

# HIGHER EDUCATION AND SDG2

# HIGHER EDUCATION AND THE SUSTAINABLE DEVELOPMENT GOALS

Series Editor

Wendy Purcell

*Emeritus Professor and University President Emerita, and Academic Research Scholar with Harvard University*

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*Higher Education and the Sustainable Development Goals* is a series of 17 books that address each of the SDGs, in turn, specifically through the lens of higher education. Adopting a solutions-based approach, each book focuses on how higher education is advancing delivery of sustainable development and the United Nations global goals.

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# HIGHER EDUCATION AND SDG2

Zero Hunger

EDITED BY

**KAREN CRIPPS**

*Oxford Brookes University, UK*

AND

**PARIYARATH SANGEETHA THONDRE**

*Oxford Brookes University, UK*



United Kingdom – North America – Japan – India  
Malaysia – China

Emerald Publishing Limited  
Emerald Publishing, Floor 5, Northspring, 21-23 Wellington Street,  
Leeds LS1 4DL.

First edition 2024

Editorial matter and selection © 2024 Karen Cripps and  
Pariyarath Sangeetha Thondre.  
Individual chapters © 2024 The authors.  
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**British Library Cataloguing in Publication Data**

A catalogue record for this book is available from the British Library

ISBN: 978-1-83608-461-7 (Print)  
ISBN: 978-1-83608-458-7 (Online)  
ISBN: 978-1-83608-460-0 (Epub)



INVESTOR IN PEOPLE

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# SERIES EDITOR PREFACE

Professor Wendy Purcell PhD FRSA

Higher education (HE) makes an important contribution to realising the sustainable development goals (SDGs). Teaching and learning support the development of responsible citizens as scholars, leaders, entrepreneurs, and professionals. Curiosity-driven and socially impactful research and innovation help advance knowledge frontiers and find solutions for the world's most pressing issues. As anchor institutions, universities and colleges are also active in civic and community settings, working in partnership with other stakeholders. Given the fierce urgency of (un)sustainable development, the climate crisis, and widening inequity within countries and across the globe, HE institutions (HEIs) need to do more and go faster to deliver fully on their potential to help achieve the SDGs.

This book series focuses on the role of HE in advancing the SDGs, identifying some actionable and scalable initiatives and pointing to opportunities ahead. In sharing the ways and means universities and colleges across the world are engaging with the SDGs, the series seeks to both inspire and enable those in the HE sector and stakeholders beyond to transform what they do and how they do it and thereby hasten progress towards Agenda 2030. Insights gleaned from case studies, reflective accounts, and student stories can help the HE sector both deepen and accelerate its engagement with the SDGs. Each book seeks to capture examples of how HEIs are fulfilling delivery of their academic mission *and* progressing the SDG concerned. Illustrating the work of students, that undertaken by faculty and staff of the institution, and conducted with partners, positions HE as a change agent operating at a systems level to help create a world that leaves no one behind.

This book on HE and SDG2 highlights the work of universities and colleges focused on achieving the goal of Zero Hunger – to end hunger, achieve food security, improve nutrition, and promote sustainable agriculture. Hunger is a complex problem that reflects the various scales from global to hyperlocal, from the community to the individual, and from field to fork, and it is growing at an alarming rate. This book clearly articulates differing perspectives across the world and serves to challenge some of our assumptions, for example that food insecurity and promoting sustainable agriculture are not simply concerns in the global South but are rapidly emerging as major issues for affluent nations of the global North. It does this by adopting a truly international flavour with authors drawn from Australia, Canada, China, Indonesia, Italy, Malawi, Northern Ireland, Peru, Turkey, the United States of America, the United Kingdom, Vietnam, and Zimbabwe. The book reveals how local issues relating to SDG2 are translated into the activities and mission of HEIs and serve to foster global partnerships.

SDG2 reflects undernourishment, chronic and acute malnutrition, wasting and stunting, as well as food insecurity and hidden hunger. It interfaces with so many of the other SDGs, 12 of the 17 goals from good health and well-being (SDG3) and quality education (SDG4) to climate change (SDG13) and life below water (SDG14) and on land (SDG15) as well as those relating to equity (SDG5 gender equality and SDG10 reduced inequalities). Food security is achieved only when everyone has physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life. From the use of high-technology supported agriculture models focused on urban food security (Chapter 2), to international research on edible insects as a novel protein source (Chapter 4), the book highlights the work of HEIs in stewardship of land as well as on-campus gardens (Chapter 6), with case studies that can be copied and scaled by the HE sector.

Health of people, planet, and shared prosperity rely upon the full participation of HE with universities and colleges, in turn, needing to pursue greater engagement with the SDGs – not least to reduce their own environmental footprint and become more equitable.

As organisations that have stood for many centuries in some cases, this demands that they adapt with new models of learning, research partnerships, and leadership and governance frameworks. Immersive engagement with the SDGs can catalyse pedagogic innovation, serve to refresh curricula, and stimulate new programme development. It can also open new avenues for research, attract new sources of funding, and energise people to deliver on the academic mission. HEIs can play a critical role in developing new systemic and transformative solutions through interdisciplinary and multi-stakeholder collaboration and a purposeful focus on the SDGs. This book illustrates this approach as it relates to SDG2 with HEIs bringing their key assets of curiosity and the pursuit of knowledge and its application to partners seeking solutions and driving innovation, operating in both local and global networks, and connecting the worlds of learning, work, and entrepreneurship in support of more sustainable development. Sustainability is a goal for today and sustainable development an organising principle for universities and colleges.

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# ACKNOWLEDGEMENTS

We extend our deep gratitude to Professor Wendy Purcell for her invaluable guidance and mentorship throughout. From supporting a vision of the book through to initiating contacts and shaping book structure, Wendy has been a constant source of wisdom and inspiration. We are also indebted to Katy Mathers and the team at Emerald along with reviewers, for their enthusiastic support and advice.

It goes without saying that we would not be in the privileged position to be writing this without the authors and student contributors. It has been a pleasure to see individual chapters weave together into this collaborative shared story of the excellent work that is happening globally to address SDG2 Zero Hunger. We are truly humbled by everyone's work and have valued the opportunity to work across disciplines on a global scale.

Personally, Karen dedicates this book to her sons Dylan and Brandon and hopes that the world they grow up in sees much faster progress towards eliminating food insecurity, hunger, and malnutrition. Sangeetha thanks her family, friends, and colleagues who have inspired and supported throughout her career, and Karen for her leadership and enthusiasm which made this project a very fulfilling experience.

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# AN INTRODUCTION TO SDG2 ZERO HUNGER

Karen Cripps and  
Pariyarath Sangeetha Thondre

*Oxford Brookes University, UK*

## INTRODUCTION

The United Nations *Sustainable Development Goal2* (SDG2) is to ‘End hunger, achieve food security and improved nutrition and promote sustainable agriculture’. The global challenge of hunger and food insecurity is exacerbated by a combination of factors including the Covid-19 pandemic, conflict, climate change, and deepening inequalities. This goal has various dimensions, namely, social in aiming to end hunger, environmental/climate through sustainable agriculture, and economic concerning food security and nutrition. Despite the launch of the *Sustainable Development Goal* in 2015, the number of people facing hunger and food insecurity continues to rise with a recent [United Nations \(2023\)](#) report describing it as a ‘polycrisis’ given alarming statistics that:

*In 2022, about 9.2 per cent of the world population was facing chronic hunger, equivalent to about 735 million people – 122 million more than in 2019. An estimated*

*29.6 per cent of the global population – 2.4 billion people – were moderately or severely food insecure, meaning they did not have access to adequate food. This figure reflects an alarming 391 million more people than in 2019 (United Nations, 2023, p. 14).*

At the most recent United Nations Climate Change Conference (COP28), world leaders highlighted the criticality of building a stronger food system for generations to come that is resilient to climate and humanitarian shocks. The challenges faced by countries in the Global North and Global South are very different with respect to SDG2 since the former may be concerned with nutritional security and sustainability of food systems generally, while the latter may be facing widespread food insufficiency and malnutrition, alongside the other concerns. However, in Western nations such as the United Kingdom, ‘average’ situations are said to hide huge variations according to socio-economic status and struggling food systems that paradoxically need to address diet-related diseases alongside food insecurity among vulnerable populations (United Nations Global Compact Network, 2023).

SDG2 is composed of 8 targets (5 outcome and 3 implementation-related) and 14 indicators. This book is appropriately timed at the mid-point of the 2030 agenda to consider the role of higher education in addressing the five outcome-related targets on ending hunger and ensuring the establishment of a sustainable food system in a world experiencing climate challenges (see Table 1.1). Given debates surrounding the operationalisation of targets and indicators pertinent to SDG2 are comprehensively addressed by authors such as Cheo and Tapiwa (2021), this book seeks to explore and showcase the contributions of *higher education institutions* (HEIs) to this global goal. The various chapters validate UNESCO-ISEALC’s (2023) bold and ambitious statement that ‘Higher education institutions can contribute to the eradication of hunger’. This book includes leading examples of HEIs as ‘change agents’, showing that many do, indeed, ‘walk the talk’ (Kumar et al., 2024). If the premise is adopted that ‘none of the SDGs will be fully achieved without the contribution of the university sector’ (SDSN, 2020), then a world with ‘zero hunger’ is achieved when

**Table 1.1. SDG2 Outcome Targets.**

SDG2 Target	Key Principles	Indicative Measurements
2.1	Hunger Food security Safe, nutritious food	Food insecurity experiences Undernourishment
2.2	Malnutrition	Stunting, wasting, anaemia
2.3	Agricultural productivity and income	Volume of production by enterprise size Income of small-scale producers by gender and indigenous status
2.4	Sustainable food (production) systems; climate/disaster resilience	Agricultural areas under productive and sustainable agriculture
2.5	Genetic diversity Traditional knowledge	Plant and animal genetic resource conservation

Source: Authors based on [United Nations \(2015\)](#).

the transdisciplinary projects presented here are adopted widely and scaled globally.

## A STRUCTURE TO RECOGNISE APPROACHES TAKEN BY THE GLOBAL SOUTH AND GLOBAL NORTH

The global, transdisciplinary nature of SDG2 demands recognition of the differing priorities, environments, and socio-economic contexts in which HEIs are located. [Kumar et al. \(2024, p. 26\)](#) contend that

*While the Global North is focused on ‘de-growth’ in the context of a significantly improved standard of living, much of the Global South is struggling to develop through economic growth strategies, thus focusing particularly on SDGs 1–3 (eradication of poverty, zero hunger and good health).*

Accordingly, as this book took shape, a clear pattern emerged by which contributors from the Global South could be grouped on the

basis of [Times Higher Education \(THE\) \(2023\)](#) SDG Impact Rankings as ‘research’-led policy and ‘community outreach’ initiatives (Part 1), and contributors from the Global North could be linked to a ‘teaching and learning’, ‘stewardship’ (campus projects), and ‘community outreach’ initiatives (Part 2).

[Ashida’s \(2023\)](#) analysis of the role of HEIs in achieving the SDGs recommends global collaboration with a sense of empathy to understand the lived experiences of those people affected by the foci of SDG2 targets. It can be contended that this book provides illustrative examples of such collaboration, with projects that most certainly nurture empathy among the actors involved that will hopefully trigger further empathetic insight and knowledge building through sharing them here.

Featuring 37 contributing authors from Indonesia, Vietnam, Malawi, Zimbabwe, Peru, China, Australia, Northern Ireland, Canada, the United States, Turkey, Italy, and the United Kingdom, the book represents geographically diverse examples of HEI approaches to SDG2. Within the chapters and cases, the student voice is featured throughout, from undergraduate through to PhD research students, alongside faculty members with research and/or pedagogic expertise.

Part 1 comprises five chapters that cover research-based policy and community perspectives offering insights into policy perspectives and the criticality of concerns in low- and middle-income countries facing arguably the most widespread severe impacts of hunger, food insecurity, malnutrition, and unsustainable food systems. Vu Thi and Juntti (Chapter 2) present innovative, high technology solutions to support urban agriculture for food security in Ho Chi Minh City based on findings from an interdisciplinary collaboration between HEIs in the United Kingdom and Vietnam. Using an example of the sugar industry in Peru, Padilla and Henríquez (Chapter 3) demonstrate the effect of adverse weather conditions on agricultural productivity and the resultant economic impact. Chopera et al. (Chapter 4) highlight the importance of using edible insects to provide culturally acceptable and nutritious food for malnourished children in Zimbabwe and is another example of North–South collaboration. Chapter 5 illustrates the contributions of a university in Malawi towards the achievement

of SDG2 targets by promoting the use of underutilised crops and improving their nutritional value by biofortification. A case study from China is also included at the end of Chapter 5 to depict strategies adopted by urban Chinese residents to ensure food security.

Part 2 is composed of three chapters that cover teaching and learning and governance through campus outreach initiatives and provides insights into the role that higher education plays in raising awareness and skills building. This begins with Lin et al.'s analysis (Chapter 6) of the potential for campus food gardens to achieve food literacy and security in Australia. Oberer et al. (Chapter 7) describe a case of a global SDG2 challenge led by academic teams in the United States and Canada with the winning entry from an internationally dispersed group of students working on a solution to nutrition and food insecurity in Indonesia.

The final chapter of the book (Chapter 8) is a series of seven case studies that directly contribute to the core themes of SDG2 targets and reflect the breadth of curriculum-based initiatives in the Global North that address both national and global issues. These are grouped into three sections beginning with student competitions. Favorite's case study of an SDG2 challenge competition involves cross-disciplinary European students working in teams with input from sustainable food system experts, which like Cripps et al.'s case study of a competition based in the United Kingdom in partnership with an Indian university highlights the close inter-connections between SDG2 and SDG12 in consideration of food waste.

The second section of this chapter presents curriculum innovation case studies by Bayram and Canaran's exposition of embedding SDG2 within a teacher training course in Turkey, and He's illustration of how it is embedded in an accountancy module at a university in Northern Ireland. Doheny-Adams et al. illustrate a pioneering interdisciplinary module open to students across the University of York that examines the 'future of food' from diverse perspectives. The final section of this chapter includes cases that illustrate campus projects and curriculum approaches focusing on addressing hunger, beginning with Hopley's account of a Canadian student initiative to distribute food to local vulnerable populations and Morin's account of how the American curriculum responds to national level strategy on addressing food insecurity. This is a

fitting chapter to close the book, as it leaves the reader with a sense of how everyone can play a part in awareness and action for SDG2.

## HOW THE CHAPTERS ADDRESS SDG2 TARGETS

### Food Security (2.1)

With more than 600 million people predicted to be facing hunger worldwide by 2030, achieving SDG2 targets 2.1 and 2.2 requires a multisector, coordinated approach to transform the food system, health system, and social protection system (FAO, IFAD, UNICEF, WFP and WHO, 2023). Innovative and sustainable approaches are needed to utilise traditional practices and exploit technological advances to improve food security in Africa and Asia, where the highest proportion of individuals are affected.

Several contributions are made that highlight the challenge of food insecurity faced in the Global South. Chopera et al. (Chapter 4) and Mwangwela et al. (Chapter 5) present the current state of food insecurity in Sub-Saharan Africa caused by climate change and environmental and socioeconomic factors. Vu Thi and Juntti (Chapter 2) allude to urban food insecurity in Vietnam contributed by urban migration and loss of agricultural land. Jiahui and Guojun's case study (within Chapter 5) examines dietary practices of urban residents in a region of China as part of a broader global study that examines dietary practices of city residents in building reflections and joint solutions. The Chinese case is especially concerned with issues around food safety. Through qualitative interviews, this reveals the relationship between dietary choices and factors such as attachment to local/regional foods, trustworthy, and accessible retail opportunities.

Interestingly, many contributions also address food insecurity in the Global North. Lin et al. (Chapter 6) showcase how universities can adopt stewardship strategies through campus food gardens that contribute to building food literacy and enabling food security. This is especially meaningful in demonstrating the challenge of food security and hunger among Western populations, where such issues might not necessarily be considered. Chapter 6 highlights, through survey research into student populations in Australia and

the use of campus food gardens across curriculum disciplines, the links between food security and student wellbeing and performance outcomes. Morin's case study (Chapter 8) examines similar challenges in the United States and the role of educators in stimulating discussion with students around food security, while Hopley's case study (Chapter 8) also highlights challenges of food insecurity in the region of Ontario, Canada. This is a fascinating exemplar of university stewardship through a volunteer student-led initiative to deliver surplus canteen food to vulnerable residents living in shelters.

### (Mal) Nutrition (2.2)

Despite global efforts to address malnutrition and food insecurity, the share of the global population experiencing undernourishment accounts for 9.3% (Our World in Data Team, 2023). This figure has been increasing since 2015, predominantly due to the prevailing impact of conflict, exacerbating effects of climate change, and the lingering shock of the Covid-19 pandemic. A resulting outcome of this polycrisis situation is the global prevalence of chronic and acute forms of malnutrition affecting children under five. The 2023 figures show 45 million and 148 million children under 5 are affected by wasting and stunting respectively (United Nations Children's Fund (UNICEF), World Health Organization (WHO), International Bank for Reconstruction and Development/The World Bank, 2023).

The chapters by Chopera et al. (Chapter 4) and Mwangwela et al. (Chapter 5) reflect these statistics on malnutrition, supporting the high prevalence of stunting, wasting, and micronutrient deficiencies in children and adults of sub-Saharan Africa. They identify various projects where the addition of plant- and insect-based foods addresses multiple goals fostering gender inclusion, traditional cuisine, cultural value, and sustainability. Oberer et al. (Chapter 7) discuss a global SDG Zero Hunger Consortium that runs an annual challenge competition. The most recent winning student team from Indonesia show how their proposed 'End-Hunger Community Centre' would address challenges of access to health and nutrition by providing diet and nutrition knowledge and enabling local empowerment through home growing and support to local food producers. The students' case study demonstrates

the impact a global team of students brought together through the forum of a competition can have in driving both awareness and capacities to develop solutions to global challenges.

### Agriculture Productivity (2.3)

At a time when some parts of the world are undergoing rapid urbanisation and economic development, the crippling effect of war, conflict, and civil war affecting many countries (e.g. Afghanistan, Colombia, Ethiopia, Iraq, Libya, Mali, Myanmar, Russia, Somalia, Syria, the Central African Republic, the Democratic Republic of Congo, Ukraine, and Yemen) continue to increase the risk of food insecurity (ACLED, 2024). In an already fragile world affected by Covid-19, war has further disrupted agriculture productivity, food exports/imports, supply chains, and food, oil, fuel, and fertiliser markets, hindering progress towards achieving SDG2 targets 2.3 and 2.4 (Ben Hassen & El Bilali, 2022). Critically, many African countries depend on Russia and Ukraine for fuel and food imports, and the ongoing war has huge implications for progress towards SDG2 in Africa (Mhlanga & Ndhlovu, 2023).

The impact of war on increasing food prices is most felt in regions of sub-Saharan Africa, where perpetuating climate catastrophes, locust swarms, civil wars, and crop failures contribute to food insecurity (Mhlanga & Ndhlovu, 2023). The impacts of climate change on agricultural productivity are elucidated in Chapter 3 as Padilla and Henriquez highlight the negative consequences of the El Niño phenomenon in the South American region, elucidating the challenges posed by weather patterns in achieving double agriculture productivity by 2030. Particular attention is drawn to the disruption caused by heavy rain to the sugar industry, schools, and HEIs, slowing down economic growth in Peru. The authors call for collaboration between HEIs, governments, and industries to build resilience against climate change impact on productivity.

### Sustainable and Climate-Resilient Food (2.4)

Reduced food exports from war-affected countries may lead to intensive agriculture elsewhere to meet the global demand for