Foreword

We live in an era in which knowledge is decisive in separating winners from losers. It does not matter whether we look at these polar outcomes – winning and losing – at the level of nations, firms, or individuals: Knowledge is a necessary requirement for winning in today's closely integrated and competitive world. Knowledge expands the achievement possibilities of those who have it. Lack of it diminishes them.

The disparities in development outcomes between prosperous and rich nations, and between rich and poor individuals, are underpinned foremost by differential access to knowledge and information. This is the reason that we, as a nation, are determined to develop a credible national Science and Technology (S&T) capability. This will rank high amongst Botswana's sources of competitive advantage in the future and will be a lasting bequest to posterity. It will also be a strong basis for sustainable human development for generations to come.

Botswana Human Development Report (BHDR), 2005 makes the point that "From the Stone Age to the Information Age, quantum leaps in human material and physical wellbeing were made possible only through breakthrough scientific and technological innovations: in agriculture, biotechnology, biomedical science, communications, industry and transport amongst others". Our experience as a nation bears this out. For instance;

- Our transport and telecommunications infrastructure has reduced the 'time space' between our people considerably, improving access to inputs, markets, services, and information.
- Our health system has delivered to a majority of Batswana, access to life saving medical technologies, and in that process eliminating or bringing under control a range of childhood diseases e.g. whooping cough, diphtheria, polio and small pox, and a range of killer diseases such as tuberculosis and sexually transmitted diseases.

I deliberately chose these examples to emphasise that investment in S&T is about human development. If S&T achievements are not shared equally amongst nations, then technology will become a source of exclusion. It would create the spectre of a technological divide in which those with access achieve unprecedented levels of prosperity whilst the majority who are without it lose competitiveness and are marginalised from the world economy as new technologies render their production systems redundant.

We need to make access to technology in Botswana a critical pillar of our strategies for S&T. Our innovation and diffusion systems should be so balanced as to serve the needs of big business and government as well as those of the great majority who depend on micro and small enterprises for livelihood. For instance, small farmers require affordable seed, fertiliser, and equipment technologies that would raise farm level productivity to give them a decent chance of moving beyond subsistence. Similar needs can be found in food processing and other forms of light manufacturing.

I should not be understood to be making the case for a focus on technologies that would trap Botswana in low value production. Mine is a case for inclusive technological investment, and for access to both new and old technologies for poor people. Our advocacy, our educational, institutional, policy and infrastructure responses to Botswana's technology needs should not engender the exclusion of particular constituencies.

In the 21st century, one class of technologies, Information and Communication Technologies (ICTs) - has been a particularly dominant force in shaping development outcomes. It is the power behind the current productivity revolution and the current phase of globalisation. The internet in particular, has delivered to individuals and organisations, communication capabilities that have produced quantum reductions in transaction costs, extended market reach, and availed unprecedented access to information. Sadly, poor countries and poor people do not have access to these technologies. As a result they suffer enormous competitive disadvantages.

The Government of Botswana (GoB), has made ICTs a priority focus for development. We have made significant investments in the requisite telecommunications infrastructure and have planned more investments to expand bandwidth. Beyond this, two other areas require urgent attention.

First, there is an urgent need to bridge the digital gap between urban and rural areas. The development possibilities that this could unleash from business to the delivery of basic services, are enormous.

Second, there is need to use the power of ICTs to improve efficiency and effectiveness in government. It is a priority of the Ministry of Communications, Science and Technology (MCST) to help government departments to use the ICT capabilities that government has availed to them to improve management efficiency and service delivery. Through effective use of ICTs, we could reduce the amount of paper moving between offices and reduce information storage costs. We could make information storage and retrieval faster and cheaper. We could save our clients the cost and inconvenience of travel to access services that they could access directly from their homes or through government offices in their own villages and towns. There are numerous other possibilities.

We have developed to the extent we have, in part, because Botswana is a decent technological diffuser. However, our capacity for technological diffusion is by no means adequate. Neither should we be content with just being technological diffusers. As a nation, we have fashioned ourselves as winners. That demands urgent and systematic

development of the country's knowledge resources. In the specific case of S&T, the establishment of the MCST is a bold institutional response to this imperative and a measure of the Government's commitment to building a credible national S&T capability.

This Report identifies a number of critical entry points for strengthening our national S&T capabilities. The public sector is one, both as a user and a producer of knowledge resources. Publicly funded institutions that do research and development work, e.g. the Botswana Technology Centre, the National Food Technology Research Centre, the Rural Industries Promotions Company, the Botswana College of Agriculture (BCA) and the University of Botswana (UB) should be our drivers of technological innovation and diffusion. To play this role, they need more funding, better networking with mature institutions in other countries, closer contact with other government institutions and industry, and more focused research and development programmes.

The second entry point is trade and investment. Technology is often embodied in goods and people. Through appropriate trade and investment policies, Botswana can expand its S&T capabilities.

The third is education. Both innovation and technological diffusion are functions of the level and quality of education. Through the Revised National Policy on Education (RNPE), we have shifted emphasis to Maths and Science and have as such given S&T a solid vote.

It has been said in this report that Botswana has the fundamentals for effective technological diffusion. Our literacy levels are high. Our education system is good. Household incomes are, on average, good and we have a good and improving infrastructure base.

To achieve our goal of building a strong national S&T capability, we need a constant and unrestrained flow of ideas. This Report is a useful contribution in this regard. We shall, later in the year, demonstrate high profile advocacy on a particular aspect of ICT when we host the World Information Technology Forum (WITFOR) in September 2005.

PELONOMI VENSON, M.P.
MINISTER FOR COMMUNICATIONS, SCIENCE AND TECHNOLOGY, BOTSWANA.

Preface

When the first BHDR was published in 1997, it made perfect sense to focus on "Challenges for Sustainable Development", because the time had come to establish a detailed Human Development Index (HDI), for Botswana. It also made perfect sense that the 2000 Report should focus on the challenge of moving "Towards an AIDS Free Generation", because the threat from the HIV/AIDS epidemic increasingly had emerged as the major challenge to human development in Botswana.

Does it then make equally perfect sense to choose "Harnessing Science and Technology for Human Development" as the theme for the 2005 Botswana Human Development Report? Yes, I very much believe so! The choice of this theme was inspired by both the recognition of what humanity has achieved so far in areas of agriculture, manufacturing, communication, medicine, etc with the aid of S&T, and by the recognition of the development possibilities that technology offers to developing countries.

Because the next phase of Botswana's development will depend to a great extent on the country's ability to leverage S&T for economic and human development, it is important to investigate the links between S&T and human development closely. In the context of globalization, the ability to harness S&T has become a key factor for both economic and human development. Globalization constantly reminds us that contrary to past thinking, it is not enough for developing countries to focus on good governance, market reforms, etc. To bridge the gap between the rich and poor countries, S&T has to become a core part of the national development strategy.

So by adopting the theme of "Harnessing Science and Technology for Human Development", we hoped to bring into focus how technology can accelerate the pace of human development in Botswana, and how human development in turn can promote the creation and implementation of technological breakthroughs in Botswana. The Report therefore explores Botswana's experiences with S&T for human development, as well as the possibilities that exist for the country to leverage technology to further advance human development.

The Report identifies Botswana as part of a large group of countries that are neither technological inventors nor diffusers. Despite this, Botswana has the potential to effectively leverage S&T for human development and facilitate technological progress. Botswana has much of the infrastructure as well as the economic and fiscal position with which to develop the S&T capabilities and capacity required to benefit from the gains of technological progress.

The BHDR 2005 articulates the fact that Botswana can become an information state. The starting point for this would be for Botswana to create and then sustain the development dynamic necessary to transform the state. For this to happen, four elements are highlighted as critical, namely: education and training; ICT infrastructure; entrepreneurship; and trade and investment.

In addressing the need to harness S&T in Botswana, the BHDR 2005 identifies five broad areas to be addressed in particular if Botswana is to become an Information Society: the fight against HIV/AIDS; economic diversification and private sector development; development of research and innovations systems; development of an ICT framework; and the enhancement of human freedoms.

Many would probably consider the top priority among these five areas to be HIV and AIDS. The current high HIV and AIDS prevalence rate has reversed some of the human development gains achieved in the three decades since independence in 1966. One of the most critical roles of S&T in this area is developing the local expertise with which to cope with the epidemic.

From the perspective of United Nations Development Programme (UNDP), the BHDR 2005 is therefore a timely endeavor. It will also feed into the World Information Technology Forum (WITFOR), to be hosted in Gaborone from 31st August to 2nd September 2005. The objective of this biennial global event is to work towards bridging the digital divide between developed and developing nations and empowerment of the common man with the help of ICTs. The BHDR 2005 makes a first attempt to articulate how Botswana can begin to bridge the digital divide and empower Batswana with and in the use of ICTs.

Preparation of this Report has not been an easy task. We are happy to have reached the end of the process, albeit two years later than intended. Consequently, allow me to conclude by recognizing the contributions of those who made this Report possible. The BHDR 2005 is a collaborative effort between the GoB and UNDP and has had technical and editorial contributions from various development partners, from the UB to the Civil Society. I also recognize the efforts of independent consultants, the Reference Group which served as a sounding board and provided guidance on production of the Report, and the BHDR team in the UNDP Botswana office. This Report would not have been possible without these efforts.

BJØRN FØRDE
UNDP RESIDENT REPRESENTATIVE

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Reference Group

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1 Sawako Inae, Debbie Tlhomelang, Sennye Obuseng and Constance Formson