

## Foreword and Acknowledgements

This Volume 20 of the *African Development Perspectives Yearbook* with the title “*Science, Technology and Innovation Policies for Inclusive Growth in Africa. General Issues and Country Cases*” has again benefited from many contributions, from various inputs and from important institutional support. The great number of contributions to this volume (essays, review articles and book reviews) was made possible because of the continuing support from African and international organisations, from numerous research and development institutions, and from many individual experts cooperating continuously with us on Africa. A great number of international and regional organisations, universities and research institutes have supported this project, such as: UNESCO (United Nations Educational, Scientific and Cultural Organisation); the ACBF (African Capacity Building Foundation); UNECA (United Nations Economic Commission for Africa); the FAO (Food and Agriculture Organization) in Rome, Italy; UNCTAD (United Nations Conference on Trade and Development), Trade and Poverty Branch, Division for Africa, LDCs and Special Programmes in Geneva, Switzerland; the Department of Economics, University of Khartoum, Sudan; the Department of Agricultural Economics, Faculty of Agriculture, Usmanu Danfodiyo University, Sokoto, Nigeria; the Department of Agricultural Economics and Rural Sociology, Institute for Agricultural Research, Ahmadu Bello University, Zaria, Nigeria; the National Institute for Animal Production, Shika, Ahmadu Bello University, Zaria, Nigeria; the Research and Innovation Management Department at the Egyptian Academy of Scientific Research & Technology (ASRT); the Agricultural Extension and Management Department, Lagos State Polytechnic, Lagos, Nigeria; the Economics Department, University of Lagos, Akoka, Yaba, Lagos, Nigeria; the Centre for Business and Technology in Africa, Flensburg University of Applied Sciences (FUAS); the University Institute of Technology, at the Faculty of Sciences of the University of Douala in Cameroon; the Department of Economics, University of Kassala, Sudan; the Royal Docks School of Business and Law, University of East London, UK; the Higher Education Academy, York, UK; the African Technology Policy Studies Network Nairobi, Kenya; the National Research Center (NRC), Khartoum, Sudan; the Department of Agricultural Economics, Ambrose Alli University, Ekpoma, Nigerira; the Federal Ministry of Agriculture and Rural Development, Abuja, Nigeria; and many others.

All these partners have directly supported the Yearbook project, comprising this volume 20 and the forthcoming volume 21 on “*Science, Technology and Innovation Policies for Inclusive Growth in Africa. Human Skills Development and Country Cases*”, with contributions, expertise and suggestions.

Special thanks go to Professor Dr. Samia Satti Mohamed Nour, Department of Economics, University of Khartoum, and to Dr. Nazar Mohamed Hassan, Regional Adviser, UNESCO Regional Office for Science and Technology for the Arab States, Cairo, Egypt. Both have given advice from the first phase of planning this publication project. The volume editor, Professor Karl Wohlmuth (from IWIM/Institute for World Economics and International Management and the Research Group on African Development Perspectives Bremen), is indebted to these two experts for encouragement, ideas, concepts, and valuable contributions to this volume 20 of the African Development Perspectives Yearbook.

Institutional support is welcomed. Many organisations in Africa, like the African Development Bank (AfDB) Group, the United Nations Economic Commission for Africa (UNECA), the African Union (AU), and the NEPAD (New Partnership for Africa's Development) Secretariat have contributed with information and encouragement. Also, the OECD (Organization for Economic Cooperation and Development) and its Development Centre, the IMF (International Monetary Fund) and the World Bank (with various offices at headquarters and in Africa) have given advice and information. We, as the Editors of the Yearbook, are always interested in their advice and guidance to structure the future work on the *African Development Perspectives Yearbook*.

For Volume 20 of the *African Development Perspectives Yearbook* the Editors of the Yearbook took up the issues of Science, Technology and Innovation (STI) Policies for Inclusive Growth in Africa: These issues are so important for the much-needed redirection of economic policies in Africa. Volume 19 had the theme of New trade and Investment policies for Africa, as structural reforms and structural transformation in Africa request policies which directly support structural change. STI policies can support structural change in many ways, via acceleration of productivity growth, development of agriculture and agribusiness, diversification of industrial production and exports towards higher value-added products, via making the services sector more productive, building human capacities for growth, and implementing inclusive growth strategies. Unit 1 of this volume 20 focusses on "Science, Technology and Innovation (STI) Policies for Inclusive Growth in Africa – General Issues". In various essays key issues are discussed, such as the role of innovations for diversification and inclusive growth, the development of STI policies in Africa and the support by UNESCO and building capacity for Africa's STI systems. Unit 2 of Volume 20 is presenting essays on "Science, Technology and Innovation (STI) Policies for Sudan's Economic Revitalization". These essays cover important aspects of Sudan's STI system, such as: How to reform the national innovation system (NISS) and the subsystems (education, science & technology, ICT) in Sudan? How can innovative firms

operate in Sudan, and how can these firms be supported by policies? How important are agricultural research systems for the field testing of research results and for yield increases in various agricultural subsectors and for various local crops? How important are foreign investors in generating knowledge spillovers to domestic firms? Unit 3 of Volume 20 is discussing the theme of “Science, Technology and Innovation (STI) Policies for Agricultural Transformation in Nigeria”. In various essays specific issues of Nigeria’s overdue agricultural transformation are presented: the role of indigenous agricultural technologies and their development and production in local Nigerian research institutes; the role of GM (Genetically Modified) crops, such as cowpea as a local staple food crop, to increase pest-resistance and yields while preserving acceptability among farmers and consumers; and the importance of looking at developing the overall value chain of local crops, such as cassava, to increase production and yield and to fortify the crop by biotechnology and breeding so that consumers receive the important minerals they need.

While the volume 18 of the Yearbook focussed on “transformative regional integration in Africa”, the volume 19 focussed on “new trade and investment policies for Africa”, and volume 20 is presenting a strategy on “STI policies for inclusive growth in Africa”; Volume 21 will continue the debate from volume 20 by focussing on “human capacity building and STI policies in Africa”. Also, volume 21 will focus on North African countries, like Egypt and Tunisia. The role of STI in private sectors in these countries, the role of technoparks, the behaviour of innovative firms, and the spread of innovations in health sectors will be discussed. Volume 21 has also a Book Reviews and Book Notes section; this section (Unit) is rich in presenting numerous review articles, book reviews and book notes on the core themes of volumes 20 and 21.

In Volumes 20 and 21 of the *African Development Perspectives Yearbook* with the common theme of STI policies for inclusive growth in Africa major strategic and policy issues are analysed. The guiding issue is how to make the STI policies becoming a part of the structural transformation process in Africa. So far, these policies are not applied in a comprehensive, integrative and coherent approach, and they lack a focus on structural transformation. The disappointing results in mobilizing resources for development, in promoting production and export diversification, in allowing for a participation of local firms in global and regional value chains, in establishing production, R&D, tertiary education and vocational training, and trade partnerships, in strengthening regional integration, and in attracting foreign direct investment for high-value added manufacturing and high-technology services sectors request a new approach towards STI systems development. Also, the

limits in African intra-regional trade, investments, technology diffusion, skilled labour migration, enterprise-to-enterprise cooperation, etc., within and between the regional economic communities (RECs) in Africa, request a completely new approach towards STI development.

Many institutions have contributed to the various volumes of the *African Development Perspectives Yearbook*, with news and information about countries and regions, with information about new research projects, with publications about policies and strategies, with documents about declarations and agreements, and with research papers, also at their early stage. So, the editors of the Yearbook can grasp new development in Africa very early, what helps in inviting contributors who are then key persons of specific units. Many regional and international organisations, like the African Development Bank (AfDB), the African Union (AU) and affiliated institutions, the UNECA (United Nations Economic Commission for Africa), the World Bank, UNCTAD (United Nations Conference on Trade and Development), UNDP (United Nations Development Programme), IMF (International Monetary Fund), UNIDO (United Nations Industrial Development Organization), and ILO (International Labour Organization), continue to support our scientific effort by sending us materials and making available - always timely - new strategy documents and drafts of their researches for our publication series, especially the *African Development Perspectives Yearbook*, but also for our Book Review and Book Notes Unit. For volumes 20 and 21, UNESCO (United Nations Educational, Scientific and Cultural Organisation) and ACBF (African Capacity Building Foundation) stepped in with huge support. But it is also true that persons in these important organizations matter; they open the doors and invite us to cooperate and to share our knowledge with them.

Also, UNU-WIDER (United Nations University - World Institute for Development Economics Research) as an institution of global importance for development research has continuously supported our work with most recent research papers, with access to their networks of researchers and affiliated institutes, and with publications and information about important scientific events in their domain of development studies. Furthermore, we would like to thank all those institutions to make us part of their global research networks, as they are informing so many others in the development field about our work for Africa, in our endeavour of continuously publishing the *African Development Perspectives Yearbook*. This is the case now since 1989 when the first volume appeared under the theme of "Human Dimensions of Adjustment".

We would also like to express our gratitude to three researchers who accepted the position as members of the Editorial Committee for Volume 20, to act as Co-Editors of a Unit and as a Volume Editor. We are indebted to Dr. Nazar Mohamed Hassan, Regional Adviser, UNESCO Regional Office for

Science and Technology for the Arab States, Cairo, Egypt, for his work, together with Karl Wohlmuth, towards the Unit 1 of Volume 20 on “STI - General Issues”, thereby introducing the theme to the readers. We are thankful to Professor Dr. Samia Satti Mohamed Nour, Department of Economics, University of Khartoum, for her work, in cooperation with Professor Karl Wohlmuth, on Unit 2 about “STI for Sudan’s Revitalization”, providing expertise on STI systems and on Sudan’s economic perspectives. Also, we are thankful to Professor Reuben A. Alabi, Professor of Agricultural Economics, Department of Agricultural Economics, Ambrose Alli University, Ekpoma, Nigeria, who is still guest professor and project director at the Institute for World Economics and International Management (IWIM), University of Bremen, at the invitation of the Dean of the Faculty of Economics and Business Studies. Professor Alabi has contributed, in cooperation with Professor Karl Wohlmuth, to Unit 3 of Volume 20 with the theme “STI Policies for Agricultural Transformation in Nigeria”. These three Co-editors of the three Units of Volume 20 have done an excellent job, and we hope to cooperate with all of them towards publishing future volumes of the Yearbook.

We are also indebted to Andrew Mold from UNECA for his continuous encouragement; beside of being an author in several of our volumes he always has pushed us to present the new Yearbook Volumes at the UNECA offices in Addis Ababa and Kigali, and/or elsewhere in Africa. In October 2016 this idea was realised. Andrew Mold, at that time Acting Director of the Kigali Office of UNECA, organized the launch event with a fine programme. A major launch event took place in Kigali, Rwanda. Our Managing Director, Professor Tobias Knedlik from the Fulda University of Applied Sciences, and our Project Adviser, Dr. Nazar Mohamed Hassan, Regional Adviser, UNESCO Regional Office, were present in Kigali. They informed the attending experts, policymakers, ambassadors, the UN staff, and the representatives of donor organizations and the media about the Yearbook Project. It was a great event, and African TV and Radio Stations reported in 48 African countries about the launch event for volumes 18 and 19 of the *African Development Perspectives Yearbook*. We are planning to hold such events in the future more regularly. Dr. Nazar Mohamed Hassan has already mentioned the idea to present the two volumes 20 and 21 of the Yearbook at UNESCO offices. This could give additional weight to the theme of “STI Policies for Inclusive Growth in Africa”. We hope that we can realise this project with the publication of the new volumes of the *African Development Perspectives Yearbook*.

Professor Dr. Tobias Knedlik, the Managing Editor of the *African Development Perspectives Yearbook*, and Professor Karl Wohlmuth, the Director of the *Research Group on African Development Perspectives Bremen* and

Volume Editor, are also thankful to Professor Dr. Achim Gutowski for his continuous work as the Book Review/Book Notes Editor of the *African Development Perspectives Yearbook*; he is already preparing the Unit 3 with Book Reviews and Book Notes for Volume 21, the forthcoming volume. This Unit will provide a great number of book reviews and book notes on books, research papers and documents being related to STI systems in Africa, but also general studies on Africa's development will be reviewed in Volume 21. The impressive list of subjects for the Book Review Unit 3 for Volume 21 is made available in the final part of this volume 20 (see the Contents of Volume 21 for the Yearbook Edition for 2019).

We are thankful to all the contributors and supporters of the *African Development Perspectives Yearbook* for their hard work, their steady encouragement and their continuous assistance. The valuable inputs from leading African research institutions and their experts have contributed over the years to the success of the *African Development Perspectives Yearbook* as an outstanding publication on and for Africa. In 2019 the project will celebrate its 30<sup>th</sup> birthday, as the first volume has appeared in 1989. The readers of the various Yearbook volumes have continuously contributed with their critical comments and with supportive encouragement, so that over time a valuable partnership has emerged between readers, contributors and editors.

Various institutions have made over the years donations and have funded specific allocations to the *African Development Perspectives Yearbook* project, but the support of the University of Bremen, Bremen, Germany is of invaluable importance. The University of Bremen was awarded by the German scientific research community in June 2012 the title "Excellence University", and the *Research Group on African Development Perspectives Bremen* is very proud about this distinction. The great honour for the University of Bremen is helping in the further work of the Research Group on African Development Perspectives Bremen. These donations and research grants to the Yearbook Project have helped us to intensify researches on African development issues, to distribute the various volumes of the Yearbook to African partner universities and to major African research institutions, and to invite research scholars from leading African research institutions to work with us in Bremen. Institutions like the Volkswagen Foundation and the Alexander von Humboldt Foundation have generously financed the stay of senior researchers at IWIM (Institute for World Economics and International Management) in Bremen. Currently, the African Economic Research Consortium (AERC) and the International Monetary Fund (IMF), African Department, are financing research of our staff/guest researchers. We are thankful for all these contributions to the researches on African development issues in Bremen and to the work on the Yearbook volumes.

Africa Research Workshops were regularly held in Bremen at the University to discuss the draft papers which were intended for publication in the Yearbook. These Africa Research Workshops served as forums for the intensive discussion of the draft papers and of related research topics. Still there is contact to many of these visitors. The Editors also want to express the thanks to the many reviewers of the draft contributions for the Yearbook volumes for their committed work. By this input the *African Development Perspectives Yearbook* has become over the years a fully refereed publication. Also, the reviewers of the many books and documents for the Book Review Unit are doing an excellent job. Past volumes, volume 19 and forthcoming volume 21 give evidence of this important part of the work of the *Research Group on African Development Perspectives Bremen*.

Many persons have given support, advice, and encouragement; others have helped with frank and critical assessments. However, the responsibility for the final product remains with the editorial team of the *Research Group on African Development Perspectives Bremen*. Both volumes, the Volume 20 for the year 2018 and Volume 21 for the year 2019 are released during the year 2018. The *Research Group on African Development Perspectives* has already started its work on Volume 22 for the year 2020 with the title “*The Sustainable Development Goals and African Development – New Ways Forward*”. The theme is related to important research and cooperation programmes of the *Research Group on African Development Perspectives Bremen* at IWIM (Institute for World Economics and International Management), University of Bremen.

In the name of the Editorial Team:

Professor Dr. Tobias Knedlik, Fulda University of Applied Sciences and IWH Halle, Managing Editor, and

Professor Emeritus Dr. Karl Wohlmuth, University of Bremen, Director of the Research Group on African Development Perspectives Bremen at IWIM, and Volume Editor.