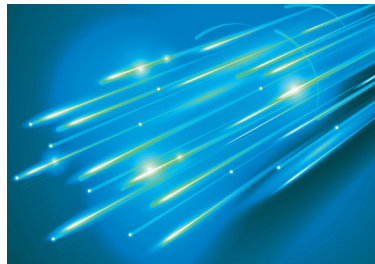




# TRANSFER OF TECHNOLOGY AND KNOWLEDGE SHARING FOR DEVELOPMENT

Science, technology and innovation issues  
for developing countries



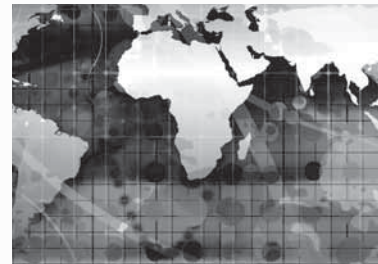
UNCTAD CURRENT STUDIES ON SCIENCE, TECHNOLOGY AND INNOVATION. **N°8**





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## Preface

In the outcome document of UNCTAD XIII, the Doha Mandate, member States noted that the development of a strong science, technology, and innovation (STI) capacity was the key to addressing many of the persistent and emerging trade and development challenges that developing countries face. Decisive and actionable STI policies needed to become a central feature of national development strategies.

Promoting and facilitating transfer of technology has long been an irreplaceable component of those policies. In this context, this report responds to the mandate given by member States in UNCTAD's Programme Narrative for the Biennium 2012–2013 for the secretariat to produce "Studies on science, technology and innovation including a comprehensive study to identify issues of developing countries on transfer of technology and knowledge-sharing for development". To complement its stronger analytical orientation the present report is being published simultaneously with another one that presents four case studies of practical experiences of transfer of technology in various developing regions of the world.

Developing country policies on technology transfer are necessarily complex and cross linked with a range of issues in the broader development agenda. Policy outcomes need to target increasing access to technology, including improving the abilities of firms and other users of technology to identify, acquire, adapt and use knowledge and technology. Underlying these outcomes are national policies that support improving domestic absorptive capacities and stimulate local innovation as well as international efforts to develop a supportive environment for technology transfer. However, it is important to bear in mind that the end purpose of these policies is not to achieve successful transfer of technology per se, but to support a process of innovation that creates value – most often economic value, but also social value – through the successful application of technology to productive activities or social endeavours. That is the reason why this report focuses not only on the effectiveness of various channels of transfer of technology but also on the policies that developing countries may implement to ensure that technology transfer contributes to more effective innovation in their economies.

Policymakers need to recognize that there is a virtuous circle whereby successful technology transfer and the resulting innovation leads to improved technological absorptive capacities, and hence more effective further transfer of technology. National or regional innovation systems are an important component in energizing this circle. Building national systems of innovation that enable both domestic innovative capabilities and absorptive capacity to effectively acquire technology from abroad is a long-term, complex effort that calls for policy persistence, coordination and integration. It also requires an appropriate international trade and investment environment, financial support and strong knowledge and technology links.

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This report was prepared by a team of the Science, Technology and Information and Communications Technology (STICT) branch of the UNCTAD Division on Technology and Logistics (DTL), comprising Angel González Sanz, Dimo Calovski and Carlos Razo. Chapter 7 of the report benefited from a major input from Dominique Foray (Ecole polytechnique fédérale de Lausanne). Overall guidance for the publication was provided by Mongi Hamdi, Head of the STICT branch and Anne Miroux, Director of the Division on Technology and Logistics.

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The report was typeset by Dimo Calovski. Sophie Combette designed the cover.

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## Abbreviations

CDN	Clean Development Mechanism
FDI	foreign direct investment
FOSS	free and open-source software
GATT	General Agreement on Tariffs and Trade
GDP	gross domestic product
GPL	General Public Licence
GVC	global value chain
ICTSD	International Centre for Trade and Sustainable Development
IPR	intellectual property right
LDC	least developed country
NIS	national innovation system
OECD	Organisation for Economic Co-operation and Development
STI	science, technology and innovation
TNC	transnational corporations
TRIPS	Agreement on Trade-Related Aspects of Intellectual Property Rights
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
VC	venture capital
WHO	World Health Organization
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

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## Chapter 1. Introduction

Technological learning and innovation are essential for economic growth and development and are major determinants of long-term improvements in income and living standards. While in the more advanced economies technological progress involves the generation of new knowledge that can be applied to productive activity, for developing countries technological progress is strongly influenced by their ability to access, adapt and diffuse technological knowledge that has been generated abroad.

For this reason, the implications for trade and development of the technology gap between developed and developing countries and the question of how to promote transfer and diffusion of technology have been part of international discussions for decades.

The varied approaches to this issue that have developed over time and the rich literature that it has generated are indicators of the complexity of the issue and of the challenges that conceiving and managing the process of transfer of technology presents for both firms and policymakers.

### 1.1 What do we mean by transfer of technology?

The literature on transfer of technology uses a

The term “transfer of technology” may also be applied to the process by which a technology developed for a specific use or sector becomes applicable in a different productive setting. Transfer of technology may refer to a process that takes place within or across national boundaries, and on a commercial or non-commercial (concessionary) basis. It may refer to the physical movement of assets or to immaterial elements such as know-how and technical information, or most often to both material and immaterial elements. Transfer of technology may be linked to the movement of physical persons or more specifically to the movement of a specific set of capabilities.

The Draft International Code of Conduct on the Transfer of Technology that was negotiated under UNCTAD auspices between 1978 and 1985 defined technology as the systematic knowledge for the application of a process that results in the manufacture of a product or the delivery of a service. Technology is not a finished product or service as such, although it can be critical for its delivery or performance. Technology does include the entrepreneurial expertise and professional know-how to deliver products and services (UNCTAD, 1985). Similarly, Burgelman et al. (2008) propose that “[t]echnology refers to the theoretical and practical knowledge, skills, and artefacts that can be used to develop products and services as well as their production and delivery systems.

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