

NAEEM HAYAT | ABDULLAH AL MAMUN

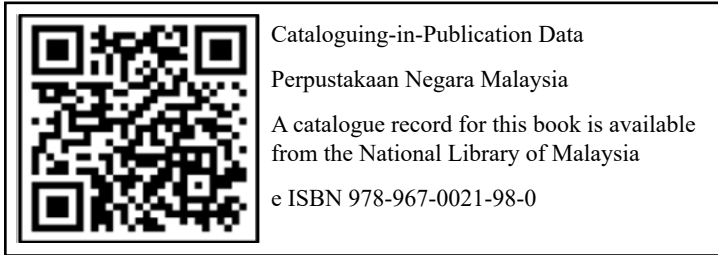
CONSERVATIVE AGRICULTURE PRACTICE

A Road to Sustainability for
Asian Countries



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PREFACE

Climate change and the rising world population are pushing for an increase in the food production system to feed the world population. The resilience of global agriculture requires a change in the existing agriculture production systems that can increase yield and reduce the climate impact. Conservative agriculture is proposed as the solution to meet the growing food demand in a climate-friendly manner. About 75% of the world's population lives in rural areas in poverty, and on average, 20% of the global population is food insecure. By 2050, the world may reach 2.4 billion, and agriculture production must increase by 60% to meet the increasing food demand.

The Agriculture Green Revolution (1960-1980) brought a rise in the harvest of wheat, rice, maize and production through yield intensification practices based on hybrid seed, tillage, use of technology, fertilizers and inorganic pesticides. The green revolution empowers the farming communities worldwide and promotes the farmers' income, farm yield and efforts in farming. The green agriculture revolution lost its competitiveness due to its increasing economic, social and environmental costs since 1990. Agriculture remains the prime contributor to global warming and emitter of greenhouse gases, and climate change is already negatively impacting wheat and maize productivity.

Increasing agriculture productivity resilience in the face of climate change and increasing world population is necessary. Adopting conservative agriculture practices can mitigate climate challenges and enhance agricultural produce. Farmers remain unaware and hesitant to change their farming practices to deal with climate change, a decline in farm organic matter, soil erosion and farm yield. The chief conservative agriculture practices are minimum tillage, crop rotation, and mulching, harnessing soil health and leading to farm productivity. Rural communities'

participation is necessary to achieve conservative agriculture practices' economic, social and climate benefits.

Diffusion of conservative agriculture practices requires collective efforts from the farmers, farmers' communities, extension staff, researchers and policymakers to achieve sustainable farm production. New knowledge offered the theoretical and empirical evidence for the conservative agriculture practices generating economic and yield level benefits. The soil fertility is promoted with conservative agriculture practices harnessing pro-poor sustainable agriculture production.

The current book contributes to compiling the state of knowledge towards conservative agriculture practices. The resilience of the global food system is associated with the mass adoption of conservative agriculture practices. United Nations Sustainable Development Goals (SDGs) promote conservative agriculture practices and responsible food consumption. Adoption and penetration of conservative agriculture practices entail the change in mindset and appropriate institutional capacity that can drive the mass adoption of conservative agriculture practices.

The current work takes stock of relevant knowledge available for conservative agriculture practices. It helps to deliver knowledge to the readers and empowers them to realize the power of conservative agriculture practices. Using conservative agriculture practices is the road to success and sustainability for the global food system. Conservative agriculture practices offer social, economic and ecological benefits. Rural employment is also associated with the use of conservative agriculture practices. Green agriculture jobs are agriculture's future, largely based on relevant knowledge and skills. Promoting green agricultural jobs can help mitigate the youth migration to urban areas.

Information technology is a vital aspect of the future of agriculture systems. Farm management smoothly runs with the use of information technology. The farm-level management facilitated by the use of sensors and the Internet of Things (IoT) became the backbone for the future

of farm management. The relevant public support is propagating and adopting conservative agriculture practices, private institutions to support sustainable agriculture and mainstream conservative agriculture practices among the stakeholders.

Overall, conservative agriculture practices are the way to meet the growing world population's food demands and rising climate change threats. Collective actions and shifting the mindset toward agriculture can bring socio-economic acceptance towards conservative agriculture practices and a sustainable global food system. Understanding the food lifecycle, corrective policies and appropriate use of technologies build the food system's resilience and synergises to achieve sustainable food supplies for the time to come.

Naeem Hayat

Abdullah Al Mamun

CHAPTER 1

GLOBAL FOOD SYSTEM AT THE CROSSROAD: CHALLENGES AND WAY FORWARD

INTRODUCTION

The modernisation of agriculture has revolutionised the global food system and enabled feeding the growing world population. However, industrialisation and green agriculture have triggered climate changes that need the attention of the earth's inhabitants. Climate change has become an obstacle to feeding people and living within the biophysical boundaries to have stable and resilient climate systems (Buchi et al., 2018). Global sustainability is a prerequisite to global development in every aspect of human life (Hayat et al., 2020). Climate change is real and has reduced global agriculture production by 3.5% and increased global environmental risk (Kassam et al., 2019). The rising world temperature, increasing climatic calamities, and climate change hamper agriculture production and challenge farmers' coping capabilities (Anderson et al., 2020). Furthermore, climate change has increased food insecurity (Lal, 2018). Climate mitigation strategies are the only way to handle climate change while maintaining a consistent food supply for the growing world population.

Climate change is impeding agriculture production and growth. The Intergovernmental Panel on Climate Change (IPCC) has reported that climate change negatively affects crop production, and developing countries are more vulnerable than developed nations (Rockstrom et al., 2017). Water scarcity and drought have become common phenomena that worsen the dry season with increased incidents over the last century (Page et al., 2020). Meanwhile, the World Bank has described the related apprehensions about the effect of climate change on the South Asian