UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

UNCTAD

HARNESSING RAPID TECHNOLOGICAL CHANGE FOR INCLUSIVE AND SUSTAINABLE DEVELOPMENT

UNITED NATIONS

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

UNCTAD

HARNESSING RAPID TECHNOLOGICAL CHANGE FOR INCLUSIVE AND SUSTAINABLE DEVELOPMENT

UNITED NATIONS
Geneva, 2021

United Nations publication issued by the United Nations Conference on Trade and Development.

UNCTAD/DTL/STICT/2020/14

eISBN: 978-92-1-005646-5

ACKNOWLEDGEMENTS

This study was prepared by UNCTAD staff members Clovis Freire and Laura Cyron. The authors worked under the supervision of Dong Wu, Chief, Science, Technology and Innovation Policy Section and the overall guidance of Shamika N. Sirimanne, Director, Division on Technology and Logistics.

UNCTAD appreciates the valuable inputs provided by the Governments of Belgium, Brazil, the Islamic Republic of Iran, Japan, Latvia, Mexico, the Russian Federation, Turkey and the United States of America, as well as by the Department of Economic and Social Affairs, the Economic and Social Commission for Asia and the Pacific, the Economic and Social Commission for Western Asia, the Food and Agriculture Organization of the United Nations, the United Nations Educational, Scientific and Cultural Organization, the United Nations Industrial Development Organization, the United Nations Office for Disaster Risk Reduction and the World Food Programme.

The study benefited significantly from discussions and inputs during the 2019–2020 intersessional panel meeting of the United Nations Commission on Science and Technology for Development (7 and 8 November 2019) and the twenty-third session of the Commission (10 to 12 June 2020).

Magali Studer designed the cover. Malou Pasinos provided administrative support.

NOTE

The United Nations Conference on Trade and Development (UNCTAD) serves as the lead entity within the United Nations Secretariat for matters related to science and technology as part of its work on the integrated treatment of trade and development, investment and finance. The current UNCTAD work programme is based on the mandates set at quadrennial conferences, as well as on the decisions of the General Assembly of the United Nations and the United Nations Economic and Social Council that draw upon the recommendations of the United Nations Commission on Science and Technology for Development, which is served by the UNCTAD secretariat. The UNCTAD work programme is built on its three pillars of research and analysis, consensus-building and technical cooperation, and is carried out through intergovernmental deliberations, research and analysis, technical assistance activities, seminars, workshops and conferences.

This series of publications seeks to contribute to exploring current issues in science, technology and innovation, with particular emphasis on their impact on developing countries.

The designations of country groups are intended solely for statistical or analytical convenience and do not necessarily express a judgment about the stage of development reached by a particular country or area.

The term “dollars” ($) refers to United States dollars unless otherwise specified.

TABLE OF CONTENTS

I. Introduction 1

II. Technological change and inequalities 3

A. Unequal access to new technologies 3

B. Biased design 4

C. Automation of tasks and digitalization of economies 5

D. Market concentration 6

E. Widening the technological gap 7

III. The role of inclusive and sustainable business models in innovative solutions 8

A. Elements and characteristics of inclusive and sustainable business models 9

B. Patterns of inclusive and sustainable business models 12

C. Sustainability and business 14

D. The challenge of reaching the extreme poor 14

IV. The role of science, technology and innovation policies 16

V. International collaboration 19

A. Research cooperation and science–policy interface 19

B. Capacity-building 19

C. Official development assistance 21

VI. Policy considerations 23

A. Creating an ecosystem for inclusive and sustainable innovation in frontier technologies 23

B. Providing directionality to technological change and mitigating risks 23

C. Enhancing international cooperation 24

Bibliography 25

Annex Selected innovative business models providing inclusive and sustainable products and services 28

LIST OF FIGURES AND TABLES

Figure 1 Proportion of the population with access to electricity, urban and rural, 2017 3
Figure 2 Monthly price of a fixed broadband basket, selected groups of countries 4
Figure 3 Equity funding to start-ups in Africa, selected countries, 2018 9
Figure 4 Total funding to start-ups in Africa per sector, 2018 9
Figure 5 Official development assistance in sectors associated with scientific, technological and innovative capacity, selected groups of countries 22
Figure 6 Official development assistance: Share in sectors associated with scientific, technological and innovative capacity, developing countries, 2017 22
Table 1 Business models: Dimensions and characteristics per dimension 12

LIST OF BOXES

Box 1 Latvia: Bridging the treatment gap – Artificial intelligence in cancer diagnosis 4
Box 2 Latvia and Mexico: Frontier technologies bringing public services closer 5
Box 3 World Food Programme: Helping refugees by teaching digital skills for joining a globalized job market 6
Box 4 Belgium, the Russian Federation and Turkey: Factories of the future 7
Box 5 Digital platforms increase access to expertise 11
Box 6 Building resilience by making frontier technologies work for the vulnerable 15
Box 7 Belgium, Latvia, Lebanon, Turkey, the United Arab Emirates and the United States: Shaping the workforce of the future 16
Box 8 Brazil and the United States: Women, digital skills and entrepreneurship 17
Box 9 Islamic Republic of Iran: Local digital transportation platforms 18
Box 10 UNCTAD and the United Nations Educational, Scientific and Cultural Organization: Policy analysis for inclusive science, technology and innovation policies 20
Box 11 United Nations Industrial Development Organization: Global eco-industrial parks programme 20
Box 12 Food and Agriculture Organization of the United Nations: Youth entrepreneurship and innovation network 20
Box 13 United Nations Technology Facilitation Mechanism 21

ABBREVIATIONS

e-commerce	electronic commerce
ICT	information and communications technology
ODA	official development assistance
STEM	science, technology, engineering and mathematics
STI	science, technology and innovation