
Foreword

This tenth volume of *Sharing Innovative Experiences* focuses on initiatives in developing countries to develop pharmaceutical products from their rich and varied flora.

Scientists have identified some 300,000 to 500,000 species of plants, many of which probably contain compounds that have medical applications. Indeed, an estimated 50,000 plant species have long been used in traditional medicine, especially in developing countries where access to modern health care is limited by many factors, among these the cost of importing modern drugs and the remoteness of hospitals and clinics from most of those who need them. For these reasons, almost 80 per cent of the population of Africa rely on traditional medicines to address their primary health care needs; certainly some 60 per cent of children suffering from malaria are first treated at home with herbal compounds. In addition, the World Health Organization (WHO) estimates that, in China, traditional herbal preparations account for 30-50 per cent of the entire country's medicinal consumption. Even in countries with broad access to modern health care, such as Japan and the United States, traditional medicine plays an important role. Indeed, Americans spent \$4.2 billion on herbs and other botanical remedies in 2001.

Such figures indicate the vast amounts of information on plant-derived medicines that are held by traditional practitioners, whether in the writings of such scholarly medical systems as Ayurveda in India, Kampo in Japan, traditional Chinese medicine and others or, as in Africa, various systems of folk medicine that tend to be transmitted orally from generation to generation. Scientists can learn a great deal from this reservoir of indigenous knowledge.

Twelve Southern countries together hold 60 per cent of the world's species; 11 are classified as having a "megabiodiversity". This botanical wealth offers immeasurable opportunities to develop pharmaceutical products for both local and international markets — and thereby to create employment and generate revenue in many developing countries. Whether so-called "herbal remedies" or single-compound allopathic drugs derived from medicinal plants or even synthetic compounds based on chemical structures extracted from plants, the products must be scientifically tested for both efficacy and safety. Indeed, science must play a central role in developing such products.

The 17 case studies that follow illustrate not only the depth of expertise present in many developing countries but also the broad range of scientific disciplines essential to developing such goods. Taxonomic botany and ecology are required to determine the precise identity and growing conditions of a medicinal plant. Similarly, agronomists must ensure the availability of sufficient plant material for a viable enterprise. Alternatively, scientifically validated practices can be applied to transfer plants collected in the wild to appropriate soils elsewhere to produce sustainable harvests. Taking a product from the discovery stage to commercialization also demands expertise in analytical chemistry, biochemistry, molecular biology, pharmacology, toxicology and a host of other disciplines. Often, institutes must build their research capacities to meet these needs — or involve commercial partners willing to invest in the development of final products.

The case studies contained in this volume offer only a few examples of hands-on experience in addressing these issues and others in 14 Southern countries. Together, they offer vital lessons to people interested in their replication or adaptation. However, they by no means represent the range of similar initiatives now being undertaken throughout the global South; this would go beyond the scope of our particular knowledge-sharing objective.

This book is the product of a partnership between the Third World Network of Scientific Organizations (TWNISO), the Third World Academy of Sciences (TWAS) and the Special Unit for South-South Cooperation (SSC) of the United Nations Development Programme (UNDP). As with other volumes in the series, this collection derives from the fact that an ever-increasing number of on-the-ground experiences show successful uses of science and technology to overcome social and economic obstacles to development. Although they often have a significant impact where they take place, they frequently remain almost unknown elsewhere. This book therefore aims not only to inspire countries and communities to draw upon these innovations for their own needs but also to stimulate the international community to support the sharing of such development knowledge on a South-South and a triangular basis.

We hope, too, that the successes and lessons described in this volume will guide other institutions in developing effective pharmaceutical products derived from medicinal plants as well as advancing direct cooperation and knowledge-sharing throughout the global South.



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