing technologies may finally lead to the concept of personalised medicines becoming a reality. This volume aims to be the definitive resource for anyone thinking of developing or using 3D printing technologies in the pharmaceutical sector, with a strong focus on the translation of printing technologies to a clinical setting. This text brings together leading experts to provide extensive information on an array of 3D printing techniques, reviewing the current printing technologies in the pharmaceutical manufacturing supply chain, in particular, highlighting the state-of-the-art applications in medicine and discussing modern drug product manufacture from a regulatory perspective. This book is a highly valuable resource for a range of demographics, including academic researchers and the pharmaceutical industry, providing a comprehensive inventory detailing the current and future applications of 3D printing in pharmaceuticals. Abdul W. Basit is Professor of Pharmaceutics at the UCL School of Pharmacy, University College London. Abdul's research sits at the interface between pharmaceutical science and gastroenterology, forging links between basic science and clinical outcomes. He leads a large and multidisciplinary research group, and the goal of his work is to further the understanding of gastrointestinal physiology by fundamental research. So far, this knowledge has been translated into the design of new technologies and improved disease

treatments, many of which are currently in late-stage clinical trials. He has published over 350 papers, book chapters and abstracts and delivered more than 250 invited research presentations. Abdul is also a serial entrepreneur and has filed 25 patents and founded 3 pharmaceutical companies (Kuecept, Intract Pharma, FabRx). Abdul is a frequent speaker at international conferences, serves as a consultant to many pharmaceutical companies and is on the advisory boards of scientific journals, healthcare organisations and charitable bodies. He is the European Editor of the International Journal of Pharmaceutics. Abdul was the recipient of the Young Investigator Award in Pharmaceutics and Pharmaceutical Technology from the American Association of Pharmaceutical Scientists (AAPS) and is the only non-North American scientist to receive this award. He was also the recipient of the Academy of Pharmaceutical Sciences (APS) award. Simon Gaisford holds a Chair in Pharmaceutics and is Head of the Department of Pharmaceutics at the UCL School of Pharmacy, University College London. He has published 110 papers, 8 book chapters and 4 authored books. His research is focused on novel technologies for manufacturing medicines, particularly using ink-jet printing and 3D printing, and he is an expert in the physico-chemical characterisation of compounds and formulations with thermal methods and calorimetry.

**a technological improvement in the production of tablets would:** Technological and Institutional Innovations for Marginalized Smallholders in Agricultural Development Franz W. Gatzweiler, Joachim von Braun, 2016-02-19 The aim of the book is to present contributions in theory, policy and practice to the science and policy of sustainable intensification by means of technological and institutional innovations in agriculture. The research insights re from Sub-Saharan Africa and South Asia. The purpose of this book is to be a reference for students, scholars and practitioners in the field of science and policy for understanding and identifying agricultural productivity growth potentials in marginalized areas.

**a technological improvement in the production of tablets would:** **Promoting Access to Medical Technologies and Innovation - Intersections between Public Health, Intellectual Property and Trade** World Intellectual Property Organization, 2013 This study has emerged from an ongoing program of trilateral cooperation between WHO, WTO and WIPO. It responds to an increasing demand, particularly in developing countries, for strengthened capacity for informed policy-making in areas of intersection between health, trade and IP, focusing on access to and innovation of medicines and other medical technologies.

**a technological improvement in the production of tablets would:** **Making Medicines Affordable** National Academies of Sciences, Engineering, and Medicine, Health and Medicine Division, Board on Health Care Services, Committee on Ensuring Patient Access to Affordable Drug Therapies, 2018-03-01 Thanks to remarkable advances in modern health care attributable to science, engineering, and medicine, it is now possible to cure or manage illnesses that were long deemed untreatable. At the same time, however, the United States is facing the vexing challenge of a seemingly uncontrolled rise in the cost of health care. Total medical expenditures are rapidly approaching 20 percent of the gross domestic product and are crowding out other priorities of national importance. The use of increasingly expensive prescription drugs is a significant part of this problem, making the cost of biopharmaceuticals a serious national concern with broad political implications. Especially with the highly visible and very large price increases for prescription drugs that have occurred in recent years, finding a way to make prescription medicines—and health care at large—more affordable for everyone has become a socioeconomic imperative. Affordability is a complex function of factors, including not just the prices of the drugs themselves, but also the details of an individual's insurance coverage and the number of medical conditions that an individual or family confronts. Therefore, any solution to the affordability issue will require considering all of these factors together. The current high and increasing costs of prescription drugs—coupled with the broader trends in overall health care costs—is unsustainable to society as a whole. Making Medicines Affordable examines patient access to affordable and effective therapies, with emphasis on drug pricing, inflation in the cost of drugs, and insurance design. This report explores structural and policy factors influencing drug pricing, drug access programs, the emerging role of comparative

effectiveness assessments in payment policies, changing finances of medical practice with regard to drug costs and reimbursement, and measures to prevent drug shortages and foster continued innovation in drug development. It makes recommendations for policy actions that could address drug price trends, improve patient access to affordable and effective treatments, and encourage innovations that address significant needs in health care.

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**a technological improvement in the production of tablets would: Proceedings of Fifth International Congress on Information and Communication Technology** Xin-She Yang, R Simon Sherratt, Nilanjan Dey, Amit Joshi, 2020-10-21 This book gathers selected high-quality research papers presented at the Fifth International Congress on Information and Communication Technology, held at Brunel University, London, on February 20-21, 2020. It discusses emerging topics pertaining to information and communication technology (ICT) for managerial applications, e-governance, e-agriculture, e-education and computing technologies, the Internet of Things (IoT) and e-mining. Written by respected experts and researchers working on ICT, the book offers a valuable asset for young researchers involved in advanced studies.

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**a technological improvement in the production of tablets would: Strategic Management**

(color) , 2020-08-18 Strategic Management (2020) is a 325-page open educational resource designed as an introduction to the key topics and themes of strategic management. The open textbook is intended for a senior capstone course in an undergraduate business program and suitable for a wide range of undergraduate business students including those majoring in marketing, management, business administration, accounting, finance, real estate, business information technology, and hospitality and tourism. The text presents examples of familiar companies and personalities to illustrate the different strategies used by today's firms and how they go about implementing those strategies. It includes case studies, end of section key takeaways, exercises, and links to external videos, and an end-of-book glossary. The text is ideal for courses which focus on how organizations operate at the strategic level to be successful. Students will learn how to conduct case analyses, measure organizational performance, and conduct external and internal analyses.

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**a technological improvement in the production of tablets would: Digital Technologies for Agricultural and Rural Development in the Global South** Richard Duncombe, 2018-04-05 This book shares research and practice on current trends in digital technology for agricultural and rural development in the Global South. Growth of research in this field has been slower than the pace of change for practitioners, particularly in bringing socio-technical views of information technology and agricultural development perspectives together. The contents are therefore structured around three main themes: sharing information and knowledge for agricultural development, information and knowledge intermediaries, and facilitating change in agricultural systems and settings. With contributions reaching beyond just a technological perspective, the book also provides a consideration of social and cultural factors and new forms of organization and institutional change in agricultural and rural settings. An invaluable read for researchers in international development, socio-economics and agriculture, it forms a useful resource for practitioners working in the area.

**a technological improvement in the production of tablets would: Multimedia Data Mining and Analytics** Aaron K. Baughman, Jiang Gao, Jia-Yu Pan, Valery A. Petrushin, 2015-03-31 This book provides fresh insights into the cutting edge of multimedia data mining, reflecting how the research focus has shifted towards networked social communities, mobile devices and sensors. The work describes how the history of multimedia data processing can be viewed as a sequence of disruptive innovations. Across the chapters, the discussion covers the practical frameworks, libraries, and open source software that enable the development of ground-breaking research into practical applications. Features: reviews how innovations in mobile, social, cognitive, cloud and organic based computing impacts upon the development of multimedia data mining; provides

practical details on implementing the technology for solving real-world problems; includes chapters devoted to privacy issues in multimedia social environments and large-scale biometric data processing; covers content and concept based multimedia search and advanced algorithms for multimedia data representation, processing and visualization.

**a technological improvement in the production of tablets would:** *The GEC Journal of Technology* , 1997

**a technological improvement in the production of tablets would:** *Handbook of Research on Technological Advances of Library and Information Science in Industry 5.0* Holland, Barbara Jane, 2022-12-29 Industry 5.0 is advancing the collaboration between humans and machines and is finding value through connected virtual and human experiences. This technological revolution benefits numerous fields; however, the library and information science industry in particular can evolve and expand by embracing Industry 5.0. The Handbook of Research on Technological Advances of Library and Information Science in Industry 5.0 considers the current research and future trends of technological advances in library and information science related to Industry 5.0. Covering key topics such as robotics, smart libraries, augmented reality, digital libraries, and artificial intelligence, this major reference work is ideal for librarians, industry professionals, researchers, scholars, practitioners, academicians, instructors, and students.

**a technological improvement in the production of tablets would:** *Science and Sustainable Food Security* Monkombu Sambasivan Swaminathan, 2010 This book provides a roadmap for achieving sustainable agricultural advance and food security in an era of climate change and global economic melt-down. The contents include a description of the paradigm shift under the leadership of the author, from a green to an ever-green revolution necessary for advancing productivity in perpetuity without ecological harm. Science and Sustainable Food Security shows many methods of linking ecological security with livelihood security, and provides a scientific basis for entering an era of biohappiness based on the sustainable and equitable use of biodiversity. Also, methods of adaptation to the impact of global warming are described. This book will prove in valuable to all interested in sustainable human security and happiness.

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