Foreword by Norman E. Borlaug

This *Handbook* is timely for several reasons. Whether we like it or not, when it comes to technology transfer, global integration has created a complex system of intellectual property management. This system includes public sector research institutions in developing countries that need guidance on how to negotiate the new and changing terrain. The *Handbook* aims to provide these institutions with such guidance in the form of a reference resource. But the *Handbook* is more than that. It not only explains the intellectual property system, but shows how both public sector research institutions and developed countries can use intellectual property to achieve their humanitarian and socio-economic objectives.

The past 50 years make up the most productive period in history, in terms of agriculture. Innovations in agricultural science and technology made possible the Green Revolution, which is reputed to have spared one billion people the pain of hunger and starvation. New health innovations have helped control the scourges of polio, leprosy, and smallpox. Although we have seen the greatest reductions in hunger in history, it has not been enough. And despite the enormous potential of modern medicine, its reach is still too short for the hundreds of millions most in need of its preventative and curative powers.

Several billion people around the globe require access to new agricultural technologies that could feed families while protecting the environment, as well as new health innovations to combat HIV/AIDS, malaria, tuberculosis, dengue, and a host of other diseases that typically afflict the poor in developing countries. New science and technology—including biotechnology—have the potential to satisfy these needs.

Today, the world food supply is nearly six billion gross metric tons and three billion net metric tons of edible dry matter. It includes cereals, roots and tubers, legumes, fruits and vegetables, livestock and fish. Within the next 50 years, the world's population is likely to increase 60%–80%, requiring global food production to nearly double. We will have to achieve this increase on a shrinking agricultural land base, with most of the increased production to occur in the countries that will consume it. Compounding the problem is the fact that more than half of the world's 800 million hungry people are small-scale farmers who cultivate environmentally sensitive marginal lands in developing countries. Bringing the power of science and technology to bear on the protection of these fragile environments is one of the greatest challenges of the 21st century.

Borlaug NE. 2007. Foreword. In *Intellectual Property Management in Health and Agricultural Innovation: A Handbook of Best Practices* (eds. A Krattiger, RT Mahoney, L Nelsen, et al.). MIHR: Oxford, U.K., and PIPRA: Davis, California, U.S.A. Available online at www.ipHandbook.org.

Despite these serious and daunting challenges, there is reason for hope. With the new biotechnology tools, we are poised for another period of rapid agricultural innovation. New science has the power to increase yields, address agroclimatic extremes, and mitigate a range of environmental and biological problems. Private industry has invested billions of dollars in research to make astonishing new discoveries and products, such as genetically modified crops. Unfortunately, with the notable exception of insect resistant Bt cotton in China and India, relatively few of the new crops developed by private industry are reaching smallholder farmers in the developing world. This situation must be corrected as soon as possible.

The world of scientific innovation works differently today than it did 50, or even 20, years ago. Developing countries can no longer rely primarily on innovations from the public sector, because the private sector has taken the lead in inventing new technologies. Even those innovations developed by public sector research institutions are inextricably part of a global IP regime since they normally build on inventions made by both public and private entities.

As part of a global system, scientific institutions in developing countries need to understand how the IP system works to be able to capitalize on new opportunities. Moreover, global public sector research no longer marches to its own beat; to move forward, it must now work in tandem with the private sector. The promise offered by the new system is enormous; developing countries need to know how to negotiate access and how to build partnerships based on mutual value exchange.

This *Handbook* is a valuable guide to navigating the complex—but bountiful—world of an increasingly global innovation system. The reader will find relevant case studies, concrete observations, and practical suggestions. The *Handbook* should be most useful to government policy-makers, senior managers of public research institutions, technology transfer officers, and scientists in developing and developed countries. It is a resource that can help governments and other institutions move forward to meet the agricultural and health challenges of tomorrow. ■

December 2006
El Batán, Mexico

NORMAN E. BORLAUG, *CIMMYT, Apdo. Postal 6-641, 06600 Mexico, D.F, Mexico.* N.Borlaug@cgiar.org