



Table of contents

Abbreviations.....	vii
OVERVIEW.....	1
Science, Technology and Human Development: Some Basic Conceptual and Definitional Issues.....	1
Botswana Thirty-eight Years of Progress and the Tragedy of HIV/AIDS.....	1
Human Development and Science & Technology: A Two Way Street.....	1
Creating a Development Dynamic.....	2
Towards an Information Society for Botswana.....	2
An Agenda for the Future.....	2
CHAPTER 1	
Science, Technology and Human Development: Some Basic Conceptual and Definitional Issues.....	3
Human Development- A Universal Pursuit.....	3
Human Development in Concept and Practice: Some Basic Contradictions.....	4
Human Development and Poverty.....	6
Human Development and Health.....	7
Human Development and the Environment: Issues of Sustainability.....	8
The Millennium Development Goals: A Global Framework for Human Development.....	10
Long Term Vision For Botswana: Towards Prosperity for All.....	12
The Nature of Human Development: Human Agency and Public Provisioning.....	12
CHAPTER 2	
Botswana: Thirty-Eight Years of Progress and The Tragedy of HIV/AIDS.....	14
An Extraordinary Record of Development Success.....	14
The Record.....	15
The Economy.....	17
Some Critical Weaknesses in Botswana's Development	17
Problems of inequality persist.....	17
Employment and unemployment.....	18
Poverty.....	18
The trap of state provision.....	18
Citizen economic empowerment.....	19
Three of the Emerging Priority Development Challenges.....	19
Health: two decades of accomplishment under threat.....	20
Globalisation and the threat of digital exclusion.....	20
Environment sustainability.....	21
CHAPTER 3	
Human Development and Science and Technology: A Two Way Street.....	23
A Complex Relationship.....	23
Science and Technology: A Key Factor Behind Progress in Human Development.....	23
Human Development: A Factor in Both Innovation and Technological Diffusion.....	24
Building a Science and Technology Capability.....	26
The Institutional Infrastructure.....	26

Policy and Legislative Environment.....	26
Leveraging Science and Technology for Human development- Achievements and Possibilities.....	27
Livestock sciences.....	27
Water management and conservation.....	28
Natural resources and rangeland management.....	28
Health care and HIV/AIDS.....	28
Other key players in the fight against HIV/AIDS.....	30
Alternative energy sources.....	30
Crop research.....	31
A Change in the Focus of Research and Development may be in Order.....	31

CHAPTER 4 **4**
Creating a Development Dynamic..... **32**

Introduction.....	32
Education and Human Development.....	32
Education: a human right.....	32
Botswana's education policy.....	33
Promoting Science and Technology.....	34
Evaluation of the Revised National Policy on Education.....	35
Botswana Response to UNESCO's Education for All Initiative.....	36
Enhancing Development Opportunities Through E-learning.....	37
Infrastructure as a Lever for Development.....	38
Educational infrastructure.....	38
ICT infrastructure in the broader economy.....	38
Entrepreneurship.....	39
Trade and Investment.....	39

CHAPTER 5 **41**
Towards an Information Society for Botswana..... **41**

Information, ICTs and Human Development.....	41
ICTs and the Millennium Development Goals.....	41
ICTs and the Global Information Society.....	42
ICTs and the internet around the world.....	42
The challenge of the digital divide.....	43
E-business and E-governance.....	43
The ICT Landscape and Human Development in Botswana.....	43
More than just infrastructure.....	44
The vision.....	44
Living the vision.....	44
Intellectual Property Rights and the Legal Environment.....	44
Energy Technologies.....	45
Grid electricity.....	45
Solar energy.....	45
Wind energy.....	46
The ICT Policy Regime.....	46
Print Media.....	46
Botswana's ICT Asset Base.....	47
Telecommunications infrastructure and data communication services.....	47
Telecommunications regulation and liberalisation.....	47
Broadcasting services.....	47
Botswana's Infostate and Technology Achievement.....	48
ICT Diffusion and the Infostate for Botswana.....	48
Telephones- The Impact of Mobile Telephony.....	48
PCs and the Internet.....	49
State of the Internet in Botswana.....	49
The Technology Achievement Index (TAI).....	81
Structure and Use of ICTs: An InfoState for Botswana.....	50
The ICT market and structure.....	50
ICT use in government.....	51
Botswana's Infostate.....	51
An Information Society for Botswana: Challenges, Prospects and Solutions.....	52



E-government for Botswana: Challenges, Priorities and Benefits.....	56
E-government Priorities.....	56
Appendix 1.....	58

CHAPTER 6

An Agenda for the Future..... 64

What Should Science and Technology Deliver for Botswana?.....	64
Fighting HIV/AIDS and the Health Crisis.....	64
Economic Diversification and Private Sector Development.....	65
Enhancing the Human Resource Base.....	65
Building an entrepreneurial culture.....	66
Empowering SMMEs through ICTs.....	66
Enhancing Opportunities for women.....	67
Developing a Research, Development and Innovations System for Botswana.....	68
The intellectual property rights regime.....	68
The ICT Framework.....	68
ICT policy.....	68
Enhancing Human Freedoms.....	68
Access to information.....	68
Universal service vs access.....	69
Public service reform and decentralisation of government.....	69

ANNEXES

Annex 1: Human Development Indices.....	70
Annex 2: Botswana Human Poverty Index.....	78
Annex 3: Calculation of the Gender Related Development Index (GDI) and Gender Empowerment Measure (GEM) for Botswana 1991-2000.....	80
Annex 4: Calculating the Capability Poverty Measure (CPM) for Botswana 1991 - 2000.....	82
Annex 5: Botswana Human Development Database	
Part 1: Time series data.....	84
Part 2: by district.....	108

BIBLIOGRAPHY..... 126

BOXES

Box 1.1: Human Development and Human Freedom.....	4
Box 1.2: Poverty and Hunger Reduction Policies, Strategies and Programmes.....	5
Box 1.3: The Concept of Sustainable Development.....	9
Box 1.4: The Millennium Development Goals.....	11
Box 1.5: The Millennium Development Goals and Vision 2016.....	13
Box 2.1: Botswana's Broad Strategy Against Poverty.....	18
Box 3.1: The Development Promise of a Special Class of Technologies.....	24
Box 3.2: Some Best Practises to Consider.....	29
Box 4.1: RNPE national Education Objectives.....	33
Box 5.1: ICTs for Human Development: goal, objective, strategy and outcomes.....	41
Box 5.2: How ICTs can help achieve Millennium Development Goals.....	42
Box 5.3: Definition of the Information Economy.....	42
Box 5.4: Key ICT Statistics and Developments Worldwide.....	43
Box 5.5: The ICT Industry in Botswana.....	51
Box 5.6: Components of Orbicom's Infostate Index for Digital Divide.....	51
Box 5.7: FDI flows:- The Case for IFSC.....	55
Box 5.8: FDI Flow Potential Through the Textile Sector.....	55
Box 5.9: Some Mobile Voice and SMS Applications.....	56
Box 5.10: E-government- Benefits and Outcomes.....	56
Box 5.11: Civil Service Reform.....	56
Box 5.12: Decentralisation.....	56
Box 5.13: Access to Public Information: - The Example of Health.....	57
Box A.1: Calculating the TAI Index for Botswana.....	58
Box A.2: Calculating the InfoState.....	59

LIST OF TABLES

Table 2.1: Breakdown of the Economically Active Population in 1999 and 2001.....	18
Table 4.1: Gross and Net Intake and Enrolment Rates: Primary Education, 2000.....	33
Table 4.2: Facilities and Technology Resources in Schools in 2000.....	34
Table 5.1: Number and Ownership of IT Companies in Botswana.....	41
Table 5.2: Infostates and Rankings, 2001.....	52
Table 5.3: Evolution of Infostates 1996-2001.....	53
Table 5.4: Challenges and Prospects for Information Society of Botswana.....	53
Table 5.5: Information Society for Botswana; Challenges for the Government.....	55
Table A.1: Current and proposed ICT Applications in Government.....	58
Table A.2: Aggregate Information & Electricity Statistics for Botswana.....	59
Table A.3: Estimated Number of Web Pages and Host Under .bw.....	59
Table A.4: ICT Diffusion in Households- 2001 Statistics.....	60
Table A.5: TAI Indicator Indices for Botswana.....	61
Table A.6: ICT Indicators for Botswana's Global Position.....	61

LIST OF FIGURES

Figure 1.1: The Vicious Circle of Poverty and Ill-Health.....	5
Figure 2.1: The Structure of the Economy.....	16
Figure 2.2: Annual Growth Performance.....	16
Figure 3.1: Links Between Technology and Human Development.....	23
Figure 4.1: Enrolment in Tertiary Institutions, 2002.....	33
Figure 4.2: Students Enrolled in Optional Science-based Courses, 1999.....	34
Figure 4.3: Time Series of Enrolments in S&T Programs, UB.....	35
Figure 5.1: People and Pcs in Rural Communities- Curiosity or Practicality?.....	42
Figure 5.2: Number of Internet Users and Countries Connected to the Internet.....	42
Figure 5.3: Growth in Number of Cellular Phone Subscribers Worldwide.....	43
Figure 5.4: ICT Products and Services in LDCs, millions, 2001.....	43
Figure 5.7: Development of the Telephone Network in Botswana.....	48
Figure 5.8: Map of Cellular Phone Availability Across Botswana.....	48
Figure 5.9: The Information Needs Gap.....	51

LIST OF CHARTS

Chart A.1: Chart of the Evolution of Infostates.....	52
Chart A.2: Evolution of Component Infostates for Botswana and Namibia.....	52

