

adoption of new technology in agriculture

The Accelerating Pace of Adoption of New Technology in Agriculture: A Comprehensive Review

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Abstract: This report examines the multifaceted process of adoption of new technology in agriculture, analyzing the factors driving and hindering its widespread implementation. We explore the diverse technologies impacting various aspects of farming, from precision agriculture techniques to advancements in biotechnology and data analytics. Through a review of existing literature and empirical data, we assess the rate of adoption across different regions and farming systems, highlighting both successes and challenges. The analysis focuses on the economic, social, and environmental implications of technological integration in agriculture, ultimately aiming to provide insights for policymakers and stakeholders to accelerate sustainable agricultural transformation.

1. Introduction: The Technological Revolution in Farming

The agricultural sector is undergoing a dramatic transformation, driven by rapid advancements in technology. The adoption of new technology in

agriculture is no longer a gradual process but an accelerating wave reshaping farming practices worldwide. This shift is fueled by the need to increase food production to meet the demands of a growing global population, enhance resource efficiency (water, fertilizer, pesticides), and mitigate the environmental impact of agriculture. This report delves into the complexities of this technological revolution, examining the various technologies being adopted, the factors influencing their uptake, and the broader implications for food security, sustainability, and rural development.

1. Technologies Driving Change in Agriculture

The adoption of new technology in agriculture encompasses a wide spectrum of innovations:

Precision Agriculture: This involves using GPS, sensors, and data analytics to optimize resource use and improve yields. Technologies like variable rate technology (VRT) for fertilizer and pesticide application, yield mapping, and remote sensing significantly enhance efficiency and reduce environmental impacts. Data from the USDA shows a significant increase in the adoption of GPS-guided machinery in the US, with over 70% of large farms utilizing this technology.

Biotechnology: Genetically modified (GM) crops, designed for enhanced pest resistance, herbicide tolerance, or improved nutritional content, have been widely adopted in certain regions. However, the adoption of GM crops remains controversial, influenced by regulatory frameworks, consumer preferences, and environmental concerns. Research from the International Service for the Acquisition of Agri-biotech Applications (ISAAA) provides data on the global hectares planted with GM crops.

Automation and Robotics: Autonomous tractors, robotic harvesters, and drones are increasingly being employed to automate labor-intensive tasks, improving efficiency and reducing reliance on manual labor. The rising cost of labor and the increasing availability of affordable automation technologies are major drivers of this trend. Studies from various agricultural engineering departments demonstrate the cost-effectiveness of robotic harvesting in certain high-value crops.

Data Analytics and Artificial Intelligence (AI): The use of big data and AI is transforming decision-making in agriculture. Predictive analytics can help farmers optimize planting schedules, anticipate disease outbreaks, and manage resources more effectively. The adoption of farm management software and cloud-based platforms is rapidly growing, providing farmers with access to sophisticated analytical tools.

1. Factors Influencing the Adoption of New Technology in Agriculture

The adoption of new technology in agriculture is not uniform across all regions and farming systems. Several factors influence the rate of adoption:

Economic factors: The cost of new technologies, potential return on investment, access to credit, and government subsidies significantly impact adoption decisions. Studies have shown that farmers are more likely to adopt technologies if they perceive a clear economic benefit.

Social factors: Farmer education and training, access to information and communication technologies (ICTs), social networks, and extension services play a crucial role in facilitating technology adoption. Social learning and peer influence are powerful drivers of change.

Institutional factors: Government policies, regulatory frameworks, research and development investments, and the availability of supportive infrastructure (e.g., reliable internet access) significantly influence the adoption process. Strong institutional support is vital for promoting wider technology uptake.

Environmental factors: Climate change, water scarcity, and soil degradation are increasing the pressure on farmers to adopt technologies that enhance resource use efficiency and resilience to environmental stresses.

1. Regional Variations in Technology Adoption

The adoption of new technology in agriculture varies significantly across different regions of the world. Developed countries generally exhibit higher adoption rates compared to developing countries, primarily due to greater access to capital, technology, and information. However, there is also a growing trend of technology adoption in developing countries, driven by initiatives aimed at improving agricultural productivity and sustainability. Data from the FAO highlights the disparities in technology adoption across different regions and farming systems.

1. Challenges and Barriers to Technology Adoption

Despite the potential benefits, several challenges hinder the widespread adoption of new technology in agriculture:

High initial investment costs: The upfront cost of purchasing and implementing new technologies can be a significant barrier for many farmers, particularly smallholders.

Lack of access to information and training: Limited access to information, training, and technical support can prevent farmers from effectively utilizing new technologies.

Digital divide: Unequal access to internet connectivity and digital literacy skills can limit the adoption of technologies relying on data and digital platforms.

Regulatory hurdles: Complex regulatory frameworks and bureaucratic processes can slow down the adoption of certain technologies, such as GM crops.

1. Policy Implications for Promoting Technology Adoption

Effective policies are essential to accelerate the adoption of new technology in agriculture and ensure its benefits reach all farmers. Key policy interventions include:

Investing in research and development: Continued investment in agricultural research is critical for developing and adapting technologies suited to local contexts.

Providing financial incentives: Subsidies, grants, and low-interest loans can help reduce the financial barriers to technology adoption.

Strengthening extension services: Effective extension programs are essential for providing farmers with the necessary training and technical support.

Improving access to information and communication technologies: Investing in rural infrastructure and promoting digital literacy are crucial for bridging the digital divide.

Creating enabling regulatory environments: Streamlining regulatory processes and establishing clear guidelines can facilitate the adoption of new technologies.

1. Environmental and Social Impacts of Technology Adoption

The adoption of new technology in agriculture has significant environmental and social implications:

Environmental benefits: Precision agriculture can reduce pesticide and fertilizer use, conserving natural resources and minimizing environmental pollution. However, the environmental impact of certain technologies, such as GM crops, remains a subject of ongoing debate.

Social impacts: Technology adoption can lead to increased farm productivity, improved incomes, and job creation. However, it can also lead to displacement of farm labor and exacerbate inequalities if not implemented equitably.

1. Conclusion:

The adoption of new technology in agriculture is a complex and dynamic process with the potential to transform food systems and improve livelihoods. While significant progress has been made, challenges remain in ensuring equitable access to technology and mitigating potential negative impacts. A multi-pronged approach involving investments in research and development, targeted policy interventions, and effective extension services is crucial for accelerating sustainable agricultural transformation and ensuring food security for a growing global population. The successful integration of new technologies will depend on addressing the economic, social, and environmental considerations that influence their adoption and ensuring that their benefits are shared widely.

FAQs:

1. What is the biggest barrier to the adoption of new technology in agriculture? The biggest barrier is often the high initial investment cost coupled with uncertainty about the return on investment.
1. How can governments promote the adoption of new technology in agriculture? Governments can promote adoption through subsidies, training programs, improved infrastructure (internet access), and streamlined regulatory processes.
1. What role does education play in technology adoption? Education and training are crucial for farmers to understand how to effectively use new technologies and maximize their benefits.
1. What are the environmental benefits of precision agriculture? Precision agriculture reduces pesticide and fertilizer use, minimizes water waste, and lowers greenhouse gas emissions.

1. What are the potential social impacts of agricultural technology adoption? It can improve livelihoods and efficiency but may lead to job displacement if not managed carefully.
1. How is AI impacting agriculture? AI is used for predictive analytics, resource optimization, and automated tasks, increasing efficiency and decision-making capabilities.
1. What is the future of technology in agriculture? The future likely involves increased automation, advanced data analytics, and more sustainable practices driven by AI and IoT.
1. How can smallholder farmers benefit from new technologies? Through accessible financing, tailored training programs, and supportive policies, smallholders can gain access and reap the benefits of technological advancements.
1. What is the role of private companies in technology adoption in agriculture? Private companies play a crucial role in developing, marketing, and providing support for new technologies. Their collaboration with governments and farmers is essential.

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adoption of new technology in agriculture: Publicly Funded Agricultural Research and the Changing Structure of U.S. Agriculture National Research Council, Division on Earth and Life Studies, Board on Agriculture and Natural Resources, Committee to Review the Role of Publicly Funded Agricultural Research on the Structure of U.S. Agriculture, 2002-03-18 The U.S. Department

of Agriculture (USDA) requested that the Board on Agriculture and Natural Resources of the National Research Council (NRC) convene a panel of experts to examine whether publicly funded agricultural research has influenced the structure of U.S. agriculture and, if so, how. The Committee to Review the Role of Publicly Funded Agricultural Research on the Structure of U.S. Agriculture was asked to assess the role of public-sector agricultural research on changes in the size and numbers of farms, with particular emphasis on the evolution of very-large-scale operations.

adoption of new technology in agriculture: Determining Factors and Impacts of Modern Agricultural Technology Adoption in West Wollega Merga Challa, 2014-09-16 Master's Thesis from the year 2013 in the subject Agrarian Studies, Wollega University (School of graduate studies), language: English, abstract: This study analyzed factors affecting modern agricultural technology adoption by farmers and the impact of technology adoption decision on the welfare of households in the study area. The data used for the study were obtained from 145 randomly selected sample households in the study area. Binary logit model was employed to analyze the determinants of farmers' decisions to adopt modern technologies. Moreover, the average effect of adoption on household incomes and expenditure were estimated by using propensity score matching method. The result of the logistic regression showed that household heads' education level, farm size, credit accessibility, perception of farmers about cost of the inputs and off-farm income positively and significantly affected the farm households' adoption decision; while family size affected their decision negatively and significantly. The result of the propensity score matching estimation showed that the average income and consumption expenditure of adopters are greater than that of non-adopters. Based on these findings it is recommended that the zonal and the woreda leaders extension agents farm and education experts, policy makers and other development oriented organizations have to plan in such a way that the farm households in the study area will obtain sufficient education, credit accessibilities and also have to train farmers to make them understand the benefits obtained from adopting the new technologies. These bodies have also to arrange policy issues that improve farm labour participation of household members and also to arrange the ways in which farmers obtain means of income outside farming activities.

adoption of new technology in agriculture: *The Economics of Risk* Donald J. Meyer, 2003 Annotation This book contains a collection of papers that address various aspects of risk, including riskmanagement and how it is applied to decisionmaking and the impact of risk on markets

adoption of new technology in agriculture: Digital technologies in agriculture and rural areas Food and Agriculture Organization of the United Nations, 2019-06-01 This report aims to identify the different scenarios where the process of digital transformation is taking place in agriculture. This identifies those aspects of basic conditions, such as those of infrastructure and networks, affordability, education and institutional support. In addition, enablers are identified, which are the factors that allow adopting and integrating changes in the production and decision-making processes. Finally identify through cases, existing literature and reports how substantive changes are taking place in the adoption of digital technologies in agriculture.

adoption of new technology in agriculture: Adoption of New Technology in Agriculture by Tribal and Non-tribal Farmers Aftab Uddin Ahmed, Kanak Kanti Bagchi, 2007 In this study an attempt has been made to investigate into the determinants of adoption of new technology in agriculture by tribal and non-tribal farmers in Indian agrarian situation of Berpeta district of Assam in particular. There are a number of conditions, which must be met before given agricultural technology can be accepted by the farmers. Some of these conditions are the result of physical environment but many others are the by- products of the cultural background of the farmers. To make the adoption of agricultural technology possible one must understand the environmental framework in which the process of adoption operates. In the absence of such an understanding useful innovations will remain unutilized. There is, thus, a definite need in countries like India for conducting scientific enquiries that may lead to the better understanding of the process of adoption of new agricultural technology.

adoption of new technology in agriculture: *Alley Farming* B. T. Kang, A. N. Atta-krah, L.

Reynolds, 1999 *The Tropical Agriculturalist* is a series of practical field guides and textbooks for: producers, farmers and farm managers, agricultural extension officers agricultural diploma, degree and vocational students, teachers and lecturers, senior secondary students, as reference books, adult education, rural and community development programmes.

adoption of new technology in agriculture: Investing in People Theodore W. Schultz, Theodore William Schultz, 1982-01-01 Argues that healthy, educated people are the world's most important resource and that the world's poor have not been adequately helped by foreign aid because of the misunderstandings of donor governments

adoption of new technology in agriculture: Prices of Fertilizers H. L. Trumbull, 1919

adoption of new technology in agriculture: Precision Agriculture: Technology and Economic Perspectives Søren Marcus Pedersen, Kim Martin Lind, 2017-11-15 This book presents cases from different countries with a main focus on the perspectives of using precision farming in Europe. Divided into 12 chapters it addresses some of the most recent developments and aspects of precision farming. The intention of this book is to provide an overview of some of the most promising technologies with precision agriculture from an economic point of view. Each chapter has been put together so that it can be read individually should the reader wish to focus on one particular topic. Precision Farming as a farm technology benefits from large-scale advantages due to relatively high investment costs and is primarily adopted on farms with medium to large field areas.

adoption of new technology in agriculture: Farm Profits and Adoption of Precision Agriculture U.s. Department of Agriculture, 2017-02-15 Precision agriculture (PA) and its suite of information technologies-such as soil and yield mapping using a global positioning system (GPS), GPS tractor guidance systems, and variable-rate input application-allow farm operators to fine-tune their production practices. Access to detailed, within-field information can decrease input costs and increase yields. USDA's Agricultural Resource Management Survey shows that these PA technologies were used on roughly 30 to 50 percent of U.S. corn and soybean acres in 2010-12. Previous studies suggest that use of PA is associated with higher profits under certain conditions, but aggregate estimates of these gains have not been available. In this report, a treatment-effects model is developed to estimate factors associated with PA technology adoption rates and the impacts of adoption on profits. Labor and machinery used in production and certain farm characteristics, like farm size, are associated with adoption as well as with two profit measures, net returns and operating profits. The impact of these PA technologies on profits for U.S. corn producers is positive, but small. Keywords: Crop production information technologies, precision agriculture, variable rate technology, soil tests, global positioning system maps, guidance systems.

adoption of new technology in agriculture: Fertilizer Use in African Agriculture , 2007 The good practice guidelines - which form the basis of an interactive policymaker's tool kit included on a CD accompanying the book - relate not only to the more focused problem of encouraging increased fertilizer use by farmers, but also to the broader challenge of creating the type of enabling environment that is needed to support the emergence of efficient, dynamic and commercially viable fertilizer marketing systems.--Jacket.

adoption of new technology in agriculture: Adoption of Bioengineered Crops Jorge Fernandez-Cornejo, William D. McBride, 2002 Use of crop biotechnology products, such as genetically engineered (GE) crops with input traits for pest management, has risen dramatically since commercial approval in the mid-1990s. This report addresses several of the economic dimensions regarding farmer adoption of bioengineered crops, including herbicide-tolerant and insect-resistant varieties.

adoption of new technology in agriculture: Digital Solutions and the Case for Africa's Sustainable Development Maake, Albert Ong'uti, Maake, Benard Magara, Awuor, Fredrick Mzee, 2020-11-20 African economies can benefit tremendously from the new wave of digital innovation and information technology by using it to build and maintain sustainable systems. However, the gap in the theory and practice of providing these solutions remains poorly understood and difficult to fill. Only by addressing this gap head-on can it be traversed to the greater benefit of African citizens.

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adoption of new technology in agriculture: World Development Report 2008 World Bank, 2007-10-15 The world's demand for food is expected to double within the next 50 years, while the natural resources that sustain agriculture will become increasingly scarce, degraded, and vulnerable to the effects of climate change. In many poor countries, agriculture accounts for at least 40 percent of GDP and 80 percent of employment. At the same time, about 70 percent of the world's poor live in rural areas and most depend on agriculture for their livelihoods. 'World Development Report 2008' seeks to assess where, when, and how agriculture can be an effective instrument for economic development, especially development that favors the poor. It examines several broad questions: How has agriculture changed in developing countries in the past 20 years? What are the important new challenges and opportunities for agriculture? Which new sources of agricultural growth can be captured cost effectively in particular in poor countries with large agricultural sectors as in Africa? How can agricultural growth be made more effective for poverty reduction? How can governments facilitate the transition of large populations out of agriculture, without simply transferring the burden of rural poverty to urban areas? How can the natural resource endowment for agriculture be protected? How can agriculture's negative environmental effects be contained? This year's report marks the 30th year the World Bank has been publishing the 'World Development Report'.

adoption of new technology in agriculture: From Agriscience to Agribusiness Nicholas Kalaitzandonakes, Elias G. Carayannis, Evangelos Grigoroudis, Stelios Rozakis, 2017-11-21 This volume presents a state-of-the-art overview of the rapidly evolving field of agribusiness, highlighting the most current issues, concepts, trends and themes in research, practice and policy. With a particular emphasis on technology, product and process innovation, the authors cover a wide array of topics relating to such issues as research and development, technology transfer and patents and licensing, with particular respect to the roles of academic institutions, private organizations and public agencies in generating and disseminating knowledge. Featuring case studies of innovative initiatives across the industry, this book will appeal to researchers, business leaders, university administrators and policymakers concerned with the multi-faceted implications of this dynamic and controversial sector.

adoption of new technology in agriculture: Farmers' Choice Helene Bie Lilleør, Ulrik Lund-Sørensen, 2013 Farmers' Choice outlines the RIPAT intervention, and examines how effective it has been. This evaluation of RIPAT brings together the analyses of economists, agricultural scientists, and anthropologists who studied the impact, implementation, adoption, and spread of the programme approaches.

adoption of new technology in agriculture: Total Factor Productivity Growth in Agriculture A. F. D. ávila, 2010 In this chapter we compute measures of total factor productivity (TFP) growth for developing countries and then contrast TFP growth with technological capital indexes. In developing these indexes, we incorporate schooling capital to yield two new indexes: Invention-Innovation Capital and Technology Mastery. We find that TFP performance is strongly related to technological capital and that technological capital is required for TFP and cost reduction growth. Investments in technological capital require long-term (20- to 40-year) investments, which are typically made by governments and aid agencies and are the only viable escape route from mass poverty.

adoption of new technology in agriculture: Drawdown Paul Hawken, 2017-04-18 • New York Times bestseller • The 100 most substantive solutions to reverse global warming, based on meticulous research by leading scientists and policymakers around the world "At this point in time, the Drawdown book is exactly what is needed; a credible, conservative solution-by-solution narrative

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adoption of new technology in agriculture: *Readings in Development Microeconomics* Pranab K. Bardhan, Christopher Udry, 2000 Volume II of this two-volume set focuses on empirical work.

adoption of new technology in agriculture: Modern Rice Technology and Income Distribution in Asia Cristina C. David, Keijiro Otsuka, 1994

adoption of new technology in agriculture: World Water Demand and Supply, 1990 to 2025 , 1998 Presents two alternative scenarios of water demand and supply for 118 countries over the 1990 to 2025 period and develops indicators of water scarcity for each country and for the world as a whole. This study is the first step in IWMI’s long-term research goal: to determine the extent and depth of water scarcity, its consequences for individual countries and what can be done about it.

adoption of new technology in agriculture: A New Era for Irrigation National Research Council, Division on Earth and Life Studies, Commission on Geosciences, Environment and Resources, Committee on the Future of Irrigation in the Face of Competing Demands, 1996-10-21 Irrigated agriculture has played a critical role in the economic and social development of the United States—but it is also at the root of increasing controversy. How can irrigation best make the transition into an era of increasing water scarcity? In *A New Era for Irrigation*, experts draw important conclusions about whether irrigation can continue to be the nation's most significant water user, what role the federal government should play, and what the irrigation industry must do to adapt to the conditions of the future. *A New Era for Irrigation* provides data, examples, and insightful commentary on issues such as: Growing competition for water resources. Developments in technology and science. The role of federal subsidies for crops and water. Uncertainties related to American Indian water rights issues. Concern about environmental problems. And more. The committee identifies broad forces of change and reports on how public and private institutions, scientists and technology experts, and individual irrigators have responded. The report includes detailed case studies from the Great Plains, the Pacific Northwest, California, and Florida, in both the agricultural and turfgrass sectors. The cultural transformation brought about by irrigation may be as profound as the transformation of the landscape. The committee examines major facets of this cultural perspective and explores its place in the future. *A New Era for Irrigation* explains how irrigation emerged in the nineteenth century, how it met the nation's goals in the twentieth century, and what role it might play in the twenty-first century. It will be important to growers, policymakers, regulators, environmentalists, water and soil scientists, water rights claimants, and interested

individuals.

adoption of new technology in agriculture: Adoption of Agricultural Production Practices, 2001

adoption of new technology in agriculture: Land Use Competition Jörg Niewöhner, Antje Bruns, Patrick Hostert, Tobias Krueger, Jonas Ø. Nielsen, Helmut Haberl, Christian Lauk, Juliana Lutz, Daniel Müller, 2016-07-29 This book contributes to broadening the interdisciplinary knowledge basis for the description, analysis and assessment of land use practices. It presents conceptual advances grounded in empirical case studies on four main themes: distal drivers, competing demands on different scales, changing food regimes and land-water competition. Competition over land ownership and use is one of the key contexts in which the effects of global change on social-ecological systems unfold. As such, understanding these rapidly changing dynamics is one of the most pressing challenges of global change research in the 21st century. This book contributes to a deeper understanding of the manifold interactions between land systems, the economics of resource production, distribution and use, as well as the logics of local livelihoods and cultural contexts. It addresses a broad readership in the geosciences, land and environmental sciences, offering them an essential reference guide to land use competition.

adoption of new technology in agriculture: Sustainable Agriculture and the International Rice-Wheat System Rattan Lal, Peter R. Hobbs, Norman Uphoff, 2004-05-24 Addressing a topic of major importance to the maintenance of world food supplies, this reference identifies knowledge gaps, defines priorities, and formulates recommendations for the improvement of the rice-wheat farming system. The book reveals new systems of rice intensification and management and illustrates the application of no-till and conser

adoption of new technology in agriculture: Enhancing Agricultural Innovation World Bank, 2006-11-03 An innovation system can be defined as a network of organizations, enterprises, and individuals demanding and supplying knowledge and bringing it into a social and economic use. This book's primary aim, therefore, is to focus on the largely unexplored operational aspects of the innovation systems concept and to explore its potential for agriculture. 'Enhancing Agricultural Innovation' evaluates real-world innovation systems and assesses the usefulness of the concept in guiding investments to support knowledge-intensive, sustainable agricultural development. A typology of innovation systems is developed; strategies to guide investments for strengthening innovation capacity are drawn up; and concrete interventions options defined. In its conclusions, the book emphasizes the importance of mechanisms for collaboration and interaction. Intermediary organizations, innovation councils, farmer organizations, and other means to strengthen collaboration are central to creating the exchange of knowledge and perspectives that will convert knowledge into valuable new social and economic products and services.

adoption of new technology in agriculture: Risk Management and the Environment: Agriculture in Perspective B.A. Babcock, R.W. Fraser, J.N. Lekakis, 2013-03-09 Risk Management and the Environment: Agriculture in Perspective is a modern academic work that seeks to bring out both to the private and the policy sectors the importance of risk management in relation to the environment in agriculture, as the world moves towards freer markets. Many efforts were pooled together in making this book. Three years ago, an attempt was made by one of the editors to get a project on 'Agricultural Risk Management and Sustainability' (ARMAS) funded by the European Commission. Probably deeming the proposal as prematurely novel for Europe, the Commission's screening experts abandoned its evaluation. Following that experience it became apparent that the literature on the theme ought to be strengthened and emphasized through a book by a well known publishing house. The editorial team was formed relatively quickly and an invitation to known experts in the field for contributions was issued. Subsequently, Kluwer Academic Publishers, evaluated an edited volume proposal package, and final revisions were made prior to submitting the entire manuscript for publication. We are gratefully acknowledging the moral support of several individuals as well as the patience of our publishers.

adoption of new technology in agriculture: Sustainable Agricultural Mechanization: A

Framework for Africa Food and Agriculture Organization of the United Nations, African Union, 2019-03-13 This framework presents ten interrelated principles/elements to guide Sustainable Agricultural Mechanization in Africa (SAMA). Further, it presents the technical issues to be considered under SAMA and the options to be analysed at the country and sub regional levels. The ten key elements required in a framework for SAMA are as follows: The analysis in the framework calls for a specific approach, involving learning from other parts of the world where significant transformation of the agricultural mechanization sector has already occurred within a three-to-four decade time frame, and developing policies and programmes to realize Africa's aspirations of Zero Hunger by 2025. This approach entails the identification and prioritization of relevant and interrelated elements to help countries develop strategies and practical development plans that create synergies in line with their agricultural transformation plans. Given the unique characteristics of each country and the diverse needs of Africa due to the ecological heterogeneity and the wide range of farm sizes, the framework avoids being prescriptive.

adoption of new technology in agriculture: Transforming the Workforce for Children Birth Through Age 8 National Research Council, Institute of Medicine, Board on Children, Youth, and Families, Committee on the Science of Children Birth to Age 8: Deepening and Broadening the Foundation for Success, 2015-07-23 Children are already learning at birth, and they develop and learn at a rapid pace in their early years. This provides a critical foundation for lifelong progress, and the adults who provide for the care and the education of young children bear a great responsibility for their health, development, and learning. Despite the fact that they share the same objective - to nurture young children and secure their future success - the various practitioners who contribute to the care and the education of children from birth through age 8 are not acknowledged as a workforce unified by the common knowledge and competencies needed to do their jobs well. Transforming the Workforce for Children Birth Through Age 8 explores the science of child development, particularly looking at implications for the professionals who work with children. This report examines the current capacities and practices of the workforce, the settings in which they work, the policies and infrastructure that set qualifications and provide professional learning, and the government agencies and other funders who support and oversee these systems. This book then makes recommendations to improve the quality of professional practice and the practice environment for care and education professionals. These detailed recommendations create a blueprint for action that builds on a unifying foundation of child development and early learning, shared knowledge and competencies for care and education professionals, and principles for effective professional learning. Young children thrive and learn best when they have secure, positive relationships with adults who are knowledgeable about how to support their development and learning and are responsive to their individual progress. Transforming the Workforce for Children Birth Through Age 8 offers guidance on system changes to improve the quality of professional practice, specific actions to improve professional learning systems and workforce development, and research to continue to build the knowledge base in ways that will directly advance and inform future actions. The recommendations of this book provide an opportunity to improve the quality of the care and the education that children receive, and ultimately improve outcomes for children.

adoption of new technology in agriculture: Agricultural Internet of Things and Decision Support for Precision Smart Farming Annamaria Castrignano, Gabriele Buttafuoco, Raj Khosla, Abdul Mouazen, Dimitrios Moshou, Olivier Naud, 2020-01-09 Agricultural Internet of Things and Decision Support for Smart Farming reveals how a set of key enabling technologies (KET) related to agronomic management, remote and proximal sensing, data mining, decision-making and automation can be efficiently integrated in one system. Chapters cover how KETs enable real-time monitoring of soil conditions, determine real-time, site-specific requirements of crop systems, help develop a decision support system (DSS) aimed at maximizing the efficient use of resources, and provide planning for agronomic inputs differentiated in time and space. This book is ideal for researchers, academics, post-graduate students and practitioners who want to embrace new agricultural technologies. - Presents the science behind smart technologies for agricultural

management - Reveals the power of data science and how to extract meaningful insights from big data on what is most suitable based on individual time and space - Proves how advanced technologies used in agriculture practices can become site-specific, locally adaptive, operationally feasible and economically affordable

adoption of new technology in agriculture: *Harvesting Prosperity* Keith Fuglie, Madhur Gautam, Aparajita Goyal, William Francis Maloney, 2020 This book documents frontier knowledge on the drivers of agriculture productivity to derive pragmatic policy advice for governments and development partners on reducing poverty and boosting shared prosperity. The analysis describes global trends and long-term sources of total factor productivity growth, along with broad trends in partial factor productivity for land and labor, revisiting the question of scale economies in farming. Technology is central to growth in agricultural productivity, yet across many parts of the developing world, readily available technology is never taken up. We investigate demand-side constraints of the technology equation to analyze factors that might influence producers, particularly poor producers, to adopt modern technology. Agriculture and food systems are rapidly transforming, characterized by shifting food preferences, the rise and growing sophistication of value chains, the increasing globalization of agriculture, and the expanding role of the public and private sectors in bringing about efficient and more rapid productivity growth. In light of this transformation, the analysis focuses on the supply side of the technology equation, exploring how the enabling environment and regulations related to trade and intellectual property rights stimulate Research and Development to raise productivity. The book also discusses emerging developments in modern value chains that contribute to rising productivity. This book is the fourth volume of the World Bank Productivity Project, which seeks to bring frontier thinking on the measurement and determinants of productivity to global policy makers.

adoption of new technology in agriculture: *Commodities and Development Report 2017* Food and Agriculture Organization of the United Nations, 2018-11-08 Commodity prices are projected to increase marginally until 2030. The challenge for developing countries is to foster an environment that combines fiscal, sectoral and social policies to prevent price volatility from impacting national economies.

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adoption of new technology in agriculture: *Agricultural Research in Africa* Lynam, John, Beintema, Nienke M., Roseboom, Johannes, Badiane, Ousmane, 2016-09-06 This book—prepared by Agricultural Science and Technology Indicators (ASTI), which is led by IFPRI—offers a comprehensive perspective on the evolution, current status, and future goals of agricultural research and development in Africa, including analyses of the complex underlying issues and challenges involved, as well as insights into how they might be overcome. Agriculture in Africa south of the Sahara is at a prospective tipping point. Growth has accelerated in the past decade, but is

unsustainable given increasing use of finite resources. The yield gap in African agriculture is significant, and scenarios on feeding the world's population into the future highlight the need for Africa to expand its agricultural production. *Agricultural Research in Africa: Investing in Future Harvests* discusses the need to shift to a growth path based on increased productivity—as in the rest of the developing world—which is essential if Africa is to increase rural incomes and compete in both domestic and international markets. Such a shift ultimately requires building on evolving improvements that collectively translate to deepening rural innovation capacity.

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adoption of new technology in agriculture: Agricultural Mechanization and the Evolution of Farming Systems in Sub-Saharan Africa Prabhu L. Pingali, Yves Bigot, Hans P. Binswanger, Hans P. Binswanger-Mkhize, 1987 The slow pace of agricultural mechanization in Africa has long been a puzzle. This book begins to solve the puzzle by looking at the conditions in sub-Saharan Africa that have led to only sporadic use of the plow rather than the hand hoe, very limited use of tractors and even oxen, and the failure of many projects seeking to move directly from hand hoes to tractors. The authors interviewed farmers at fifty sites in ten countries. They found that the pace of mechanization has been slow in Africa because it often is not cost effective. Among the issues discussed in the book are : (a) the effect on yields of substituting plows for hoes; (b) the cost-effectiveness of using draft animals as opposed to tractors; (c) conditions under which tractors can be used more efficiently than oxen; and (d) the negative consequences of government interventions to encourage the use of tractors beyond what is economically justified.

adoption of new technology in agriculture: The Journal of Agricultural Economics Research , 1990

adoption of new technology in agriculture: Agroforestry Howard A. Steppler, P. K. R. Nair, 1987 Perspectives on agroforestry. Prominence and importance of agroforestry in selected regions. Impact measurement and technology transfer. Research findings and proposals.

adoption of new technology in agriculture: Proceedings of the International Symposium on Agricultural Innovation for Family Farmers Food and Agriculture Organization, 2019-08-15 This first International Symposium on Agricultural Innovation for Family Farmers called for inclusive research and education systems to facilitate innovation; robust bridging institutions; support to

family farmers; and integrated policies and increased investments to create an enabling environment for innovation and scaling up. Innovation is the process whereby individuals or organizations bring new or existing products, processes or ways of organization into use for the first time in a specific context. Innovation in agriculture cuts across all dimensions of the production cycle along the entire value chain - from crop, forestry, fishery or livestock production to the management of inputs and resources to market access. The symposium provided inspiration for innovation actors and decision makers to unlock the potential of innovation to drive socio-economic growth, ensure food and nutrition security, alleviate poverty, improve resilience to changing environments and thereby achieve the Sustainable Development Goals.

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