

RNR SECTOR TENTH PLAN (2008 – 2013)

Enabling farming communities to overcome poverty



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ACRONYMS

AFD	Administration & Finance Division
AMS	Agriculture Marketing Service
APB	Annual Plans & Budgets
ASMEP	Application Software for Monitoring & Evaluation Program
BAFRA	Bhutan Agriculture & Food Regulatory Authority
BAoB	Biodiversity Act of Bhutan
BAP	Biodiversity Action Plan
BFI	Bhutan Forestry Institute
BPFES	Budget Policy and Fiscal Framework Statement
BPSMP	Bhutan Power System Master Plan
CNR	College of Natural Resources
CoRRB	Council for Renewable Natural Resources Research of Bhutan
DNB	Department of National Budget
DoA	Department of Agriculture
DoF	Department of Forest
DoL	Department of Livestock
DPA	Department of Public Accounts
DPO	Dzongkhag Planning Officer
DPU	Dzongkhag Planning Unit
DSC	Druk Seed Corporation
DT	Dzongkhag Tshogdu
ECC	Extension Coordination Committee
FCB	Food Corporation of Bhutan
FMU	Forest Management Unit
FNCA	Forest & Nature Conservation Act
FNCR	Forest & Nature Conservation Rule
FY Ps	Five Year Plans
GDI	Gross Disposable Income
GDP	Gross Domestic Product
GG+	Good Governance Plus



GNH	Gross National Happiness
GNHC	Gross National Happiness Commission
GNHCS	Gross National Happiness Commission Secretariat
GNHI	GNH Index
GT	Gewog Tshogde
HRDMP	Human Resources Development Master Plan
IAU	Internal Audit Unit
ICS	Information & Communication Services
ICTMP	Information & Communication Technology Master Plan
IMS	Information Management Section
M&E	Monitoring and Evaluation
MDGs	Millennium Development Goals
MHCE	Monthly Household Consumer Expenditure
MMT	Mobile Monitoring Team
MoA	Ministry of Agriculture
MPCE	Monthly Per Capita Expenditure
MTR	Mid-Term Review
MYRB	Multi-Year Rolling Budget
NAP	National Agricultural Policy
NBC	National Biodiversity Centre
NFSS	National Food Security Strategy
NMES	National Monitoring and Evaluation System
NPGP	National Pasture & Grazing Policy
NPHC	National Post Harvest Centre
NRDCL	Natural Resources Development Corporation Ltd.
NRTI	Natural Resources Training Institute
NSB	National Statistical Bureau
OGTP	One Geog Three Products
P&HCB	Population & Housing Census of Bhutan
PAR	Poverty Analysis Report
PPD	Policy and Planning Division
RAIS	Regional Agro-biodiversity Information System



RBM	Result-Based Management
RCSCS	Royal Civil Service Commission Secretariat
RDTTC	Rural Development Training Centre
RNR	Renewable Natural Resources
RNR-RCs	Renewable Natural Resources Research Centers
SAARC	South Asian Association for Regional Cooperation
SDGs	SAARC Development Goals
SRC	Scientific Review Committee
TYRPB	Three Year Rolling Plan and Budget
TYRPB	Three-Year Rolling Plans & Budgets
UWICE	Ugyen Wangchuck Institute of Conservation and Forestry
VAM	Vulnerability Assessment Mapping
WA	Water Act
WVP	Water Vision & Policy



ROYAL GOVERNMENT OF BHUTAN
Ministry of Agriculture
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ཕྱོད་བརྗོད།

1. འཆར་གཞི་བཅུ་པ་འི་དམིགས་དོན་གཤམ་ཅན་ཅིག་ གནམ་ལོ་ 2004 ལས་ དམངས་གཙོ་བོ་གཞུང་འགོ་བཙུགས་ཏེ་
 ལས་དོན་ཁག་ལེ་ལྷ་ཅིག་ལུ་ གཞུང་གྱི་དམ་འཁུགས་ལྱུང་བ་འགྱུ་མི་ལུ་ ཞིབ་བཞེད་དང་འབྲེལ་གཏོགས་འབད་ནི་
 ཡིན་མ་ལས་ དམངས་གཙོ་བོ་ལམ་ལུགས་འདི་ དོན་དག་དང་ རྒྱལ་ཅིག་བཟོ་ནི་འི་དམིགས་དོན་ལུ་ དཔལ་འབྱོར་གྱི་
 གནམ་ཚད་གོང་འཕེལ་གཏང་ཏེ་ མི་ལྷན་གནས་ལྷངས་ནང་ དཔལ་འཕོངས་གྱི་དཀའ་ངལ་ སེལ་བའི་སྒོ་ལས་ ལ་
 རབས་བཟང་པོ་འི་རང་བཞིན་དང་ལྷན་མ་བཟོ་ནི་དང་ སྤྱི་དོན་གྱི་དམངས་གཙོ་དང་ དཔལ་འབྱོར་གྱི་དབང་ཆ་དེ་ ཡན་
 ཚུན་གཏོས་མོས་གྱི་ ཕ་དོན་ཅིག་ཡིན་མ་ལས་ ཕ་དོན་དེ་ལུ་ གཞུང་གི་ཁ་བྱག་ལས་ ལག་ལུ་གོང་འཕེལ་གྱི་དོན་ལུ་
 འབྲེལ་གཏོགས་ འབད་ནི་ཡིན།



ལྷན་པོ།
MINISTER

སོན་མ་ལྷན་ཁག།

ROYAL GOVERNMENT OF BHUTAN
Ministry of Agriculture
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འཆར་གཞི་བཅུ་པ་འི་དམིགས་ཡུལ་དང་། བརྗོད་ཚིག་དོན་མ་དུ་ལུ་འཕོངས་མཐའ་ལྟུང་དོན་དེ་དཔལ་འབྱོར་གོང་
འཕེལ་ལུ་ བརྗོད་ཀྱི་ལུ་ བརྗོད་ཀྱི་གོང་འཕེལ་ རྒྱལ་ཡོངས་ཀྱི་འཆར་གཞི་ཚུ་ རྒྱལ་མཐུན་ལག་ལུ་འཕེལ་གྱི་དང་།
གོང་གསལ་ཁྲོམ་དེ་གོང་འཕེལ་གྱི་དང་། མཐའ་གཞི་ཐབས་བརྒྱད་ཀྱི་མཁོ་ཆས་གོང་འཕེལ་ མི་སྟོབས་གོང་འཕེལ་
དང་། མཐའ་འཕོངས་ཀྱི་ཐབས་བརྒྱད་ཀྱི་མཁོ་ཆས་ལས་ དེ་ཚུ་ག་ར་ རྒྱལ་ཡོངས་དགའ་སྤྱོད་དཔལ་འཛུམས་ཀྱི་
དམིགས་དོན་ འགྲུབ་གྱི་འཕེལ་བརྒྱུད་ཡིན།

དཔལ་འཕོངས་དཀའ་ངལ་སེལ་གྱི་དེ་ གཞུང་གི་ དམིགས་ཡུལ་གཙོ་བོ་ཅན་ཅིག་ཡིན་མ་དུ་ དེ་ཡང་སོན་མ་ལྷན་ཁག་ལུ་
དམིགས་བསལ་ཀྱི་ ཡུལ་འགན་ལོག་ཏུ་ཡོད་པ་ལས་ ཡུལ་འགན་དང་འཁྲིལ་ཏུ་ གོང་གསལ་གོང་འཕེལ་ཀྱི་ མཁོ་
ཆས་གྲུབ་ཐབས་ལུ་ གོང་གསལ་འཆོ་བའི་གནས་ཀྱི་དང་། ཡུན་བརྩན་ཐོག་གོང་འཕེལ་གྱི་དང་། གནས་ཚུལ་དང་།
རྒྱུ་འབྱེད་བརྒྱུད་ཚུ་ ཡུན་བརྩན་ཐོག་ འཛིན་སྲུང་ལག་ལུ་འཕེལ་གྱི་དང་། བཟའ་བྱུང་གི་སོན་མ་ལྷན་ཁག་གི་དང་།
ཕུ་འབྲོག་གི་འབྲོག་བརྒྱུད་ཚུ་ ཡུན་བརྩན་ཐོག་ལག་ལུ་འཕེལ་གྱི་དང་། ཐབས་ལམ་གོང་འཕེལ་གྱི་དང་། བཟའ་
ཆས་ཀྱི་ཕྱི་སྤྱོད་གོང་འཕེལ་ གྱི་དང་། དམིགས་ཡུལ་བརྒྱུད་ཡིན། དམིགས་ཡུལ་དེ་ཚུ་ འགྲུབ་ཐབས་ཀྱི་དོན་
ལས་ སོན་མ་ལྷན་ཁག་གི་ རྒྱུ་འབྲོག་གསལ་དང་། ཡུལ་འགན་གི་ ཐབས་བརྒྱུད་ཀྱི་ཐོག་ལས་ ལག་ལུ་
འཕེལ་གྱི་ཡིན།

གོང་གསལ་གྱི་འབྲོག་བརྒྱུད་ཚུ་ ཆོང་ལམ་འཆོལ་ཏུ་ ཆོང་འབྲེལ་འཕེལ་གྱི་དཀའ་ངལ་མཐའ་ལྟུང་དོན་དེ་ སོན་མ་ཆོང་
ཆས་ཚུ་ ཡུལ་ཆོང་ གོང་ཆོང་གི་དོན་ལུ་ རྒྱུ་འབྲེལ་ཐབས་ཀྱི་སྤྱོད་གྱི་ དེ་ལས་ ཆོང་ལམ་དང་འཁྲིལ་ཏུ་ གོང་གསལ་



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ནང་འཛོལ་བསྐྱེད་ཡུལ་མེད་ གྲུང་ནི་གསུམ་དེ་ སོ་ནམ་ཡུན་ལག་གི་ སྒྲུབ་སྤྲོད་གསུམ་ཡིན། དེ་དང་གཅིག་ཁར་
ལས་རིམ་ཚུ་གི་འཆར་གཞི་དང་ འཛིན་སྐྱོང་ལེགས་བཅོས་ གྲུང་ནི་དང་ བརྟ་བརྟུན་ཚུ་འཛིན་སྐྱོང་དང་ ལུང་ལམ་
གོང་འཕེལ་ གྲུང་དྲེ་ སྤེལ་བྱས་དང་ཁྲིམས་དོན་ལུ་གི་སྒྲིག་བཀོད་ཚུ་ ཅ་བརྟན་བཟོ་ནི།

ཡུན་ལག་གི་ཐབས་ཤེས་གསར་པ་ཅིག་ ཆེད་འོག་ལག་ ༢༠༥ ནང་ ཆེད་འོག་རང་སེའི་ འཆར་གཞི་བཅུ་པའི་ ལས་
རིམ་མ་ཅིས་བར་ ཆེད་འོག་གི་གནས་ལུངས་དང་འཁྲིལ་དྲེ་ འོས་འབབ་ཡོད་པའི་འཛོལ་བསྐྱེད་གསུམ་ (One

Geog Three Products - OGTP) ལ་ཁྲོད་ངོས་འཛིན་འབད་དེ་ ངོས་འཛིན་གྲུབ་པའི་ལས་རིགས་ཚུ་
གྲུབ་འབྲས་འབྱུང་ཐབས་ལུ་ ཡུན་ལག་གི་ལ་བླུག་ལས་ འཆར་གཞི་འོས་རིམ་གྱི་ ལས་རིགས་ལག་མ་འདྲ་ཕ་ ༢༩
ལག་ལཱ་འབྲེ་འབྲེལ་ཐོག་ལས་ འཕུལ་རིག་དང་ མ་དདུལ་གྱི་རྒྱབ་སྐྱོར་ལྷན་ཁྲིམས་ ཐབས་ཤེས་གསར་པའི་ དམིགས་ལུ་
དེ་ཡང་ ཆེད་འོག་དང་དྲེ་བའི་འཆར་གཞི་གཤེས་གཅིག་སྒྲིལ་བཟོ་ནི་དང་ ལས་རིམ་དེ་ཚུ་ལས་བརྟན་དྲེ་ དདུལ་གྱི་འོང་
འབབ་ཡུལ་གསེད་ གྲུང་ཐོག་ལས་ དཔུལ་འཕོངས་ཅ་མེད་གྲུང་ཚུགས་ནི་ལུ་ ལེ་ཡན་འབྱུང་ཐབས་ཡིན།

སོ་ནམ་ཡུན་ལག་གི་ འཆར་གཞི་བཅུ་པའི་ བརྟན་དོན་དེ་ མོང་གསེབ་ནང་གི་མི་དེའི་གནས་ལུངས་ གོང་འཕེལ་
གྲུང་ཐོག་ལས་ དཔུལ་འཕོངས་གྱི་དཀའ་ངལ་མེད་པ་བཟོ་ནི་དེ་ཡིན་མ་ལས་ བརྟན་དོན་དང་འཁྲིལ་དྲེ་ རྒྱལ་ཡོངས་
དཀའ་སྐྱོད་དཔུལ་འཛུམས་གྱི་ དགོངས་དོན་ འགྲུབ་ནི་ལུ་ བཅོལ་ཤུགས་བསྐྱེད་ནི་ཡིན།

འཆར་གཞི་འོས་རིམ་པ་དང་འཁྲིལ་དྲེ་ དངོས་མཐོང་གི་གྲུབ་འབྲས་འབྱུང་ཚུགས་ནི་ལུ་ ཡུན་ལག་འོག་གི་ ཟེའོང་
ཡོངས་ལུ་ བཀྲིས་ལེགས་མོན་ ལྷ་ནི་ཡིན།



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རང་བཞིན་སྤར་འབྱུང་འཕྲོན་བསྐྱེད་ གྲོང་གསེབ་ནི་བདེའི་སློག་ཤིང་།
དབུལ་འཕྲོངས་མར་ཕབ་ཐབས་ལམ་ འཆར་གཞི་བཅུ་པའི་ཕྱག་འགན།
ཐབས་ཤེས་ཅན་གྱི་སྲིད་འཆར་ མི་སེར་ཕན་པའི་ཞབས་ཏོག།
སྤོང་ནས་བཙོན་ཤུགས་བསྐྱེད་དེ་ མ་འོངས་དོན་ཆེན་འགྲུབ་ཤོག།

(རྫོག་ཀར) སྤྲུ་རྒྱ་མཆོ།

སྒོ་ན་མ་སྒོ་ན་པོ།



THE RNR SECTOR TENTH PLAN AT A GLANCE





CHAPTER 1: BACKGROUND

1.1 Introduction

Bhutan is an agrarian country with about 69% of the population residing in the rural areas. Majority of them are engaged in subsistence farming which is supported by the integrated use of agricultural, livestock and forest resources. The remaining 31% live in the urban areas.

GNH is the philosophy which guides the human and socio-economic development of the country. GNH places the individual at the centre of development and suggests a comprehensive and multi-dimensional approach to realizing and sustaining happiness. It prescribes that equitable economic development can be attained and sustained through conservation of environment, preservation and promotion of culture, and enhancement of good governance. GNH is pursued in Bhutan through a long-term vision and medium-term plans. As a long-term vision the country has adopted the Vision 2020 which set milestones to be achieved for measuring GNH. The milestones are based on the economic, environmental, cultural, and governance parameters of GNH.

The Vision 2020 milestones require the RNR sector to achieve a three-fold increase in real incomes of farmers by 2012; increase the value of horticultural exports by 200% by 2007; increase the value of horticultural exports by 300% by 2012; ensure that 75% of rural population live within the distance of a half-day walk from the nearest road; maintain 60% forest cover at all times; preparation of master plan for other [all] watershed areas by 2007, and have the biodiversity resource base inventoried by 2002.

As a member of global community, Bhutan is also party to international conventions. Being so, the country has to fulfill the obligations related to global and regional Conventions. In particular, Bhutan has embraced international benchmarks for improving the quality of life by committing to attain the MDGs and the SDGs. To fulfill the MDGs, the RNR sector has to contribute to halving extreme poverty and hunger of the 2000 level by 2015, promoting gender equality, and ensuring environmental sustainability. Similarly, the SAARC development goals require RNR sector to eradicate hunger poverty; halve proportion of people living under the poverty line by 2010; ensure absolute reduction in the number of poor within the same period; ensure nutrition and dietary improvement for the poor; ensure a robust pro-poor growth process by mandatory budget allocation targeted to rural and informal economy sectors; strengthening connectivity of poorer regions and of poor as a social group; ensure effective participation of the poor and of women in anti-poverty policies and programs; maintain acceptable level of forest cover; maintain acceptable level of water and soil quality; ensure adequate conservation of biodiversity; and ensure wetland conservation in the region in accordance with the RAMSAR Convention.



In the 9th Plan, Bhutan's annual economic growth averaged about 6.1%. Due to increase in imports Bhutan's trade deficit widened by 8.6% during the period even though the inflow of grants and concessional loans offset the growing deficit. The inflation rate averaged at 7.7% (National accounts statistics, 2000-2005). External debt grew by 30% leading to the widening of the ratio of outstanding debt to GDP from 70% to 74.5%. However, the total debt ratio was maintained below 5%. While most of the external debt was in the form of soft loans, commercial loan was accessed by the private sector to invest in the tourism sector. The country's international reserve grew by 2.7%.

In the 9th Plan the economic growth was led by construction sector followed by agriculture sector which contributed **12%** to GDP growth. Within RNR sector agriculture accounted for **33%**, forest **45%**, and livestock **22%** of the total contribution. The export value of agriculture products increased by Nu. 99.3 million from 286.5 m in 2004 to 585.8 m in 2005 (AMS, MoA).

1.2 Significance of the RNR Sector

The rural population depends predominantly on the economic activities that are supported by the sustainable use of natural resources. The urban population, besides their direct dependence on the RNR sector for timber and non-timber resources, also depends on a host of renewable natural resources for industrial enterprises. The RNR sector continues to dominate the economy by contributing 18.6% to the GDP in 2007.

Table 1: GDP contribution of the RNR Sector (Nu. in millions)

	2003	2004	2005	2006	2007
GDP	29385.3	32319.6	36914	404,94.8	515,21.5
Growth rate	7.2%	6.8%	6.5%	6.3%	21.4%
Contribution by the Sector	24.8	24.3%	22.6%	22.0%	18.6%
Agriculture	10.9	10.8%	10.1%	9.8%	8.5%
Livestock	7.4%	7.2%	7.0%	6.7%	5.8%
Forest	6.6%	6.3%	5.5%	5.4%	4.2%

Source: Statistical Year Book, NSB, 2008.

1.3 Poverty Incidence and Indicators¹

The PAR 2004, based on the BLSS 2003, estimated that 31.7 percent of the Bhutanese population (or about 173,500 of the 547,000 extrapolated total number of persons from the sample) belonged to households who were consuming less than the national poverty line of

¹ Adapted from PAR 2007 (NSB)



Nu. 740.36 per person per month. Further, the PAR 2004 indicated that poverty in Bhutan was more of a rural phenomenon, i.e. 97.4 percent of the poor reside in rural areas.

Poverty, which may be thought of as a deprivation of the basics of life, is a multi-dimensional phenomenon. This deprivation includes not just insufficient consumption (and income) but also lack of opportunities and assets, inadequate education, poor health and nutrition, lack of sanitation, insecurity and powerlessness. Over the year, there has been much interest in poverty measurement across countries, including the Kingdom of Bhutan. Poverty reduction strategies have been developed that specify set of plans for improving the living standards of the needy. The Kingdom of Bhutan, as part of the global community of nations, committed itself to the Millennium Development Goals (MDGs), a series of 8 time-bound goals and 18 quantitative targets on economic and social development. The MDGs include

goals and targets on reducing poverty and hunger, improving education, promoting gender equality, improving health and achieving environmental sustainability by 2015. Tracking the progress of Bhutan in meeting the MDGs has been a concern of RGoB, its development partners and other poverty stakeholders.

The RGoB has addressed a wide range of poverty issues broadly through its development targets, as reflected in the 9th FYP in Bhutan 2020. These targets closely match the MDGs, and as such, stand as a testimony of Bhutan's strong national political commitment to socio-economic development and GNH which ensures that the Bhutanese people not only have per capita consumptions above the poverty line but also enjoy better quality of life. Poverty and related issues are being addressed nationally and have been an important thematic subject at various national and international forums. The RGoB is also a party to a Poverty Reduction Partnership Agreement wherein the Government has committed itself to attainment of international development goals as enunciated in the World Summit for Social Development Declaration in 1995. The PAR 2004, and other previous poverty studies, suggested that despite good governance and a remarkable progress in the economic development of the country, poverty is still reality in contemporary Bhutan.

The PAR 2007 provided a more focused picture of poverty in Bhutan down to the Dzongkhag level, based on consumption expenditure data and other poverty related indicators sourced from the BLSS 2007 covers living standard indicators covering both monetary and non-Monetary dimensions of well-being, including health, education, economic activities, and physical infrastructure. These aspects of welfare demand policies and programs that deliberately target the poor and seek to bring them closer to the mainstream of the nation's development process with a view to maximize GNH in the country.

Although many resources have been allocated on development over the past four decades, the RGoB recognizes that much still needs to be done as poverty still persists. The changing scenario in international development assistance has also compelled and RGoB to make sure



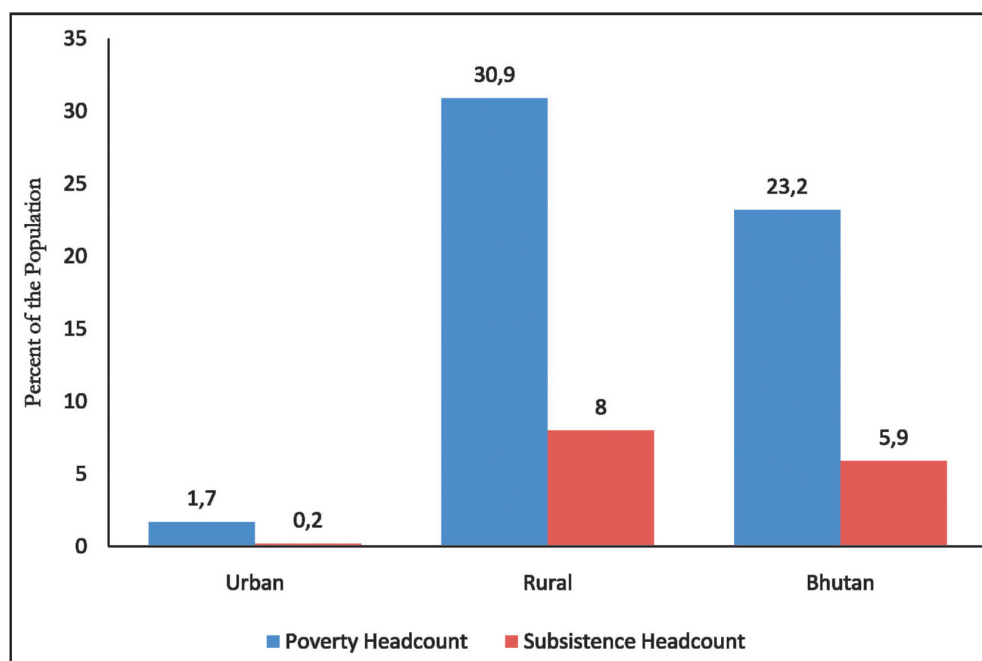
that its development focus is geared more toward assisting vulnerable groups. It is hoped that this report will become a valuable guide and tool for development planning in setting evidence-based priorities for helping those who need help the most.

Poverty Incidence

The food poverty line and total poverty line are used to compute for subsistence and poverty incidence, respectively. Figure 1 illustrates subsistence and poverty incidence, in terms of the percentage of the population, across urban and rural areas. The poverty head count i.e., the percentage of the poor persons, in the country is estimated at 23.3 percent. This means that, of the approximately 629,700 extrapolated population from the sample, there are about 146,100 poor persons who belong to households whose per capita real consumption is below the total poverty line of Nu. 1,096.94 per person per month.

It can be observed that subsistence incidence, i.e. extreme poverty, is relatively small in the country: only six in a hundred persons throughout Bhutan belong to households that are spending per person less than the food poverty line. Around thirty seven thousand three hundred persons belong to such households with per capita consumption below the food poverty line of Nu. 688.96 per persons per month. Poverty urban areas, less than two percent of the population are poor; and only one in a thousand persons are extremely poor: While the proportion of extremely poor persons in rural areas of about eight percent is quite small, this is quite large in relation to that of urban areas.

Figure 1: Poverty and Subsistence Headcount in Bhutan, 2007





The poverty and subsistence incidence statistics are shown in Table 3, together with their standard errors as well as the contributions to national poverty and subsistence. Since the poverty incidence figures are estimates based on a sample survey, it is important to consider standard errors, to indicate the level of precision of these estimates. It is estimated that poverty rate in Bhutan in 2007 is 23.2 percent, which has a margin of error of 1.5 percentage points. In other words, there is 95% confident that true poverty rate is between 21.7% and 24.7%. Urban poverty (estimated at 1.7, but which could range from 0.9% to 2.4%) is much lower than rural poverty (which is likely to be within 29.9% to 32.9%). In addition, forty nine out of fifty poor persons throughout the country reside in rural areas. Among the extremely poor; practically every one resides in rural areas. Consequently, as was pointed out in the PAR 2004, efforts toward poverty reduction ought to be largely focused toward rural development.

Table 2: Poverty and Subsistence Incidences by Area (Percent of Population), 2007

Area	Poverty Headcount		Subsistence Headcount		Population Share
	Index	Contribution to National	Index	Contribution to National	
Urban	1.7 (0.4)	1.9	0.16 (0.10)	0.7	26.4
Rural	30.9 (1.0)	98.1	8.0 9(0.5)	99.3	73.6
Bhutan	23.2 (0.8)	100.0	5.9 (0.4)	100.0	100.0

Figures in parentheses are the standards errors of the estimates

Poverty is co-related to food security and cash income. Therefore, poverty reduction involves ensuring food security and enhancing cash income. Food security in turn is the function of availability of food, access to food, and utilization of food. Food availability refers to physical availability of food in a given area at any point in time, made available either through domestic production or purchase. Access to food refers capacity to avail food either through purchase or other means. Utilization of food refers to the proper use and consumption of food by the population and involves ensuring appropriate nutritional intake, sanitation and food habits.

The VAM 2005 defines vulnerability to food shortage as a measure of decline in availability of food, access to food, or consumption levels. It confirms that food insecurity prevails in the country among certain segments of the population. The report shows that 51 Geogs are most vulnerable to food insecurity. Vulnerability to food insecurity is presented in Table 4.

Food insecurity, as in the case of poverty, is largely confined to the rural areas. Chronic food



insecurity prevails in pocket areas among landless farmers, daily wage earners, and farmers with insufficient land or livestock. Food insecurity is attributed as the main causal factor of poverty, while landlessness and lack of productive assets are the two causal agents of food insecurity. Therefore, access to agricultural land or productive assets needs to be assured for tackling poverty and food insecurity.

Table 3: Vulnerability to food insecurity by Dzongkhags²

Rank	Zones	Dzongkhags	Mean PCA Index	Levels of vulnerability
1	Central	Zhemgang	-0.32	<div>Most</div> <div>↓</div> <div>Least</div>
2	Eastern	Pemagatshel	-0.32	
3	Western	Wangdue	-0.32	
4	Eastern	Mongar	-0.27	
5	Eastern	Trashiyangtse	-0.27	
6	Western	Gasa	-0.22	
7	Southern	Sarpang	-0.20	
8	Eastern	Samdrup Jongkhar	-0.18	
9	Southern	Samtse	-0.15	
10	Eastern	Lhuentse	-0.14	
11	Western	Dagana	-0.12	
12	Western	Chhukha	-0.02	
13	Central	Trongsa	0.00	
14	Eastern	Trashigang	0.09	
15	Southern	Tsirang	0.11	
16	Western	Ha	0.49	
17	Western	Paro	0.53	
18	Central	Bumthang	0.61	
19	Western	Punakha	0.63	
20	Western	Thimphu	0.82	Least



CHAPTER 2: THE RNR SECTOR

2.1 *Introduction*

The Vision 2020 states “In our system of priorities for the future there is one priority that stands above all others: it is the need to ensure the future independence, sovereignty and security of our nation-state”. The Vision 2020 ascribes that the main objectives of development should be human development, preservation and promotion of culture and heritage, balanced and equitable development, good governance, and environmentally sustainable development.

Human development refers to improvement in the standard of living, quality of life, and levels of welfare and well-being. Culture and heritage refer to the wisdom of promoting awareness and appreciation of our rich cultural heritage which is vital to Bhutan’s unique identity, as well as interpretation of values in dynamic and development-oriented ways.

Balanced and equitable development refers to the necessity to support disadvantaged and vulnerable groups as well as to ensure that development is regionally balanced. Governance refers to the importance of developing our institutions, human resources and governing system, while environmentally sustainable development refer to the necessity of balancing the production and ecological functions of the environment.

GNH also recognizes that for happiness equitable economic development, conservation of environment, preservation and promotion of cultural heritage and enhancement of good governance are necessary.

2.2 *Principles of Sector Policy*

The RNR sector is the custodian of the country’s renewable natural resources and the natural environment. Its roles and responsibilities in contributing towards realizing the goals of the Vision 2020 and GNH are much greater than generally perceived. Following principles underlines the RNR sector policies, strategies, and programs:

- A people-centered development; aspirations of people for a better life to be realized through active public participation and community-based institutions;
- Sustainable economic development based on the country’s resource potential and comparative advantages;



- A balanced and equitable development based on country's renewable natural resources;
- Attaining an environmentally sustainable development by safeguarding the integrity of the country's fragile ecosystem; and
- Culturally sensible and responsible development preserving cultural heritage;

2.3 *The Natural Setting*

Bhutan is totally a mountainous country. The land rises from about 150 meters in the south to about 7000 meters in the north. Based on the relief, the country can be divided into three altitude zones: The Sub-Himalayan Foothills; The Inner Himalayas; and The Greater Himalayas. The Sub-Himalayan Foothills is about 50 kilometers wide with altitude ranging from about 150 meters to 2000 meters above sea level. The Inner Himalayas is about 70 kilometers wide with the altitude ranging from 2000 meters to 4000 meters. The Greater Himalayas lie over 4000 meters measuring about 30 kilometers in width.

The three broad altitudinal zones display different agro-ecological zones, shown in Table 4, determined by physiographic and climatic conditions. Although a small country, Bhutan experiences a wide range of climatic conditions. The south-west monsoon winds which come from the tropical region in the Indian Ocean and the Bay of Bengal bring heavy rainfall from June to September. The amount of rainfall diminishes from the west to the east due to the rain shadow effect of the Black Mountain Range.

Climatically, Bhutan can be divided into three broad zones: Sub-tropical Zone, the Temperate Zone, and the Alpine Zone. The sub-tropical zone can be categorized as wet sub-tropics and humid sub-tropics. The principal plant species that are found in the wet sub-tropics include sisso (*Dalbergia sisso*), khair (*Acacia catechu*), sal (*Shorea robusta*), etc. Vast expanse of savannah type grassland dominated by sua grass (*Pollinia ciliata*) also occurs in this zone. The humid sub-tropics is home to species such as alnus (*Alnus nepalensis*), walnut (*Juglans regia*), magnolia (*Magnolia spp.*), with several species rhododendron and maples as understoreys.

Oaks (*Quercus spp.*), blue pine (*Pinus wallichiana*) spruce (*Picea spinulosa*) are the dominant warm temperate species, often with bamboo and rhododendron species as understoreys. The main species of the cool temperate forest include fir (*Abies densa*), juniper (*Juniperus recurva*) hemlock (*Tsuga dumosa*), larch (*Larix griffithiana*), and birch (*Betula utilis*, *Betula alnoides*).



Table 4: Agro-ecological Zones of Bhutan

Agro-ecological zone	Altitude Range (masl)	Annual Rain-fall (MM)	Mean Temperature in Celsius	Dzongkhags
Alpine	3600-4600	<650	5.5	Gasa and some part of Bumthang, Thimphu, Wangdue, Paro, Trashigang and Trashi Yangtse.
Cool Temperate	2600-3600	650-850	9.9	Bumthang, Haa and some part of Thimphu and Wangdue
Warm Temperate	1800-2600	650-850	12.5	Paro, Thimphu and some part of Trongsa and Zhemgang
Dry Subtropical	1200-1800	850-1200	17.2	Punakha, Wangdue, Trongsa, Lhuentse, Trashigang, Trashi Yangtse, Mongar
Humid Sub-tropical	600-1200	1200-2500	19.5	Samtse, Tsirang, Zhemgang, Chhukha, Pemagatshel,
Wet Subtropical	150-600	2500-5500	23.6	S/Jongkhar, Sarpang, Dagana

Source: Department of Agriculture, 1990 and ISNAR 1992



Figure 2: Administrative Map of Bhutan

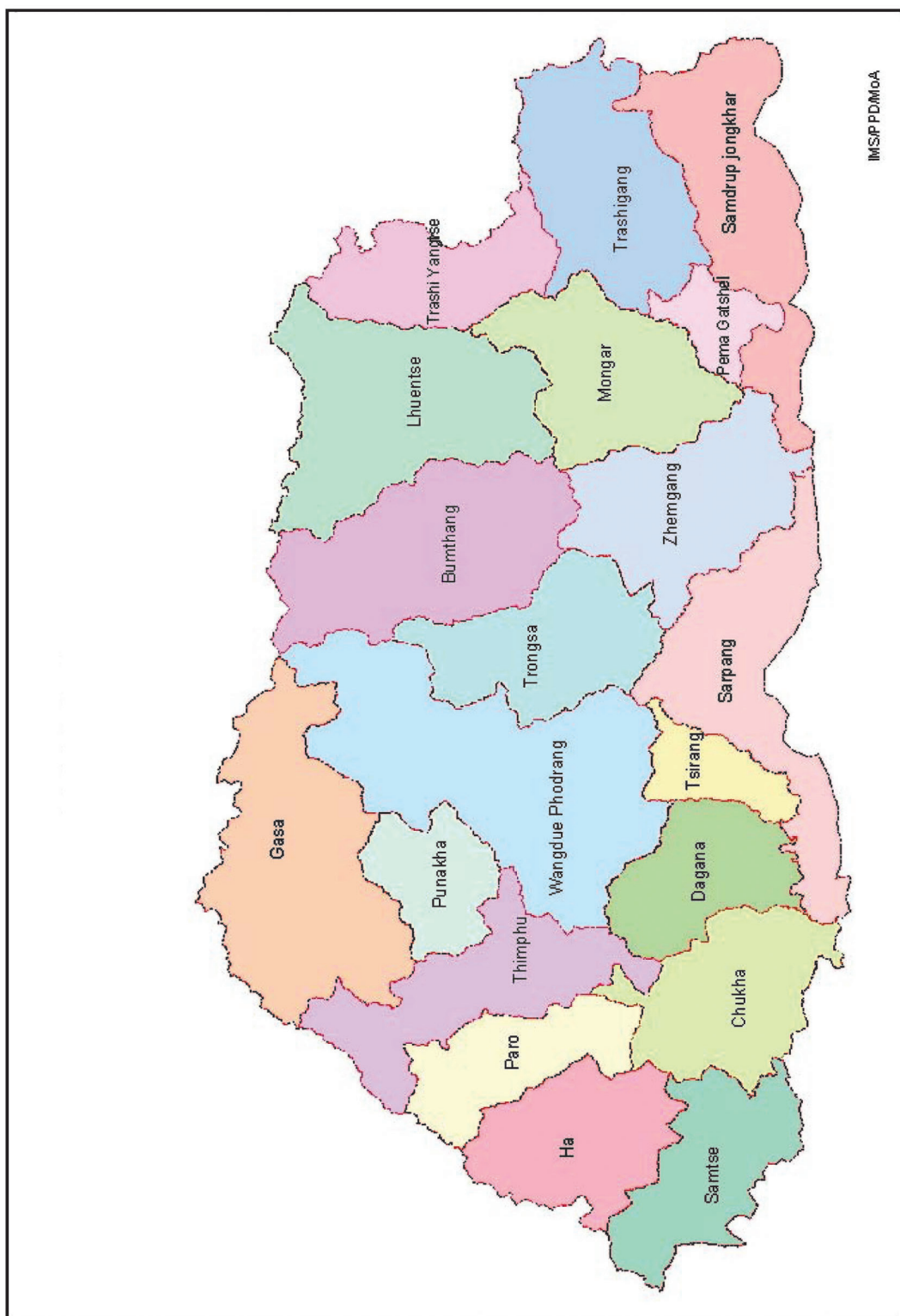




Figure 3 : Land cover Map of Bhutan

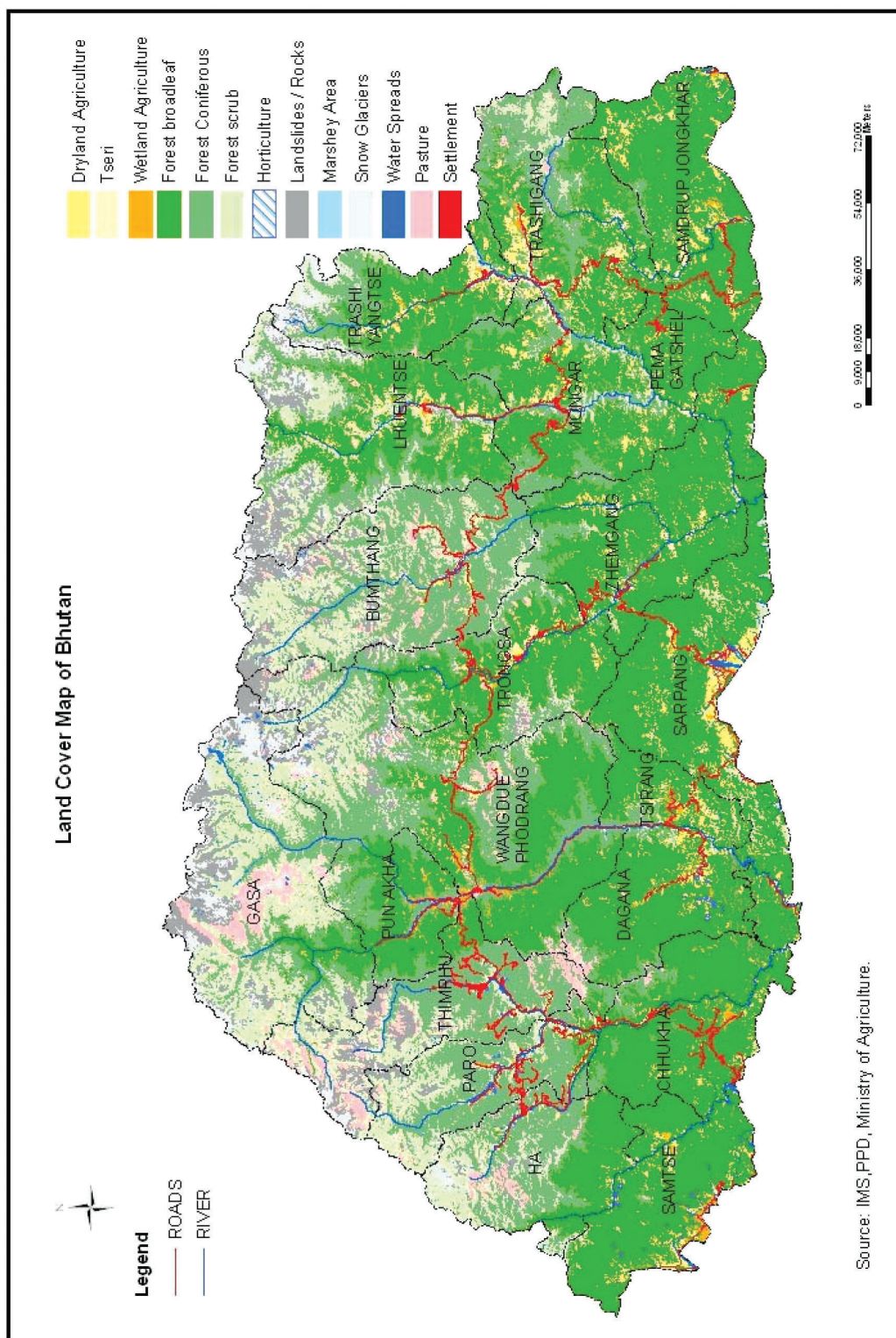




Figure 4: Agro-ecological Zones of Bhutan

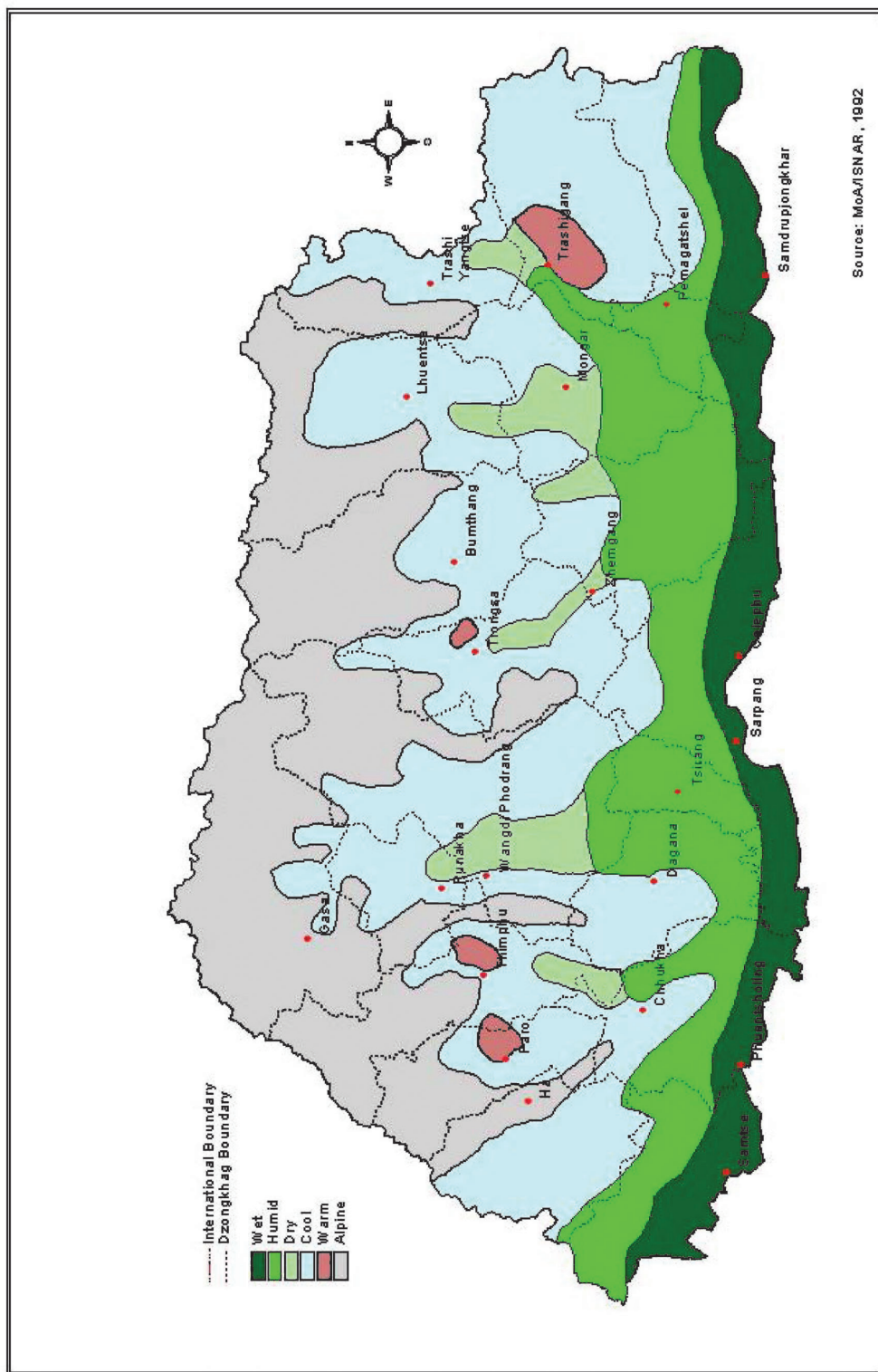
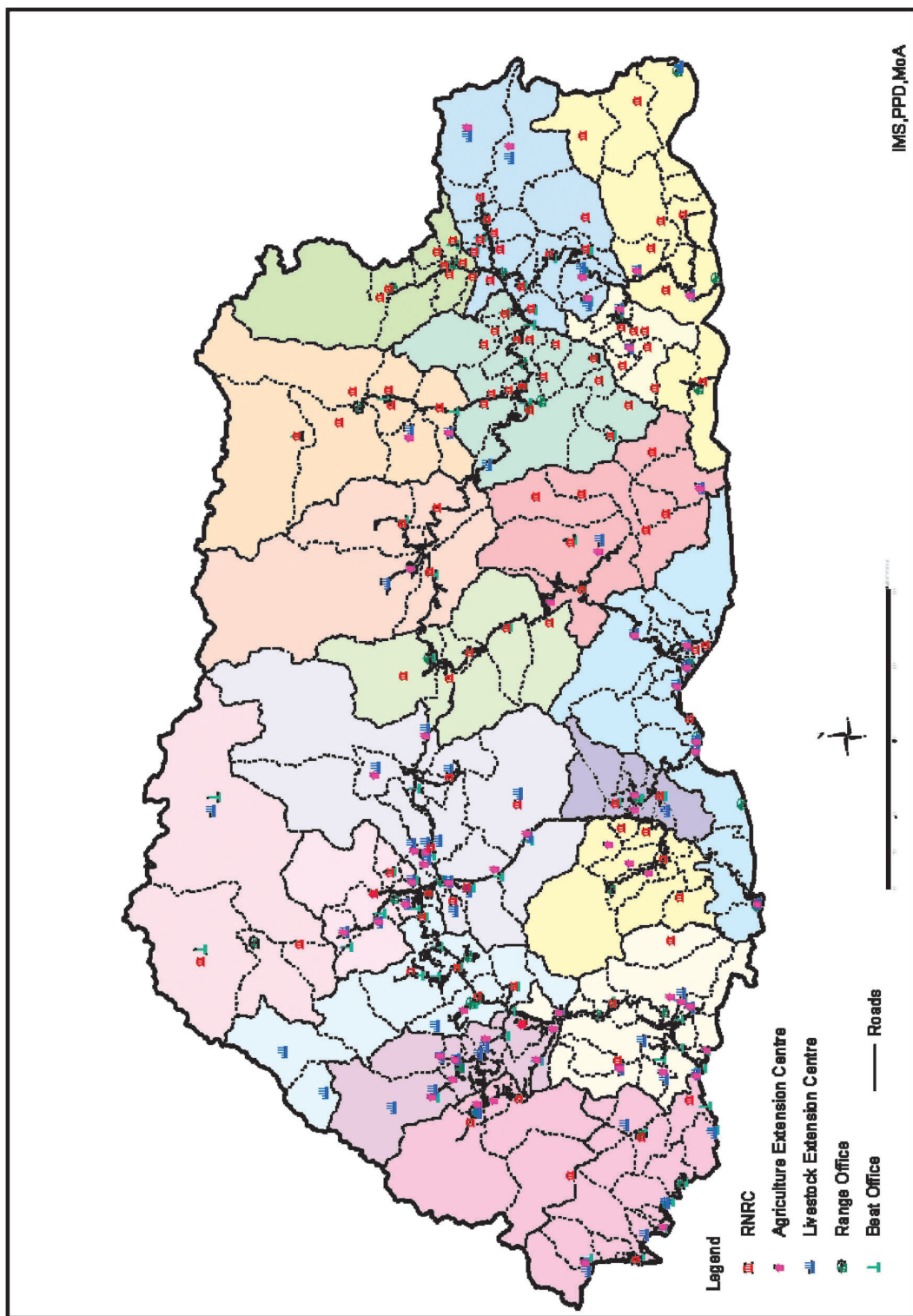


Figure 5 : Map of RNR Infrastructures





2.3.1 Natural Resource Base

Bhutan has a total land area of 38,698 km². Out of this 72% is covered by forest, 3.9% by pasture, 7.7% by agriculture, 0.1% by plantations and orchards, 0.1% by settlements, and 15% by others such as perpetual snow, rock outcrop, water spreads, etc. Land resources include both physical and biological resources in land and water. Physical resources encompass soil and mineral resources, while biological resources include flora and fauna. Flora and fauna include both wild and domesticated species and genetic resources.

Table5: Land Cover and Land Use Type

Land use type	Area (ha)	%
Coniferous Forest	1061621	26.5
Broadleaved forest	1510661	37.7
Plantation	6427	0.2
Scrub	325812	8.1
Total Forest	2904521	72.5
Natural Pasture	155346	3.9
Improved Pasture	1095	0
Total Pasture	156441	3.9
Wetland	38761	1
Dry land	97724	2.4
Tseri	88332	2.2
Mixed	84027	2.1
Total Agriculture	308844	7.7
Orchards	2222	0.1
Plantations	3566	0.1
Total Orchards	5788	0.1
Settlements	3128	0.1
Perpetual Snow	298860	7.5
Rock outcrop	200754	5.0
Water spreads	30376	0.8
Marshy Areas	3528	0.1
Landslips/ Eroded Areas	95431	2.4
Total Others	628949	15.9

Source: LUPP, PPD, MoA 1994



2.3.2 Agricultural and Livestock Resources

Agriculture involves the use of bio-physical resources for food production. The natural resources that support agriculture include soil resources, agro-biodiversity, water, and biophysical aspects. The average size of farm is 4.3 acres (Compendium of RNR Statistics 2008).

Agro-biodiversity includes domesticated plant resources which have value for food, medicines and other economic values. Bhutan has many races of rice, wheat, barley, buckwheat, mustards, and other minor crops. Table 6 summarizes the agro-biodiversity available in the country.

Table 6: Crop Diversity

Crops	Native races/species/ varieties
Rice	353
Maize	47
Wheat	24
Barley	30
Amaranthus	17
Beans	37
Peas	9
Soyabean	16
Chili	18

Source: 9th Plan Document

The traditional subsistence farming is slowly evolving into commercial ventures. Cashing on the comparative advantages is pursued consciously, along with the promotion of high-yielding and disease-and-pest resistant varieties. Small scale commercial agri-business ventures are in emergence. Value addition to agro-products through post-harvest storage and processing are new features of agricultural production system.

Orchard is another important land use as the cash income from this particular land use is by far higher than from other land use. For instance, elsewhere in the Himalayas the economic returns from the unit area of land used for orchard has been recorded as eight times higher compared to the returns from other agricultural use. Predominant horticultural crops include apple, potatoes, orange, and vegetables, while walnut, plum, pear, peach, guava, and areca nut are also grown. About 28% of the rural households own orchards (RNR Statistics 2000).



Sokshing, woodlot for leaf litter, is another land use. It is an important element of farming as it supplies leaf litter to replenish soil nutrients and to improve physical properties of soil.

Table 7: Percent holders and land area holdings by land types

Land type	Wetland	Dryland	Orchard	All types
Thram holders (%)	54.8	88.7	16.9	100
Land area (%)	17.7	76.5	5.9	100
% Area falling under land size category of “up to 5 acres”	73.8	35.3	68	44
% Area falling under land size category of “above 5 acres”	26.2	64.7	32	56

Source: *Compendium of RNR Statistics 2008*

Table 8: Agricultural Land Use by agro-ecological zones

Agro-ecological Zone	Wet-land	Dry land	Tseri	Kitchen Garden	Orchard	Sokshing	Tsam-drog	Dzongkhag
Alpine	243	349	<100	<100	<100	138	5,121	Gasa, parts of Bumthang, Thimphu and Wangdue
Cool Temperate	350	5,039	6,108	255	165	451	14,725	Bumthang, Haa, parts of Thimphu and Wangdue
Warm Temperate	4,576	7,600	2,089	425	2,513	5,342	92,212	Paro, Thimphu parts of Trongsa and Zhemgang
Dry Sub-tropical	18,679	37,349	19,188	1236	1,009	10,781	281,467	Punakha, wangdue, Trongsa, Lhuentse, Trashigang, Trashigang, Trashigang, Mongar
Humid sub-tropical + Wet sub-tropical	29,594	68,950	47,866	953	17,791	2,067	40,126	Samtse, Tsirang, Zhemgang, Chhukha, Pemagatshel, S/Jongkhar, Sarpang, Dagana



Livestock resources comprise of domesticated terrestrial and aquatic animals, such as fishes, cattle, yak, horse, goat, sheep, poultry and pig. Livestock production entails use of pasture and agricultural lands for producing livestock feed and fodder.

Livestock rearing is an integral part of agriculture. Besides economic benefits livestock enterprise is critical for renewing the productive capacity of agriculture land resources. The presence of cattle in farms is crucial for ensuring transfer of biomass from natural forests and pasture to the farms as they commute to forests for grazing and return to the farms loaded with biomass. The collective dung thus generated in the farms forms substantial part of soil nutrient. Livestock rearing includes cattle, buffalo, yak, horse, sheep, goat, pig and poultry. In 2000 about 77.5% of the rural households are involved in rearing cattle, while about 2.2% rear Yak, 23.8 % keep horse, 15.7% rear goat, 37.5% rear pigs and 65.5% involved in rearing poultry.

Table 9 : Livestock population in 2007

Livestock type	Numbers
Cattle	319,899
Buffalo	1,551
Yak	51,500
Horses	26,303
Sheep	12,415
Goats	28,300
Pigs	27,000
Poultry	200,629

Source: CountrySTAT-Bhutan (www.rnrstat.bt/csbhutan)

Pasture land use supports livestock enterprise by supplying feed and fodder for livestock population, particularly cattle and Yak. Most pasture fall within the alpine agro-ecological zone. Intensive fodder development is not common as the farmers, owing to small land holding, are unable to allocate much land for feed and fodder development.

Traditionally, livestock rearing formed part of subsistence agriculture which produced agricultural and livestock products for self-consumption. Triggered by urbanization and enterprise development in agriculture, livestock a shift toward commercialization of farming activities has seen a modest beginning. Modernization of farming has become evident in the farms closer to the urban areas. Better breeds of cattle are kept to increase production and reduce herd size. Animal health care services are becoming more efficient and effective to suit the improved breeds. Feed and fodder management are improving as well. Livestock



products from such farms enjoy the ready markets in the urban areas. Farmers are realizing the importance of working as groups to make the farm enterprise cost-effective.

2.3.3 Forest and Wild Biodiversity Resources

The forest-based natural resources include forest land, wild flora and fauna. The floral resources include timber and non-timber resources grown in broadleaved and coniferous forests. The availability of non-timber resources are yet to be estimated. The alpine areas also harbour a host of medicinal plants and other non-timber forest products. The faunal resources include both aquatic and terrestrial species.

Out of the total forest area about 39.5 percent is set aside as protected areas and biological corridors for environmental conservation. A preliminary assessment of forest resources in the country has indicated that about 54% of the total forest, excluding the protected areas, is found unsuitable for commercial forestry due to steep lie of the land. It turns out that this portion of the forest is more valuable for protective function than productive function. About 8% holds potential for commercial forestry in which trees can be harvested and the new forest can be created through planting.

The most tangible economic use of forest is for timber. The timber is supplied to the market from the forest management units, which are operated under a scientific plan. So far 15 forest management units are in operation covering 4.4% of the total forest area.

The timber resources required to meet the urban demand are harvested by corporation accordance with management plans, which are then sold to the private sawmills. The sawn timbers are traded in the local market by sawmillers. Generally, timber for rural populations is supplied by the Natural Resources Development Corporation Limited (NRDCL). Where NRDCL cannot operate rural people are allowed to harvest their requirement as per approval of the Government. As a new initiative, community groups are formed to create community forests and manage them for their own use. In addition, rural communities depend on the forest for fuel wood, farming tools and implements, grazing, sand and boulders, leaf litter, grazing, fodder, and food.

There is a wide ranging intangible and priceless ecological benefits associated with forest. In addition, terrestrial rivers find their courses through forest which regulates the flow and ensure that the lag time is longer during the storm and the fluctuation between and the base flow and the peak flow is low. Moreover, forested watersheds guarantee minimum sedimentation of rivers. This phenomenon is desirable for a cost-effective and sustainable hydropower generation as the cost of de-silting dams can be minimized and the potential of running power plants at higher capacity during the lean season is high.



The forest production system is characterized by sustainable management of timber resources. Regeneration of timber resources through natural and artificial regeneration methods is an important aspect of this system. Management of forest resources for renewable energy is also an important aspect of the forest production system. In addition, the forest production system includes sustainable management and utilization of non-timber forest products, such as medicinal plants, edible natural forest products, bamboo products, etc. for both rural and industrial uses.

Occurrence of the Palearctic realm of Euro-Asia and the Indo-Malayan realm of the Indian sub-continent, together with complex physiographic and climatic factors, endow Bhutan with biodiversity. The diverse ecosystems, almost intact, provide habitats to a wide spectrum of species which are repository of genetic materials. Owing to this, Bhutan is recognized as one of the 10 biological “hotspots” on earth. Relatively large fraction of land with natural forests is set aside as protected areas. The ecological integrity is maintained through *in situ* conservation of ecosystems and species. There are nine protected areas as parks or wildlife sanctuaries that together constitute 39.5 percent of the country including 9.5 percent biological corridors covering some 3804 km² of forest area to enhance the mobility and movement of organisms.

The biodiversity resources in Bhutan have wide ranging values, ranging from spiritual, ethical, educational, cultural, and aesthetic values to a host of economic values. While the economic values are not quantified, biodiversity resources certainly provide food supplements as well as fibre and medicine.

The natural biodiversity encompasses organisms residing in terrestrial and aquatic ecosystems. The terrestrial ecosystems include tropical lowland forest, sub-tropical hardwood forest, temperate broadleaved forest, chir pine forest, blue pine forest, mixed coniferous forest, fir forest, juniper and rhododendron shrub forest, alpine meadows, and permanent snow and glaciers. It is estimated that there are around 5,500 species of vascular plants, more than 770 species of birds and more than 160 species of mammals inhabiting the terrestrial ecosystems. High-altitude fauna include “flagship” species such as snow leopard, blue sheep, red panda, tiger and takin. In the temperate zone, tiger, leopard, goral, serow, grey langur and macaques are found. Old growth in the temperate broadleaved forests provides habitat for the Himalayan black bear, red panda, squirrels, sambar, wild pig and barking deer. In the lush tropical forests of the south, animals include the tiger, clouded leopard, elephant, greater one-horned rhinoceros, water buffalo and golden langur.

The aquatic ecosystem encompasses the network of rivers which emanate from the northern glacial lakes and flow to India. Glacial and fresh water lakes, hot springs and marshy areas and irrigated paddy fields form part of the aquatic ecosystem.



The ecological integrity is maintained through *in situ* conservation of ecosystems and species. There are nine protected areas as parks or wildlife sanctuaries that together constitute 39.5 percent of the country including 9.5 percent of the areas under biological corridors biological corridors covering some 3804 km² of forest area to enhance the mobility and movement of organisms.

Table 10: Commercially Used Forest

Agro-Ecological	Name of Forest Management Unit	Area covered by Management Plan (ha)
Cool Temperate	- Karthung	4716
	- Wewathang	17537
	Sub-total	22,253
Warm Temperate	- Haa East	7040
	- Sele La	9253
	- Paro-Zorsh	16150
	- Changay-Hele La	4692
	- Gidakom	13100
	- Khatela	9407
	- Gogona	8080
	Sub-total	67,722
Dry Sub-tropical	- Korila	13840
	- Lingmethang	10578
	- Khaling	7277
	- Chendeji	9706
	- Dongdechu	4856
	- Wangdigang	9620
	Sub-total	55,877
Total		145,852



2.3.4 *Water Resources*

The four major rivers with their numerous tributaries endow Bhutan with abundant water resources which have multiple use potentials at the national level. The annual discharge is estimated at more than 50,000 million cubic meters and the per capita water availability is one of the highest in the region. Water resource, as a vital input to agriculture, fulfills objective of increasing food security. It also enhances socio-economic development through generation of hydropower; contributes to industrial development and urbanization. Water also upholds health and sanitation and contributes to reducing expenditure on health care. The agricultural water requirements are met from tertiary and secondary tributaries of the major river systems. The demand for domestic water is mostly fulfilled by water from local springs and small streams.

In addition to domestic uses, continued availability of water is crucial for agricultural production, hydropower generation and industrial development. Water is indispensable for agriculture, the predominant sector in the Bhutanese economy, which provides a livelihood for around 69.1 percent of the labour force. Irrigation is largely limited to land that is terraced and supplied by an irrigation canal (wet land) and accounts for around only 14.5 percent of total agricultural land. Bhutan is endowed with abundant water resources with multiple use potentials at the national level. RGoB recognizes water as the main resource for fulfilling Bhutan's objective of socio-economic development based on increasing agricultural self-sufficiency, harnessing hydropower potential and industrial development. The four major rivers with their numerous tributaries that drain the country constitute the water resources potential of the country.

2.4 *Demographic Setting*

The Population and Housing Census Report, 2005 shows that 0.49% of the total population reside in the alpine region, 2.54 % in the cool temperate region, 23.1 % in the warm temperate region, 28.92% in the dry sub-tropical region, 30.65% in the humid sub-tropical region, and 14.31% in the wet sub-tropical area. In other words, 25.66 % of the population resides in the Inner Himalayas, while 73.88% resides in the Sub-Himalayan Foothills. Even though average population is low, population density is the highest in the Sub-Himalayan Foothills followed by the Inner Himalayas.



Table 11 : Distribution of Human and Livestock Population by Agro-ecological Zones

Agro-ecological zone	Human population	
	Nos.	%
Alpine	3,116	0.49
Cool Temperate	16,116	2.54
Warm Temperate	146,757	23.1
Dry Subtropical	183,607	28.92
Humid Subtropical	194,600	30.65
Wet Subtropical	90,786	14.3
Total	634,982	100

Source: Pe&HCoB, 2005

2.5 Economic Setting

Bhutan is an agrarian country. The economy depends heavily on sustainable management of the natural resources. Most of the population lives in rural areas, where agriculture is the main source of employment and livelihood. Other sectors, such as hydropower, forestry, and tourism, also depend on the protection and sustainable utilization of forest and land resources. The economic potentials related to the sector are realized through agricultural, horticultural, livestock, forest production and environmental conservation for ecosystem services. All these production systems jointly contribute at least one fourth to the overall economic growth.

The agricultural production system encompasses both agriculture and horticulture. The agriculture undertakes production of wetland and dry land agricultural crops. The horticultural production includes cultivation of horticultural crops exclusively on dry land. Agriculture land use consists of wetland, dry land, orchard, *sokshing*, shifting cultivation, and kitchen garden. Wet lands are terraced fields commonly found in relatively broad valleys and on gentle slopes. Traditionally, this category of land is irrigated and used mainly for cultivation of rice, which is the staple. However, in some of the farms close to urban centres complimentary use of wetlands for growing vegetables and wheat is common. About 59% of the rural households own wetland.

Dry lands are primarily used for growing food crops such as maize, wheat, buckwheat, barley, foxtail millet, mustard, vegetables, finger millet, potatoes, soyabeans, etc. Dry lands are characterized by steeper slopes as compared to the wet lands, and mostly occur where scope for irrigation is poor. Statistically, about 87% of the rural households own dry lands (RNR Statistics 2000). Traditionally, shifting cultivation used to be another major land use, with



about 48% of the rural households owning shifting cultivation land (RNR Statistics 2000). However, this land use has now ceased to exist with most of such land being converted to dry lands. About 26% of the rural households also own kitchen garden according to RNR Statistics 2000.

2.6 *Institutional Setting*

Since the initiation of FYPs consistent investment has been made to strengthen the government institutions and improve human resources. In early 1990s the MoA embarked on an internal re-structuring. In 1993 planning and policy functions that the Departments used to dispense were consolidated and integrated into the Ministry and a Policy and Planning Division (PPD) was created. Similarly, administration and finance functions of the Departments were consolidated and integrated into the Ministry for which Administration and Finance Division (AFD) was created. These two divisions were mandated to provide services to the Departments related planning, policy, administration and finance. The rationale behind this organizational change was to free up the Departments from such functions in order ensure more time for them to focus on technical matters. Around the same time, inherent interdependence of agriculture, forest, and livestock was conceived as critical factor for sustainable agricultural development. Integrating agriculture, forest and livestock gained focus and significance and ushered in organizational changes within the ministry. In 1993, research and extension services were combined together and the DoA, renamed as REID, was made responsible for this. Research and extension services of the DoAH were merged with the REID, while only research service of the DoF was merged with it. Forestry extension service continued with the DoF, renamed as DFS. The agricultural and livestock input supplies and farm mechanization were combined together and merged with the DoAH, which was renamed as the CLSD. Also in 1993 NRTI, BFI, FCB and BLC, later renamed as FDCL and now NRDCL, became autonomous agencies under the MoA. In 1999 further reorganization continued and the REID was renamed as the DRDS, FSD as DOFS, and CLSD as DALSS. In the same year additional autonomous agencies were created which included QCRS, NBC, DSC, and ICS. In 2003 QCRS was renamed BAFRA and AMS was created. The DSLR was taken out of MoHCA and placed under MoA. In early 2003 DRDS was bifurcated into DoA and CoRE. The DALSS was renamed as DoL. In the same year the CoRE was renamed as CoRRB. The College of Natural Resources (erstwhile NRTI) is now under the auspices of the Royal University of Bhutan.

2.6.1 *Mandates and Functions*

The key functions of the Ministry of Agriculture are as follows:

- To develop agriculture, livestock and forests for the benefit of the Bhutanese people through continuous research and development process;



- To raise the living standard of rural people through the promotion of income generating agro-based enterprises, reduction of drudgery and improvement of nutrition and health, access to services, market and information;
- To protect the country's natural environment through the sustainable and judicious use and management of its land, water, forest and biological resources;
- To ensure food safety through preventive and mitigation measures including quality control of all RNR based consumer products and produces and regulatory measures; and
- To represent the interest of the rural people of the country in the functions of the government.

2.6.2 Organizational Set Up

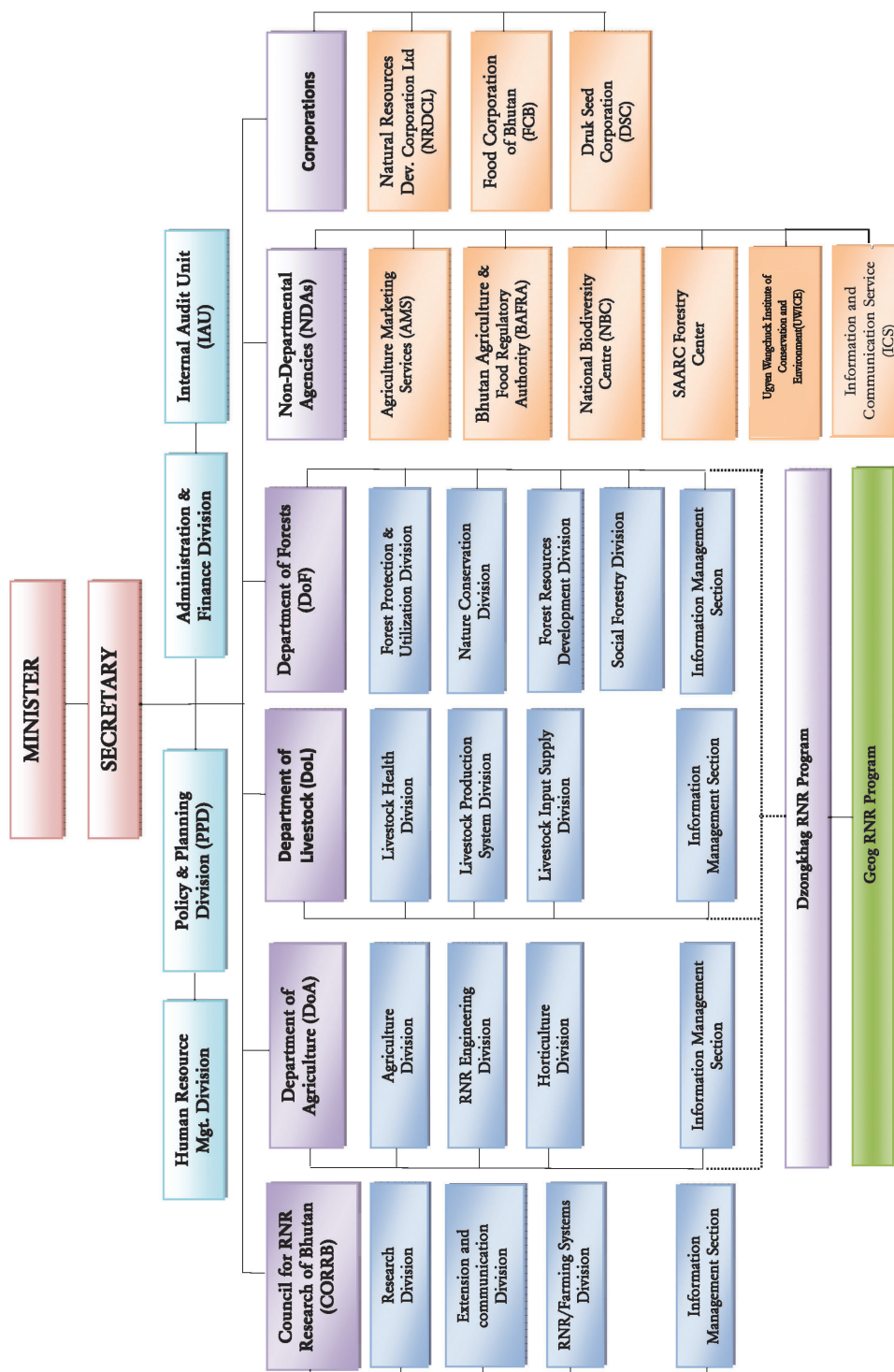
The Ministry of Agriculture is headed by a Minister who is supported by a Secretary. The Secretariat of the Ministry, which is supported by the PPD and the AFD discharge policy analysis, planning, financial and administrative functions. The DoA, DoL, and DoF discharge technical functions. Specialized cross-sectorial supports and services are provided the non-departmental agencies: NBC, BAFRA, and ICS. Commercial functions are discharged by FCB, FDCL and DSC. The research programs are implemented by CoRRB. The departmental programs include technical support by the central agencies to the Dzongkhag and Geog programs. The field programs are planned and implemented by the technical staff posted in Dzongkhags and Geogs. In the case of forestry, a functional division at the centre provides technical support to the decentralized Dzongkhags and Geog programs. There are other functional divisions at the centre which provide technical support to the territorial divisions, national parks and wildlife sanctuaries. The territorial divisions, national park management offices, and wildlife sanctuary management offices implement their programs as central programs. These agencies also are responsible for law enforcement.

Generally, non-departmental organizations provide support to the technical departments in terms of communication and information services, marketing services, law enforcement, and ex-situ agro-biodiversity and animal biodiversity conservation services.

As of the beginning of the 10th Plan the Organizational Structure of MOA looked as presented in Figure 6.



Figure 6: RNR Sector Organizational Structure for the Tenth Plan (2008-2013)





CHAPTER 3: PERFORMANCE REVIEW OF THE 9TH PLAN

3.1 Introduction

In the 9th Plan the objectives pursued by the RNR sector are (i) Attainment of National Food Security; (ii) Conservation and Management of Natural Resources; (iii) Enhancement of Rural Income; and (iv) Generation of Employment Opportunities

The following strategies were employed to realize the objectives: (i) Creation of an enabling policy and legal framework; (ii) Improving planning and management of the programs; (iii) Improving monitoring and evaluation; (iv) Generation of appropriate technology; (v) Delivery of extension services; (vi) Creation of an enabling financial environment; (vii) Delivery of inputs to farmers; (viii) Mechanization of farming; (ix) Enhancing markets for primary products; (x) Developing infrastructure; (xi) Diversification of the sector; (xii) Enhancing the integrity of the natural resources; (xiii) Promotion of economic growth and employment; (xiv) Strengthening human resources and capacity building; (xv) Introduction and adoption of information technology; (xvi) Mobilization of financial resources; (xvii) Strengthen administrative and financial management of the programs; and (xviii) Strengthening National Geo-Information Management System and Geo-Physical Survey and Technology Transfer.

The strategies that contributed towards achieving all the four objectives are: Strengthening administrative and financial management of programs; Creating of an enabling policy and legal framework; Improving planning and management of the programs; improving monitoring and evaluation; Introduction and adoption of information technology; and Strengthening human resources and capacity building.

In the area of administrative and financial management automated budgeting accounting system and revenue accounting system have been introduced. The work related to these two areas has become efficient and cost-effective. Delivery of financial services related to payment for procurement of both office items and construction, have been improved. Follow up on the audit observations has been intensified and systematic actions were rendered.

Considerable efforts have been dispensed to make policy and legal environments more enabling for effective implementation of programs of the sector. The BAOB 2003 has been enacted. Drafting of the rules to enforce the Act has been initiated. A WVP have been formulated. A WA has been drafted. Revision of the LA has been initiated. The FA 2005 has been enacted. The FNCR has been revised. A NAP has been drafted. Drafting of a NPGP Policy has been initiated. A national framework for organic production has been developed and adopted. A NFSS has been adopted. A HMP has been drafted and adopted. Utilization of *Cordyceps sinensis* for local development has been legalized. Review of agricultural subsidy has been initiated.



ASMEP, application systems for monitoring and evaluation program, was designed for the Sector. Since it could not be operationalized the manual system has been adopted partially. The ASMEP has been migrated into the national monitoring and system developed by PCS.

In the area human resource development a plan has been prepared and implemented.

In the 9th Plan, information technology was accorded due importance. An ICTMP was developed and adopted. A website and internet establishment was launched for the Sector. A LAN for MOA headquarters, the four RNR-RCs, and other non-departmental organizations has been established. Targeted audiovisual communication materials have been produced. Electronic versions of strategic documents such as RNR Census 2000, sample surveys, rural-urban migration, etc. have been published. An RAIS has been created. Over 500 varieties of local rice have been collected and catalogued.

Information and communication technologies have been employed to communicate the extension messages to stakeholders. The bi-monthly issues of RNR Newsletter, the Annual RNR Journal, and the Annual RNR Extension Diary were published. The RNR Extension Calendar produced annually. The RNR Farmers Newsletter was launched in Dzongkha. Radio program on RNR was put on the air every week.

Extension system was strengthened by improving the physical infrastructure, increasing extension staff, training extension staff, training farmers and improving extension management. During the 9FYP number extension centres increased and the number of extension staff increased by 11.5%.



3.2 Overview of 9 FYP achievements in terms of the major objectives

Main objective	Achievements	Constraints and problems	Recommendations
Food Security	<ul style="list-style-type: none"> • Cereal productivity increased by 29% • Food access improved through distribution systems, road access and market and product development. • Incidences of stunting and child mortality decreased. • RNR Food security strategy formulated • Technology generated by research system and disseminated by extension system • Input supplies provided to farmers, including improved livestock breeds, seeds, fertilizers and pesticides • Farm mechanization through provision of power tillers and other machineries. • Irrigation canals constructed and renovated. • Veterinary services provided through the extension system and regional veterinary laboratory centers 	<ul style="list-style-type: none"> • Cereal area decreased by 24% (2000-2004) • Agricultural area is diminishing • Cereal import increased • Self-sufficiency rate in cereals has decreased from 77 to 69% • Deficit of agricultural trade balance has increased • Wildlife depredation of crops and livestock • Landslides and flooding affecting agricultural land and infrastructure necessary for marketing and access • Input supplies not rationalized • Lack of targeted intervention for food security 	<ul style="list-style-type: none"> • The excess land, land conversion and related issues should be resolved with the view to ensure adequate land access • Compliance with environmental standards for rural infrastructure must be ensured through capacity building and accountability • The scope of food security must be broadened beyond cereals and direct self-sufficiency • Export-oriented agriculture production be promoted • An RNR disaster management strategy be devised • Continue scientific research on wildlife ecology for long term solution and implement short term measures • Rationalize and reorganize input supply to match the real needs in terms of timing, quality and quantity. • Target vulnerable food insecure groups and areas



Main objective	Achievements	Constraints and problems	Recommendations
Income generation and employment generation	<ul style="list-style-type: none"> Improved road and market access has boosted incomes and decreased the costs of inputs and supplies. The domestic market for processed agricultural product has grown Horticultural export volumes have increased by 13.5% Farmers' groups and enterprises established to promote livestock enterprises and boost incomes Income from NTFP increased through the CBNRM and ICDP activities, as well as legislation. Income generation from medicinal and aromatic plants National framework for national organic production Rural enterprise development program implemented through micro capital grants and technical support Large number of farmer engaged in rural infrastructure development The proportion of farmers engaged in agriculture reduced from 79% to 69% Rural Development Training Centre established in Zhemgang Employment in Resin tapping, mushroom collection, etc, increased 	<ul style="list-style-type: none"> No impact-oriented and targeted income generation approach Small holders and remote farmers economically marginalized Horticultural export values have decreased in real terms despite an increase in volume Non-recognition of farmer groups as a legal entity by the Cooperatives Act. No value addition to primary products at farm level Access to credit difficult and expensive Extension system does not address farm economics and enterprise development Population in agriculture decreasing and farming community ageing Access to credit difficult and expensive Lack of entrepreneurial spirit and skills Protection-centered natural resource management as opposed to sustainable management and utilization No clear policy and strategy to enable private sector involvement in RNR sector development 	<ul style="list-style-type: none"> Adopt targeted income generation programs, in terms of groups and area Revise the Cooperatives Act to accommodate farmer groups as legal Value addition to primary products to be integrated into farm operations Extension services should include farm economics and enterprise development Tax incentives for rural enterprises Rural credit schemes through cooperative/ farmer's bank Leasing of government land for rural enterprise Promotion of demand driven and packaged peri-urban agricultural enterprises Enhance access to natural resources through CBNRM Private sector driven small-scale natural resource-based enterprises Promote processing and value-adding agriculture enterprises



Main objective	Achievements	Constraints and problems	Recommendations
Conservation and Management of Natural Resources	<ul style="list-style-type: none"> Forest cover increased. 70% of total energy requirement met through fuelwood Community participation in forest management enhanced through community and private forestry initiatives Corridor system established and protected area increased Social forestry programs strengthened through with the establishment of Social Forestry Division Forest Management Code adopted Forest and Nature Conservation Rules revised Management plans for most protected areas and FMUs formulated Community forestry guidelines published Biodiversity conservation strategy prepared Royal Botanical Park established Land management campaign conducted and institutionalized Bhutan Water Policy, Bhutan Water Act and Bhutan Water Vision prepared Enactment of Biodiversity Act 2003 National Herbarium and Royal National Gene Bank established 	<ul style="list-style-type: none"> Watershed management plans have not been initiated as planned Annual per capita consumption of fuelwood remains the highest in the world at 1.2 tonnes per capita Losing forest areas to socio-economic infrastructure Limited accessibility to forest resources No major investment in optimizing forest regeneration Lack of management plans for NT-FPs Weak forestry extension Protection-centered management of forest resources Outdated management plans for PAs Not all PAs have management plan and those that have remain largely unimplemented 	<ul style="list-style-type: none"> Strengthen forestry extension Review and update management plans for PAs Formulate management plans for all PAs Organized timber supply from outside FMUs A comprehensive management plan for NT-FPs



Main objective	Achievements	Constraints and problems	Recommendations
Cross-cutting consideration		<ul style="list-style-type: none">• Data and information management remain weak• Lack of baseline indicators• HRD master plan not in place• 9FYP structure not logical-programs, strategies and objectives not measurably linked.• M&E system not fully functional• Accountability to results lacking• Annual plans not based on the FY plan• Financial system difficult to use in practical planning, monitoring and assessment.	<ul style="list-style-type: none">• Integrated information management system on both technical and administrative issues should be established in the secretariat.• Baseline data for major development objectives must be defined at both national and local level.• HRD master plan must be completed before the start of the 10 FYP.• The logical links between objectives, outcomes, outputs and activities must ensure in measurable terms in the 10 FYP. This should also facilitate effective monitoring and accountability to results.• The financial system should be revised to provide better services to the users.



3.3 *Issues, Constraints and Lessons Learnt and Recommendations*

Issues, constraints & lessons	Recommendations for 10 FYP
Food Security	
Inadequate conceptual clarity on food security.	<ul style="list-style-type: none">• Conceptual clarity and framework for assessment food security should be developed and understood by all.
Food security assessment requires time series data on food production, import, export, food distribution, cash income of farmers, employment, nutrition, food insecure target groups, which are not available in present information system.	<ul style="list-style-type: none">• Such information should be inclusive in information system and information sharing should be coordinated.
Coordinated intervention at enhancing food security was lacking.	<ul style="list-style-type: none">• Programs for food security should be planned coordinated and implemented at all levels and across all relevant sectors based on a national food security strategy.
The growth in other economic sectors is said to have led to the loss of active agricultural work force and created farm labor shortage. However, the information available in NP&HC reveals that 2.4% of economically active rural population is unemployed. The unemployed are vulnerable to food insecurity and therefore poverty stricken.	<ul style="list-style-type: none">• Necessary emphasis should be given to the production of niche products and to promote non-farm employment for cash income of farmers to facilitate adequate access to food.
Loss of crops and livestock to wildlife is perceived to have risen, impacting on food security negatively. Loss of crop and livestock to wildlife could not be compensated.	<ul style="list-style-type: none">• While long-term scientific research on wildlife ecology could be carried out to find a lasting solution to depredation of crops and livestock by wildlife, short-term measures to reduce the loss of crop and livestock to pest and predators should be implemented.



Issues, constraints & lessons	Recommendations for 10 FYP
Landslides and floods impacted negatively on the productivity of agricultural land vital infrastructure.	<ul style="list-style-type: none">• Enhance food reserve in to cope up with possible food shortage in times of natural or man-made disaster of catastrophic scale.• An RNR disaster management strategy should be devised as part of the national disaster management plan.• Compliance to the environmental standards in rural infrastructure development must be ensured through capacity building and accountability to avoid degradation of agricultural land and other natural resources.
Loss of productive agricultural land for infrastructure development and natural calamities continued.	<ul style="list-style-type: none">• The excess land, land conversion and related issues should be resolved to ensure adequate land for food production.
Rural Income Enhancement and Employment Generation	
Farm economics and enterprise development lacking in extension delivery system.	<ul style="list-style-type: none">• Extension services should include farm economics and enterprise development.
Concrete, impact-oriented, and targeted income generation programs were lacking.	<ul style="list-style-type: none">• Income generation programs have to be target specific in terms of groups and location based on the potential assessment. Input supplies should be packaged systematically to generate results.
Lack of value addition to primary products at farm level and difficult and expensive credit facilities also affected income generation.	<ul style="list-style-type: none">• Value addition to primary products should be integrated into farm operations.• Promotion of processing and value addition to agricultural and livestock products through private sector.
Lack of skills and entrepreneurial spirit, lack of favorable credit facilities also impacted negatively on this objective.	<ul style="list-style-type: none">• Tax incentives should be provided to promote rural enterprises and credit facilities to be made more enabling.



Issues, constraints & lessons	Recommendations for 10 FYP
<p>Small holding, remote and economically marginalized farmers were non-conducive to income generation.</p> <p>Non-recognition of farmer groups as legal entities by the Cooperatives Act impeded promotion of cooperative and group income generating programs.</p>	<ul style="list-style-type: none">• Cooperatives Act should be made enabling to recognize farmer groups as legal entity.
<p>Input generation and supply have not been based on realistic demand and clear impact through targeted areas and groups.</p>	<ul style="list-style-type: none">• Agriculture and livestock input generation and supply should be reviewed and modified to ensure the availability and accessibility to inputs in required quality and quantity for targeted areas and groups. Impact from such inputs should be pre determined.
<p>No specific policy and strategy to support private entrepreneurs to farm-based or natural resource-based enterprises.</p> <p>Importance of protection over sustainable utilization of natural resources discouraged promotion employment generation programs.</p>	<ul style="list-style-type: none">• Enhance access to natural resources through CBNRM to promote private sector driven small-scale natural resource-based enterprises.• Leasing the government land should be considered to facilitate rural enterprise. Support demand-driven and packaged peri-urban agricultural and livestock enterprises to be supported.



Issues, constraints & lessons	Recommendations for 10 FYP
Conservation and Management of Natural Resources	
Watershed management planning has not been initiated in the 9FYP.	<ul style="list-style-type: none">• Watershed planning should be initiated.
Per capita fuelwood consumption and timber price continues to be one of the highest in the world	<ul style="list-style-type: none">• Timber supply from non-FMUs to be more organized and timber supply and demand should be balanced.
Forest regeneration and restoration of degraded forests has received little investment.	<ul style="list-style-type: none">• While sustainable use of natural resources should proportionate to forest regeneration and restoration.
The potential of NTFPs continued to go untapped since no initiative was taken to formulate management plans for NTFPs.	<ul style="list-style-type: none">• Develop a comprehensive management plan for sustainable management of NTFPs
Forestry extension is relatively weak and protection of forest resources continues to receive overemphasis over sustainable utilization.	<ul style="list-style-type: none">• Strengthen forestry extension
Management plans of some of the protected areas are outdated, while some of the protected areas yet to be brought under scientific management.	<ul style="list-style-type: none">• Review and update management plans for protected areas. Formulate management plans for all protected areas.
The work on soil classification is yet to be completed and hence natural resources planning no based on land capability.	<ul style="list-style-type: none">• Soil classification and database should be completed and land capability exercise should be initiated.
Soil erosion remains as a major problem in agriculture development. Appropriate strategies and action plans are not in place. Land management is yet to become a regular program.	<ul style="list-style-type: none">• Enhance knowledge base on soils and formulate strategies to institutionalize land management and soil conservation programs



CHAPTER 4: THE 10TH PLAN OBJECTIVES, STRATEGIES AND INDICATORS

4.1 *Vision and Mission*

VISION

Sustainable natural resources for equitable social and economic well being of the Bhutanese people and the nation state.

MISSION

To ensure sustainable social and economic well-being of the Bhutanese people through adequate access to food and natural resources.

4.2 *10th Plan Theme*

The formulation of the 10 FYP has been guided by the directions provided by Vision 2020; MDGs; poverty alleviation and in the strategic push in MoA to strengthen marketing, access and production. Since by far most of the people living under the poverty are rural, MoA has a special responsibility and role in poverty alleviation.

Although, there has not been a specific poverty strategy for poverty alleviation, the sector has prepared the RNR food security strategy paper and also carried out a food security vulnerability mapping which will guide identification of strategies and coverage of programs for poverty alleviation through the RNR sector.

4.3 *Sector Objectives*

The policy objectives for the 10 FYP will be as follows:

4.3.1 *To enhance sustainable rural livelihood*

With 69% of the population living in the rural areas engaged in economic activities that are based on the natural resources, enhancement of rural livelihood will be an important development objective of the RNR sector. Making rural livelihood productive and sustainable will form a core element of this objective.



Typically, rural livelihood in Bhutan is supported by farming which is characterized by inherent interdependence among forests, livestock and agricultural enterprises. Therefore, enhancement of rural livelihood will involve improvement of economic returns from these enterprises.

Improvement of economic value of farm enterprise will be pursued through intelligent development, utilization, and management of forest, agriculture and livestock resources. Productivity of these resources will be enhanced through application of production boosting technologies, mechanization of farming, reduction of post-harvest losses, reduction of losses incurred by pest and diseases, application of information and communication technology, and improving vital farm infrastructure and production inputs.

Commercialization of farming, integration of farm enterprise into market through enhanced connectivity, upstream improvement of farm products, product specialization, improvement of trading of farm products, professional management of farm enterprises, and application of information and communication technology to integrate farm enterprise into the market are critical elements of enhancing sustainable rural livelihood.

Professional management of farm enterprise will be promoted through vocational training of progressive and enterprising farmers. Vocational training will address capacity requirement associated with commercialization of farming.

Commercialization of farming and diversification of utilization of forest resources will be promoted to facilitate development of rural-based small-scale industries to process and add value to the products. Through this alternative employment and livelihood opportunities will be enhanced.

The pursuit of this objective will lead to increase in food production and enhancement of cash income to the rural population and contribute to poverty alleviation.

4.3.2 To conserve and promote sustainable utilization of forest and water resources

Bhutan is endowed with diverse ecosystems owing to natural occurrence of complex physiographic and climatic settings. These diverse ecosystems provide a basis to social, economic and cultural developments of the country. Specific to the sector forestry, agriculture and livestock developments take place within these ecosystems.

For centuries Bhutan has realized the need to strike a balance between the productive and protective functions of the ecosystems. There is also a clear recognition that sustainability of the economic benefits depends inevitably on the vitality of the regenerative capacity of the ecosystems. Therefore, a conscious policy directs the economic use of the natural re-



sources endowed in the ecosystems such that the vital, intangible, and regenerating capacity of the ecosystems are not vitiated and devitalized. Environmental conservation continues to be recognized one of the four pillars of the Gross National Happiness, the guiding development philosophy of the country. The draft Constitution of the country makes the policy of maintaining a minimum of 60% of the total land area under forest cover and elevates the importance of ecological integrity to sustainable economic development a constitutional requirement.

The pursuit of such a wise policy has secured a high green credential to the country among the nations. Therefore, in the 10th Plan, in keeping with the policy nature conservation and sustainable utilization of renewable natural resources will receive further impetus. While the protection of environment and unique flora and fauna will form an important objective for the sector, sustainable utilizations of forest, land, biodiversity, and water resources will be accorded due importance to promote economic development of both urban and rural populations.

The conservation of the natural environment and development of renewable natural resources are also vital for long-term sustainability of hydropower, tourism, and natural-resource-based industries. Therefore, enabling such industries to realize their potentials will also be part of the objective of the sector.

While the apparent and tangible benefits of the productive functions of Bhutan's ecosystems accrue to the local populations, intangible environmental benefits and services conceivably accrue to the global communities. As part of this objective attempts would be made to secure compensation for such services such that investment to maintain the ecosystems to sustain such benefits and services becomes tenable.

4.3.3 To promote sustainable utilization of arable agriculture and pasture land resources

Sustainable utilization of arable agriculture and pasture land resources is crucial for poverty alleviation and enhancement of rural livelihood since food security and income generation – two crucial elements of poverty – are dependent on agriculture and livestock enterprise. Arable agriculture land is the basic resource for agriculture development as much as pasture land is basic to livestock development. Therefore, sustainable management of arable agriculture and pasture lands will receive more attention in the 10th Plan.

A typical Bhutanese farm economy is characterized by functional interdependence between agriculture and forest, livestock and agriculture, and forest and livestock. Nutrient replenishment and structural improvement of agricultural land depends on the flow of biomass from the forest through direct application of compost manure or livestock manure. The



watersheds are the sources of water for irrigation and livestock consumption. The forest supplements the pasture lands in providing feed and fodder for cattle. In addition, forest provides a host of resources to support the livelihood of farming communities.

The functional interdependence between forest and agriculture will be maintained in perpetuity and enhanced where necessary to enhance sustainable utilization of arable agriculture land resources. As part of this objective conscious review of how this interdependence is being vitiated will be carried out and necessary measures will be initiated to restore and strengthen.

Institutional and management arrangements will be enhanced to add impetus to sustainable utilization of pasture land resources. Logically, management practices will be improved to enhance the productivity and carrying capacity of pasture lands. Through this, economic returns will be enhanced and negative environmental consequences associated with overgrazing will be reduced. Eventually, increase in the productivity and the carrying capacity of pasture lands will be cashed on and turned into a means to reduce the incidence of grazing in the forest and reduce the problem associated with multiple uses of forest resources.

4.3.4 To enhance food security

Securing access to food is a basic human right and guaranteeing this has been a principal policy objective of the Royal Government for many years. For instance, the land reforms implemented in the 1950s and 1980s were aimed at equitable land ownership, preserving prime agricultural land, and promoting self-sufficiency in cereals to ensure food security to the population. As a result, although the income and material living standard of many Bhutanese people's are low, particularly in rural areas, the incidence of abject poverty and hunger is nonexistent in Bhutan. Indeed, this can be attributed to the welfare-oriented development policy inspired by the concept of Gross National Happiness.

For long, food security in Bhutan has been narrowly equated with enhancing food availability through striving to attain an appropriate level of food self-sufficiency. Securing access to food and effective utilization of food has been neglected. However, it is now recognized that food security means ensuring food availability, securing access to food, and effective utilization of food.

The overall goal of the Tenth Plan is alleviation of poverty. Since poverty is attributive of unavailability of food, lack of access to food, and ineffective utilization of food poverty alleviation has to address all these three issues together. In the Tenth Plan the sector will address poverty by enhancing food security through increasing food availability and securing access to food.



To enhance food security food production will be increased and access will be secured through enhancement of cash income of rural population. Since rice is the most preferred staple cereal at the moment, it is aimed at achieving a 50% self sufficiency through domestic rice production.

4.4 Sector Strategies

4.4.1 Triple Gem Approach

The RNR sector's strategies will be guided by the RNR Triple Gem of Marketing, Access and sustainable Production. The Triple Gem concept of Efficient and Effective Marketing, Improving Access and Enhancing Production will be the guiding principle and underlying commonality in all the programs and projects being implemented during the 10th Plan. The concept of Triple Gem in practice means rural development through improvement of livelihoods of farmers. It is a concept that ultimately aims at achieving the gross National Happiness for the people of Bhutan and achieving a sustainable, yet vibrant, Bhutanese economy at large.

The strategies of non-Departmental agencies should be synchronized with the strategies the Departments.

Targeted Marketing: Enhanced production and access will improve the cash income earning capabilities of the farmers. The marketing arm of the Ministry is being redefined and strengthened. A paradigm shift from subsistence farming to market driven farming is being promoted. Markets and marketing of agricultural produce from farms to the consumer centres is another critical factor for rural development. Marketing mechanisms will include value addition, as well as market intelligence to orient production to meet market demands. As Bhutan can never be a volumes player we have to concentrate on high quality produces and ensure that these are marketable. The conversion of the extra production to cash income will take place only through proper marketing.

Improving Access: Lack of access in many parts of the country is a huge challenge to the Ministry and providing access through farm and power tiller roads though expensive is demand driven. The provision of improved access will open up many of the production pockets as well as provide better connectivity. The enhanced production will also have to be moved out of the farm area and farm inputs brought in. These roads will serve to improve service delivery efficiency of the extension agents and also make the transportation of inputs and produce easier to handle. This axis of PAM also means creating better access to information and technology.



Enhancing Production: It is essential to enhance production using the best practices and suitable technologies so that the primary objective of food security is met. For this to happen, all other supporting programs and service orientation should be aligned so that production in all the sub-sectors is significantly increased. Both horizontal expansion of the land under cultivation, by bringing fallow agricultural land into production, as well as increasing the productivity of the land in use will be taken up.

4.4.2 General Strategies

In general the following strategies will be adopted in implementing the identified priority programs.

(i) Creation of an enabling policy and legal framework

Policies and legislations required for making RNR sector development more vibrant and enabling, existing policies and legislations will be reviewed and amended. Where necessary new policies and legislation will be identified, formulated and enacted. Subsidies provided under the current plan will be reviewed and appropriate subsidies and taxation will be used to enhance development and conservation processes.

(ii) Strengthening compliance to policy and legal frameworks

Compliance of stakeholders to technical and regulatory standards within the frameworks of existing and new policies and legislation will be enhanced.

(iii) Improving planning and management of the programs

Capacity and skills for planning and management of programs will be improved at all levels, including the farming communities. Management of programs will be made efficient and effective to maximize the benefit of limited financial resources. Planning and management frameworks will be improved to promote flexibility and dynamism in the implementation of programs.

(iv) Improved information management and dissemination

Decision-making will be made more objective and effective by improving the reliability and accuracy of data and information required for realistic planning and management. Information gathering, processing, retrieval and dissemination will be made efficient to improve access information; to expedite flow of information; to enhance outreach of educational and promotional programs; to maximize the opportunities offered by the information technology; to improve the effectiveness of use of print and audio-visual materials; and, to facilitate and coordinate development of spatial data standards and efficient data sharing mechanism.



(v) *Improving research services*

Research as a means to boost economic productions of farms will be strengthened. Technologies specific to different agro-ecological environments will be generated to enhance production. Adoption of production-enhancement technologies will be strengthened by improving research outreach services.

Research programs will be based on the demands of the clients. The clients will be consulted in the prioritization of research programs to ensure that the technologies generated through research serve the actual needs of the clients. Since farming in the country is characterized by multiple land use practices research programs will be designed and implemented in an integrated manner involving a multi-disciplinary team of experts and stakeholders.

(vi) *Provision of basic services*

One-size-fits-all and one-type-suits-all approaches of providing basic services such as supply of seeds, pest and disease control, and other farming inputs will give way to providing services suitable to agro-ecological specificities. Right inputs and services reaching right clients in right time will be enhanced. Cost-effective and suitable institutional and management arrangements to deliver farming inputs to the clients will be promoted.

(vii) *Delivery of extension services*

Extension services related to choice of right technologies, adoption and promotion of technologies, changing the perceptions of clients about sustainable and productive livelihood practices, reduction of post harvest losses of commodities, promotion of agricultural trade, promotion and management of farm enterprises, enhancement of cash income through economic diversification and efficient trading, value addition of agricultural commodities through proper packaging and quality assurance, formation of co-operatives to enhance marketing of commodities, improving credit delivery system, etc. will be strengthened by improving the quality of extension staff as well as strengthening the extension management system. Competency of extension agents and capabilities of clients will be enhanced through continuous training.

(viii) *Creation of an enabling financial environment*

Investment opportunities will be enhanced through proper packaging of credits at small, medium, and big scales as well as enhancing access to credit. Saving schemes will form an integral component of the agricultural credit services.



(ix) *Farm mechanization*

Farming will be transformed into cost-effective, economically efficient, more rewarding, and low drudgery enterprise by enhancing farm mechanization. Mechanization will cover a wide range of options starting from production boosting machinery to value-adding mechanical devices. Mechanization will be subsidized in order to promote specialization in farming, to alleviate farm labour shortage, to enhance the efficiency of farming, and promote privatization.

(x) *Strengthening agriculture marketing*

A marketing master plan will be adopted to expand local markets for primary products. Export of low volume and high value products will be enhanced. Vertical and horizontal integration and improvement of agricultural, horticultural, livestock and forestry products will be enhanced. Agricultural, livestock, horticultural and forest products specialization and certification will be strengthened for external markets.

(xi) *Developing adequate level of vital infrastructure*

Development of vital infrastructure such as extension centres, farm roads, power tiller tracks, quality control laboratories, irrigation facilities, research facilities, and, forestry and nature conservation outposts will be continued. Renewable natural resources extension centres will be integrated with other Geog facilities to realize the integrated Geog concept.

(xii) *Diversifying the economic base of the sector*

Harnessing of comparative advantages associated with altitudinal and climatic diversity and relatively pristine environment, high-value and low volume products, off-season produce will be improved. Optimization of economic values of medicinal and aromatic plants, floriculture, and organic fruits and vegetables will be promoted. Realization of economic opportunities inherent in agro-tourism and eco-tourism will be enhanced.

(xiii) *Enhancing the integrity of the natural resources*

Integrity of natural resources will be enhanced by improving the management of protected areas. More forests will be managed according to sustainable utilization plans. Community-based natural resource management will be enhanced through community and private forest. Ecological integrity of forest areas will be upheld by preventing environmental degradation entailed by unsustainable economic practices and by improving productive capacity of degraded forest land through afforestation and reforestation. The invaluable water resources will be protected through proper watershed management plans.



(xiv) Promotion of economic growth and alternative employment

Agriculture, livestock and forestry enterprises which have potential for commercialization will be identified and promoted as commercial enterprises and integrated into market systems. Vocational trainings will be enhanced to strengthen the management of commercial farm enterprises. Corporate management system for farm enterprise will be enhanced through institutionalization of framers' associations and co-operatives. A suitable financial system to support farm enterprises will be promoted.

(xv) Strengthening human resources and capacity

Human capital of both professional staff and farming communities will be enhanced through a human resources development master plan. Emphasis will be given to long-term as well as short-term training programs. Academic qualifications will be enhanced through continuing education programs. Strategic collaborations, partnerships and linkages with external and internal partners will be enhanced for capacity building of professional staff. Farmers' field school and study tours will continue to be employed as the principal means to educate farmers on better farming practices and farm enterprise management. Vocational training will imparted to the potential farm entrepreneurs.

(xvi) Improving the monitoring and evaluation of the programs

The National Monitoring &Evaluation (M&E) System will be strengthened to promote an effective implementation of programs. A set of program indicators will be adopted for the measurement of the impacts of the programs.



4.5 OPPORTUNITIES AND CHALLENGES

A critical aspect that challenges the country's ability to maintain national food security through agriculture production relates to the steady decline in the farming community population due to outbound migration and changes in occupation that has caused acute farm labour shortages. This is further compounded by the diminishing economic viability of food grain cultivation that has resulted in less acreage being cultivated each year and the chronic loss of crops and livestock to wildlife predation and devastation by natural calamities. As a result, there has been a continued decline in cereal cultivation and production and a corresponding drop in the self-sufficiency levels for cereals.

The Royal Government's national food security policy includes the pragmatic perspective of maintaining broad national self sufficiency through sustaining the cost of food imports (excluding processed food items) from the sale and exports of cash crops and ensuring that the latter is adequate to cover food import costs. The policy also includes ensuring that households have assured access to food at all times for healthy living. Since the country has reliable access to cheap food import for food security, mainly from India and in view of the rapidly growing local and external markets, the strategic focus necessitates a greater degree of commercialization of agriculture and specialization in horticulture export, NWFPs and niche organic products. However, in view of the global trends and market failures such as the one triggered by crop failures in major world food producers and increasing energy (fuel prices) in 2007-08, the need to maintain certain level of food self sufficiency has become inevitable. Therefore, import substitution in major crops such as rice and other basic commodities will have to be pursued through increased production levels. Efforts to enhance household food security will also be done through the market rather than a complete dependence on self-reliance.

A greater level of commercialization of agriculture and the further promotion of horticulture export, NWFPs and niche organic products represent significant opportunities to stimulate growth of the RNR sector and raise income and employment levels among the rural population while also maintaining national food security concerns. This strategic approach of utilizing urban market and export demand as a key driver for the rural economy is also highlighted in the strategic framework aspect of integrated rural-urban development for poverty alleviation.

The mechanisation of agricultural production is a way to address the labour shortage in rural areas by increasing the productivity of labour. In addition, it could make agricultural activities more attractive to the younger generation and would also generate employment opportunities related to the acquisition, maintenance and operation of farm machinery.

Actualizing this presents a realistic prospect of reducing rural poverty in a significant and sustainable way and this will be effectively capitalized on. While over the Ninth Plan horti-



culture produce and sale of NWFPs did expand in volume, the potential of earning cash income for farmers from horticulture development, organic farming, harvesting NWFPs and use of community and private forestry as a platform for poverty alleviation and income generation was not fully realized. The main constraints include the restrictions of current land use policy due to environmental concerns, ambiguity and conflict over user rights and the primacy of regional equity that resulted in agriculture investment resources being spread too thinly. Experience over the Ninth Plan reflects that the objective of enhancing household food security, rural incomes and employment could be addressed more effectively through the implementation of concrete, impact-oriented and targeted programs. The lack of or limited value addition to primary products, small land holdings and difficulties relating to access and the cost of accessing micro-credit were some of the other factors that restricted income growth from the RNR sector and will need to be addressed during the Tenth Plan.

The wildlife/farming conflict, i.e. the considerable crop losses due to wildlife pests, clearly illustrates the trade-off involved in pursuing two of the major development objectives of Bhutan: food security and environmental conservation. It should be kept in mind that not taking a decision on the issue in terms of striking a balance between the two objectives (i.e. continuing with the status quo) means in reality a bias against food security. Moreover, the issue is particularly relevant as it affects food security in two ways. First, it impacts on the availability of food due to production losses and, second, it reduces the access to food due to the forgone income of farmers. This situation appears to be even more relevant as the affected farmers belong to the most food insecure groups. Finally, there is another perspective to the wildlife/farming issue. Farmers losing their crops to wildlife might become increasingly reluctant to support the country's environmental policy. A complementary measure to be considered is the compensation of farmers for their crop losses due to wildlife. It is finally a political question how the cost of a strong conservation policy is shared between specific groups of the society (such as the affected farmers) and the society as a whole. Alternatively, subsidised crop insurance programs might help to ease the problem.

Rural-urban migration is likely to accelerate, and without mitigating action will probably lead to increasing congestion, environmental degradation, conflicts of interest, and socio-economic problems in the cities, as well as further loss of an active segment of rural society. Consequently, urban planning must try to alleviate the problems associated with the rapid urbanisation, including initiatives at both governance and practical level. In the urban areas this would entail zoning to optimise and clarify land use, harmonisation of rules and regulations, transparency in decision-making, compliance with rules and regulations, proportional sanctions and other undertakings could greatly improve the overall governance. Furthermore, development of some of the minor townships should be encouraged, particularly in the eastern part of the country. This will also provide better services, job opportunities and market outlets for rural communities in the vicinity.



CHAPTER 5: PROGRAM PROFILE

All RNR sub sector plans and Dzongkhag plans will be based on the following list of programs. There will not be different set of programs for central agencies and Dzongkhags. Programs may be interpreted as group of interdependent activities that need to be implemented to generate a desired result. For the 10 FYP the sector will implement the following programs:

5.1. Department of Agriculture

Introduction

To provide for a longer term vision for the growth and development of Agriculture sub sector, it is deemed necessary to review and formulate long term strategies for Agriculture and Horticulture development. It was also, therefore necessary to review and formulate long term policy and legislative measures to facilitate these development strategies within and even beyond the 10 FYP.

Vision

Agriculture potential is fully realized to provide equitable income and livelihood for the rural population and agriculture continues to manifest itself as a sustainable living culture that contributes to food needs, economic security, poverty alleviation and happiness.

Mission

To promote agricultural growth through increased production and enhanced rural income; develop social and physical infrastructures to make rural areas vibrant and more attractive; sustain productivity of land and water resources and pursue an appropriate agriculture development model for Bhutan that includes conservation of environment and human health and poverty alleviation.

Objectives

- Promote agriculture as a provider of employment and livelihood. Enhance and sustain the productivity of labor and land and increase and stabilize domestic food production through appropriate policies, legislation and monitoring. Food security will be enhanced through increased production of nutritionally adequate traditional foods and cereals crops, meeting at least 50% of the rice requirement internally.
- Pursue horticulture development based on agro-ecological conditions and emphasiz-



ing commercialization and specialization to transform farming from subsistence to a market-oriented farming system.

- Provide adequate support to agriculture and horticulture development through enabling legal, institutional, technical and financial environment.
- Introduce subsidies, incentives and other mechanisms as a tool for agricultural growth
- The present level of subsidy should be increased and pro-poor and farmer friendly credit policies and strategies formulated and pursued.
- Pest and soil fertility management strategies should focus on sustainability and production of healthy crops.
- Introduce regulations and strategies that minimize loss (opportunities lost, guarding cost and yield loss) by wild animals.
- Develop regulations and policies which protect and optimized use of land resources through land capability assessment;
- Develop and adopt marketing strategies that reflect interests of producers and local consumers to enhance rural income and employment.
- While basic services for agricultural development will be provided to all the geogs and farmers, special attention should be given to small, marginal and tenant farmers.
- Implement policies and programs to address rural poverty and to reduce gaps between communities and regions and between rural and urban areas.
- Develop and maintain institutions institutional mechanisms to implement the agriculture development policies and strategies. Institutional changes should be accompanied by proportionate change and allocation of mandates and resources.



Program Description

MoA/01: Arable Agriculture Commodity Development Program.

<i>A. Program Overview</i>		
1	Sector	<i>Agriculture</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty Reduction, Food security, Income generation and Employment generation</i>
3	Expected Results	<i>Increase national rice self sufficiency level from 50% to 65% (Rice production increased from 54,325 MT per year to 62,474 MT per year by the end of 10 FYP) Increase national food self-sufficiency to 70%</i>
4	Relevant MDG & SDG	<i>MDG Goal 1: Eradicate extreme poverty and hunger SDG Goal 1,2,3: Eradication of hunger poverty, halve proportion of people in poverty by 2012, and ensure adequate nutrition & dietary improvement for the poor</i>
5	Donor Agency	
6	Target Group	<i>Farming Communities</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>New</i>
9	Tentative Timeframe	<i>Five Years (2008 - 2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent:25.10 Capital:60.00 Total:85.10</i>
11	External Financing Required (Nu. in million)	<i>60.00</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Department of Agriculture, Dzongkhags and Geogs</i>
14	Documents Available	<i>National Food Security Report, 2004; National Food Security Strategy Paper, Draft Sector Tenth Plan</i>

Note: Crops included are rice, maize, other cereal crops and, oilseeds and legumes.



B. Situational Analysis:

The agricultural farming in the country revolves mainly around growing food grains for self-sustenance with about 69 percent of people depending on it for their livelihood. The major commodity crops grown in the country are paddy, maize, wheat, buckwheat, barley and millet. In 2004, there were about 127,125 acres of land under cereal crop cultivation with total production of 156,304 MT. Over the years the demand for rice is increasing since it is the most preferred cereal. The annual import of rice for the last three years is 46,629 MT (imported through FCB and private traders) valued at 384,157,000 (Bhutan Trade Statistics 2003 to 2005). The imported rice is mainly for the increasing urban population. Oilseed and grain legumes production has been a constant part of the country's farming system. Mustard is one of the major sources of vegetable oil for consumption and cash income. Grain legumes are grown in almost all parts of the country. However, production remained stagnant in terms of acreage and yield, due to low emphasis received in the past. Available sources indicate that there is potential for production of 3,110 MT of oilseed and 7,710 MT of grain legumes.

Inferring from the above situation, there is shortage of food in the country. Farmers suffer from a persistent cycle of low productivity in agriculture mainly because of poor soil fertility, low levels of input supplies and substantial crop losses due to pests and lack of proper post-harvest management. This is mainly due to low level of investments in cereal production in the past. About 56 percent of rural households experienced food shortages for more than 2 months in 2000. Therefore, substantial improvements need to be made in the delivery of improved seeds, inputs and technology, in order to achieve food security and the target of minimum 70 percent self-sufficiency in food grain production.

Inadequate institutional coordination among the technical Departments, AMS, extension services in the field and external agencies such as the MoEA has been a hindrance. There is also a need to enhance investment in areas of seed improvement, inputs and technology for commodity crops. Post-harvest management of commodity crops should be addressed collaboratively with the Post-harvest management program.

C. Strategy:

The arable agriculture commodity development program will be pursued through the overall RNR Sector's Triple Gem Approach of enhancing production, improving access and targeted marketing. In addition, the sector will be focusing on targeted intervention in the potential pockets through timely delivery of technical support, supply of improved seed varieties, improvement of crop management technology and practices, and other inputs necessary for enhancing production. Linking the production to the market will be given priority. Investments will be made to commercialize the cultivation of cereals particularly rice in selected potential areas to increase rice production for import substitution. The arable agriculture



program will be guided by a set of program specific milestones. The program will aim to enhance food availability, accessibility to food and stability of food. Stability aspect of food security will be enhanced through coordination with other programs such as land and water management programs.

The project plans shall be harmonized with the national arable agriculture commodity program to ensure optimal use of resource and avoid duplication of efforts. For more effective co-ordination, each program shall be headed by a Commodity Co-ordinator, who will liaise with relevant projects, research program and other agencies within and outside the MOA. Focus shall be given through targeted intervention in potential commodity crops at national level. Where necessary institutional coordination must be reviewed and upgraded. Timely delivery of improved seeds, inputs and technology shall be accorded priority. Improved post-harvest management shall be adopted.

D. Results Framework:

Impact	Outcome	Output	Projects/Activities
Proportion of rural households living below the poverty line reduced from 30.9% to 20% through enhanced food security	Availability: National food self sufficiency increased to 70% (food availability) Food storage and distribution houses set up in four regions.	Improved crop management (Rice production increased from 54,325 MT per year to 62,474 MT per year); Improved pest management practices adopted; Infrastructure strengthened; Post-production & marketing enhanced; Improved Soil fertility and input supply	Promoting minor cereals and oil seeds; Rice Commercialization Maize Storage & Value addition; Timely supply of inputs; Linking production to market/s Land and water management

E. Management Arrangements:

The Department of Agriculture shall be responsible for the overall execution, coordination and technical support of the program and the Dzongkhag and Gewog administrations shall carry out the implementation. The Department shall prepare a comprehensive plan for commodity and cereal crop development in coordination with all the stakeholders – researchers,



extension officers, input suppliers, producers, retailers, millers and exporters. This comprehensive plan shall be used as a guide for increased production of cereals. The comprehensive plan shall also entail the coordination mechanism among the different stakeholders.

Budget

#	Description of Projects/ Activities	Budget (Nu. in million)
1	Rice Development	30.000
2	Maize Development	10.000
3	Oil seeds and Grain Legumes Development program	10.000
4	Other cereals (wheat, buckwheat, millet etc.)	10.000
Total		60.000

MoA/02: Post Harvest Management Program.

A. Program Overview		
1	Sector	<i>Agriculture</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty reduction, Income generation, Employment generation, Food security, Environmental sustainability</i>
3	Expected Results	<i>Post harvest loss of crops reduced from 20% to 10%;</i>
4	Relevant MDG & SDG	<i>MDG Goal 1: Eradicate extreme poverty and hunger SDG Goal 1,2,3: Eradication of hunger poverty, halve proportion of people in poverty by 2012, ensure adequate nutrition and dietary improvement for the poor</i>
5	Donor Agency	
6	Target Group	<i>Farming Communities and traders</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>New</i>
9	Tentative Timeframe	<i>Five Years (2008-2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent: 46.000 Capital:99.50 Total: 145.5</i>
11	External Financing Required (Nu. in million)	<i>99.50</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Department of Agriculture, Dzongkhags and Geogs</i>
14	Documents Available	<i>Draft Sector Tenth Plan</i>



B. Situational Analysis:

The Post Harvest Management Program was initiated in 1997 with the establishment of the National Post Harvest Center under the Department of Agriculture. The main objective of the Program is to enhance market value and reduce post-harvest loss of all agricultural crops. The estimated post-harvest loss of agricultural and horticultural crop ranges between 20-30% of the total production. During the Ninth Plan, two integrated food-processing plants were established in Dagapela and Goling and one is presently underway in Pemagat-sel. About thirty dryers were established in different parts of the country for drying fruits, vegetables, and mushrooms. The adoption of post-harvest technology has increased through the conduct of various demonstrations and promotional programs; for instance, the use of improved packaging materials such as fiberboard and plastic crates has had a major impact. In 2006, a consignment of apples (preserved in cold storage) was exported to Bangladesh for the first time. Continued support would be required during the Tenth Plan especially in the area of creating awareness on post-harvest management and technology.

Notwithstanding the achievements, Post Harvest Management Unit (PHU) of the Ministry must strengthen coordination and collaboration with the BCCI, Agro-Industries and cottage food industries. Post-harvest management of crops requires development in terms of infrastructure and technology.

C. Strategy:

The main strategies in the Tenth Plan will include improving post harvest handling through introduction of appropriate technology, infrastructure development and demonstration and trainings. The program will also continue to support small-scale food processing enterprises to crops to enhance rural income, food security and create rural employment. During the 10th Plan, major investments will have to be made in the development of agriculture based infrastructures. Cold stores, modern packing houses, food processing enterprises, modern crop handling and transport system are imperative to reduce loss, increase value and revolutionize the way crops are handled, marketed and consumed.

The program shall strengthen linkages within the Ministry and agencies outside the Ministry particularly BCCI, Agro-Industries and cottage food industries. Assistance through introduction of appropriate post-harvest value addition technologies, especially for the cottage food industries shall be given due importance.

**D. Results Framework:**

Impact	Outcome	Output	Projects/Activities
Mean annual rural household cash income increased from Nu. 10,700 to above Nu. 35,000	Reduce post harvest losses of agricultural and horticultural crops by 10% from the estimated 20%.	Post harvest handling & Food processing technologies improved;	Development of post-harvest handling technologies & value addition;
Proportion of rural households living below the poverty line reduced from 30.9% to 20% through enhanced food security	Enhance the market value of agricultural crops by 5 – 10%.	Improved post harvest infrastructures for agriculture crops particularly HH level (1-2 mt) maize store established;	Infrastructure Development;
		Rural food industries established	Development of Rural Food Industry

E. Management Arrangements:

The Department of Agriculture shall be responsible for the overall execution and coordination of the program. The National Post-Harvest Center under the Department shall provide technical support in collaboration with the Research centers, Agriculture Marketing Services Division, Agriculture Machinery Centre and Extension services for implementation by the Dzongkhags and Geogs.

Budget:

#	Description of Projects/ Activities	Budget (Nu. in million)
1	Development of Post-harvest Handling Technologies & Value Addition	34.300
2	Development of agri-based Rural Enterprises	15.200
3	Infrastructure Development	50.000
Total		99.500

***MoA/03: Integrated Pest Management Program.***

<i>A. Program Overview</i>		
1	Sector	<i>Agriculture</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty Reduction, Income generation, employment generation, environmental sustainability</i>
3	Expected Results	<i>Reduced pre-harvest crop losses to pest(including wildlife) and diseases from 20-30% to 10-15%, and minimize crop losses to storage pest from 25-20% to 15%</i>
4	Relevant MDG & SDG	<i>MDG Goal 1&7: Eradicate extreme poverty & hunger, and ensure environmental sustainability SDG Goal 1,2,22: Eradication of hunger poverty, and halve proportion of people in poverty by 2012, and ban on dumping of hazardous waste, including radioactive waste</i>
5	Donor Agency	
6	Target Group	<i>Farmers with special focus on vulnerable Geogs</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>Ongoing/ New</i>
9	Tentative Timeframe	<i>Five Years (2008-2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent:38.720 Capital: 30.00 Total: 68.720</i>
11	External Financing Required (Nu. in million)	<i>30.00</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Plant protection service center, extensions, Dzongkhags and Geogs</i>
14	Documents Available	<i>Draft Sector Tenth Plan</i>



B. Situational Analysis:

The Plant Protection Program was initiated with the start of the Agriculture Development Program in the early 1960s. Due to the diverse ecological condition, the country is prone to a diverse spectrum of pests and plant diseases that cause heavy crop losses. Unlike in other parts of the world, the magnitude of crop losses to pests in Bhutan has not been accurately assessed. However, sources from various estimates indicate that the overall pre-harvest loss to pests is about 20 to 30 percent and post-harvest loss to storage pests is about 10 to 20 percent.

In the past development plans, research were undertaken on plant pest and diseases such as citrus fruit fly, rice blast disease, potato late blight disease, apple scab, chilly blight disease, diamond back moth on cabbage and cauliflower, etc. Extensive surveys were carried out on wild boar problems in relation to crop damage, social costs of guarding crops at night, and use of traps and citrus greening diseases. A database on pests and diseases is also maintained at the National Plant Protection Center and the information is made available through journals, newsletters, etc.

C. Strategy:

The focus of the Tenth Plan will be to reduce pre-harvest and post-harvest losses to pests by about 50 percent or achieve a storage pest loss of 5 to 10% and pre-harvest loss of 10 to 15%. This target will be achieved through research and development, adoption of appropriate pest management technologies, development of institutional framework and good agricultural management practices, strengthening information/database and enhancing awareness and building capacity of the extension workers and farmers. Recognizing crop depredation by wildlife as a major problem faced by the farming communities, special focus will be given to mitigate the problem including compensation schemes.



D. Results Framework

Impact	Outcome	Output	Projects/Activities
Proportion of rural households living below the poverty line reduced from 30.9% to 20% through enhanced food security	Reduced pre-harvest crop losses to pest (including wild-life) and diseases from 20-30% to 10-15%, Minimize crop losses to storage pest from 25-20% to 15%	At least 20% of the farmers adopt integrated pest management (pre and post harvest pest management practices) and good agricultural practices.	Development of Integrated Pest Management and good agricultural practices for major crops; Improved diagnostic and other service facilities Awareness Campaign and Training

E. Management Arrangements:

The Department of Agriculture shall be responsible for the overall execution and coordination of the program. The National Plant Protection Center of the Department of Agriculture shall take the lead role in the implementation of the program in coordination with the Dzongkhags and Geogs.

Budget

#	Description of Projects/ Activities	Budget (Nu. in million)
1	Integrated Pest Management, Awareness Campaign, and Farmers Training	10.000
2	Infrastructure Development	20.000
Total		30.000

***MoA/04: Irrigation & Water Management Program.***

A. Program Overview		
1	Sector	<i>Agriculture</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty reduction, Income generation, Food security, Employment generation,</i>
3	Expected Results	<i>Portion of wetland with dry season irrigation increased from 40% to 70%.</i>
4	Relevant MDG & SDG	<i>MDG Goal 1: Eradicate extreme poverty and hunger SDG Goal 1,2, 21: Eradication of hunger poverty, halve proportion of people in poverty by 2012, wetland conservation</i>
5	Donor Agency	
6	Target Group	<i>Farmers in rural areas</i>
7	Scope	<i>Nationwide</i>
8	Status-Ongoing or New	<i>Ongoing/New</i>
9	Tentative Timeframe	<i>Five Years (2008-2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent:0.000 Capital:70.50 Total:70.50</i>
11	External Financing Required (Nu. in million)	<i>70.50</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Department of Agriculture, Dzongkhags and Geogs</i>
14	Documents Available	<i>Draft Sector Tenth Plan</i>



B. Situational Analysis:

Irrigation development in the country so far has, more or less been confined to paddy irrigation. Paddy is grown in almost all Dzongkhags and at least 62,000 acres are irrigated paddy land, contributing to 34.5 percent of the cereal production in the country (Agriculture Statistics, 2005). According to RNR Statistics 2000, while area under paddy cultivation has been reduced because of loss of land to urban expansion, industrial development, and government infrastructure development, the yield per unit area has increased. In 2005, paddy production was 67, 606 MT.

In the past, development assistance focused mainly on construction of new irrigation channels and rehabilitation and renovation of the existing channels to augment seasonal shortage of water supply. During the Ninth Plan, about 133.21 km of new irrigation channels have been constructed and 458.56 km have been renovated.

In the Tenth Plan, 60 km of irrigation channels will be constructed in the 6 eastern regions through the IFAD funding. Other Area Development Projects like ECRADP and DRDP will continue to support construction of new irrigation schemes and improve existing ones. Support on irrigation development is thinly spread across country irrespective of the potential areas for development. Management of existing irrigation systems by the farmers are generally weak leading to low water use efficiency. Implementation of irrigation projects and the National Irrigation Policy (NIP) modules have become weak following the transfer of irrigation engineers to MoWHS. Knowledge of extension agents on NIP modules is weak. Research on irrigation and water management is very limited. Except in the form of some demonstration plots for orchards using drip irrigation there is no RGOB support vis-à-vis irrigation, for crops other than paddy. The focus of Irrigation development on crops other than paddy must be enhanced. The functioning of Water User's Association have been fairly inefficient. Information management on irrigation schemes are at best sketchy.

C. Strategy:

Sector strategies in the Tenth Plan will include the exploring of water sources and adoption of appropriate technologies to improve access to water and efficiency in the use of water resources including the options of water harvesting/lift pump and drip irrigation. More resources will be invested in areas where there is potential for increased production of paddy through wetland expansion and improved irrigation water supply. Potential for groundwater development in the southern belt will be explored.

The Water User Associations will also be strengthened through trainings and workshops in order to ensure sustainable management of water resources. Training will be provided to extension agents in the implementation of NIP modules. Extending irrigation to crops other than paddy will be one of the focuses in the Tenth Plan. Information management of



irrigation schemes will be improved by updating the national irrigation inventory/database and ensuring a mechanism of periodic updation. This will assist in planning of irrigation development in the future. Protection & re-vegetation of catchment with suitable species will be explored to rejuvenate water source wherever possible in potential and feasible areas and where watershed program do not cover such irrigation source protection.

D. Results Framework:

Impact	Outcome	Output	Projects/Activities
Proportion of rural households living below the poverty line reduced from 30.9% to 20%	Portion of wetland with dry season irrigation increased from 40% to 70%.	Taklai Irrigation channels renovated; Alternative water sources/technologies explored; Studies/policy review conducted & database developed; Water User Associations formed and their capacity strengthened; Extension agents trained on NIP modules.	Renovation of Irrigation Channels in emergency; Renovation of Taklai Irrigation Channel; Water Harvesting & Irrigation of Cash Crop; Drip & Sprinkler Irrigation Trials; Feasibility Study of large scale irrigation and Ground Water; Policy Review & Database Development; Establishing and Strengthening of Water User Associations

E. Management Arrangements:

The Department of Agriculture shall be responsible for the overall execution and coordination of the program. The Dzongkhags and Geogs, however, shall implement the construction, renovation, and rehabilitation of irrigation channels.

**Budget**

#	Description of Projects/ Activities	Budget (Nu. in million)
1	Renovation of Irrigation Channels in emergency including renovation of Taklai irrigation channel	35.000
2	Water Harvesting & Irrigation of Cash Crop	12.500
3	Policy Review and Irrigation Database Development	1.000
4	Strengthening Water User Associations	3.000
5	Drip & Sprinkler Irrigation Trail	4.000
6	Feasibility Study for large scale irrigation	15.000
Total		70.500

***MoA/05: Seed and Plant Development Program.***

A. Program Overview		
1	Sector	<i>Agriculture</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty reduction, Income generation, Food security, Environmental conservation, Employment generation.</i>
3	Expected Results	<i>Quality and quantity of seeds and planting materials supply increased from 2 % to 50% of requirement</i> <i>Availability and access increased from 100 mt to 600 mt of food crops and, fruit seedlings from 2,00,000 nos to 5,00,000 nos</i>
4	Relevant MDG & SDG	<i>MDG Goal 1, 7: Eradicate extreme poverty and hunger, ensure environmental sustainability SDG Goal 1, 2,: Eradication of hunger poverty, halve proportion of people living in poverty by 2012</i>
5	Donor Agency	
6	Target Group	<i>Farming communities</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>New</i>
9	Tentative Timeframe	<i>2008-2013</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent:24.70 Capital:20.00</i> <i>Total:44.70</i>
11	External Financing Required (Nu. in million)	<i>20.000</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Department of Agriculture</i>
14	Documents Available	<i>Draft Sector Tenth Plan</i>



B. Situational Analysis:

The promotion of improved variety of seeds can play a critical role in increasing agricultural productivity. It determines the upper limit of crop yields and productivity of all other agricultural inputs to the farming system. In the mid 1970s, the government recognized its critical role in agricultural transformation and increased focus on seed system development. A nationally coordinated seed production program began in 1984 with the establishment of National Seed and Plant Program. In 1995, it became a corporation and was renamed as Druk Seed Corporation (DSC) with the objective of making the institution economically self-sustaining. The DSC however, has to depend on government subsidies, as it is not able to meet the cost of production and distribution due to the high costs of transportation and low level of demand from the rural communities. Further, the corporation is unable to meet the needs of smallholder farmers as the seed production is limited to a few varieties and the quality of the seed produced is inconsistent. Over the years, large-scale seed production farms, technical laboratories, processing plants and certification systems have been established. However, there has been limited success according to the Seed Sector Development Review conducted in 2006.

In view of the above and considering the important roles that public, private, formal and informal sectors can play in seed production and distribution, a national seed and plant program is being proposed to facilitate seed and plant production, distribution and marketing.

C. Strategy:

The program will be promoted through the establishment of a new unit under the Department of Agriculture, which will take the lead role in creating an enabling environment, facilitating the development of seed and plant material and decentralizing the production and supply system through the formation of producer groups/associations. Private sector investment and involvement in seed and plant production shall be pursued. Seed health and quality shall be improved through proper training of the seed growers and putting in place seed inspection and certification system.

The seed distribution system shall be improved by strengthening the seed retailers/ distributors at all levels (Dzongkhg and Geog) through training and incentives.

**D. Results Framework:**

Impact	Outcome	Output	Projects/Activities
Proportion of rural households living below the poverty line reduced from 30.9% to 20%	Quality and quantity of seeds and planting materials supply increased from 2 % to 50% of requirement; Availability and access increased from 100 mt to 600 mt of food crops and, fruit seedlings from 2,00,000 nos to 5,00,000 nos	A comprehensive seed sector development strategy developed. Capacity of private and farmers' groups enhanced and information developed and made available	Establishment of Seed and Plant Unit; Development and Implementation of Strategy to enhance Production Distribution and Marketing Promoting seeds growers' association; Development/review of clear cut specific crop promotion guidelines

E. Management Arrangements:

The Department of Agriculture shall be responsible for the overall execution, coordination and implementation of the program in collaboration with the DSC and private and farmers' groups.

Budget

#	Description of Projects/ Activities	Budget (Nu. in million)
1	Establishment of Seed and Plant Unit	7.000
2	Development and Implementation of Seed Sector Development Strategy	1.000
3	Enhancing Production, Distribution and Marketing	8.000
4	Promoting private seed units and seed growers' associations	2.000
5	Seed vouchers (free seeds) during crop failures/disasters	2.000
Total		20.000

***MoA/06: Horticulture/Cash Crop Development Program.***

A. Program Overview		
1	Sector	<i>Agriculture</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty Reduction, Income generation and Employment generation</i>
3	Expected Results	<i>Value of horticulture export increased from Nu.476 million per year to Nu. 900 million per year Portion of farmers engaged in horticulture export cropping increased from 10% to 25%.</i>
4	Relevant MDG & SDG	<i>MDG Goal 1, 7: Eradicate extreme poverty and hunger, ensure environmental sustainability SDG Goal: 1,2,3: Eradication of hunger poverty, halve proportion of people living in poverty by 2012; ensure adequate nutrition and dietary improvement for the poor.</i>
5	Donor Agency	
6	Target Group	<i>Cash crop growers</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>New</i>
9	Tentative Timeframe	<i>Five Years (2008 - 2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent:156.74 Capital:118.85 Total:275.59</i>
11	External Financing Required (Nu. in million)	<i>118.85</i>
12	Executing Agency	<i>Ministry of Agriculture (MoA)</i>
13	Implementing Agencies	<i>Department of Agriculture, Dzongkhags, Geogs</i>
14	Documents Available	<i>Draft Sector Tenth Plan</i>



B. Situational Analysis:

The main crops included under the horticulture commodity development program are citrus, potato, fruits and nuts, vegetable, and mushroom. All of these crops play a vital role in enhancing and ensuring household level income generation as well as strengthening food security and nutrition. Fruit tree crops such as apple, oranges and arecanut are important export items for the country and they accounted for 93.27 percent of the 44,755 MT total fruit crops production in 2004. The total area under fruit tree crops is around 13,000 hectares. Potato is commercially grown in most parts of the country. The national average yield of potato is 4,593 kg/acre while the highest yield reported was 6,732 kg/acre (RNR Statistic, 2000). The major vegetable crops cultivated are chili, radish, turnip, potatoes, ginger, beans, broccoli, green leaves, cabbage, etc. The total harvested area under vegetables in 2004 was 24,605 acres with production of 78,043 MT.

Although a diverse range of crops are grown in the country, production has been limited as most of these crops are produced for subsistence needs. Inadequate land resources for horticulture/cash crop development are a factor constraining commercial horticulture production and cash crop development. There is a need to strengthen Institutional linkages with external agencies in third countries. The horticulture sub-sector is still faced with inadequate professionals/specialists for important and major cash crops. Concurrently inadequate budget for planned activities is an issue. Lack of adequate infrastructure such as post harvest facility, cool chains, storage, grading etc. must be addressed. Existing credit system for horticulture/cash crop development is inappropriate.

C. Strategy:

The Triple Gem Approach of enhancing production, improving access, and targeted marketing shall be the overall guiding strategy for the horticulture commodity development program. Commercialization of farming, professional management of farm enterprises, and integration of farm enterprises into the market form some of the important strategies for cash crop development.

The existing citrus farms that have been affected by citrus greening and other diseases will be rehabilitated.

As facilitated by the Land Act 2007, horticulture development in GRF land through lease arrangements shall be carried out. The conversion of private registered land for horticulture/cash crop cultivation shall be promoted through appropriate incentives. For commercialization, the program shall strengthen the existing linkages and explore new market and institutional linkages particularly with AMS and Post Harvest Program. To promote specialized focus HR requirement shall be incorporated in the HRMD plan. To improve the credit system, the program shall reschedule repayment scheme in consultation with relevant financial institutions for fruit crops.

**D. Results Framework:**

Impact	Outcome	Output	Projects/Activities
Mean annual rural household cash income increased from Nu. 10,700 to above Nu. 32,000.	Portion of farmers engaged in horticulture export cropping increased from 10% to 25%;	Potato production increased from 47,399 MT to 75,000 MT	Potato Development
		Citrus export volume increased from 23,000 MT to 30,000 MT	Citrus Development
	Value of horticulture export increased from Nu.476 million per year to Nu. 900 million per year	Acreage under vegetable production increased from 18,592 to 30,000 acres.	Fruits & Nuts Development
		Mushroom Production increased from 35 MT to 70 MT	Vegetable Development
			Mushroom Development

E. Management Arrangements:

The Department of Agriculture shall be responsible for the overall execution and coordination of the program. The Dzongkhag and Gewog administrations will carry out the actual implementation of the program. The Department shall collaborate closely with Research Centers, Agriculture Marketing Service Division, National Post Harvest Program and other relevant stakeholders for provision of technical inputs in the implementation of the program.

Budget

#	Description of Projects/ Activities	Budget (Nu. in million)
1	Potato Development	15.400
2	Citrus Development	40.000
3	Fruits and Nuts Development	20.000
4	Vegetable Development	10.000
5	Mushroom Development	33.450
Total		118.850

**MoA/07: Organic/Natural Agriculture.**

A. Program Overview		
1	Sector	<i>Agriculture</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty Reduction, Income generation and Employment generation</i>
3	Expected Results	<i>Proportion of rural households adopting organic farming principles increased from 1.5% to 10%</i> <i>Area under certified organic agriculture increased from 150 to 300 acres</i>
4	Relevant MDG & SDG	<i>MDG Goal 1, 7: Eradicate extreme poverty and hunger, ensure environmental sustainability SDG Goal: 1,2,3: Eradication of hunger poverty, halve proportion of people living in poverty by 2012; ensure adequate nutrition and dietary improvement for the poor.</i>
5	Donor Agency	
6	Target Group	<i>All farmers in potential areas</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>New</i>
9	Tentative Timeframe	<i>Five Years (2008 - 2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent: 31.00 Capital: 24.5</i> <i>Total: 55.50</i>
11	External Financing Required (Nu. in million)	<i>24.50</i>
12	Executing Agency	<i>Ministry of Agriculture (MoA)</i>
13	Implementing Agencies	<i>Department of Agriculture, Dzongkhags, Geogs</i>
14	Documents Available	<i>National Framework for Organic Farming in Bhutan</i>

B. Situational Analysis:

The organic industry in Bhutan is still in its infancy but there is increasing interest from both the government as well as the private sector. Generally, there is a lack of clear understanding of what encompasses organic. Many think that the absence of agrochemicals qualifies for organic, which is not true. As there are no policies and systems that directly support the



development of organic industry in the country to date, the DoA has developed a National Framework for Organic Farming in Bhutan to provide some guidelines and support for the growth of industry and the private sector. There is a need to explore the prospects for Marketing, market identification, research and development of market at national, regional and international levels.

The National Organic Program was established under the Horticulture Division in 2006 and has been promoting organic agriculture in Bhutan.

Besides the lack of policy on the organic industry, the lack of personnel with technical knowledge and skills and proper information on organic farming in the research system as well the extension system is acute. Under the program, given the stage of its development, shortage of staff is an issue. There is a need for a holistic approach to organic farming development in Bhutan as a cluster approach with integrated farming including livestock and forests. Focus on community production in any potential area duly supported by strong R&D and extension systems will also be explored. Dissemination of awareness on advantages of organic farming in terms of both livelihood support and income generation through a farming system's approach based on good agriculture practices (GAP) must be pursued. Protection, support and assistance to areas declared as organic, eg. Gasa must be provided through appropriate incentives and support for organic agriculture.

There is need for a national standard to be developed and a system of regulation to be adopted to regulate the organic import and export. A national system of marketing with a national logo needs to be developed for marketing of organic products in Bhutan. Capacity in this area is poor and there needs to be focused activity for establishing this enabling environment for Bhutan.

Use of chemical fertilizers and subsidy must be reviewed so as to re-appropriate subsidy to other areas of agriculture development.

C. Strategy:

Taking advantage of the country's pristine environment coupled with limited use of the agro-chemicals, organic/natural farming will be promoted on piloting basis. Further, organic/natural farming will also be expanded to sustainable cultivation of the MAPs.

A three pronged strategic approach will be adopted to cover potential development areas.

1. In rural areas where access to agrochemicals is limited or non-existent.
2. Incorporate organic farming principles to existing farming practices to enhance sustainable land use for environmental protection resource management.



3. Expand organic production approached that are at infant stage currently.

Develop a community or a group of producers with common interest supported with well planned/designed programs considering the whole value chain. Establish Producer Company in pilot sites and involve NGOs and private sector to implement some programs as public –private partnership.

The program in collaboration with AMS shall enhance focus on market information and market development on organic products. Review regional and international standards, consultation with relevant stakeholders and framing of regulations shall be pursued. The provision of subsidy on chemical fertilizer must be reviewed and alternative incentives such as compost sheds, fencing materials and irrigation could be provided. The program shall provide focused support to pro-organic development programs in declared organic areas.



D. Results Framework

Impact	Outcome	Output	Projects/Activities
Proportion of rural households living below the poverty line reduced from 30.9% to 20%	Area under certified organic agriculture increased from 150 to 300 acres	Policy related to organic development in place with enabling environment and National Logo for Organic Bhutan; Research centres and line departments have included organic programs and generated technologies as production options;	Develop organic farming policy; Development of strategy and implementation plan; Develop Organic standards and appropriate regulation (Participatory Guarantee System) accreditation and certification system with a national logo;
Mean annual rural household cash income increased from Nu. 10700 to above Nu. 32,000	Proportion of rural households adopting organic farming principles increased from 1.5% to 10%	Potential production areas and markets have been identified and supported; Rural farmers adopting organic farming to produce nutritious food for own consumption with surplus production for marketing. Proportion of rural households trained and adopting organic farming principles increased from 1.5% to 10% A well structured organic industry from consumer, production, technology back up, input supplies and services to processing, trading and exports is in place.	Establish National Organic Program (NOP) to carry out awareness creation and general coordination of organic industry; Baseline survey for identified potential areas and initiate organic production; Develop incentive led packages for organic farmers in rural areas; Establish appropriate infrastructure for production, processing and packaging of organic produce at the farm level; Market development for organic produce and facilitation; Finance/ credit/grants/subsidies HRD- capacity development.



E. Management Arrangements:

A National Organic Program (NOP) created within the Ministry of Agriculture with adequate staff and sufficient resources and representation from relevant sectors to take on the planning, development and advocacy functions required to advance the organic sector nationally. This office should be placed at a common ground with access to all departments and agencies to address and access crosscutting issues based on farming systems.

The scope of activities for the NOP will include providing advice on research and development, adjusting/proposing government policies, programs and regulations, developing strategies to improving extension and advisory services to accommodate and support organic farming and improve consumer awareness about organic produce and products by interacting with the private sector and traders and markets and coordinate capacity building required for organic sector development.

The NOP will be guided and assist in program planning with a team of Technical Working Group (TWG) consisting of focal persons from relevant agencies and departments. An empowered Committee (EC) consisting of heads of selected agencies will provide overall development of the organic sector and major program directions.

Budget

#	Description of projects/Activities	Budget(Nu. in millions)
1	Development of national strategies and policies	1.000
2	Institution set up	2.000
3	Production and industry support	2.000
4	Infrastructure and logistics	7.000
5	Research and Development	2.000
6	Market development and marketing chain	1.000
7	Education & information	1.000
8	Finance/ credits/grants/ subsidies	1.500
9	HRD and capacity building	7.000
Total		24.500

***MoA/08: National Medicinal and Aromatic Plants Program.***

A. Program Overview		
1	Sector	<i>Agriculture</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty reduction, Income generation, Employment generation, MAP resource conservation, environmental sustainability</i>
3	Expected Results	<i>MAP cultivation expanded to around 15 Dzongkhags; Number of species under cultivation increased to 10. Number of farmers engaged in MAP cultivation increased from 100 to 200.</i>
4	Relevant MDG & SDG	<i>MDG Goal 1: Eradicate extreme poverty and hunger SDG Goal 1,2,3: Eradication of hunger poverty, halve proportion of people in poverty by 2012, ensure adequate nutrition and dietary improvement for the poor</i>
5	Donor Agency	
6	Target Group	<i>Farming Communities and traders</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>New</i>
9	Tentative Timeframe	<i>Five Years (2008-2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent: 8.20 Capital: 40.45 Total:48.65</i>
11	External Financing Required (Nu. in million)	<i>40.45</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Department of Agriculture, Dzongkhags and Geogs</i>
14	Documents Available	<i>Draft Sector Tenth Plan</i>



B. Situational Analysis:

The sector initiated the cultivation of medicinal herbs and plants in collaboration with the Institute for Traditional Medicine Services (ITMS) in the late 1990s. The focus in the Tenth Plan will be to build a strong database system, improve quality of the medicinal materials, up-scale production in terms of both species and acreage, improve marketing links and develop sustainable management practices.

The country's vast topography harbors around 7000 different species of plants of which 600 species have been identified with medicinal properties. Of these identified species, almost 300 are in traditional use.

With the introduction of a small traditional medicine dispensary in Dechencholing in 1968, gSo-ba-Rig-pa was officially incorporated in the National Health System of Bhutan. The objective of which was, alongside modern medical organization, provide alternative treatment for people and also preserve, promote and propagate the unique cultural & social tradition attached to this system.

The popularity of traditional medicine and the strong foothold with the establishment of indigenous medical units in nearly all dzongkhags, have given rise to a pressing demand for medicinal plant resources. This has raised issues on sustainability and conservation in recent years. Conservation of medicinal plants with emphasis on sustainable collection regimes and formulation of management strategies has been accorded significant priority.

Cultivation of medicinal plants, which was initiated in the late 1990s under the aegis of the Ministry of Agriculture, has progressed to become successful alternative farming ventures for farmers thereby easing the pressure on wild collection.

To facilitate local communities, there is a need to delineate clearly the rights of access to collect MAP including the issuance of permits while at the same time ensuring the sustainability of the resources. Realistic pricing guidelines for MAP taking into account the costs of production has been missing resulting in unrealistic farm gate prices. One of the causes for unrealistic farm gate price and incidences of mismatch between market and product is lack of integrated product-market chain.

In keeping with the objectives and the theme of the 10 FYP, the program will focus on "rural poverty alleviation" through increased rural income generation. Domestication and cultivation of medicinal plants will be provided strong priority in parallel with the objectives of improved and increased crop diversification. The program will also help develop organizational methodologies & systems for sustainable utilization of medicinal plants resources.



C. Strategy:

The main strategies in the Tenth Plan will include improving cultivation packages for the priority species, including post harvest handling and value adding through semi processing and new product development. The program will, in collaboration with AMS identify markets for the cultivated and collected materials and help to provide maximum benefits to the farmers. The program shall ensure to address the issue of access and permits through the new Forest Policy, revised FN & C Act and Rules, and developing implementing guidelines. Upon review of regional and international price structure on relevant MAPs and assessing the local costs of production, the program shall develop a pricing guideline. Cultivation of MAPs with high returns to the farmers shall be promoted through lease arrangements on GRF land and by introducing them in the private lands.

D. Results Framework:

Impact	Outcome	Output	Projects/Activities
Proportion of rural households living below the poverty line reduced from 30.9% to 20%	Number of farmers engaged in MAP cultivation increased from 100 to 200.	Sustainable cultivation of MAPs expanded to at least 15 Dzongkhags; No. of MAP species under cultivation increased to 10 200 farmers trained in improved and Sustainable collection of MAP; Improved MAP processing units established.	Development of sustainable collection & cultivation packages for the priority species Value addition, product development and marketing Quality standardization and certification,
Mean annual rural household cash income increased from Nu. 10,700 to above Nu. 32,000.			

E. Institutional Arrangements

The Department of Agriculture shall be responsible for the overall execution and coordination of the program. The National Medicinal Aromatic plants Program under the Department shall provide technical support in collaboration with the Research centers, Agriculture Marketing Services Division and Extension services for implementation by the Dzongkhags and Geogs.



Budget

#	Description of Projects/ Activities	Budget (Nu. in million)
1	Germplasm management	1.100
2	Production Management and cultivation	2.000
3	Product development of MAP	18.500
4	Infrastructure development	18.850
Total		40.450

***MoA/09: Integrated Soil Fertility & Sustainable Land Management Program.***

<i>A. Program Overview</i>		
1	Sector	<i>Agriculture</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty reduction, Income generation, Environmental sustainability and Food security</i>
3	Expected Results	<i>At least 30-40% of farmers practice sustainable land management; Land evaluation and land capability information available for making informed decisions;</i>
4	Relevant MDG & SDG	<i>MDG Goal 1 & 7: Eradication of extreme poverty and hunger, and ensuring environmental sustainability SDG Goal 1,2,18: Eradication of hunger poverty, halve proportion of people in poverty by 2012, acceptable level of water and soil quality</i>
5	Donor Agency	
6	Target Group	<i>Farming Communities</i>
7	Scope	<i>Nationwide</i>
8	Status-Ongoing or New	<i>Ongoing/New</i>
9	Tentative Timeframe	<i>Five Years (2008-2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent:111.90 Capital: 266.00 Total: 377.90</i>
11	External Financing Required (Nu. in million)	<i>266.00.</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>National Soil Service Center, Dzongkhags and Geogs</i>
14	Documents Available	<i>Sustainable Land Management Project, 2005; Draft Sector Tenth Plan</i>



B. Situational Analysis:

About 69 percent of the country's population live in the rural areas and subsist on an integrated livelihood system of crop agriculture, livestock rearing, and use of different varieties of forest products. An average rural household owns 3.48 acres of land, which is often spread over different agro-ecological zones and altitudes.

The rural landscape is highly susceptible to landslides, soil run-off and seasonal floods owing to its characteristic steep terrain, fragile geological conditions and heavy rains. In certain pockets intensive land use has caused soil erosion, landslides and forest degradation resulting in depletion of soil fertility and overall land degradation. An example of such a situation is observed in Radhi Gewog, where with an area of only 29 square km, around 10 percent of the land has been lost or rendered unproductive due to land degradation and landslides (World Bank, 2005). There is a general understanding that anthropogenic factors such as overgrazing, deforestation, poor farming practices, poor soil and irrigation water management and indiscriminate development of infrastructure such as roads have contributed to the land degradation problem.

The ecosystem services are now being disturbed mainly through events of land degradation that includes loss of top soils, landslides and flash floods. These events are triggered largely by removal of vegetative cover through deforestation and over grazing, poor management of agricultural land and water resources, and construction of infrastructures to meet the needs of growing population. This is a serious concern for Bhutan when the arable land is less than 8% of the total land, where more than 70% of the arable land is under dry land farming system, and urbanization is taking place at a rapid pace. On an average, a household is cultivating less than two hectares of land to feed his family. Any loss of soil or land from these sites would reduce crop yield, and the offsite effect would be addition of sediment loads into our rivers which are the sources of our clean energy. A clear and gentle river turning into a muddy and rough flow during the monsoon period shows the level of soil loss.

Several initiatives have been taken to combat land degradation such as, review of the 1979 Land Act, land management campaigns carried out in various parts of the country since 2005 and commencement of the Sustainable Land Management Projects under GEF and DANIDA funding.

C. Strategy

This Ministry of Agriculture is preparing a National Action Plan for land management. The framework for the land management program will cover land used for agriculture, forest and livestock. Key elements will be sustainable land management including soil conservation and management of land. The focus of the Tenth Plan will be on mainstreaming sustainable land management into government policies and plans. Strengthening database management & in-



formation, dissemination of information for extension workers, farmers, planners and policy makers shall be the key strategies adopted. Piloting and replication of effective application of sustainable land management practices and capacity building of the local communities will be pursued.

Efforts will be made in identifying and mapping critical/vulnerable areas, in producing soil fertility maps to develop and promote best practices for soil fertility management, in developing, and disseminating information on soil classification and land capability and promotion of integrated soil fertility management. The land use data of 1999 will also be updated for effective planning and management purposes.

D. Results Framework

Impact	Outcome	Output	Projects/Activities
Proportion of rural households living below the poverty line reduced from 30.9% to 20% through enhanced food security	Increase arable land productivity through integrated soil fertility management; Policy decisions guided by soil and land information studies	Sustainable land management practices adopted & capacity of stakeholders enhanced; Land evaluation and land capability information available for Dzongkhags; National Land Management Strategy developed and implemented	Soil, Plant, & Water Sample Analysis; Land Evaluation and Land capability information made available; Soil Quality Assessment & Integrated Fertility Management; Sustainable Land Management Capacity strengthened; Preparation of National Action Program for Land degradation

E. Management Arrangements:

The Ministry of Agriculture shall be the overall execution and coordination agency for the Program. The National Soil Service Center under the Department of Agriculture shall be main agency for the implementation of the Program in collaboration with the Dzongkhags and Geogs.



Budget

#	Description of Projects/ Activities	Budget (Nu. in million)
1	Soil, Plant, fertilizer and Water Sample Analysis	5.000
3	Sustainable Land Management Project	245.000
4	Mainstreaming of sustainable land management	16.000
Total		266.000

***MoA/10: Rural Access Program***

A. Program Overview		
1	Sector	<i>Agriculture</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty reduction, Income generation, Employment generation</i>
3	Expected Results	<i>Proportion of rural population living more than 1 hour's walk from road reduced from 40% to 20%</i>
4	Relevant MDG & SDG	
5	Donor Agency	
6	Target Group	<i>Remote Geogs and Villages</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>Ongoing/new</i>
9	Tentative Timeframe	<i>Five Years (2008-2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent:43.00 Capital: 73.20 Total:73.20</i>
11	External Financing Required (Nu. in million)	<i>116.20</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Department of Agriculture, Dzongkhags and Geogs</i>
14	Collaborating Agency	<i>Ministry of Works and Human Settlement</i>
15	Documents Available	<i>Draft Sector Tenth Plan</i>



B. Situational Analysis:

Improving rural access through the development of farm roads and power tiller tracks is a big challenge given the rugged terrain and scattered settlements of the rural population. The construction of farm roads and power tiller tracks was given high priority during the Ninth Plan as it was seen as an important strategy to reduce poverty through rural accessibility.

During the Ninth Plan, approximately 800 km of farm road and 173 km of power tiller tracks have been constructed. As a result, the proportion of rural households located within a distance of 1 hour's walk has decreased from 58 percent in 2000 to 40 percent in 2005 (RNR Statistic, 2000 & PHCB, 2005). According to the Vulnerability Assessment and Mapping study carried out by the Ministry of Agriculture and World Food Program in 2005, 37 percent of the Geogs falling under the most vulnerable category emphasized that improvement of road accessibility would reduce food insecurity in their Geogs. Keeping in line with the Tenth Plan goal of poverty reduction, the sector's objective is to reduce the proportion of population living beyond one hour's walk from a road-head to 20%. The construction of 63 km of farm roads in the 6 eastern Dzongkhags will be funded by IFAD under the Agriculture Marketing Enterprise Promotion program (AMEPP) during the Tenth Plan.

The program shall, taking environmental concerns among other factors into consideration, improve the quality & design of roads constructed. Clear and relevant policy in farm roads development must be adopted and pursued. There is a need to better handle the clearance procedures in terms of certification/clearance by different/relevant agencies.

C. Strategy:

The key strategy of the sector in the Tenth Plan shall be the construction of farm roads and power tiller tracks in the rural areas, which will be guided by the Rural Access Master Plan. This plan will be based on the Dzongkhag Rural Access Planning (DRAP) reports. DRAP is finalized in 12 Dzongkhags and the reports on the remaining 8 Dzongkhags will be completed by August 2008.

In order to expedite the process, the Department of Agriculture shall out-source some of the survey, design and supervision of the constructions. This is also to lessen the work burden on the already-overstretched Dzongkhag Engineering Sector. The ultimate expectation is the improvement in quality of roads designed and constructed by outsourcing some of the survey, designs and supervisions of constructions while backstopping to ascertain acceptable standards, environmental friendly techniques for road construction. The Central Machinery Unit located in Bumthang will provide technical backstopping through the provision of earth moving machineries at subsidized rate.



The most important approach is to have a very clear and relevant Policy in Farm Roads development. Such a policy shall ensure that all Geogs and Dzongkhags follow a clear, transparent and consistent screening and prioritization process. It shall also have clear directives on construction of bridge and maintenance of roads constructed. Maintenance of roads will be given due priority to ensure their long term sustainability. Specific standards/specifications of different roads and maintenance policy with clear roles and responsibilities of different agencies/communities shall be specified in collaboration with the Department of Roads taking into consideration the realistic capacity of the community. The implementing agencies will be adequately backstopped to ascertain that the roads are constructed to acceptable standards and environmental friendly techniques are applied. To support construction of farm roads, CMU will maintain a pool of machinery equipment so that infrastructure work beyond the capacity of outsourced agencies can be taken up without delay. Timely clearance for rural access activities shall be ensured by streamlining the procedure in consultation with relevant certification/clearance agencies.



D. Results Framework:

Impact	Outcome	Output	Projects/Activities
Mean annual rural household cash income increased from Nu. 10,700 to above Nu. 35,000.	Proportion of rural population living more than 1 hour's walk from a road head reduced from 40% to 20%	Farm road and PTT Maintenance Policy in place Nos. of FR and PTT survey, design and supervision outsourced;	Development of Farm Roads and PTT maintenance policy; Outsourcing of some Farm Road Survey, Design & Supervision Works;
Proportion of rural households living below the poverty line reduced from 30.9% to 20% through enhanced food security		750 Kms of FR constructed using CMU machineries (Baseline 250 Kms)	Purchase of Non-destructive Testing Equipment & Procurement of Aerial Photos/Maps; Strengthening of CMU, Bumthang

E. Management Arrangements

The overall coordination and execution of the Program shall be carried out by the Department of Agriculture. Although construction of the farm road and power tiller tracks are carried out by the Dzongkhags and Geogs, the Department in collaboration with Central Machinery Unit (CMU), Bumthang will continue to provide technical support, design, supervision and quality control.

Budget

#	Description of Projects/ Activities	Budget (Nu. in millions)
1	Purchase of Non-destructive Testing Equipment, Procurement of Aerial Photos/ Maps	1.100
2	Outsourcing Farm Road Survey, Design & Supervision Works	9.200
3	Farm Road & Power Tiller Track Maintenance Policy.	1.000
4	Machinery support for farm roads	61.900
Total		73.200

**MoA/11: Farm Mechanization Program**

A. Program Overview		
1	Sector	<i>Agriculture</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty reduction, Income generation, Employment generation, Food security and Environmental sustainability</i>
3	Expected Results	<i>Out-reach farm machinery services extended to genwog level.</i>
4	Relevant MDG & SDG	<i>MDG Goal 1: Eradicate extreme poverty and hunger; SDG Goal 1, 2: Eradication of hunger poverty, halve proportion of people in poverty by 2012</i>
5	Donor Agency	
6	Target Group	<i>Farming Communities</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>Ongoing</i>
9	Tentative Timeframe	<i>Five Years (2008-2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent:277.11 Capital: 60.696 Total: 337.806</i>
11	External Financing Required (Nu. in million)	<i>60.696</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Department of Agriculture, Agriculture Machinery Center, Dzongkhags and Geogs</i>
14	Documents Available	<i>Draft Sector Tenth Plan</i>



B. Situational Analysis:

The Agriculture Machinery Center (AMC) was established in Paro in 1983. The main responsibility of the AMC is to promote farm mechanization in the country. Later, 3 more regional centers were established at Khangma, Bhur and Bajo to extend agricultural machinery service coverage to the remote communities. Since its establishment in 1983, AMC has successfully established more than 6,000 small agro-based enterprises in the country such as rice mills, flour mills, oil mills, power tillers, etc. Such labor saving machinery and equipment have served to ease the life of the farming community. The demand for labor saving technologies is quite high and promotions are being carried out accordingly. It is believed that farm mechanization has addressed the shortage of farm labor to a large extent, however no assessments have been carried out.

It is strongly believed that Farm Mechanization will be inevitable and continue to play a pivotal role during the Tenth Plan and in the long term. With the limitation on the civil service employees, the provision of services will increasingly become difficult. The focus therefore, of the program will be to support the entrepreneurs who will provide services to individual farmers. On the other hand, AMC will also extend the outreach of farm machinery, equipment & tools to the remote areas, provide timely and quality back up support for installation, repair and maintenance and continue to conduct research on innovative and appropriate farming technologies. The approach will be to strengthen the private sectors in the manufacture and development of farm machines.

C. Strategy:

In the Tenth Plan, the AMC will continue to pursue the promotion of labor saving technologies as in the past basically in a holistic manner, i.e. carry out all the supporting activities such as making available the quality and appropriate technologies, providing back-up support services, training and carrying the research and development. Currently the Japanese Assistance for farm mechanization as KR-II Grant and Technical Assistance Project are substantial and will continue to play an important role throughout the 10th Plan period and beyond. However, effort is simultaneously being made to make itself sustaining by developing indigenous technologies. In view of high demand for certain subsidized farm machinery, the program shall review the provisions of subsidy on farm machineries.

The program shall establish Gewog Machinery Centers in 5 Geogs, 18 private agricultural rural workshops with the main objective of reaching out to the vulnerable/remote pockets of the rural community and providing timely and quality back-up support services.

Another strategy will be to strengthen the involvement of Farmers' Groups/Associations, private enterprises dealing in farm machinery, build the capacity of the members of such groups to enable them to provide services to the farmers when required and promote ap-



propriate storage structures. While AMC will continue to support the individual farmers, the emphasis will be to support the groups, communities and individuals who in turn will provide services to the farmers in the localities. Training the Gewog extension and farmers' groups on machine installation, repair and maintenance shall be pursued.

D. Results Framework:

Impact	Outcome	Output	Projects/Activities
Proportion of rural households living below the poverty line reduced from 30.9% to 20%	Farm labor shortage addressed to a large extent	Sustainability of farm machineries enhanced Safe and quality services ensured Capacity of end users enhanced Outreach of farm machinery services extended to Gewog level	Strengthening R&D Inspection and Quality Control; Capacity Building; Enhancement of Outreach Services; Infrastructure Development.

E. Institutional Arrangements

The Department of Agriculture shall be responsible for the overall execution and coordination of the program. The AMC through its regional centers will play a key role in enhancing outreach services and building capacity of the end-users.

Budget

#	Description of Projects/ Activities	Budget (Nu. in million)
1	Enhancement and sustainability of farm machinery	23.360
2	Inspection and Quality Control	4.061
3	Improving efficiency and effectiveness of farm technology	3.828
4	Enhancement of Outreach/support Services	28.750
5	Supply and distribution of revolving farm machinery	0.697
Total		60.696

***MoA/12: Extension Coordination and Information Management Program.***

A. Program Overview		
1	Sector	<i>Agriculture</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty reduction, Income generation, Food security, Environmental conservation and Employment generation.</i>
3	Expected Results	<i>Commodity production focused based on suitability and economic potential of the areas through mapping of potential production sites, data generation and publications; 16 technologies on different management and production aspects generated and applied in the field.</i>
4	Relevant MDG & SDG	<i>MDG Goal 1, 7: Eradicate extreme poverty and hunger, ensure environmental sustainability; SDG Goal 1, 2,: Eradication of hunger poverty, halve proportion of people living in poverty by 2012</i>
5	Donor Agency	
6	Target Group	<i>Farming communities</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>New</i>
9	Tentative Timeframe	<i>2008-2013</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent:7.10 Capital:12.00 Total:19.10</i>
11	External Financing Required (Nu. in million)	<i>12.00</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Department of Agriculture</i>
14	Documents Available	<i>Draft Sector Tenth Plan</i>



B. Situational Analysis:

Commodity extension has a definite goal with focus approach in collaboration with and participation of all the relevant stakeholders targeted towards achieving production increase within a given period of time having linked to access and markets. In the Tenth Plan, attempt will be to refine extension services addressing location specific potentials and constraints to enhance households and national food security and income.

C. Strategy

Sector strategies in the Tenth Plan will be harmonizing, rationalizing and linking research and extension services with relevant agencies, and familiarizing commodity development approach through field demonstration and capacity building process.

The agricultural extension policy has been reviewed and re-formulated with an objective to re-vitalize the extension services for enhancing the delivery of services. Based on the experiences and lessons learnt, the following areas will receive major thrust:

- i. Review of the agriculture diploma curriculum of CNR in consultation with technical departments of the MoA.
- ii. Development of proper supervision and monitoring system for Departments and Dzongkhags.
- iii. Adopt and institute a reward and penalty system based on performance of the field staff .There is a need to take policy decision on the non-performers.
- iv. Ensure availability of proper extension materials.
- v. All geog RNR centers be well equipped with equipment/materials required by extension
- vi. Development and endorsement of clear guidelines for deployment, placement and transfer of extension staff.
- vii. Development of clear and agreed Terms of Reference (ToR) for extension staff.
- viii. Establish extension division in the technical departments to improve the coordination of extension activities including supply of inputs.
- ix. Institute a system of a regular supervisory contact between extension staff and their supervisors; and
- x. Link research activities to extension services and vice-versa.



D. Results Framework

Impact	Outcome	Output	Projects/Activities
Proportion of rural households living below the poverty line reduced from 30.9% to 20%	Commodity production based on suitable production areas through mapping of potential sites, data generation and publications; 16 technologies on different management and production aspects generated and applied in the field	Farmers adopt scientific farming practices Functional farmers group established with clear mandates and responsibilities	Collection of data and publications; Capacity building and awareness; Development of extension materials; Supply of extension tools and equipment

E. Institutional Arrangements

The Department of Agriculture shall be responsible for the overall execution, coordination and implementation of the program in collaboration with other agencies, Dzongkhags and Geogs.

Budget

#	Description of Projects/ Activities	Budget (Nu. in million)
1	Information generation and management	2.000
2	Farmers training and extension materials	6.000
3	Technology Transfer and Community Development	4.000
Total		12.000



5.2. Department of Livestock

Introduction

Livestock is an integral part of the agriculture system in Bhutan. More than 69% of the population of the country lives in rural areas of which more than 90% rear livestock of one kind or the other. In high altitude region, it is the mainstay of the rural livelihood; while in lower altitude the farming system is mixed and population depends on arable and livestock farming.

Livestock products are part of the main diet of Bhutanese and demand for products is increasing day by day. It is an important economic activity as it contributes to 7.3% of the GDP and about 22% of the rural household income. It has therefore great potential for contributing to pro-poor rural enterprise development

The overarching policy of the sub-sector is to increase livestock production and productivity through formulation, consolidation, streamlining and implementing of sound livestock development programs and activities. An integrated working approach will be adopted to seek complementarities and synergy between programs and activities. People's participation and building local organizations for livestock development will be pursued vigorously. This is expected to enhance income generation and contribute to poverty alleviation program of the government.

Vision

To contribute to poverty alleviation by delivering appropriate and prompt services for sustainable livestock development and to ensure safety and satisfaction of consumers of livestock products.

Sub Sector objective

Long Term Objectives

- Create enabling environment for farmers/entrepreneurs to invest in livestock activities
- Enhance income generation capacity of rural communities.
- Enhance livestock production and productivity.
- Achieve greater self-sufficiency in livestock products.
- Improve the nutritional status of people.



Immediate objectives

- To develop appropriate interventions for enhancement of availability of feed and fodder resources
- To expand the fodder resource base by integrating fodder, exploring rangelands and leasing in forest land
- To implement effective and efficient disease prevention and control programs
- To provide superior quality inputs to the farmers.
- To provide effective breed improvement services.
- Reduce the population of unproductive cattle in the country.
- To provide interventions to increase production
- To organize farmers groups, markets and marketing networks



Program Description

MoA/13: Feed & Fodder Development Program.

A. Program Overview		
1	Sector	<i>Livestock</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty Reduction, Income generation, Employment generation, Environmental sustainability</i>
3	Expected Results	<i>Land brought under improved pasture development increased by 20% from 3864.5 acres 2006/07 level to 4636.92 acres by 2013</i>
4	Relevant MDG & SDG	<i>MDG Goal 1 & 7: Eradicate extreme poverty and hunger, and ensure environmental sustainability; SDG Goal 1,2,3: Eradication of hunger poverty, halve proportion of people in poverty by 2012, and ensure adequate nutrition and dietary improvement for the poor</i>
5	Donor Agency	
6	Target Group	<i>Farmers rearing livestock</i>
7	Scope	<i>Nationwide</i>
8	Status-Ongoing or New	<i>New</i>
9	Tentative Timeframe	<i>Five Years (2008-2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent:87.21 Capital:23.076 Total:110.286</i>
11	External Financing Required (Nu. in million)	<i>23.076</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Department of Livestock, Dzongkhags and Geogs</i>
14	Documents Available	<i>Draft Sector Tenth Plan</i>



B. Situational Analysis

Livestock is an integral part of the farming system and continues to play a vital role in the livelihoods of the rural farming community. They provide farmyard manure, draft power, meat, and dairy products such as milk, butter, curd, whey and cheese. The total livestock population in the country is about 712,000 heads, out of which 45 percent is cattle population (RNR Statistics, 2000) and at least 78 percent of households in the country own cattle. In view of this situation, the feed & fodder development program was given utmost importance in the development plans since the 1980s. Efforts have been made in the production of fodder germplasm, improvement of nutrition and feed mills, development of rangelands, etc. Skewed distribution of pasture land/tsamdro must be remedied in light of the enabling provision under the Land Act 2007. There is a need to increase improved pasture coverage to address shortage of feed and fodder during lean seasons (mostly in winter). The Poor Quality of feed remains an issue.

Till date, fodder germplasm (seeds & seedlings) have been distributed on full subsidy to the farmers. However, the introduction of improved pasture is yet to make an impact in terms of coverage. Only 1.7 percent of households have improved pasturelands, which amounts to less than 1000 acres at the national level (RNR Statistics, 2000).

C. Strategy:

Research on new improved varieties, improved technological packages, alternative sources and integration of fodder production with horticultural development will be carried out in the Tenth Plan. In addition, based on the findings from pilot studies, the Department shall promote leasing of Government reserved land for improved pasture development and also come up with appropriate measures to improve rangeland management in the high altitude regions. Improved pasture production will also be encouraged in private land to enhance production. Farmers' access to fodder germplasm will be improved by upscaling establishment of fodder germplasm banks and building capacity of farmers in fodder germplasm production. There is a need for research on new improved fodder species and up scaling existing fodder germplasm banks. The National Tsamdro and Grazing Management Policy and strategies will be finalized and implemented.

Revitalization of animal nutrition and feed mills shall also be taken up in the Tenth Plan. Micro feed mills will be established in potential areas and farmer's groups will operate and manage them. In order to improve the feed quality, the program shall review the existing centralized system of tendering and make improvements. Information and database management will also be strengthened.

**D. Results Framework:**

Impact	Outcome	Output	Projects/Activities
Proportion of rural households living below the poverty line reduced from 30.9% to 20%	Land brought under improved pasture development increased by 20% from 3864.5 acres 2006/07 level to 4636.92 acres by 2013	National grazing resource management policy and strategies implemented.	Rangeland management and development; Leasing of government land for improved pasture development; Pasture Development in private & government lease land;
	Farmers adopt improved technologies to enhance feed and fodder development	New fodder species adopted by 20% from 3208 farmers (2006/07) to 3849 farmers by 2013.	Fodder germ-plasm production, distribution and quality control; Infrastructure development; Animal Nutrition and Feed Mill

E. Institutional Arrangements:

The Department of Livestock shall be responsible for the overall coordination and execution of the program. The National Feed and Fodder Development Program under the Department shall provide technical inputs for implementation at the Dzongkhag and Gewog levels. The program will be implemented in close coordination with the research and extension services in the promotion of feed & fodder development.



Budget

#	Description of Projects/ Activities	Budget (Nu. in million)
1	Pasture and Fodder Development	2.850
2	Animal Nutrition and Feed Mill	2.328
3	Rangeland Development	1.258
4	Infrastructure Development	13.250
5	Agri machineries and general tools , Office equipment & Professional services	3.390
Total		23.076

***MoA/14: Livestock Health & Laboratory Services Program.***

A. Program Overview		
1	Sector	<i>Livestock</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty reduction, Income generation and employment generation</i>
3	Expected Results	<i>Reduction in loss of livestock from diseases by 1.2% from 17913.6 nos of death in 2005 to 13779.4 nos of death from disease by 2013.</i>
4	Relevant MDG & SDG	<i>MDG Goal 1: Eradicate extreme poverty and hunger; SDG Goal 1,2,3: Eradication of hunger poverty, halve proportion of people living in poverty by 2012, ensure adequate nutrition and dietary improvement for the poor</i>
5	Donor Agency	
6	Target Group	<i>Livestock rearing households</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>New</i>
9	Tentative Timeframe	<i>Five Years (2008-2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent:289.814 Capital: 145.490 Total: 435.304</i>
11	External Financing Required (Nu. in million)	<i>125.035</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Department of Livestock, Dzongkhags and Geogs</i>
14	Documents Available	<i>Draft Sector Tenth Plan</i>



B. Situational Analysis:

Livestock health services play a vital role in livestock development in the country. With the increase in exotic crossbreeds, the livestock population is becoming more susceptible to diseases. This is further compounded by the increasing threats of trans-boundary diseases such as avian flu, rinderpest, etc. Currently there are 4 regional veterinary laboratories at Gedu, Gelephu, Bumthang and Khaling. Each of these regional laboratories caters to the nearby Dzongkhags and central farms. During the Ninth Plan, a total of 66,962 samples were tested and clinical services were provided to peri-urban farmers. Case studies and research were carried out on the warble problems in Laya and Paro, tuberculosis and mastitis survey in Thimphu and sero-surveillance for bird flu in the country. Due to the systematic monitoring and purposive sero-survey exercise, the country was conferred the status of “free from Rinderpest” in 2005. This was one of the significant achievements of the disease prevention and control program. There is still immense need to strengthen animal health services. Diseases such as Zoonotic, Foot and Mouth, Gid and Rabies, Avian Influenza, etc. will continue to be a major threat to livestock health and development. Basic standard materials & equipments to carry out livestock extension health and laboratory activities continue to be inadequate in the gewog centres. There is also a need to strengthen both clinical and epidemiological animal health services and infrastructure.

C. Strategy:

During the Tenth Plan, the program shall strengthen the existing infrastructure facilities, services, management and human resource development to enhance efficiency, effectiveness and timely delivery of animal health services to the rural communities particularly in the remote areas. The creation of Disease Free Zones (DZFs) regarding important economic diseases like FMD, rabies etc would be initiated. In order to improve and increase the animal health coverage and accessibility in remote areas, Community Animal Health Workers will be trained and necessary equipment, knowledge and skills will be provided. Apart from this, other outreach program such as starting of mobile veterinary clinic and establishment of veterinary outpost clinic would be carried out.

The program shall ensure to supply the basic materials & equipments required for extension health and laboratory activities at the Gewog Centers and introduce a monitoring mechanism through proper inventory.

Effective coordination between National Center for Animal Health (NCAH), Regional Veterinary Laboratories (RVL), Dzongkhag Field Units and the Gewog Extension Services, and Bhutan Agriculture and Food Regulatory Authority (BAFRA) in terms of disease surveillance and regulatory measures shall be established. The national focal points for disease prevention, vaccine production and distribution and clinical services needs to be clearly spelt out.



D. Results Framework

Impact	Outcome	Output	Projects/Activities
Proportion of rural households living below the poverty line reduced from 30.9% to 20%	Reduction in loss of livestock from diseases by 1.2% from 17913.6 nos of death in 2005 to 13779.4 nos of death from disease by 2013.	Reduced incidence of diseases outbreak by 20% Modality on Disease Free Zones creation put in place	Disease prevention & control; Veterinary Epidemiological services strengthened; Vaccine Production, Procurement & Distribution; Clinical and Laboratory Services; Regional Veterinary Laboratory Services; Institutional Development; National Animal Hospital outreach program; Training of Community Animal Health Workers; Infrastructure development; Provision of livestock health services to the rural areas;

E. Management Arrangements:

The Department of Livestock shall be the overall execution and coordination agency for the Program. The National Center for Animal Health under the Department as an apex body for livestock health, shall provide technical inputs through the network of Regional Veterinary Laboratories, Dzongkhag field units, national focal points for disease prevention and control, vaccine production and distribution, national referral veterinary laboratory, clinical services, clinical research and extension coordination.

**Budget**

#	Description of Projects/ Activities	Budget (Nu in million)
1	National Centre for Animal Health (Serbethang)	43.480
2	Regional Livestock Resource Centre (Tsimasham) – provide livestock health, breeding, feed and fodder and other allied services	11.500
3	Regional Livestock Resource Centre (Wangdue) – provide livestock health, breeding, feed and fodder and other allied services	21.032
4	Regional Livestock Resource Centre (Zhemgang) – provide livestock health, breeding, feed and fodder and other allied services Provision of Veterinary Laboratory Services (Bumthang Region)	11.500
5	Regional Livestock Resource Centre (Khangma) – provide livestock health, breeding, feed and fodder and other allied services	11.500
6	National Animal Hospital, Langjophakha, Thimphu- Provision of clinical veterinary Services	44.580
7	Livestock Central store, P/ling- renovation and fencing	1.900
Total		145.490

***MoA/15: Livestock Breeding and Input Supply Program.***

A. Program Overview		
1	Sector	<i>Livestock</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty reduction, Income generation, Food security, Employment generation</i>
3	Expected Results	<i>Livestock productivity enhanced from 1.9kg milk/day/animal (2007 level) to 2.185kg milk/day/animal by 2013 85% of livestock input demand met through in-house capacity.</i>
4	Relevant MDG & SDG	<i>MDG Goal 1: Eradicate extreme poverty and hunger; SDG Goal 1,2,3: Eradication of hunger poverty, halve proportion of people in poverty by 2012, and ensure adequate nutrition and dietary improvement for the poor.</i>
5	Donor Agency	
6	Target Group	<i>Farmers rearing livestock</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>New</i>
9	Tentative Timeframe	<i>Five Years (2008-2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent:771.561 Capital:146.670 Total:918.231</i>
11	External Financing Required (Nu. in million)	<i>161.799</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Department of Livestock, Dzongkhags and Geogs</i>
14	Documents Available	<i>Draft Sector Tenth Plan</i>



B. Situational Analysis:

The crossbreeding program for cattle as well as other species began in 1985. The breeding program was supported through the establishment of farms across the regions. Currently, there are 2 exotic cattle farms, 2 Mithun farms, 1 Nublang farm, 3 pig breeding centers, 3 poultry farms, 1 sheep farm, 1 horse farm and 2 fish culture farms located in different parts of the country. The improved breed bulls from these farms are the main sources of input supply for cattle breeding in the villages. This is further supported through artificial insemination services. Today, 11 percent of cattle, 4 percent of equine, 14 percent of pig and 5 percent of poultry are of improved breed out of the livestock population of 712,000 heads (RNR Statistics, 2000). Although the percentage of improved breed achievement is quite low, there is high potential and demand for improved breed in the peri-urban areas and for crossbreed of Siri and Mithun in the rural areas.

Under the current scenario, most of the infrastructure of government farms requires either major renovation or re-designing to make it more favorable for the animals. Further, the quality of feed needs improvement as the existing centralized system of tendering has not been very effective in improving the quality of feed to enhance livestock production. The viability of the existing farms is greatly compromised due to existing management and operations system which are more geared towards meeting the social objectives rather than fulfilling economic priorities. The national livestock identification and recording system must be reviewed and modernized to facilitate useful information database. The inventory of information could be designed to achieve uniformity and be able to update periodically with the change in livestock population dynamics.

C. Strategy:

In view of the constraints highlighted above and to ensure adequate input supply for improving livestock production in the rural areas, strengthening infrastructure development of the farms and diversification of farm activities will be given priority in the Tenth Plan. Farm infrastructure development shall focus on introducing appropriate designs while revamping the existing ones and constructing additional facilities.

Business operational and management system will be introduced as an important strategy in the farms for attaining economic viability and gradually push for privatization. The existing livestock breeding policy and strategy will be reviewed, and standard codes of practice will be developed to enhance productivity. Adoption and dissemination of standard codes of practice in private farms to enhance productivity shall be initiated and shall include the dairy farm record keeping, livestock inventory and other modern methods of dairy farming. Production of breeding stock through contract farmers will be promoted. Design and implement effective IMS following standard code of practice.



More livestock input generating farms need to be established at strategic locations for easy generation and distribution to the client Dzongkhags and farms. For example, a fish seed production centre will be established at Sonam thang, Samdrupjongkhar to cater increasing demand of the Dzongkhag and also for 6 eastern dzongkhags. Currently all fingerlings have to supplied from WWFCC, Gelephu which is often hampered by volatile situation in Assam

D. Results Framework

Impact	Outcome	Output	Projects/Activities
Proportion of rural households living below the poverty line reduced from 30.9% to 20%	Livestock productivity enhanced from 1.9kg milk/day/ animal (2007 level) to 2.185kg milk/day/animal by 2013; 85% of livestock input demand met in-house	Improved breed supply increased by 25%; Livestock cross breed population increased by 25%; National cattle identification and recording system developed; Farmer's managed input production unit supported; Nublang farm strengthened; Native Breed Conservation program developed;	Systematic cross breeding program in place; Supply of high performing and adaptive breed; Improved database management system; Supporting establishment of farmer managed livestock Input production unit; Enhancing productivity of government farms; Farm management.

E. Management Arrangements:

The Department of Livestock shall be responsible for the overall execution and coordination of the program, particularly for carrying out policy reviews and development of database and management system. The implementation of the program will be carried out in collaboration with the Dzongkhags and Geogs.

**Budget:**

#	Description of Projects/ Activities	Budget (Nu. in million)
1	Livestock Breeding	20.790
2	IMS and M & E	5.450
3	Livestock Input Supply	120.430
Total		146.670

MoA/16: Livestock Production Program.

A. Program Overview		
1	Sector	<i>Livestock</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty reduction, Income generation, Food security, Employment generation and environmental sustainability</i>
3	Expected Results	<i>Increased dairy production from 7179 MT (2007 level) to 7897 MT by 2013</i> <i>Increased meat (poultry, pork, beef and fish) production 2001.7MT (2007 level) to 2202 MT by 2013.</i>
4	Relevant MDG & SDG	<i>MDG Goal 1: Eradicate extreme poverty and hunger;</i> <i>SDG Goal 1,2,3: Eradication of hunger poverty, halve proportion of people living in poverty by 2012, and ensure adequate nutrition and dietary improvement for the poor</i>
5	Donor Agency	
6	Target Group	<i>Prospective individuals and community based groups</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>Ongoing</i>
9	Tentative Timeframe	<i>Five Years (2008 - 2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent:79.248 Capital: 442.640 Total:521.888</i>
11	External Financing Required (Nu. in million)	<i>638.312</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Department of Livestock, Dzongkhags, Geogs</i>
14	Documents Available	<i>Draft Sector Tenth Plan</i>



B. Situational Analysis

Livestock products mainly include dairy products, meat, wool and eggs. As per the DoL, 2007 data, about 19,927 MT of milk, 1,649 MT of pork, 547 MT of beef, 151 MT of chicken and 5.39 million eggs were produced. Livestock production in the country has contributed to food security through improvement in nutrition status of the rural population. However, due to the shortage of land, labour and capital investment for the program, livestock production has been relatively low and a large share of such products is still imported. Inadequate access to land resources for pasture development is another difficulty. Further, the market and marketing network is still not well developed.

Information management of livestock production within the country must be strengthened. According to the Bhutan Agriculture and Food Regulatory Authority (BAFRA), import of livestock products amounted to 6,253 MT of beef, 3,469MT of pork, 781,341 cartons of eggs and 2,134,730 liters of milk between 2000 and 2005. There is huge potential for livestock product development particularly in the peri-urban areas and in some Dzongkhags. According to RNR Statistics 2000, there are 47,528 milking cows of local breed and 8,080 of improved breed. More than 3,300 diary backyard units and 200 piggery and poultry backyard units exist in the country.

In view of the high potential for both income generation capacity and increasing the nutritional and dietary status of the population, the program will continue to focus on creating an enabling environment to boost livestock production in the country.

C. Strategy:

The key strategy is to adopt an integrated approach for livestock production with clear linkages between production, processing and marketing initiatives. Therefore all other programs like feed and fodder, livestock breeding, livestock health etc will be geared towards increasing the livestock production and productivity. A master plan for each commodity will be formulated for effective and efficient implementation. Private-public partnership will be used as a major platform to increase production, and productivity, processing, value addition and marketing of livestock products.

There is a need for subsidy support in order to promote improved technologies. The program shall study and introduce product and market chains for the farmers to take up planned livestock production activities. The potential of livestock production in peri-urban areas with comparative market advantage shall be further developed. Diversification of farm activities particularly in southern Bhutan (eg. Fishery, piggery and poultry) has to be encouraged and assistance shall be given in the formation of farmer's groups and associations based on firm bye-laws. Training shall be conducted on product processing, diversification and marketing. Establishment of appropriate processing units for livestock products shall be supported and



farmers shall be trained to adopt standard codes of practice on livestock production record management. The imposition of restriction in meat production and marketing on auspicious periods is a constraint to development of meat industry and will be pursued for removal of such restrictions.

Stall feeding of cattle will be promoted in order to reduce grazing pressure on natural forest/rangeland and to promote proper and efficient use of improved pasture resources. However, this will depend on the availability of government land on lease for improved pasture development. The program shall coordinate with Feed and Fodder Development Program on pasture development and provide support in terms of machineries, equipments and technology.

Backyard farms and processing plants will be established and farmers will be trained on improved backyard management practices. Providing access to market for livestock products and the formation of farmers groups will be employed as major strategies to boost livestock production in the rural areas. Proper information management of livestock production and their utilization both for domestic and exports shall be maintained with the IMS of the DoL.

Pro-poor livestock development experiences gained from Samthang Fishery community development, Wangdue will be replicated in other poor community to address the poverty alleviation. Therefore, pro-poor livestock development framework will be formulated and implemented accordingly. It will basically target the poorest of the poor and concentrate on marginal communities in remote areas.



D. Results Framework

Impact	Outcome	Output	Projects/Activities
Proportion of rural households living below the poverty line reduced from 30.9% to 20%	Increased dairy production from 7179 MT (2007 level) to 7897 MT by 2013	Dairy, poultry, pork and fish production, processing and marketing enhanced	Strengthening Live-stock Development Initiatives through livestock production, processing and marketing;
Mean rural household cash income increased from Nu. 10700 to above Nu. 32,000	Increased meat (poultry, pork, beef and fish) production 2001.7MT (2007 level) to 2202 MT by 2013.	Production and marketing chain developed Home/group production and processing increased	Establishment of farmers groups and associations; Development of public-private partnership initiatives; Training on production and processing; Replication of Pro poor activities for livestock enterprises development based on Samthang experiences.

E. Management Arrangements:

The overall coordination and execution shall be carried out by the Department of Livestock. The various Livestock Divisions and programs under the Department shall provide all supportive services required by the Dzongkhags and Geogs in the implementation of the program and towards this, focal person from each service providing agencies will be identified with clear roles and responsibilities.

**Budget:**

#	Description of Projects/ Activities	Budget (Nu. in million)
1	Dairy Production –Milk Processing	120.950
2	Piggery Processing Centre	115.000
3	Poultry Processing Centre	51.000
4	Fishery (Community Farms)	86.000
5	Goat farm	8.600
6	Sheep	7.200
7	Equine	1.7.000
8	Infrastructure (DVH+RNR-EC+NLBP)	52.150
Total		442.150

***MoA/17: Targeted Highland Livelihood Support Program***

A. Program Overview		
1	Sector	<i>Livestock</i>
2	Linkage to National Development Objectives & Strategies	<i>Design and support development of environmentally friendly, socially equitable & economically sustainable rural livelihood strategies and options for yak herders in high altitude areas.</i>
3	Expected Results	<i>Increased dairy (yak) production by 20%.</i>
4	Relevant MDG & SDG	<i>MDG Goal 1: Eradicate extreme poverty and hunger; SDG Goal 1,2,3: Eradication of hunger poverty, halve proportion of people living in poverty by 2012, and ensure adequate nutrition and dietary improvement for the poor</i>
5	Donor Agency	
6	Target Group	<i>Rangeland Communities</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>Ongoing on trial basis</i>
9	Tentative Timeframe	<i>Five Years (2008 - 2013)</i>
10	Indicative Costs (Nu. in million)	<i>Total: 34.760</i>
11	External Financing Required (Nu. in million)	<i>34.760</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Department of Livestock, Dzongkhags, Geogs, Communities & Private sectors</i>
14	Documents Available	<i>Draft Sector Tenth Plan</i>



A. Situational Analysis:

The people in the rangeland still continue to rely on traditional methods and technologies for dairy processing and for treating their sick animals. Given the remoteness and lack of difficulty in accessing services and improved technology, the highland communities have not benefited proportionately from the mainstream development process. An alternative approach to poverty alleviation and economic advancement of these communities is to launch a targeted highland livelihood support program. The community still depends on time consuming dairy processing methods and spends lot time to collect fuel wood, water and dung for cooking and heating purposes. This does not allow them to invest their time on income generation and other development activities.

Moreover, Yak farming is increasingly becoming less attractive due to its hard and difficult nature of work. Unless appropriate measures are taken to make yak farming more attractive through provision of appropriate technologies and options, they might opt to migrate and take up alternative livelihood source in urban areas.

Apart from safeguarding the border and acting as informal national border security, yak herders are also responsible for maintaining and utilization of the rich resources that are available in these high altitude areas. Therefore sustainable resource utilization options must be made available to these communities.

A. Strategy:

The key strategy is to have a dedicated and separate program to address the priority needs of yak herders. Emphasis will be given to increasing the feed and fodder resource base by promoting winter and summer fodder to produce hay for winter feeding. Hygienic dairy processing will be promoted through distribution of improved dairy processing equipment like cream separator, butter churner and packaging and transportation materials. Farmer's training on improved pasture production, dairy processing and on group formation will be given priority. In order to promote sustainable use of alternative energy source, solar lighting, solar cooking and biogas production using portable digester will be introduced or piloted whichever is appropriate. In order to improve the meat processing and to encourage humane and hygienic yak meat processing, a micro meat processing unit will be established. Community Animal Health Workers will be trained and equipped as a way of increasing the coverage and reach of veterinary service. Veterinary Clinic Outposts will be established at a strategic location which benefit majority of households in the area.



D. Results Framework

Impact	Outcome	Output	Projects/Activities
Proportion of rural households living below the poverty line reduced from 30.9% to 20%	Increased dairy (yak) production by 20%.	Increased availability of winter fodder; Improved dairy and meat processing technology promoted; Increased coverage of animal health services; Sustainable alternative energy efficient technologies introduced.	Feed and fodder training and demonstration; Promote improved fodder variety; Construction of Meat processing Units; Supply of dairy processing equipments; Training of Community Animal health worker; Promote sustainable alternative energy sources for heating, cooking and lighting

E. Management Arrangements:

The activities will be executed by the Department of Livestock in collaboration with the concerned Dzongkhag Administration, Yak herder communities and relevant outside stakeholders. Regarding the promotion of sustainable alternative energy resource, it will be done in close collaboration with the Department of energy under the Ministry of Economic Affairs and ICIMOD. The result of the activities will be shared among all the concern stakeholders for further dissemination and recommendation for replication in other similar rangeland areas.



Budget

	Description of Project/Activities	Budget (Nu.millions)
1	Fodder production	13.560
2	Training of Community Animal Health Workers and equipping with necessary basic equipment	2.500
3	Dairy processing equipment	5.000
4	Establishment of meat processing units	1.200
5	Supply of portable solar lamps, solar cookers, biogas digester	10.000
6	Establish veterinary clinic outpost	2.500
Total		34.760

5.3 Department of Forest

Introduction

Based on the goals, priorities and the milestones as reflected in Vision 2020, MDGs and the 10th Plan guideline of the Planning Commission and the RNR Sector Planning Guideline, the forestry sub-sector is determined to work toward three long term goals during the 10th FYP. They are as follows:

- i. Ensuring 60% of the country's geographical area is maintained under forest for all times to come.
- ii. Conservation and promotion of sustainable utilization and management of biodiversity, forest and water resources.
- iii. Meeting the long-term needs of all the people for wood and other forest products by placing all the country's productive forest areas under sustainable management.



The broad objectives of the forestry sub-sector are outlined below:

- To ensure maximum people's participation in sustainable forest resource management in order to improve the protective and productive functions of forest ecosystems and to generate income and enhance rural livelihood from forest resources
- To conserve the unique biodiversity of the country for the benefit of the future Bhutanese generations and the world community as a whole.
- To protect the fragile mountains eco-systems from erosion, landslips, forest fire and other natural calamities.
- To protect and rehabilitate watersheds for the production of quality water for drinking, irrigation and for the production of hydroelectric power.
- To manage forest resources on a sustained yield basis based on silvicultural principles and scientific management prescriptions.
- To enhance forestry extension and service delivery through awareness, publicity and improvement of forestry services to the public.
- To enhance and improve Forest Information collection, management and dissemination
- To ensure that all Bhutanese citizens have access and rights to forest products at a reasonable cost and timeframe.
- Development of human resources through higher education and training

In line with the Royal Government's theme of Poverty Alleviation for the 10th plan, the priorities for the forestry sub-sector for the 10th plan are outlined below.

- Ensuring maximum people's participation in sustainable forest resource management in order to improve the protective and productive functions of forest ecosystems and to generate income and improve rural livelihood from forest products.
- Commercialization of Non Wood Forest Products to generate employment and income opportunity for rural people through proper feasibility study and management guidelines.
- Institutionalization and operationalisation of Ugyen Wangchuck Institute of Environment and Forestry Studies, Lamagonpa, Bumthang for imparting high standard forestry education.



- Developing comprehensive watershed management plan for one major watershed.
- National forest inventory to be conducted and preparation of the national forest status report.
- Strengthening forest management units (FMUs) and management of forest areas outside FMUs.
- Operationalisation of Khaling and Phibsoo Wildlife Sanctuaries and Toorsa Strict Nature Reserve, biological corridor and Botanical Park
- Enhancing ecotourism within protected areas through commercializing in Manas in particulars to enable employment opportunities and income generation for local residents.
- Enhancing forestry extension and service delivery through awareness creation, developing extension materials, publicity and creating enabling legal and policy environment
- Establish effective information management system within the department.



Program Description

MOA/18: Participatory Forestry Program

A. Program Overview		
1	Sector	Forestry
2	Linkage to National Development Objectives & Strategies	Poverty Reduction, Income generation, Employment generation and Environmental conservation
3	Expected Results	Proportion of forest area managed as community and private forest increased from less than 1 % of GRF to 4%. Proportion of households involved in community and private forestry increased from 4% to 7%.
4	Relevant MDG & SDG	MDG Goal 1 & 7: Eradicate extreme poverty and hunger, and ensure environmental sustainability; SDG Goal 1, 17, 18, 20: Eradication of hunger poverty, acceptable level of forest cover, acceptable level of water and soil quality, conservation of bio-diversity
5	Donor Agency	
6	Target Group	Prospective farmers and community forest management groups
7	Scope	National
8	Status-Ongoing or New	On-going
9	Tentative Timeframe	Five Years (2008 - 2013)
10	Indicative Costs (Nu. in million)	Recurrent:95.95 Capital:83.20 Total:179.15
11	External Financing Required (Nu. in million)	83.20
12	Executing Agency	Ministry of Agriculture
13	Implementing Agencies	Social Forestry Division (Department of Forests), Dzongkhags and Geogs
14	Documents Available	Framework for Implementation of Decentralized Forestry Activities, 1993; Draft Sector Tenth Plan



B. Situational Analysis:

Participatory forest management was conceptualized in 1979 through a Royal Decree. The importance and the need for people's participation in protection and management of forest were further emphasized through the decentralization policy. Forestry activities which have direct relevance for the sustenance of the rural community and which demand intensive community participation for effective implementation have been decentralized since 1993. Decentralized activities include development and management of community & private forest, protection of forest from fire and encroachment into sokshing and tsamdrol, allocation of dry firewood, and sanctioning of rural timber. Forestry extension units have been created in the Dzongkhags with trained foresters to assist in the implementation of the decentralized forestry activities and enhancing forestry extension. With the creation of enabling policy environment, community forestry has picked up pace towards the end of the 9th FYP. Dzongkhags still face staff shortage as one extension agent has to look after 2-3 Geogs. Difficulty in authenticating land boundary due to shortage of surveyors in the dzongkhags was a major obstacle for private forestry development.

Some of the major achievements made during the Ninth Plan are:

- 72 community forests established and handed over to local communities covering 9,000 ha of Forest area engaging 3,940 rural households. 121 private forests established;
- Five CFs has started generating income from sale of forest produce;
- A draft Community Forestry development strategy is prepared. 17 case studies on community forestry aspects published and four volumes of CF manuals published;
- In-country community forestry study tour guidelines for CFMGs published

An assessment of the Ninth Plan shows that there is tremendous potential for community and private forestry development. This program also presents a big scope for income generation, enterprise development, employment opportunities and will contribute to increasing forest cover. The demand from the rural communities for community and private forestry has been increasing.

C. Strategy:

Community forestry development will be given a special focus with the objective of empowering rural communities to sustainably manage local forest resources and contribute to income generation, poverty alleviation and employment generation. Up-scaling community forestry, development of CF-based enterprises and good governance of forest resources will



be strengthened. Some of the specific strategies to address participatory forestry program in the 10th plan are as follows.

A clear legal and policy framework will be developed through the revision of the Forest Policy, the FNC Act 1995 and the Rules to address legal rights and ownership of community forests for the Community Forest Management Groups. To enable rural communities to fully meet their timber and wood requirements from community forests, the resource area allocation will be increased from the current ceiling of 2.5 ha per household to a minimum of 5 ha per household and this change will be addressed in the FNC Rules. With the operationalization and strengthening community forestry across the country, rural timber subsidy will be reduced and ultimately phased out in 10-15 years time-frame. Pertinent policy measures will also include supporting private forestry assistance to registered land owners.

To enhance income generation, poverty alleviation and employment from community forests, establishment of forest resource based enterprises and regional CF associations will be supported with proper feasibility studies. A business economist will be hired through SNV or some other donors to support CF and NWFP business feasibility planning and product development.

To enhance the capacity and capability of the Department, Dzongkhags and the communities in the implementation of community forestry, private forestry and forestry extension programs, human resource capacity will be strengthened through a series of long-term, short-term and in-service training programs. In particular, community forest management groups (CFMGs) shall be provided a series of in-country training programs on record keeping, book keeping, and planning aspects to ensure smooth implementation of CF plans, enhance equity and good resource governance.



D. Results Framework:

Impact	Outcome	Output	Projects/Activities
Forest areas in the vicinity of the communities sustainably managed by local people contributing to enhancement of rural livelihoods and to maintaining the forest cover.	Revenue generated from the sale of natural resources through forest managed as Community & Private forestry increased from Nu. 1.066 million to Nu. 37 million; Proportion of forest area managed as community and private forest increased from less than 1 % of GRF to 4%; Proportion of households involved in community and private forestry increased from 4% to 7%.	400 community forests established and managed by local communities (Baseline: 72 community forests) About 1000 private forests developed (Baseline: 121 private forests) Forestry extension capacity and services enhanced	Strengthening Community Forestry development; Strengthening Private Forestry; Strengthening Forestry Extension Services; Strengthen human resource capacity at different levels through a series of ex-country and in-country training programs.

E. Institutional Arrangements

The Department of Forests shall be the overall executing and coordination agency for the Participatory Forestry Program. The Social Forestry Division shall provide technical backstopping required by the Dzongkhags, Geogs and the field forestry offices for enhancing management of participatory forestry program. In order to effectively implement participatory forestry program, the Department of Forests shall place adequate number of qualified forestry personnel in dzongkhags and Geogs.

Budget:

#	Description of Projects/ Activities	Budget (Nu. In million)
1	Strengthening Community Forestry	62.000
2	Strengthening Private Forestry	5.000
3	Strengthening Forestry Extension Services	16.200
Total		83.200



MoA/19: Non-Wood Forest Resource Development Program

A. Program Overview		
1	Sector	<i>Forestry</i>
2	Linkage to National Development Objectives & Strategies	<i>Food security, Poverty reduction, Income generation, Employment generation and environmental conservation</i>
3	Expected Results	<i>Sustainable community management of NWFPs Species increased from 4 to 20; At least 100 NWFP management groups formed with significant contribution to income generation in rural communities.</i>
4	Relevant MDG & SDG	<i>MDG Goal 1 & 7: Eradicate extreme poverty and hunger, and ensure environmental sustainability; SDG Goal 1, 17, 18, 20: Eradication of hunger poverty, acceptable level of forest cover, acceptable level of water and soil quality, conservation of bio-diversity.</i>
5	Donor Agency	
6	Target Group	<i>Community forest/NWFP management groups/Traders/Businesses</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>New</i>
9	Tentative Timeframe	<i>Five Years (2008 - 2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent:95.95 Capital:65.00 Total:160.95</i>
11	External Financing Required (Nu. in million)	<i>65.00</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Social Forestry Division (Department of Forests), Dzongkhags and Geogs</i>
14	Documents Available	<i>Framework for Implementation of Decentralized Forestry Activities, 1993; Draft Sector Tenth Plan</i>



B. Situational Analysis

Bhutan is rich in NWFP resources. More than 600 medicinal plants, 97 mushrooms, 97 fruits and nuts, 34 bamboos, 14 canes, 25 oil/resin species, 20 spices, 38 fibres, 70 ornamental plants, 181 fodder species, 36 dyes, 12 food crops (yams) and 77 forest vegetables have been identified and described by the Department of Forests that are used by people in rural areas, are traded and exported. There are many NWFPs yet to be known and understood.

At the household level NWFPs are used mainly for subsistence purposes as well as for the local market. Numerous case studies show or have shown the potential of NWFPs for income generation. The RNR Statistics 2000 show that 42% of households in the country use bamboo resources for a variety of purposes; 21% of households are engaged in harvesting mushrooms from the wild, and 38.6% of households in fern top harvest during summer months (Ministry of Agriculture, 2000). Farmers from Mongar, Lhuentse, Trashigang, and Trashiyangtse earned an income worth Nu. 51,247,045 over a period of 10 years (1994-2004) from the sale of lemon grass oil (EODP, 2006). In Bjoka, Zhemgang Dzongkhag a study revealed that 66% of the monetary income was derived from bamboo & cane products (Moktan, et al., 2004). The Laya communities located at 3,700 meters above sea level are semi nomadic pastoralists with income from a variety of activities, including: 12% of income from yak husbandry, 8% from agriculture, 14% from incense making, and 50% of their income is derived from the collection and sale of *Cordyceps sinensis* (Namgay, et al, 2007). Also case studies have shown the economic importance of NWFPs in the past: On average Chirata (*Swertia chirayita*) contributed to 42% of the household cash income of Shingkhar Lauri farmers in 1996-97 (Pradhan et al, 1998) and star anise (*Illicium griffithii*) provided a good cash income for farmers in Yabrang in Trashigang Dzongkhag and Aja Nye in Mongar Dzongkhag (Mukhia et al., 2006).

Despite the tremendous potential and opportunity for NWFPs to support poverty alleviation and enhance income generation in rural areas, NWFP development has been not given importance in the national policy in the past. Inadequate coverage of NWFPs in forest related policies has resulted in poor priority for NWFPs, inadequate planning and poor resource allocation. Policies should comprehensively cover all relevant aspects such as local participation in NWFP development, Investment promotion, Technology development, Role of private enterprise and informal sectors, Patenting of products/processes etc. Also, there is very limited technical capacity in the Department of Forests in the sustainable use and management of NWFP resources in the country.

Under the DoF leadership, a multi-stakeholder NWFP working group comprising of members from ITMS, RNR Research, Ministry of Economic Affairs, and private sector have been formed to provide technical and advisory support to the Department. This body will provide technical advisory support to the Department of Forests and also form an institution platform to share experiences and information on various use and management of NWFPs



in the country.

Some of the major achievements made during the Ninth Plan are:

- Seven Community Forests specifically for NWFPs has been established.
- A draft report on commodity chain analysis for wild mushrooms has been developed.
- National NWFP survey for 11 dzongkhags compiled and 20 NWFP species prioritized for management.
- Draft National NWFP strategy prepared.
- A multi-stakeholder NWFP Working Group formed with the Department of Forests taking the lead and facilitating role.
- A draft NWFP collection and harvesting framework developed

C. Strategy:

In the 10th FYP, NWFP management will be given special focus with the objective of income generation, poverty alleviation and empowerment of rural communities in forest resource management. With some of the decentralized forestry programs such as protection of tsamdro and sokshing becoming redundant with the nationalization of tsamdro and sokshing by the Land Act 2007, additional programs needs to be decentralized to the dzongkhags. Since NWFPs have so much link to rural livelihoods and have great scope for poverty alleviation, this program will be decentralized to the dzongkhags.

A clear legal and policy framework will be developed through the revision of the Forest Policy, the FNC Act and the Rules to address legal rights and ownership of community groups to collect, harvest, trade and export NWFPs within the community forestry framework. A 5-10 km radial distance from the villages and settlements shall be designated for collection and management of NWFPs for local community management groups including areas falling within FMUs and protected areas with the exception of core zones. NWFP management will be an additional decentralized forestry program to be fully implemented by the dzongkhag forestry sector in the 10th plan and beyond.

Surveys of prioritized NWFP species will be surveyed and technical guidelines for sustainable harvesting and management framework will be developed and tested for application and use in the field. At least survey methodology and harvesting and management guidelines for at least 20 NWFP species of commercial value will be implemented in the 10th plan.

To enhance income generation, poverty alleviation and employment from sustainable NWFP management, establishment of NWFP resource based enterprises will be facilitated and sup-



ported with adequate feasibility studies.

To enhance the capacity and capability of the Department of Forests, Dzongkhags and the Communities in the management and implementation of NWFP program, the Department will strengthen the capacity through long-term, short-term and in-service training programs. For the implementation of in-service training programs, SFD shall collaborate with relevant institutions such as College of Natural Resources and the Ugyen Wangchuck Forestry and Environmental Institute.

Community management groups will be trained in book keeping, planning and decision making in collaboration with the Rural Development Training Centre (RDTC). Besides, community management groups will also be trained in harvesting techniques of NWFPs.

D. Results Framework

Impact	Outcome	Output	Projects/Activities
Enhanced rural livelihoods and incomes through sustainable utilization and commercialization of NWFP resources at community, dzongkhag and the national level.	<p>Sustainable community management of NWFPs</p> <p>Species increased from 4 to 20;</p> <p>At least 100 NWFP management groups formed with significant contribution to income generation in rural communities.</p>	<p>At least 20 NWFP species brought under sustainable management (Baseline: 4 NWFP species);</p> <p>100 NWFP management groups formed. (Baseline: 7 NWFP management groups formed);</p> <p>NWFP resource assessment guidelines developed;</p> <p>Management and harvesting guidelines developed.</p> <p>(Baseline: draft harvesting guidelines for 6 NWFPs developed)</p> <p>Feasibility studies for NWFP enterprise development conducted.</p> <p>(Baseline: 0)</p>	<p>Strengthening NWFP management through development of national NWFP strategy, resource assessment guidelines and harvesting manuals;</p> <p>Development of legal framework for the use, trade and export of NWFPs;</p> <p>Institutional strengthening for leading and coordination of NWFP management;</p> <p>Building information network for trade and export of NWFPs and establishment of enterprises;</p> <p>Capacity building for DOF personnel and communities</p>



E. Institutional Arrangements

The Social Forestry Division, Department of Forests shall be the overall executing and co-ordination agency for the NWFP Program. SFD shall also provide technical backstopping to the DoF field offices and dzongkhag administrations and coordinate with other agencies in the government and the private sector for NWFP management and trade.

Budget

#	Description of Projects/ Activities	Budget (Nu. In million)
1	Strengthening Management of NWFP resources	40.00
2	Strengthening Legal Framework for NWFP management	5.00
3	Strengthening coordination and collaboration with NWFP management stakeholders and institutions	5.00
4	Strengthening NWFP product development, enterprises, marketing and trade.	15.00
Total		65.00

***MoA/20: Forest Resources Development Program***

A. Program Overview		
1	Sector	<i>Forestry</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty Reduction, Income Generation, Employment and Environmental Sustainability</i>
3	Expected Results	<i>Area under sustainable forest management increased from 5% to 10%. Affordable housing materials provided to rural households through creation enabling forestry policies and timber prices.</i>
4	Relevant MDG & SDG	<i>MDG Goal 1, 7: Eradicate extreme poverty and hunger, and ensure environmental sustainability; SDG Goal 1, 2, 17, 18, 20: Eradication of hunger poverty, halve proportion of people in poverty by 2012, acceptable level of forest cover, acceptable level of water and soil quality, conservation of bio-diversity</i>
5	Donor Agency	<i>None</i>
6	Target Group	<i>Forest Management Units (FMU), working circles and Outside FMU</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>On-going</i>
9	Tentative Timeframe	<i>Five Years (2008-2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent: 115.340 Capital:89.85 Total:205.19</i>
11	External Financing Required (Nu. in million)	<i>89.85</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Forest Resource Development Division, Department of Forests</i>
14	Collaborating Agency	<i>NRDCL</i>
15	Documents Available	<i>Forest Resource Potential Assessment, 2004; Draft Sector Tenth Plan</i>



B. Situational Analysis:

Forest resources are important for economic and ecological sustainability. An over-riding objective of the Government is to protect the country's fragile mountain environment and its unique flora and fauna for future generations. This requires that natural resources are utilized in a sustainable way and trade-off between short-term economic gains and sustainable long-term economic development is managed well. The forest resource development program has been initiated to develop sustainable forestry management plan and system. This is to ensure that forest resources are utilized and extracted in a sustainable manner.

Some of the major achievements made during the Ninth Plan are:

- 19 FMUs are in operation and 6 units are in the planning stage;
- The total area covered under the FMUs is estimated at 127,362 hectares;
- Management guidelines for management of areas outside FMUs developed;
- A national forest management code of Bhutan published to guide resource management

C: Strategy:

- Additional FMUs and working schemes will be opened up across the country to meet the domestic wood demands in the country.
- Timber import will be encouraged and facilitated to mega projects, large constructions and industries to ease pressure on state forest resources
- In order to bring about sustainable management of forest areas outside of FMU, CFs, protected areas system, which is currently not under any management, particularly to meet the rural demand for timber and fuel wood, these forest areas will be brought under some form of scientific management. However, this is an interim measure as many of these areas over time will be brought under community forestry.
- A nationwide Forest inventory will be conducted to develop forest resource information base and to facilitate decision making in forest based industry investments.

**D. Results Framework:**

Impact	Outcome	Output	Projects/Activities
Sustainable management of production forest with science based interventions to meet the long term needs of the people for all types of forest resources.	Area under sustainable forest management increased from 5% to 10%. Affordable housing materials provided to rural households through creation enabling forestry policies and timber prices.	6 new FMU management plans implemented (baseline:19 FMUs); 20 working schemes implemented; 20 Management plans for forests outside FMUs prepared and implemented (baseline:0); Timber demands for domestic needs are met (baseline: 214,000 cubic meters); One National Forest inventory conducted (baseline:0)	Strengthening sustainable management of FMU system for wood production; Strengthening management of Forests Outside FMU system; Forest Demarcation; Development of Wood Based Industries; Facilitating Timber import; National Forest Inventory.

E. Management Arrangements:

The overall execution and coordination of the program shall be carried out by the Department of Forestry. The Forest Resource Development Division will play a key role in providing technical guidelines and other support for implementation of the program in close collaboration with the Territorial Divisions, National Parks Services and the Natural Resource Development Corporation Limited.



Budget

#	Description of Projects/ Activities	Budget (Nu. in million)
1	Sustainable Management of FMU	48.000
2	Management of Forest Outside FMU	12.000
3	National Forest Inventory	35.170
5	Forests Demarcation	2.000
6	Wood Based Industries	0.680
Total		89.850

***MoA/21: Watershed Management and Plantation Program.***

A. Program Overview		
1	Sector	<i>Forestry</i>
2	Linkage to National Development Objectives & Strategies	<i>Food security, Poverty Reduction, Income generation, and environmental conservation</i>
3	Expected Results	<i>Master-plan for atleast 2 river basins developed and implemented; Degraded and barren forestlands mapped; 10,000 acres of plantation established, 12 nurseries created.</i>
4	Relevant MDG & SDG	<i>MDG Goal 1 & 7: Eradicate extreme poverty and hunger, and ensure environmental sustainability; SDG Goal 1, 17, 18, 20: Eradication of hunger poverty, acceptable level of forest cover, acceptable level of water and soil quality, conservation of bio-diversity</i>
5	Donor Agency	
6	Target Group	<i>Government agencies, communities, wood-based industries, power corporations</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>New</i>
9	Tentative Timeframe	<i>Five Years (2008 - 2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent:95.95 Capital: 123.00 Total:218.95</i>
11	External Financing Required (Nu. in million)	<i>123.00</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Department of Forests, Dzongkhags and Geogs</i>
14	Documents Available	<i>Framework for Implementation of Decentralized Forestry Activities, 1993; Draft Sector Tenth Plan</i>



B. Situation Analysis

In the past planned periods, watershed management activities were taken up in relation to other activities such as plantation, soil conservation and lately through land management. But watershed management at the broader landscape level was not given importance. In the 9th FYP, a Watershed Management Section was created under the Social Forestry Division, but due to limited technical, financial and human resources, it remained a section without much activity. However, towards the end of the 9th plan, SFD took the lead in developing a watershed management framework for the Wangchu River Basin with support from the FAO-Netherlands Partnership Program. Some field level land management and soil conservation activities were taken up at the dzongkhag and field divisions. The Wang Watershed project based in Paro was more of a regular RNR project without much focus on watershed *per se*. Some small scale research-based watershed management was taken up in Lingmutey-chu (Wangdue-Punakha) and Radhi (Trashigang).

Plantation forestry is on-going. In the 9th plan, only a little above 5,000 acres of plantation was created. While some of the plantations created in the 1960s are in good health, have reached harvesting stage and are being utilized, most plantations are in poor state as there have been limited maintenance and tending. Financial constraints have been a major obstacle to proper plantation development. It would become increasingly difficult in the future to meet timber and woods demands in the country from natural forest, as natural timber stock is fast depleting. Therefore, plantation forestry becomes increasingly important and the government must provide adequate financial support to proper development of plantation forestry.

Achievements in the 9th plan include the following.

- Watershed section within the Social Forestry Division was created; One critical catchment was notified for protection;
- Draft Wangchu River Basin management framework developed;
- A series of land management and soil conservation activities were taken up;
- Norms and Standards for Plantation and Nurseries revised; and
- More than 5000 acres of plantations have been created;

Watershed management is a very important program that has implications for the sustainability of many other development programs and ensuring ecosystem services.



C. Strategy

A holistic approach to watershed management through different levels of watershed management planning and implementation will be the main strategy for watershed management. With the Department of Forests taking the lead, institutional mechanisms will be developed to mainstream watershed management in the national planning process. To strengthen plantation forestry, a nation wide survey of all the degraded and barren forest lands will be conducted to develop appropriate plantation programs. Feasibility to outsource plantations through contract system will also be studied. Degraded forestlands will be leased out to Wood-based industries for growing forest crops to meet their raw materials, commercial timber plantations, carbon sequestration etc.

D. Results Matrix

Impact	Outcome	Output	Projects/Activities
Protection and sustainable management of watersheds and catchments for ecosystem services and human well being.	Master plan for atleast 2 river basins developed and implemented; Degraded and barren forestlands mapped; 10,000 acres of plantation established, 12 nurseries created.	River basin level management framework developed and implemented for 2 major river basins (Baseline: 1 draft RBM framework for Wangchu prepared); 3 critical catchment areas notified for protection (Baseline: 1 notified); Watershed management committees established and functioning at national and dzongkhag levels (baseline: 0); Degraded and barren forest lands mapped for plantation (baseline: 0); Objective-based plantation carried out with a minimum of 10,000 acres in 5 year period (base line: 53,126 acres of plantation created till date)	Strengthen institutional mechanism across agencies to direct watershed management at different levels; River basin level management planning; Sub-catchment level management planning; Participatory Micro watershed management; Mapping of degraded and barren forest lands; Strengthen plantation forestry; Strengthen nurseries management; Strengthen human resource capacity to manage watershed and plantation programs.



D. Management Arrangements:

The Department of Forests will be the lead agency for watershed management and plantation program. The Social Forestry Division will provide technical backstopping to the territorial divisions, parks and dzongkhags in watershed management and plantation and liaise with stakeholders for effective implementation of the program. Different levels of watershed management committees will be formed to steer watershed management.

Budget

#	Description of Projects/ Activities	Budget (Nu. In million)
1	Strengthening institutional mechanism for effective watershed management	10.000
2	River basin level watershed management planning	18.000
3	Sub-catchment level watershed management planning and implementation	40.000
4	Mapping of degraded and barren forestlands	5.000
5	Afforestation and Re-forestration	40.000
6	Strengthening nurseries management	15.000
7	Capacity development of Farmers	5.000
Total		123.000

**MoA/22: Forest Protection Program**

A. Program Overview		
1	Sector	<i>Forestry</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty Reduction, Income Generation and Environmental Sustainability</i>
3	Expected Results	<i>Protection of forests from fires, pest and diseases, and effective land use monitoring.</i>
4	Relevant MDG & SDG	<i>MDG Goal 1, 7: Eradicate extreme poverty and hunger, and ensure environmental sustainability; SDG Goal 1, 2, 17, 18, 20: Eradication of hunger poverty, halve proportion of people in poverty by 2012, acceptable level of forest cover, acceptable level of water and soil quality, conservation of bio-diversity.</i>
5	Donor Agency	<i>None</i>
6	Target Group	<i>Nationwide</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>On-going</i>
9	Tentative Timeframe	<i>Five Years (2008-2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent: 47.500 Capital: 243.04 Total: 290.54</i>
11	External Financing Required (Nu. in million)	<i>243.04</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Forest Protection Division, Department of Forests</i>
14	Collaborating Agency	<i>NRDCL, Dzongkhags, Wood-based industries</i>
15	Documents Available	<i>Forest Resource Potential Assessment, 2004; Draft Sector Tenth Plan</i>



B. Situational Analysis:

The program is geared towards protection of forest from pest and diseases, protection and management of forest fires, land encroachment and to regulate and facilitate delivery of forestry services through proper silviculture treatment and through proper field truthing and vigilance. The service delivery of the Department of Forests has been a subject of debate amongst the general public. The quality of services had not been to the expectation of the client compounded by varieties of problems. Further, with rapid change in land use and the creation of more roads-net work even in the remote parts of the country has made forestry personnel to response to this situation. This also necessitates the Department of Forest to keep vigilance over the resources that are lying adjacent to the road heads. The utilization of forest resources is based on the principle of sustainability guided by proper management plan to ensure that the impacts on the resources are negligible.

Forest fires destroy large areas of forests every year damaging valuable timber, other wood and non-wood resources and biodiversity. As a result of forest fires, many land slides and soil erosion occurs. With limited human and financial resources DoF is not able to effectively combat forest fires. In the last 16 years, there have been 988 forest fire incidents and 397,970 acres of forests damaged by forest fire. There have been few pest and disease problem such as the dying of Yika in eastern Bhutan, pine die-back in Thimphu-Paro and some pine looper problem in some parts of the country.

Monitoring land use change is a very import function of this program and this will become even more important with increased development activities in the years ahead.

Some of the major achievements made during the Ninth Plan are:

- Revision of the Forest and Nature Conservation Rules 2003, 2006
- The FNC Rules 2006 is further revised (draft form) to enhance service delivery. The protection section is revamped to increase its efficiency and effectiveness to curb and control illegal activities on forest and forest resources

In the 9th plan it is learnt that some reshuffling of programs are required to be done in line with service delivery and effectiveness of program functioning. In this connection, management of forest fires which are more of protection function than extension is now brought under central program with the Forest Protection program and implementation to be lead by territorial divisions and parks.



C. Strategy:

- Public service delivery will be enhanced through decentralization of authority and responsibility from the department to the field divisions and dzongkhags with adequate infrastructure facilities.
- A strengthened protection unit will be created within DoF to monitor forest pest and disease, and illegal activities
- To strengthen the protection and management of forest fires, a vigorous forest fire fighting volunteer program will be established to complement the existing mechanism.
- A systematic land use monitoring will be developed through regular tracking of changes in land use.

D. Results Framework

Impact	Outcome	Output	Projects/Activities
Forest cover maintained at 60%	Protection of forests from fires, pest and diseases, and effective land use monitoring.	Reduced pest and diseases; Reduced forestry of-fences and conflicts; Effective land use monitoring; Service delivery enhanced	Strengthening Forest Protection from pest and disease and anti-poaching; Strengthening forest fire management; Strengthening land use monitoring; Strengthening service delivery.

E. Institutional arrangements

The Department of Forests shall be over all lead agency for the management of the Forest Protection Program. The Forest Protection Division will provide technical backstopping to the field agencies for implementation.

**Budget**

#	Description of Projects/ Activities	Budget (Nu. in million)
1	Strengthen Forest Protection through proper infrastructure development	153.990
2	Strengthen service delivery through improvement in field facilities and creation of enabling regulatory environment	45.050
3	Strengthen Land Use monitoring	2.000
4	Forest Litigation	00.000
5	Forest Fire Management	26.100
6	GIS and Information management system	15.900
Total		243.040

***MoA/23: Nature Conservation Program.***

A. Program Overview		
1	Sector	<i>Forestry</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty Reduction, Bio-diversity conservation, income generation, and Environmental Sustainability</i>
3	Expected Results	<i>Three Parks established;</i> <i>Toorsa strict nature reserve operationalised.</i> Present list of protected species conserved and nos. new species identified for conservation
4	Relevant MDG & SDG	<i>MDG Goal 1&7: Eradicate extreme poverty and hunger, and ensure environmental sustainability;</i> <i>SDG Goal 1, 2, 20: Eradication of hunger poverty, halve proportion of people in poverty by 2012, and conservation of bio-diversity</i>
5	Donor Agency	<i>None</i>
6	Target Group	<i>Protected areas</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>New</i>
9	Tentative Timeframe	<i>Five Years (2008 - 2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent:140.08 Capital: 190</i> <i>Total:330.08</i>
11	External Financing Required (Nu. in million)	<i>190</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Nature Conservation Division, Department of Forest</i>
14	Documents Available	<i>Draft Sector Tenth Plan</i>



B. Situational Analysis:

The key characteristics of the nature conservation program include focus on biodiversity conservation in the protected areas; biological corridors and conservation areas; commitment to positive human-nature interaction; promotion of public environmental education; encourage partnership in conservation program to address a wider range of issues; and optimizing the use of limited resources.

Management of parks and protected areas in harmony with competing demands such as infrastructure development, human activity and resulting pressure on environment remains a major challenge. There is a need for support and guidance from the NEC and other agencies at the national level particularly on benefit sharing of environment conservation.

Currently, there are 9 protected areas as parks or wildlife sanctuaries that together constitute 26 percent of the country's total land area. These protected areas are further linked by biological corridors covering some 3,804 km square of forest area to enhance the mobility and movement of wildlife.

Some of the major achievements made during the Ninth Plan are:

- Sakten Wildlife Sanctuary and Royal Botanical Park at Lampelri operationalized;
- The Biodiversity Act of Bhutan has been enacted;
- The Convention on International Trade of Endangered Species of Wild Fauna and Flora has been ratified;
- The Forest and Nature Conservation Rules has been enacted;
- Collection of *Cordyceps sinensis* has been legalized;
- Book on Mammals of Bhutan has been published
- Studies on human wildlife conflict, livestock depredation by wild dogs, research on endangered species of fauna and flora in the protected areas have also been initiated.
- Community based Eco-tourism has been established as Nabji Korphu Jigme Singye Wangchuck National Park.



C. Strategy

During the 10th FYP focus will be on sustainable utilization of protected area resources for the benefit of resident communities through sustainable tourism, community management of local forests through community forests and management of NWFPs. However, designated core zones of protected areas will be strictly protected for biodiversity conservation purposes.

Some of the specific strategies of the program in the 10th plan are as follows.

- Ecotourism will be strongly pursued in protected areas in collaboration with the Tourism Council of Bhutan and the tour agencies with the objective of sustainable income for park residents from tourism and biodiversity conservation.
- An eco-tourism strategy will be developed
- Sustainable use of forest resources in the protected areas will be carried out to benefit local residents through ICDP program
- Sustainable solution to Human wildlife conflict will be developed and implemented
- Operationalization of 3 protected areas and biological corridors



D. Results Framework

Impact	Outcome	Output	Projects/Activities
Environment and ecosystem maintained in pristine condition	Atleast 10% of residents in the protected area benefit from eco-tourism. Present list of protected species conserved and nos. new species identified for conservation	Management of existing parks and botanical gardens strengthened (Baseline: 6 parks operational, 1 botanical park); 4 new protected areas and 1 botanical park in the sub-tropical ecological zone established; 4 biological corridors brought under scientific management (baseline: 0); Database of biodiversity in the protected areas developed; Local communities engaged in Community-based management of forest resources; Eco-tourism activities to be implemented in the 6 parks and wildlife sanctuaries	Management of Protected Areas; Management of Biological Corridors; Management Plan and ICDP; Management of Botanical Parks; Species Conservation, Research & Monitoring; Biodiversity Inventory & Data Management; Community forestry and NWFP management in the multiple and buffer zones of all protected areas; Tourism program to be implemented in collaboration with Tourism Council of Bhutan; Capacity building to be developed to park staffs and tour guides

E. Management Arrangements:

The Department of Forestry shall be responsible for the overall execution and coordination of the program. Technical support shall be provided by the Nature Conservation Division for implementation of the program in the protected areas and biological corridors. The park managements shall also closely work with Social Forestry Division and the Dzongkhags and Geogs to enhance people's participation in planning and implementation of the Integrated Conservation Development Program pertaining to sustainable management of park resources for income generation and poverty alleviation. The DoF in collaboration with the Tourism Council of Bhutan will be implementing the Eco-tourism activities in protected areas.



Budget

#	Description of Projects/ Activities	Budget (Nu. in million)
1	Management and Planning of Protected Areas	80.000
2	Management of Biological Corridors	15.000
3	Management of Botanical Parks	50.000
4	Species Conservation, Research & Monitoring and data management	10.000
5	Eco-tourism and ICDP	35.000
Total		190.000

MoA/24: Forestry & Environmental Education Program.

A. Program Overview		
1	Sector	<i>Forestry</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty Reduction, Environmental Conservation and Employment Generation,</i>
3	Expected Results	<i>Enhanced human resource capacity in the conservation and sustainable management of forest and environmental resources</i>
4	Relevant MDG & SDG	<i>MDG Goal 1, 7: Eradicate extreme poverty and hunger, ensure environmental sustainability; SDG Goal 20: Conservation of biodiversity</i>
5	Donor Agency	
6	Target Group	<i>Forestry students</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>New</i>
9	Tentative Timeframe	<i>Five Years (2008 - 2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent::188.510 Capital:155.71 Total:344.22</i>
11	External Financing Required (Nu. in million)	<i>155.71</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Department of Forest</i>
14	Documents Available	<i>Draft Sector Tenth Plan</i>



B. Situational Analysis:

The education related to forest and environment is an important component in achieving sustainable development and management. The concept of forestry education had been instituted in the country in 1961 to train the forestry personnel at the forest guard and forester level. However, with the change in time and needs for developing professionalism in the way we manage forest and natural resources and the need to upgrade the entry level and curriculum was raised in various forums. This has led to the conceptualization and institution of Ugyen Wangchuck Institute of Conservation and Environment (UWICE), Lami Gompa, Bumthang, which will start in 2008. The UWICE will provide training and education at the level of forest guards and rangers in the initial years followed by Bachelors degree in forestry in the future.

C. Strategy:

The infrastructure development for the new Institute is underway and scheduled to be completed by 2008. Initially, the program will focus on Diploma level training for forest rangers and certificate level courses for forest guards. As the institute grows, tertiary level training and degree program will also be introduced.

Some of the specific strategies of the program in the 10th plan are as follows.

- Development of additional infrastructure for academic, housing, library, sports, etc.;
- Development of teaching curriculum and corresponding syllabus and reading materials;
- Development of learning resources such as library, ICT, laboratories, and field stations;
- Networking and collaborating with other reputable international universities;
- Development of Bhutan Museum of Natural History; and
- Development of degree level program.



D. Results Framework

Impact	Outcome	Output	Projects/Activities
Enhanced human resource capacity in the conservation and sustainable management of forest and environmental resources and thereby contribute to the process of sustainable economic development	<p>Skilled and qualified forest guards and rangers available</p> <p>Enhanced scientific knowledge on natural resource of Bhutan</p>	<p>Ugyen Wangchuck Forestry and Environment Institute established</p> <p>Publication and dissemination of information on natural resources of the country enhanced</p>	<p>Diploma Training , Degree Program, In-service /Upgradation;</p> <p>Research/ Scholarly Activities;</p> <p>Infrastructure Development/ Resources;</p> <p>Curriculum & Syllabus Development;</p> <p>Staff & Student Exchange Program;</p> <p>Library Development;</p> <p>Sports & Culture Program;</p> <p>Bhutan Museum of Natural History</p>

E. Management Arrangement:

The infrastructure development component of the program shall be executed by the Department of Forestry. For the establishment of the institution, relevant government agencies like the Royal University of Bhutan, Ministry of Education, Ministry of Agriculture and other international agencies shall be closely involved. The Institute and the DoF will liaise with RUB for curriculum development and validation particularly for Diploma and Bachelors level Education Program. In the beginning of the 10th plan, the UWICE program shall continue at CNR until the infrastructure is ready at Lamegonpa. The Institute will also liaise and collaborate with a number of teaching institutions and universities in the region and internationally to build up the capacity and caliber of the institute.



Budget

#	Description of Projects/ Activities	Budget (Nu. in million)
1	Diploma Training	14.850
2	Inservice/Upgradation	25.000
3	Research/Scholarly Activities	10.200
4	Human Resource Development	30.000
5	Curriculum & Syllabus Development	10.000
6	Institutional Collaboration/ Networking	4.000
7	Staff & Student Exchange Programs	9.000
8	Library development	5.500
9	Sports and Culture Program	5.000
10	Infrastructure development	91.000
Total		204.550

5.4 Council of RNR Research of Bhutan (CORRB)

Introduction

Up to the early 1960s research in Natural Resource Management was left to innovative Bhutanese farmers who experimented with new production methods and new plant and animal species and plant varieties. Activities of such informal research had a strong impact on the Bhutanese farming system with introductions such as mithun, chilli, maize and potato. The first documented government sponsored research activities started in the mid 1960s, after the inception of the first development plans in 1961. Early activities focused largely on agriculture. Unfortunately these early activities are poorly documented and lacked follow up and continuity.

Agricultural extension service has evolved in relation to agricultural research systems under the assumption that research systems would develop agricultural technologies, and extension systems would disseminate them to farmers who are viewed as passive beneficiaries rather than clients, stakeholders, and active participants. Bhutan must develop a pluralistic extension model involving client orientation and participation; decentralization of service delivery; outsourcing of service delivery; and co-financing by direct beneficiaries. By adopting a stronger client orientation, advisory services are now expected to provide tailor-made



solutions to innovators in their specific circumstances. Moreover, such advice should not only cover the technical aspects of agricultural production, but also the economic, financial, and institutional dimensions.

Vision

To be a premier and dynamic organization contributing towards the enhancement of socio economic prosperity and happiness of the agriculture communities in the country.

Mission

- To coordinate and support the generation of appropriate and effective RNR technological options, efficient extension and communication system to improve the livelihoods of agricultural community through sustainable natural resource management.
- To trigger and steer innovative research and extension approaches in line with the changing spatial and temporal dimensions

Goal

The development goal of CORRB is to sustainably enhance rural livelihoods by increasing agricultural productivity and profitability. The purpose is to ensure that research and extension policies and strategies address the needs and opportunities of the poor and others farmers in a sustainable manner thereby reducing poverty.



Program Description

MoA/25: RNR Research Program

A. Program Overview		
1	Sector	<i>Renewal Natural Resources</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty reduction, income generation, food security & environmental conservation.</i>
3	Expected Results	<i>Productivity of agricultural crops, livestock and forest increased through adoption of improved technology.</i>
4	Relevant MDG & SDG	<i>MDG Goal 1,7: Eradicate extreme poverty hunger, ensure environmental sustainability SDG Goal 1.2.3.20: Eradication of hunger poverty, halve proportion of people living in poverty by 2012, ensure adequate nutrition and dietary improvement for the poor.</i>
5	Donor Agency	
6	Target Group	<i>Farming communities</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>Ongoing/New</i>
9	Tentative Timeframe	<i>Five years (2008-2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent 541.410 Capital: 219.85 Total: 761.830</i>
11	External Financing Required (Nu. in million)	<i>219.85</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Council for RNR Research of Bhutan (CoRRB)</i>
14	Documents Available	<i>Draft Sector Tenth Plan</i>



B. Situational Analysis

Research is an integral part of RNR sector development and it will continue to play a key role in improving livelihoods of the Bhutanese population. Research is geared towards need based, impact oriented and participatory delivery of research services. Apart from generating technological packages and knowledge on RNR sector development, research also strives to source and develop improved genetic materials for crops, plants and livestock; new management practices that will raise output or conserve resources; better understanding on socio-economic factors that enhance productivity and have major impact on poverty reduction. In addition CoRRB also supports school agriculture programs to educate and inculcate importance of farming among youths.

Some of the major achievements made during the Ninth Plan are:

- Development and promotion of high yielding food crops varieties including 5 varieties of rice, 2 varieties of maize 3 varieties of grain legumes. In rice productivity increased by 5,000 to 10,000 tons/year; and in maize 12-14000 tonnes per year.
- Developed and promoted high yielding horticultural crop varieties (apple 3 varieties, citrus 3 varieties, vegetable 11 varieties, other fruits and nuts 12 varieties, potato 1 variety, persimmon 1 variety and cardamom 3 varieties.
- Developed and promoted new fodder species (sub-tropical 3 spp., temperate 5 spp.)
- Developed sustainable management techniques for non-wood forest products (Bamboo, Cane, Daphne, Chirata, Pipla)
- Legalization of the collection of *Cordyceps sinensis*;
- Generation of 16 technologies on different management and production aspects and
- School Agriculture program implemented in 121 schools involving students in vegetable and fruit production, dairy, poultry, piggery and fishery;

There exists a lack of coordination on RNR research between CORRB and non RNR agencies (eg. CNR, ITMS, etc) and also between agencies within MoA (DoA, DoF, NSSC, NPPC, DoL, BAFRA, etc) resulting in duplication of efforts, wastage of resources, lack of credibility, etc. Current research priority setting is not based on standard tools and mechanisms, and the research priority is not necessarily in line with national priorities.

During the Tenth Plan, the CoRRB will continue to carry out research studies in the five



main broad areas of field crop, forestry, livestock, horticulture and RNR systems. In the areas of field crop and horticulture, the focus of the research will be on development of improved varieties, better crop management practices, postproduction processing and marketing. In forestry, the priority will be to conduct research on sustainable utilization of non-wood forest products and intensification of community forestry program. Livestock research will focus on optimizing feed and fodder resource production (from wetland, dryland orchard and pastoral systems) and breed improvement to increase livestock production. RNR systems research will carry out research on cross cutting issues such as watershed, organic farming, soil and water management, plant protection and socio-economic aspects.

C. Strategy

The main strategies adopted by CoRRB in the Tenth Plan will include the following:

- Pursue adaptive and applied research, and conduct strategic research where appropriate.
- Ensure that the research is based on farmer's needs and opportunities and is participatory in nature and impact oriented
- Research organization shall be structured to align research outputs with priorities of departmental programs and needs of farming communities/clients.
- Reach out to poor, marginal, remote communities through research out-reach programs,
- Validate and showcase research results through on-farm trials, demonstration and technology parks in collaboration with extension.
- Foster strong linkage and partnership with national, regional and international research institutions/Universities for exchanging technologies and expertise.

There is a need to establish a Technical Committee to promote collaboration between Research and other agencies. Ways and means to promote ownership of research by agencies shall be adopted. CoRRB shall develop priority setting mechanisms/tools in terms of research.



D. Results Framework

Impact	Outcome	Output	Projects/Activities
Mean rural household cash income increased from Nu. 10,700 to a Nu. 32,000	Value of horticulture export increased from Nu. 476 million to Nu. 900 million annually.	Cash crop varieties increased from 62 to 68 Improved management practices increased from 28 to 34	Horticulture Research
	Dairy, meat and egg production increased by 20-25% (Existing Baseline: Milk 3974 Mt, Beef 547.8Mt, Eggs 5.4 million cartons, Pork 1649.2Mt).	Improved varieties of feed and fodder increased from 12 to 17 Improved management technologies increased from 7 to 12.	Livestock Research
	NWFP production and export increased by 5% on the existing value of 12.46 m	Improved harvesting and cultivation methods and management practices increased from 7 to 22	Forestry Research
	Availability of local organic produce increased from 0% to 5%.	3 Post production technologies developed Management practices for organic farming developed for 5 commodities.	RNR Systems Research



	Increased production & productivity of food/cash crops	5 improved Soil fertility & pest management practices developed	RNR Systems Research
Proportion of rural households living below the poverty line reduced from 30.9% to 20%	Rural per capita cereal production increased from 180kg to 220 kg	6 new improved varieties of cereal crops released (baseline: 10 varieties)	Field Crop Research
	Conservation and sustainable management of forest resources (20% of forest under protected area and 60% under forest cover)	4 improved forest management practices developed. Community Based Natural Resources Management (CBN-RM) rights developed for 4 major natural resources. Research or implementation?	Forestry Research
	Genetic resources conserved (Rice 500, Maize 60, other cereals 40, vegetables 50 and fruits 35)	30% Local crop varieties and 90 % livestock breeds characterized and documented.	Field Crops Research RNR Systems Research Horticulture Research Livestock Research

E. Institutional Arrangement:

The Council for RNR Research of Bhutan (CoRRB) shall be responsible for the overall execution and coordination of the program. The CoRRB shall also collaborate closely with the technical departments of forestry, agriculture, livestock and other relevant non-departmental agencies of the MoA. The actual research will be carried out by the Research Centers located at Yusipang, Bajo, Jakar and Wengkhar.



Budget

#	Description of Project/Activities	Budget (Nu. In Million)
1	Field Crop Research (RC Bajo)	36.100
2	Forestry Research (RC Yusipang)	31.950
3	Livestock Research (RC Jakar)	35.300
4	Horticulture Research (RC Wengkhar)	57.000
5	Information and Communication Services	16.200
6	Coordination and partnership program for research	4.500
7	School Agriculture	20.000
8	Research communication	5.300
9	Plants and equipments	3.500
10	Professional Service	5.000
11	Vehicle	5.000
Total		219.850

5.5 Rural Development Training Center

Introduction

The increased school enrolment of children and youths has brought about a situation where an increasing number of young people, including school leavers, are without gainful employment. Agriculture still offers the maximum employment opportunities in Bhutan. As the Bhutanese farmers are getting older day by day, it is only logical that the government accords high priority to encourage the young school leavers to join the farming community. Consequently, the Rural Development Training Center (RDTC) is geared towards inviting youths to join skills trainings that allow them to join agriculture and be gainfully employed.

Vision

RDTC envisions building up a critical mass of farmers who are interested and capable to



participate in the commercial farming on an economically and environmentally sustained basis.

Mission

RDTC sees itself as the knowledge centre that is able to meet the skill and knowledge needs of the modern day farmers and contributes to an improved image of the farming profession.

Objectives

- Providing the farmers with easily accessible knowledge and skills that will enhance production of crops and livestock and that makes them able to sell more of their products profitable;
- Providing the farmers with knowledge and skills that will allow them to make best use of existing opportunities for collaboration (farmers groups) and for gainful networking with relevant services;
- Support the formation of self help groups and their networking for experience exchange and collaboration;
- Sharing the market and other relevant information;
- Enhancing the image of farming by creating awareness about the potential of agriculture for gainful self-employment and meaningful livelihood.



Program Description

MoA/26: Rural Development Training Program

A. Program Overview		
1	Sector	<i>Agriculture</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty Reduction, Income generation and Employment generation</i>
3	Expected Results	<i>Number of RNR farm enterprises increased from 12 to 20 through vocational training at RDTC</i>
4	Relevant MDG & SDG	<i>MDG Goal 1, 7: Eradicate extreme poverty and hunger, ensure environmental sustainability; SDG Goal: 1,2,3: Eradication of hunger poverty, halve proportion of people living in poverty by 2012; ensure adequate nutrition and dietary improvement for the poor.</i>
5	Donor Agency	
6	Target Group	<i>Farmers and School dropouts</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>New</i>
9	Tentative Timeframe	<i>Five Years (2008 - 2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent:28.70 Capital:25.22 Total:53.92</i>
11	External Financing Required (Nu. in million)	<i>25.22</i>
12	Executing Agency	<i>Ministry of Agriculture (MoA)</i>
13	Implementing Agencies	<i>Rural Development Training Center</i>
14	Documents Available	<i>Draft Sector Tenth Plan</i>



B. Situational Analysis:

The increased school enrolment of children and youths has brought about a situation where an increasing number of young people, including school leavers, are without gainful employment. Agriculture still offers the maximum employment opportunities in Bhutan. It is therefore logical to encourage the young schools leavers to join agriculture. For this to happen, it is important to make farming attractive by providing commercial flavor. Consequently, the Rural Development Training Center (RDTC) was established in Zhemgang with the aim to build up a critical mass of educated farmers interested to participate in the commercial farming on an economically and environmentally sustained basis. Initially, the RDT was geared towards inviting youths to join skills trainings that allow them to gainfully employ themselves and contribute to nation building through agriculture. Despite considerable efforts made to offer attractive training opportunities related to farming, agriculture has not been very attractive to the youths as yet. RDTC therefore, currently has focused more on the existing farmers to improve their farming practices with the purpose that the youth will gradually be introduced to the potential of agriculture through awareness creation such as inviting school children to attend practical training during school breaks.

C. Strategy:

RDTC will focus on the empowerment of farmers through the provision of information, knowledge and skills, giving special attention to providing equal opportunities for women farmers. Empowerment of farming communities will be pursued through conducting skills based training in specific crop and animal production technologies, farm management and record keeping trainings for successful planning and management, sharing information on recent farming trends and future perspectives and, establishing farmers network for easy sharing of lessons learned and experiences.



D. Results Framework

Impact	Outcome	Output	Projects/Activities
Proportion of rural households living below the poverty line reduced from 30.9% to 20%	Number of RNR farm enterprises increased from 12 to 20 through vocational training at RDTC	300 farmers trained and 60% of them apply farm business skills No. of farmers groups formed through the facilitation and their sustainability	Training needs assessment including skills requirement; Farm Business and Farm Management Training; Community and Associations leaders Training; Youth agriculture awareness program; Assessment of training impact and post training support and backstopping needs

E. Institutional Arrangements;

RDTC will function as a non departmental organization reporting to the Secretariat through the HRMD. The RDTC management will be guided by the management board represented by the heads of the organization under the Ministry of Agriculture and other relevant organizations. The head of the RDTC will be responsible to the Secretary, Ministry of Agriculture.

Budget

#	Description of Projects/ Activities	Budget (Nu. in million)
1	Capacity Development and post training backstopping	10.700
2	Need based and impact oriented vocational Training Program	9.520
3	Infrastructure Development	5.000
Total		25.220



5.6 *Agriculture Marketing Service*

Introduction

The Agricultural Marketing Services has been entrusted with the mandate to look into the marketing aspects of all agricultural produce viz. agriculture, horticulture, livestock and non-wood forest products across the country with the view to putting in place an efficient and effective marketing system. The immediate priority needs to be focused on improving the domestic marketing system as it has a direct bearing on the performance of RNR products in the export markets.

The limited intra-regional trade calls for promotion of products within the domestic markets, from surplus to deficit areas. As the domestic market is limited, promotion of exports by ascertaining the potential products through identification of export markets is crucial for creating an outlet for the farmers. The comparative advantage Bhutan has over its neighbors has to be exploited which would be very instrumental in reducing the growing trade gaps with India. However the key here is to identify sustainable markets to encourage and ensure sustainable production systems. The identification and development of alternative markets are deemed necessary to encourage competition and ward off volatility of markets, with niche markets for high value and organic products.

While there is a shift in the emphasis from conventional to high value and organic farming, the lack of appropriate framework and necessary legislation to support marketing would be an impeding factor. Other policies like transportation, communication, credit etc that impact marketing directly or indirectly needs to be reviewed and recommendations made accordingly.

An important element in marketing is the availability of necessary infrastructures that has to be catered for to facilitate marketing. These are required to be maintained all along the supply chain. These infrastructures not only provide a meeting place for the buyers and sellers but reduce losses and costs and support the conduct and performance of the products.

The Foreign Direct Investment Policy which was introduced recently places major thrust on agro-processing, forestry and wood based industry, livestock industries etc. which would necessitate the proposed organization to play a key role in facilitating investments and in its development. Similarly on a lower scale, viable agribusiness ventures have to be identified and promoted accordingly amongst the private sector which would also require proper legislative measures and supports.

Furthermore, to meet the challenges of the rapid globalization and with Bhutan's accession as a member to the World Trade Organization (WTO), the need for a greater responsibil-



ity in terms of marketing has been emphasized. Farmers and other stakeholders have to be prepared for the eventuality when the flood gates would be forced open.

In the light of the above, the farmers are required to be educated and trained on various marketing related aspects essentially on the basic economic decisions they have to make, and create awareness on markets, quality & standards etc. They should be informed and made to understand the reality in which they have to operate and accordingly prepare them to make necessary adjustments.

Goals and Objectives for 10th FYP

As enshrined in the Vision 2020 document, horticulture is expected to become a major source of income for the farmers and export income for the nation in future. Vision 2020 document stipulates an increase in horticultural production by 200 percent by the year 2007 and 300 percent by 2012. Cash crops like apples, oranges, potatoes etc., which are increasingly demanded in the neighboring countries of Bangladesh & India, have been very instrumental in raising the living standards of the rural people.

Encouraging sustained increased production would necessitate sustainable markets with proper means to facilitate the movement of produce between the two. This is the triple gem concept which envisions that increasing production, improving accessibility and strengthening marketing are interdependent and an integral element in the development of the agriculture sector. The Triple Gem concept has to function collectively for effective transformation of the agriculture sector into a vibrant profitable industry.

Based on the goals, priorities and the milestones as reflected in vision 2020, MDGS and the 10th Plan guideline of the Planning Commission Secretariat and the RNR sector Planning Guideline; the Agricultural Marketing Services has the following long term goals during the 10th FYP:

- Transforming the agriculture sector from subsistence farming to market oriented system
- Build an efficient and effective marketing system within the country
- Play a lead role in facilitating the marketing of agriculture, horticulture, non-wood forestry and livestock products

The objectives for the 10th plan are as follows;

- To improve the marketing efficiency of agricultural, horticultural, livestock and non-wood forest products
- To efficiently promote infrastructure development for agricultural marketing



- To develop and promote intra-regional trade
- To develop and promote export markets for RNR products

Program Description

MoA/27: Agriculture Marketing Program

A. Program Overview		
1	Sector	<i>Agriculture</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty reduction, Income generation, Employment generation and Food security.</i>
3	Expected Results	<i>Markets for agricultural goods identified and established within and outside the country.</i>
4	Relevant MDG & SDG	<i>MDG Goal 1: Eradicate extreme poverty and hunger SDG Goal 1, 3: Eradication of hunger poverty, ensure adequate nutrition and dietary improvement for the poor</i>
5	Donor Agency	
6	Target Group	<i>Potential farmers</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>New</i>
9	Tentative Timeframe	<i>Five Years (2008 - 2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent:95.370 Capital:114.870 Total:210.24</i>
11	External Financing Required (Nu. in million)	<i>114.870</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Agriculture Marketing Services, Dzongkhags and Geogs</i>
14	Documents Available	<i>Draft Sector Tenth Plan</i>



B. Situational Analysis:

Sale of agriculture produce, livestock and forest continues to be a major source of income to farmers throughout the country although it has mostly been limited to the domestic market. The emergence of cash crop marketing to our neighbouring countries is a recent trend, which came about as a result of improved transport facilities, access to market, and increased demand from food processing industries. In fact due to profitable earnings from the cash crops, many landowners especially near the road heads have started converting their paddy land into orchards. Lack of information on the prices, demand and supply situation and market outlets is a major constraint for informed planning and decisions. Non-conducive legal requirements for creation of farmer's cooperatives and lack of enabling legal environment for group formation and associations have been problematic in formation of farmers' groups or associations.

Lack of adequate human resources continues to bog down the field activities of the program. Coordination between the AMS and the technical Departments of MoA including the extension services are extremely poor. Beyond the Ministry, there is a need to strengthen collaboration with the MoEA and the Ministry of Information and Communications. Market for niche products such as high-value-low-volume and organic products must be further developed.

C. Strategy:

During the Tenth Plan, the major focus of the program will be on developing market infrastructure, a marketing framework, strong market database and information management system and dissemination of proper inventory methods and upgrade the existing information management for agriculture product market. Therefore, a strong database and information management system will be developed. Research on niche markets and niche products will also be given priority. Niche markets will also be identified for high value and organic products, the demand for which is gradually increasing in the global market. The program shall support the revision of the Cooperative's Act to provide enabling legal provisions on farmers' group formation, associations and cooperatives. Formation of associations or cooperatives will be promoted and infrastructure such as collection depots, storage facilities, etc. will be developed to facilitate onward transportation to the markets.

Market information system and marketing framework will include elements that will enable marketing of agricultural produce between regions within the country as well as outside. For pharmaceutical products, aside of maintaining and strengthening collaboration with ITMS, identification of new markets will be initiated. The program shall strengthen coordination between marketing and technical Departments within MoA. It shall support the amendment of extension policy delineating the marketing responsibility of extension services. The pro-



gram shall maintain and reinforce linkages between agriculture marketing, the MoEA and Ministry of Information and Communications. The program shall also address the marketing human resource requirements.

D. Results Framework

Impact	Outcome	Output	Projects/Activities
Proportion of rural households living below the poverty line reduced from 30.9% to 20%	Increased agricultural trade both within and outside the country	Markets within and outside the country established (for e.g. Market potential offered by mega hydro projects looked into and rural production areas linked to these areas;	Market Research;
Mean annual rural cash income increased from Nu.10,700 to 32,000		In collaboration with ITMS markets for pharmaceutical products explored; Agriculture trade policy and agribusiness entrepreneurs developed; Marketing infrastructure facilities developed ; Marketing information system improved	Agribusiness and Trade Promotion; Marketing Extension & Farmers' Group Formation; Collaboration with FCB for FCB to be pro-active in carrying out physical marketing of RNR produce; Market Infrastructure; Development of Market Information;

E. Management Arrangements:

The Agriculture Marketing Services Division (AMSD) under the Ministry of Agriculture shall be responsible for the overall execution and coordination of the program. Close coordination shall be maintained with relevant agencies such as the Ministry of Economic Affairs and Ministry of Information and Communications. The implementation of the program will be carried out in coordination with the research and extension services in the Dzongkhags and Geogs.

**Budget:**

#	Description of Projects/ Activities	Budget (Nu. in million)
1	Market Research and Development	15.000
2	Market Information Development	10.000
3	Agribusiness and Trade Promotion	28.000
4	Marketing Extension & Farmers' Group Formation	24.370
5	Marketing Infrastructure Development	37.500
Total		114.870

5.7 Bhutan Agriculture and Food Regulatory Authority (BAFRA)Introduction

The Bhutan Agriculture and Food Regulatory Authority (BAFRA) was established on 5th August 2000 as the Quality Control and Regulatory Services (QCRS) as part of the restructuring exercise of the royal government to address the need to regulate the quality of agricultural products and also implement both the plant and livestock quarantine measures to protect the country from exotic agriculture and livestock pests. In 2003, BAFRA was also designated as the National Food Inspectorate. In view of the expanding responsibilities, the agency was renamed as BAFRA in November 2003.



Program Description

MoA/28: Bio-security and Quality Assurance Program.

A. Program Overview		
1	Sector	<i>Agriculture</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty reduction, food security, bio-diversity conservation</i>
3	Expected Results	<i>At least 3 plant and animal quarantine stations fully equipped and functional (from 0-3). 100% food handlers trained and licensed by 2013 from 0 in 2007. No. of HAC-CP certified companies increased by 100% (from 2 on 2007 to 4 in 2013). Quality of all commercial inputs regulated as per standards</i>
4	Relevant MDG & SDG	<i>MDG Goal 1, 7: Eradicate extreme poverty and hunger, and ensure environmental sustainability SDG Goal 1 & 20: Eradication of hunger poverty, and conservation of bio-diversity</i>
5	Donor Agency	
6	Target Group	<i>Farming communities and traders</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>New</i>
9	Tentative Timeframe	<i>Five Years (2008 – 2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent:288.825 Capital:117.185 Total:406.010</i>
11	External Financing Required (Nu. in million)	<i>117.185</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>Bhutan Agriculture and Food Regulatory Authority</i>
14	Documents Available	<i>Draft Sector Tenth Plan</i>



B. Situational Analysis:

The Bhutan Agriculture and Food Regulatory Authority (BAFRA) was established in 2000 as Quality Control and Regulatory Services (QCRS) to take care of food quality control and regulatory services. It was renamed as BAFRA in 2003. The main objectives of the program are to prevent entry, establishment and spread of pests and diseases that present risk to health and life of plants, animals and humans; to ensure that the available food in the market is safe for human consumption; to promote and facilitate trading in plants, animals and their products by providing pre-export and import quarantine measures; and to implement a national bio-safety framework to regulate and facilitate safe transfer, handling and use of genetically modified organisms and their products and to minimize the adverse effects on the conservation and ensure sustainable use of biodiversity. During the Ninth Plan, BAFRA offices were established in all 20 Dzongkhags, 5 entry points and the city service center in Thimphu. However, the shortage of qualified manpower and lack of infrastructural facilities poses a challenge to the successful implementation of the program.

C. Strategy:

The key strategies for the Tenth Plan include development of basic infrastructural facilities, human resource development, strengthening legislations and standards for inspection and certification. The priority programs for the Tenth Plan will include the strengthening of plant and livestock quarantine measures, input quality assurance, inspection and certification, developing laboratory services, food safety and quality assurance and development of basic infrastructure in the Dzongkhags.

**D. Results Framework:**

Impact	Outcome	Output	Projects/Activities
Proportion of rural households living below the poverty line reduced from 30.9% to 20%	At least 3 plant and animal quarantine stations fully equipped and functional (from 0-3); 100% food handlers trained and licensed by 2013 from 0 in 2007.No. of HACCP certified companies increased by 100% (from 2 on 2007 to 4 in 2013); Quality of all commercial inputs regulated as per standards	Acts, rules, regulations and standards instituted and enforced; Basic infrastructure including laboratory services developed and operationalized; Strengthened human resource capacity; At least 50% of the population aware of the plant and animal quarantine system, the seed rules and regulations, the pesticides act, the food act and the livestock act of Bhutan (increase from 0-50% in 2013 from No. Awareness in 2007)	Strengthening Plant & Livestock Quarantine Measures; Development of Laboratory Services Infrastructure; Input Quality Assurance, Inspection and Certification; Food Safety and Quality Assurance ; Office construction in 5 Dzongkhags

E. Management Arrangements:

The Bhutan Agriculture and Food Regulatory Authority of the Ministry of Agriculture shall be the overall execution, coordination and implementing agency of the program. BAFRA shall also closely collaborate with other technical departments particularly in enforcement of the Acts such as Livestock Act, Nature Conservation Act, Pesticide Act, etc.



Budget

#	Description of Projects/ Activities	Budget (Nu. in million)
1	Strengthening Plant & Livestock Quarantine Measures	38.185
2	Input Quality Assurance, Inspection & Certification	16.000
3	Development of Laboratory Services	39.000
4	Food Safety and Quality Assurance	14.000
5	Infrastructure Development	10.000
Total		117.185

5.7 National Biodiversity Center

Introduction

International Convention on Biological Diversity (CBD) was ratified in 1995 by the 73rd session of the National Assembly of Bhutan. Consequent to the ratification of the convention, Bhutan developed the first Biodiversity Action Plan (BAP) of Bhutan - a guiding policy document for conservation and sustainable utilization of biological resources of the country. The National Biodiversity Centre was instituted in 1998 as a non departmental agency under the Ministry of Agriculture to coordinate the implementation of Biodiversity Action Plan and other biodiversity conservation and sustainable utilization programs in the country. Considering the cross-sectoral nature of the responsibilities, the National Biodiversity Management Board (NBMB) was formalized on 2nd August 2000. The NBMB is a national level decision making body on issues related to biodiversity. The Board guides and approves all policy issues and plans related to biodiversity conservation and utilization in the country.

In the last 10 years of its establishment, NBC has following functional biodiversity conservation and sustainable utilization facilities in place: a) National Herbarium b) National Gene Banks for Crop and Animal Genetic Resources Conservation and c) Serbithang Botanical Garden. The National Herbarium has a collection of about 10,000 herbarium specimens and 9 volumes of publications on flora of Bhutan. The Crop gene bank has collected and conserved more than 500 accessions of crop germplasm and the animal gene bank has germplasm collection of local poultry, pig and sheep. The Serbithang Botanical Garden has living



collection of about 153 species of orchids and more than 200 ornamental and economic plants including bamboos.

National Biodiversity Centre in consultation with biodiversity stakeholders in the country is in the process of formulating BAP III to outline the biodiversity conservation activities in the 10FYP and will be completed before June 2008. The Biodiversity Act of Bhutan, 2003 - a latest legislation for regulating access and benefit sharing (ABS) to biological resources in line with the requirements of the CBD is also in place. Currently, the centre is drafting implementing rules and regulations of the Biodiversity Act.

Vision

“Effective Conservation, Sustainable utilization & equitable sharing of benefits arising from access and use of biological resources for present and future generations”

Mission

Biological resources effectively conserved and sustainably used for enhancement of livelihood, food security and environmental well-being of the country.

The objectives of the NBC are;

1. To develop institutional and national capacity in the technical, managerial and policy areas of biodiversity.
2. Collection, conservation and sustainable use of biological diversity of the country for food and agriculture.
3. Develop policies, legal framework and tools to facilitate access, use and benefit sharing of biological resources.
4. Strengthen biodiversity knowledge base for research and effective management of biological resources.



Program Description

MoA/29: National Biodiversity Conservation Program.

A. Program Overview		
1	Sector	<i>Biodiversity</i>
2	Linkage to National Development Objectives & Strategies	<i>Poverty reduction, Biodiversity conservation and Income generation</i>
3	Expected Results	<i>75% of crop and 50% of animal genetic resources characterized and documented</i> <i>Representative of 5000 species of vascular plants collected and conserved</i> <i>Biodiversity Action Plan III developed and implemented</i>
4	Relevant MDG & SDG	<i>MDG Goal 1, 7: Eradicate extreme poverty and hunger, ensure environmental sustainability;</i> <i>SDG Goal 1, 20: Eradication of hunger poverty and conservation of biodiversity;</i>
5	Donor Agency	
6	Target Group	<i>National</i>
7	Scope	<i>National</i>
8	Status-Ongoing or New	<i>Ongoing/ new</i>
9	Tentative Timeframe	<i>Five Years (2008 – 2013)</i>
10	Indicative Costs (Nu. in million)	<i>Recurrent: 95.766 Capital: 89.22</i> <i>Total: 184.986</i>
11	External Financing Required (Nu. in million)	<i>89.22</i>
12	Executing Agency	<i>Ministry of Agriculture</i>
13	Implementing Agencies	<i>National Biodiversity Center</i>
14	Documents Available	<i>Biodiversity Action Plan 2002; Biodiversity Act of Bhutan 2003; Draft Sector Tenth Plan</i>



B. Situational Analysis:

The National Biodiversity Center was established in 1998 as a non-departmental agency under the Ministry of Agriculture. The main objectives of the center is to ensure effective conservation and sustainable utilization of genetic resources for sustainable livelihood and food security, and to ensure adequate national capacity to participate in global efforts to conserve and use biodiversity resources for food, agriculture development, industrial development and environmental conservation. Prior to and during the 9th Plan, the center focused mainly on establishing infrastructure, building human resource capacity, and strengthening national and international cooperation.

Some of the programs initiated during the 9th FYP were:

- Development of national herbarium and flora of Bhutan;
- Agro-biodiversity conservation;
- Biodiversity use and conservation in Asia;
- Animal genetic resources conservation;
- Development of royal botanical garden; and
- Development of an integrated biodiversity information system.

The Biodiversity Action Plan, which was published in 1998, has been revised in 2002 and the Biodiversity Act of Bhutan was enacted in 2003.

C. Strategy:

The key strategies that will be adopted for biodiversity conservation during the Tenth Plan are as follows:

- Strengthening gene bank, botanical garden and herbarium for ex situ and in situ;
- collection to facilitate conservation and sustainable utilization;
- Strengthening inventory, survey, documentation and information management system;
- Enhancing capacity of the technical staff and farmers through on-farm management training;
- Integration of conservation, research and development with effective utilization of genetic resources;



- Strengthening collaboration with relevant international institutions; and
- Commercialization/sustainable utilization of biological resources through bio-prospecting.

D. Results Framework:

Impact	Outcome	Output	Projects/Activities
Proportion of rural households living below the poverty line reduced from 30.9% to 20%	National plant genetic resources conserved; Crop and animal genetic diversity collected, characterized, documented and effectively conserved in ex-situ for sustainable utilization; Information and knowledge on flora and biodiversity of the country enhanced and used effectively	1 Field gene bank established; 75% of crop and animal genetic diversity collected and preserved in the seed gene bank; 60% of the plants species from cool to warm temperate ecological zones collected; 50% of inventory on characterization and documentation of indigenous livestock, poultry and fish completed; 1 botanical garden established in the south; Pilot project on bio-prospecting initiated	Conservation and sustainable utilization of plant and animal genetic resources; Establishment of National Herbarium and Floristic Botanical Garden; Development of National Biodiversity Information; Development Infrastructure; Implement bio-prospecting.

E. Management Arrangements:

The overall execution, coordination and implementation shall be carried out by the National Biodiversity Center under the Ministry of Agriculture. The center shall also coordinate with Research Centers, Nature Conservation Division and the Dzongkhags and Geogs for implementation of the program.

**Budget**

#	Description of Projects/ Activities	Budget (Nu. in million)
1	Ex situ conservation and sustainable utilization of plant genetic resources for food and agriculture	20.970
2	In situ conservation, development and sustainable utilization of plant genetic resources	14.200
3	Animal genetic resources conservation and sustainable utilization	19.150
4	National Herbarium and Floristic program	8.500
5	Serbithang Botanical Garden	11.8 00
6	National Biodiversity Information Development and Management and secretariat	4.600
7	Bio-prospecting	10.000
Total		89.220



CHAPTER 6: HUMAN RESOURCES MANAGEMENT AND DEVELOPMENT

A Master Plan for human resource development of the Sector is prepared based on the human resource needs assessment. The Plan spells out types and level of human resources development across the sector. The plan also specifies concrete measures to be employed in deployment of competent and qualified human resources at local levels. Institutional linkages, partnership and collaboration to be forged with strategic local and external partners in order to implement the plan are described in the plan.

6.1 Human Resource Management

The Ministry of Agriculture is one of the biggest ministries in terms of the size of human resource. The Ministry has pool of human resource with different background under different departments/division/centers. The Human Resource Management has therefore become vital for the ministry in order to make the optimum use of its human resource. The HR management is by nature a complex issue if we do not have proper tool to tackle it. The Ministry of Agriculture has at present a total number of more than 3000 staff.

Table 12: Staff strength by position level

Agencies	EX/ES	P	S	O	Others
Department of Forest	2	187	721	165	213
Department of Agriculture	3	168	355	74	10
Department of Livestock	5	162	417	56	18
Council for RNR Research of Bhutan	2	95	105	45	16
BAFRA	1	31	177	2	1
Secretariat	1	89	91	45	6
Total	14	732	1806	387	264



Table 13: Staff strength of MoA as on December 2008

Agencies	No.
Department of Forest	1288
Department of Agriculture	609
Department of Livestock	653
Council for RNR Research of Bhutan	263
Bhutan Agriculture & Food Regulatory Authority	152
Secretariat	232
Total	3197

Table 14: Staff strength by qualification

Agencies	Ph.D	M.Sc	Bachelors	PGD	Diploma	Cert/ others
Department of Forest	4	39	16	20	236	975
Department of Agriculture	1	35	31	9	294	239
Department of Livestock	-	18	19	6	311	299
CORRB	4	29	17	15	77	122
BAFRA	-	8	4	-	113	27
Secretariat	1	27	45	-	17	142
Total	9	156	132	50	1048	1804

Table 15: Staff strength by Headquarters/Centers/Dzongkhags

Agencies	HQ	DZ	CENTERS
Department of Forest	157	544	587
Department of Agriculture	53	272	281
Department of Livestock	30	256	370
Council for RNR Research of Bhutan	24	239	
Bhutan Agriculture & Food Regulatory Authority	17	54	81
Secretariat	115	117	
Total	415	1463	1319



Although the ministry boast of having a large pool of human resource, it still requires additional manpower in the 10th plan to efficiently and effectively carry out the various programs and projects outlined during the plan period. The Ministry has proposed for about 50% increases of the existing total staff. As evident from the Table 16, the bulk of the proposed increase is from marketing and forestry services.

Table 16: Staffing proposal in 10th plan

Position Category	Approved Posts	Proposal	Increase/decrease	Existing	Gap against proposal	Increase (%)
SECTT	72	82	10	58	24	14
AMS	17	38	21	16	22	124
NBC	33	45	11	28	17	33
RDTC	12	12	0	9	3	-
AMEPP	18	19	1	17	2	6
RLP	5	6	1	5	1	20
BAFRA	127	224	97	143	81	7
DOF	1325	2077	752	1270	726	57
DoL	259	353	94	217	146	36
DoA	241	369	128	261	108	53
CoRRB	234	308	74	217	91	32
Total	2343	3533	1189	2241	1221	-

Although the Ministry proposes for 50 percent increase in the number of HR during the 10th Plan, it will at the same time be offset by the retirement of 300 personnel during 2009 and 2018 due to their superannuation age. The details of the same are given below.

Table 17: Summary on no. of People Retiring in 10 years time

Age	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
Position Category	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
	M	F	M	F	M	F	M	F	M	F
EX					1		2		1	
ES								2	2	3
P	1	10	7	9	15	20	16	17	18	6
S	5	5	8	12	23	16	26	26	35	26
O					1	2		2	1	3
Sub Total	6	15	15	21	40	38	44	47	57	38



Table 18: Details on no. of People retiring in 10 years time

Age	1950		1951		1952		1953		1954		1955		1956		1957		1958		1959	
Position	2009		2010		2011		2012		2013		2014		2015		2016		2017		2018	
Category	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
SECRETARIAT																				
EX	1																			
ES	1																			
P	2																			
S	1																			
O	2																			
Sub Total	3																			
DEPARTMENT OF FOREST																				
EX	1																			
ES	1																			
P	4																			
S	5	4	4	2	5	5	14	12	14	16	20	7								
O	5																			
Sub Total	8																			
DEPARTMENT OF AGRICULTURE																				
EX	0																			
ES	1																			
P	4																			
S	0																			
O	1																			
Sub Total	4																			
DEPARTMENT OF LIVESTOCK																				
EX	1																			
ES	2																			
P	1	1	1	3	4	6	5	4	7	1										
S	0	1	1	1	0	2	4	1	5	13										
O	1																			
Sub Total	1																			
COUNCIL FOR RNR RESEARCH OF BHUTAN																				
EX																				
ES																				
P	1																			
S	2																			
O	3																			
Sub Total	1																			



6.2 Human Resource Development

The broad human resource development strategies for 10th FYP are:

- Manning all programs and activities with skilled man power
- Developing and strengthening the capacity of the In country training institutes of the RNR sector
- Identify relevant training institutes in ex countries
- Resource mobilization
- Identifying training needs and implementation of training of existing staff
- Identify in-service diploma/PG diploma for BSc studies at CNR (20 for each sector in a year)
- Equip all the Dzongkhag with minimum staff requirement and enhance their knowledge skills and capacity thorough higher studies and training
- Optimum utilization of CNR & UWEFI for refresher course, specialized course, up gradation courses and skill development training of the in-services RNR staff

Key Result Areas (KRAs) associated with the human resource development objectives/activities are:

- All field programs, dzongkhags and geogs provided with adequate and skilled manpower.
- Developed and strengthened the capacity of the in-country training institute of the RNR.
- Increased the postgraduate level researchers and extension officials.
- Enhanced the research capacity and output and adequate coverage by the extension to deliver the services.
- Improved the critical mass of researchers and extension agents and their required knowledge and skills;
- Quality of research and extension improved through increased capacity of different research centers and extension centers (basically the dzongkhags and geogs) by way of specialization in different fields;



- Inventory of forestry completed, forest management plans put in place and 26% of the country under protected area managed efficiently and Management Plan Developed for the Major River Basins of the country

The main competency requirements (gaps) in the Ministry of Agriculture are in the following areas:

- Agronomy, Plant Breeding, Horticulture, Plant Protection, Soil and Water Management, Land management, Farming System and Agricultural Economics, Agriculture Engineering and Farm Mechanization, Organic Farming and Methods, Rural Development, Commodity Development, Field Crops and Vegetables and Post Harvest Development and Technologies.
- Forest ecology and silviculture, Designing Forest Resources and Inventory, carrying out biodiversity and socio-economic surveys, Forest Protection and management, Techniques to review Forest Land Use, Community Forest mobilization/participation, Conservation and Environment, Climate Change, Watershed management, Non-Wood Forest Resource Product and Management, Nursery Management, Natural Resources Management, Forest Fire Control and technique and Eco-Tourism.
- Technical knowledge on participatory extension methodology and communication skills, Extension and communication Services and Participatory Management, Research Methodology, Agriculture Business and Marketing, Co-operatives Developments and methods.
- Livestock System Economics, Animal Health, Production and Nutrition Technology (large and small animal), Fodder Development, Rabies control, Dairy Husbandry, Technology and Processing, Laboratory Analytical skills and methods.
- Plant Inspection and Certification, Food Science and Safety Management, Animal and Plant Quarantine Management.

BSc Program in College of Natural Resources

The Ministry of Agriculture is proposing BSc program in College of Natural Resource, Lobesa. One of the objectives of the program is to create opportunity for the in-service staff to upgrade their qualification without having to go ex-country, which involves huge investment. The program is proposed to be commenced in June 2009. The intake for the initial year would be 20 each for three sectors, Forestry, Agriculture and Livestock. The selection criteria for the up-gradation degree course are developed in consultation with Royal University of Bhutan and Royal Civil Service Commission. One of the thrust areas for selecting the candidates would be the performance of eligible candidate in their present duties. If the



intake remains same as proposed, the Ministry of Agriculture would have 350 additional upgraded BSc holders by the end of 10th plan.

Table 20: Budget summary of HRD proposal for the 10th plan (in million Nu.)

Agencies	Long term	Short term	Total
DoA	27.792	38.250	66.050
DoF	54.027	46.788	100.820
DoL	29.634	11.556	41.190
CoRRB	53.271	29.295	82.570
NBC	17.388	8.2965	25.680
AMS	11.88	2.400	14.280
PPD/HRMD	12.528	3.977	16.510
AFD		1.701	1.700
BAFRA	39.69	4.682	44.370
TOTAL	246.21	146.95	393.160

Table 21: Summary of HRD in 10th Plan by field/level (in million Nu.)

Field	No. of Slots	Budget
Ph.D	8	32.118
M.Sc	51	104.463
PGD	147	91.935
PG Certificate	78	1.008
Bachelors	2	5.184
Diploma	26	11.502
Short term	312	146.950
Total	624	393.160



CHAPTER 7: POLICY, PLANNING AND IMPLEMENTATION PROCESS

7.1 *Policy process*

In many developing countries there has, in recent years, been a renewed emphasis on the importance of policy measures in securing economic development. This has arisen both from disillusionment at the failure of many past development projects to achieve their objectives, and acknowledgement that a favorable macroeconomic and sectoral policy environment that provides incentives for economic activity is a precondition to economic growth and development. While Bhutan has enjoyed much greater stability and higher sustained economic growth than many countries, there has, within Government, been increasing emphasis on the importance of sound national and sectoral policies.

It is useful to distinguish between policy making which is the responsibility of the Government and policy planning and analysis which is carried out by Ministries and Departments. The quality of Government policy making will, to a great extent, depend on the thoroughness of the preceding planning and analysis on which it is based. Sector policy planning may be considered an iterative process occurring at all levels within Government, but with the Sector Ministry having a coordinating and overseeing role. It is also important to acknowledge the technical aspects of RNR sector policy making which are rightfully the preserve of the Technical Departments. For example, it is for the Department of Livestock to identify which breeds of improved livestock should be promoted, and for the Department of Agriculture (DoA) to determine which crop varieties should be included in its research and extension programs.

The main Government economic policy document is the National Plan. The preparation of the National Plan provides a focus for the formalization of Government policies and is usually the period of most active policy making. However, policy determination is a continual process and Government policy statements may be issued at any time. For PPD there is an on-going requirement to undertake policy studies and analysis for the RNR sector to support policy-making by Government.

The Ministry has constituted several committees to devolve and decentralize various decision making processes, and also it is the intention of the ministry to provide faster, transparent and informed decisions to various stakeholders.

RNR GNH Committee: This highest decision making committee in the Ministry was constituted to enable participatory and analytical based policy and strategic decision making within the Ministry of Agriculture and to enhance information exchange, improve cross-



agency coordination in the RNR Sector through regular and structured meetings. The forum will review, endorse and recommend on major policy and strategic issues within the sector. Issues to be reported and discussed for endorsement by the forum includes but not limited to the following;

- Formulation and packaging of new or reviewing of existing policy directives based on regular policy briefs (all strategic and policy proposals should be submitted to the forum in the form of policy briefs).
- Coordination with other sectors on issues and programs related to inter-sector cooperation and partnership
- Coordination of Cross cutting issues within the sector
- Endorse coordination of major RNR events (such as the RNR conference, RNR Expo)
- Review progress (half yearly) reports
- Endorse new publications and studies
- Endorse or authorize institutional development initiatives within the sector
- Discuss and endorse new project concepts and proposal under the RNR sector.
- Discuss and decide on ad hoc major RNR issues and events

Human Resource Committee (HRC): In accordance with the requirement of the Bhutan Civil Service Rules (BCSR) 2006, the ministry also constituted the HR Committee to guide and address all human resource actions within the ministry to promote broader participation, ensure fair and transparent HR decisions based on merit. The committee will also ensure that the HR actions taken are in line with the Government policies and the organizational goals and objectives. The main task of the HR committee is to a) review effective enforcement of code of conduct/discipline, private trade rule and BCSR; b) formulate/review HR policy matters, as and when directed; d) review and appeal on the position classification system (PSC); d) review appeal on the appraisal of performance by managers; and e) review and adjudicate disciplinary cases on time.

RNR Good Governance Committee (RNR GGC): In view of the Royal Government's effort to make the delivery of services effective and efficient thereby contributing meaningfully to fulfillment of the Gross National Happiness, MoA has instituted this committee to specially assist the MoA in the prevention of any corrupt practices. The Committee is entrusted with full authority to review, examine and investigate wherever necessary, and



maintain full transparency. The committee will also recommend for taking disciplinary action against officials and agencies involved in corrupt practices. The committee, inter alia, will review administrative, procedural and managerial lapses including rules and regulations; recommend appropriate measures to enhance transparency and prevent fraud and corruption; create awareness on the adverse impact of corruption and facilitate as a forum to raise issues on corruption through media and other means; assess cases referred by the Head of the Ministry to the Committee (administrative, financial including misappropriation, embezzlement issued by the IAU-MoA) and make appropriate recommendations; examine the complaints shared by Anti-Corruption Commission and recommend appropriate actions; and assess cases proposed by members and make suitable recommendations.

Extension Coordination Committee (ECC): The ECC has the overriding mandate to facilitate the coordination and integration of RNR Extension services amongst the various agencies of the MoA viz: CoRRB, DoA, DoL and DoF and other relevant agencies. The ECC functions as a technical committee with CoRRB. It reviews and develops extension policy framework and strategy periodically; coordinate cross-cutting extension related issues, eg farmers groups and cooperatives, extension research needs amongst various agencies of the MoA and beyond; promote and represent MoA on forums such as conferences, seminars on cross-cutting extension themes and policies and strategies; review and propose innovative extension approaches; and strengthen linkages between research and extension

Scientific Review Committee (SRC): The scientific review committee has been constituted to a) assess and appraise on issues related to material transfer (biological resources that are not for consumption and not been utilized), b) assess and appraise on issues of related to access of genetic resource, c) consultations related to acts such as National Biodiversity Act, Forest and Nature Conservation Act, National Environment Protection Act, the Livestock Act, etc., d) assessments particularly focusing on issues related to export of genetic resources. The SRC will be coordinated by NBC and the views from the committee shall be subject to ministry's approval.

7.2 *Planning process*

The 10 FYP formulation process took place at the time of profound political and structural changes taking place in the country. As the adoption of parliamentary democracy was foreseen to take place at the advent the 10 FYP, challenges and opportunities ensuing from such a change were given due consideration in the formulation of the 10th Plan.

The Government declared poverty reduction to be accorded top priority for the 10th Plan. Since most of the people living under the poverty are in rural areas the RNR sector recognized poverty reduction as its main focus. The sector vision, mission, objectives, strategies and programs were framed with this consideration.



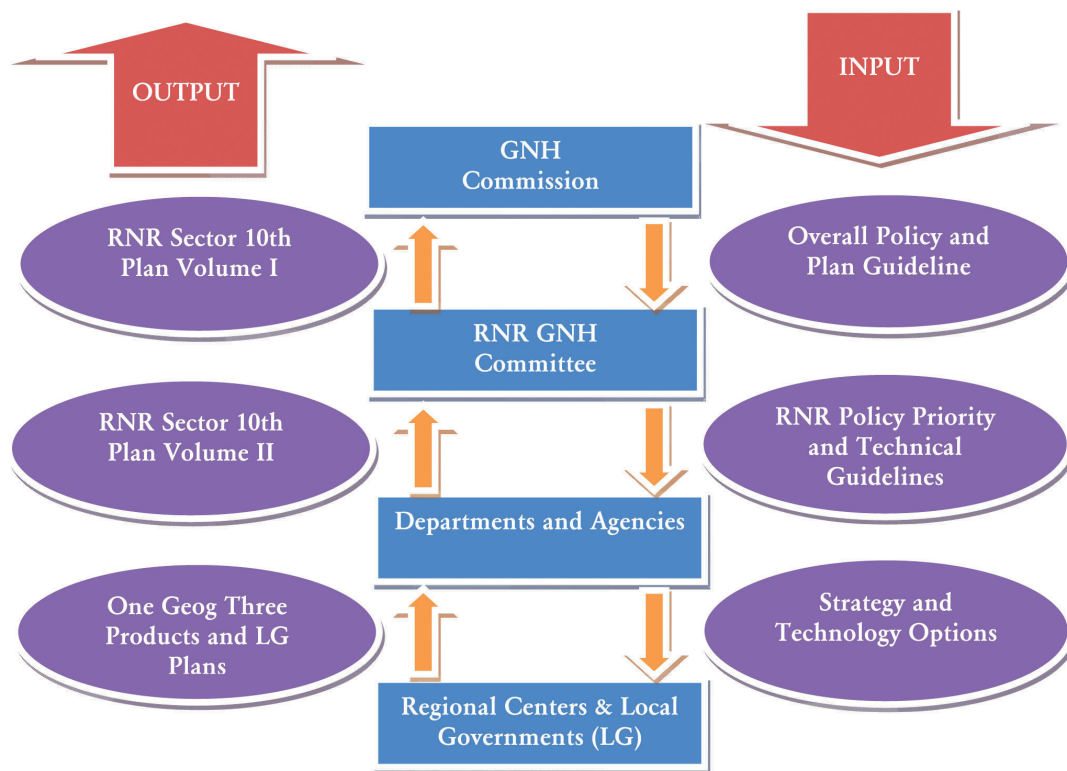
With the reconstitution of the Gross National Happiness Commission (GNHC), the role of coordinating local level planning was assumed the GNHC Secretariat. The GNHC further entrusted this responsibility to the Dzongkhag Planning Units (DPUs). The Dzongkhags and Geogs were required to formulate their plans, while the centrally operating departments and non-departmental agencies were to formulate their plans, independently. With this the need to harmonize the central plans (of departments and non-departmental agencies) with the local plans (of Dzongkhags and Geogs) became crucial. As a result, the need to issue a technical guideline for the sector was inevitable: one to provide overall format for the sector plan and two to ensure that potential disharmony between the central plans and the local plans are tackled right from the start. The Technical Guideline was issued to the Departments and Dzongkhags to guide the preparation of the Sector Plan. Following the Technical Guideline departments, Dzongkhags and Geogs prepared their plans. The preparation of Dzongkhag and Geog plans.

The RNR sector 10th plan was formulated through a consultative and participatory process involving all stakeholders. The planning process for the preparation of the 10 FYP started with a strategic planning workshop, whereby all the departmental and non-departmental agencies of the Sector took part in this workshop. Subsequently, another stakeholder workshop to concretize the various programs to be implemented during the 10th plan was also held with all the agencies of the MoA.

During the workshops, logical linkages were established between vision, mission, objectives, and programs. Concrete indicators were decided for the programs to measure their impacts, outcomes, and outputs using the national monitoring and evaluation system.

Although the central plans were formulated keeping in consonance all the planning processes, the local RNR plans could not be formulated as

Figure 7: Illustration of RNR Sector Planning Process



7.3 One Geog Three Products (OGTP) Concept

The 10 FY planning process for local level plans took place between the GNHC and the local level planning institutions. The main technical and policy backstopping institutions to the local plans, the sector, have not been involved in the planning process. As a result wide gaps emerged between the central plans/programs (the tied grants) and the local plans/activities (the local grants). In reality these two plans do not make a sector plan in isolation. Major issues such as poverty alleviation, income generation, employment generation and conservation can only be addressed in totality only if the central and local plans work together. To enable such a mechanism planning process should enable close interaction between the two. Such a process is particularly relevant for the RNR sector whose main clientele are the rural communities, the major stakeholder of local plans. The need for such a mechanism has been demonstrated by the local plans that are dominated by infrastructure development with no links to their purposes and are not in line with national policies and program context.



To foster closer link between the central plans; harmonize local plans with national policies; align central program resources and inputs with local plans and to bring about sharpened focus to local plans, the RNR sector carried out Dzongkhag level technical discussion with all field level RNR sector staff. The RNR plan harmonization exercise, called the “One Geog Three Products” (OGTP) approach to planning aimed to identify at least one to three products to be emphasized by every Geog depending upon market availability and potential production by the concerned Geog. Although the approach literally emphasizes on identification local products based on local situation, the approach has been used as broad concept for planning with the following functional objectives:

- Discuss and clarify on national RNR policies, programs and longer strategies for common understanding;
- Engage the local Extension who have the best local knowledge in planning process;
- Provide an assessment of the local plans from a central policy and programming perspective as well as local knowledge from field staff;
- Identify Market-Access and Production potential based products for development in a particular Geog. This is to bring about focused efforts in terms of investment as well as structured marketing system;
- Link local plans and central plans and provide an appropriate organizational arrangement for the central programs (tied grants) to support and facilitate the implementation of local plans;
- Provide logical and meaningful impact to programs and activities in the local plans.

7.4 Implementation Arrangement

The implementation of RNR programs involves the Ministry, technical departments, non-departmental agencies, Dzongkhags, and Geogs. The 10th Plan has adopted 29 programs which will be implemented jointly by all concerned.

Departmental programs related to research, information and communication, national biodiversity and genetic resources, food and agriculture regulatory services, policy, planning, administrative and financial services will be implemented by the respective non-departmental agencies. The departments will determine together with the non-departmental agencies such programs and reflect in their plans. Some of such programs will be for the plans of the non-departmental agencies.



Against every program the departments, Dzongkhags, and Geogs will specify their own roles and responsibilities in their plans. Generally, the departments will provide technical and regulatory support to the Dzongkhags and Geogs. The Dzongkhags will also provide technical and administrative support to the Geogs. The Geogs will implement the field works related to the 10th Plan.

Every department, Dzongkhag, and Geog will specify clearly the programs for which tied grants will be provided to the Dzongkhags and Geogs. They should formulate and include an arrangement as to how such programs will be implemented jointly. The Dzongkhags and Geogs plans have to delineate clear roles and responsibilities for Dzongkhag extension staff and Geog extension staff.



CHAPTER 8: BUDGET REVIEW AND OUTLAY

8.1 Introduction:

Budgeting is important both in short-term economic management and for medium-term development planning. The decisions on how much to spend, how to allocate that expenditure, and how to finance it have macroeconomic implications for the level of aggregate economic activity, the balance of payments, and consumption and investment. The Budget also helps to determine Government's influence on the economy as an investor and a provider of services. The budget gives the Government's authorization for public sector agencies to incur expenditures. It also provides the framework for the subsequent monitoring of expenditure and for ensuring accountability.

8.2 RNR Budget Expenditure and Execution

The total expenditures of the RNR sector for 2003/04-2007/08 and the budgeted appropriations for 2008/09 are shown in Figure 8 below.

Figure 8 – RNR Sector Expenditures 2003/04-2007/08 & Budget 2008/09 (Mill. Nu.)

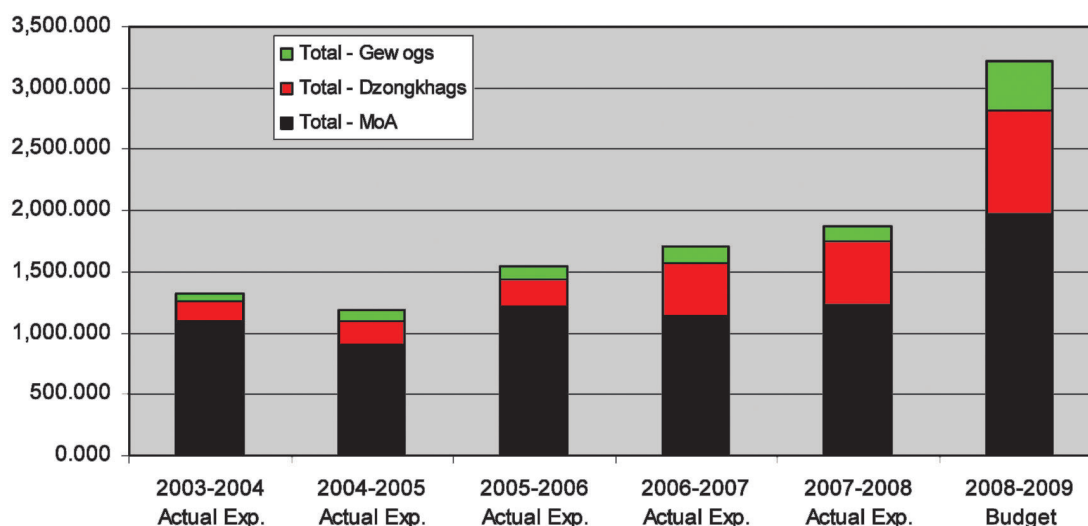


Figure 8 shows that the total expenditures of the RNR sector in absolute terms has increased every year since 2004/05, while the entire change from 2003/04 to 2007/08 is +42%. The appropriated budget for 2008/09 would imply an increase of 72 % compared with that of the previous fiscal year, but – cf. below – due to low budget execution rates the actual



2008/09 expenditures are likely to lead to a significantly lower increase.

The relative shares for each of the three implementing levels – central (MoA), Dzongkhags and Geogs – are shown in 9 below.

Figure 9– RNR Sector Expenditures 2003/04-2007/08 & Budget 2008/09 (%)

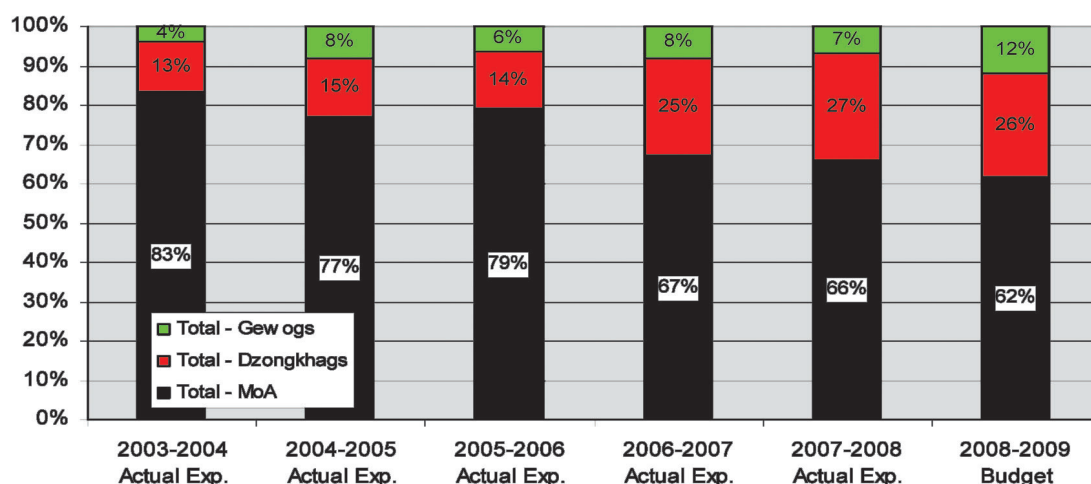


Figure 9 shows that that the Dzongkhags' relative share of the total RNR sector expenditures has increased steadily, from 13% in 2003/04 to 27% in 2007/08, and with a more or less similar share budgeted for 2008/09. The MoA's relative share has decreased almost every year since 2003/04. A relative increase is budgeted for Geogs in 2008/09 though whether this will in fact be the out-turn will depend mainly on their implementing capacity and the timely availability of committed donor funds.



The size of the RNR sector out of the total RGoB expenditures is shown below in Figure 10 below.

Figure 10– RNR Sector as a Share of RGoB Allocations, 2003/04-2008/09 (%)

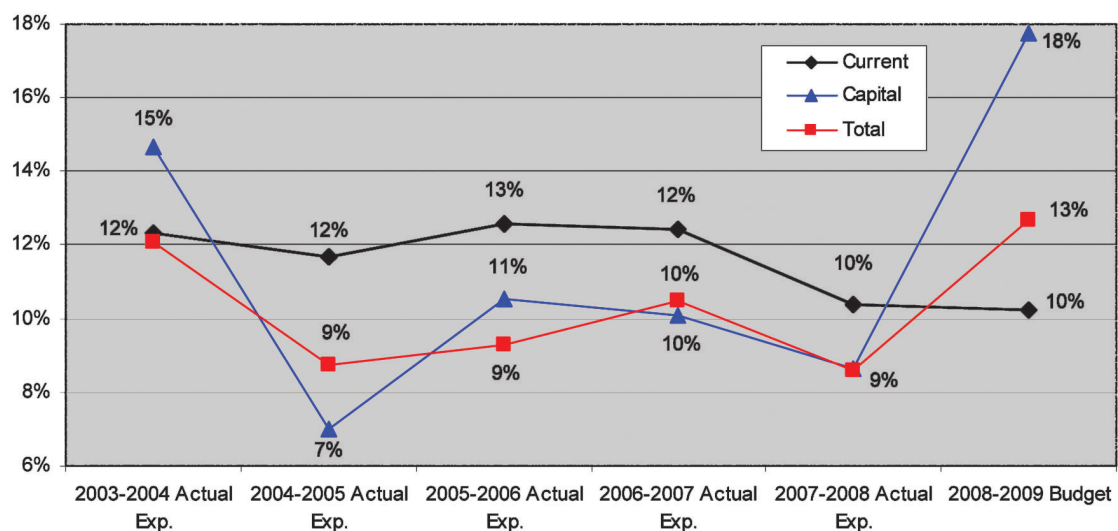


Figure 10 shows that the RNR sector's total share of expenditures has overall decreased from 12.1% in 2003/04 to 8.6% in 2007/08. This has mainly been due to the variations in the share of the capital expenditures, while the share of current expenditures has generally been stable apart from 2007/08. The appropriation for 2008/09 shows that the RNR sector's budgeted allocation of the total RGoB budget is considerably higher for the capital budget compared to the actual out-turn during the previous five years (which again is due to low budget execution rates, cf. below).



The distribution between capital and current expenditures is shown in Figure 11 below.

Figure 11– RNR Sector Current & Capital Allocation Shares, 2003/04-2008/09 (%)

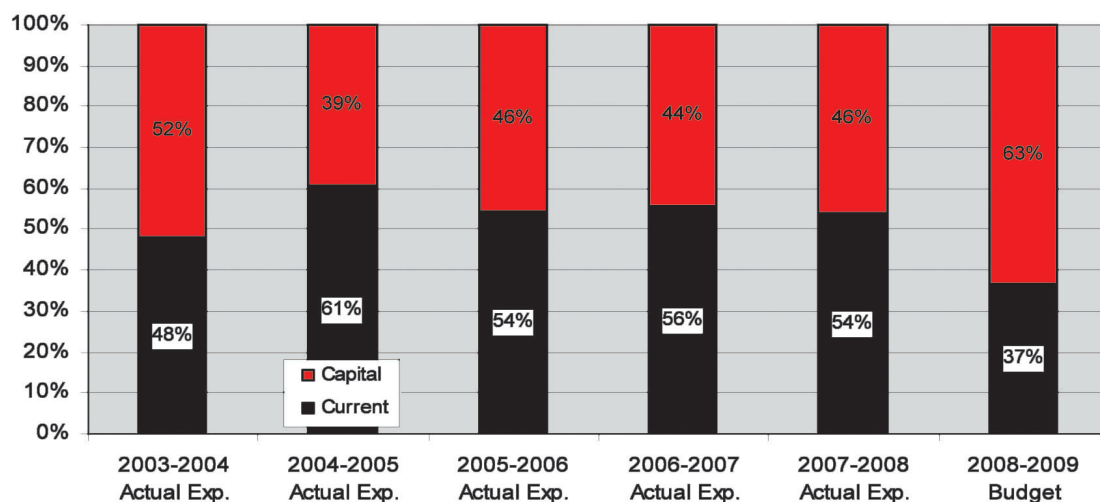


Figure 11 shows that, apart from 2003/04, current expenditures make up a slightly larger share than capital expenditures. As the appropriations for 2008/09 indicate, the budget is actually largest for capital expenditures, but due to budget execution rates being particularly low for the capital budgets –cf. below – current expenditures become the largest share.

The current, capital and total budget execution rates – i.e. the share of the budgets that is utilised through implementation of activities during the fiscal year – are shown for the RNR sector in Figure 12 below together with the total RGoB budget execution rates for comparison.



Figure 12 – RNR Sector and RGoB Budget Execution Rates, 2003/04-2007/08 (%)

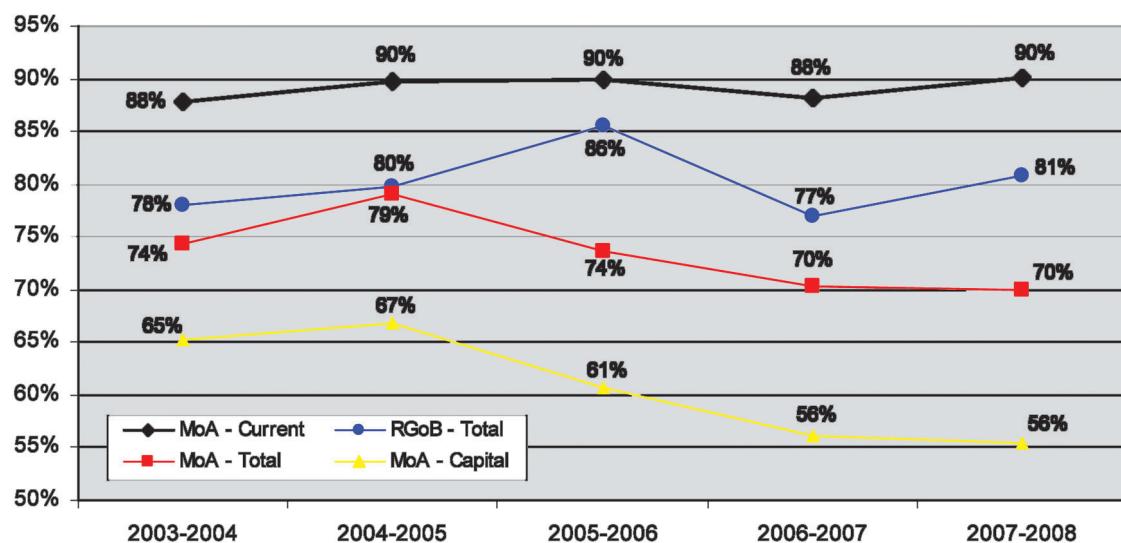


Figure 12 shows that the total RNR sector budget execution rates are below that of the RGoB as a whole for all years. While the MoA execution rate for the current budget has been relatively high and stable throughout the period, that of the capital budget decreased during the five-year period, from 65% in 2003/04 to 56% in 2007/08 (for the RGoB the 2007/08 figure is 70%, i.e. 14%-points higher). The RNR sector's ability to deliver public services as expressed in its policy statements is thus comparatively weak. The main reasons for the low budget execution rates – complex procurement procedures, delays or retraction of committed donor funding and low implementation capacity – are further analysed and discussed in sub-section 3.2.2 below.



The budget execution rates for each of the three implementing levels – central (MoA), Dzongkhags and Geogs – are shown in Figure 13 below.

Figure 13– RNR Sector Budget Execution Rates, 2003/04-2007/08 (%)

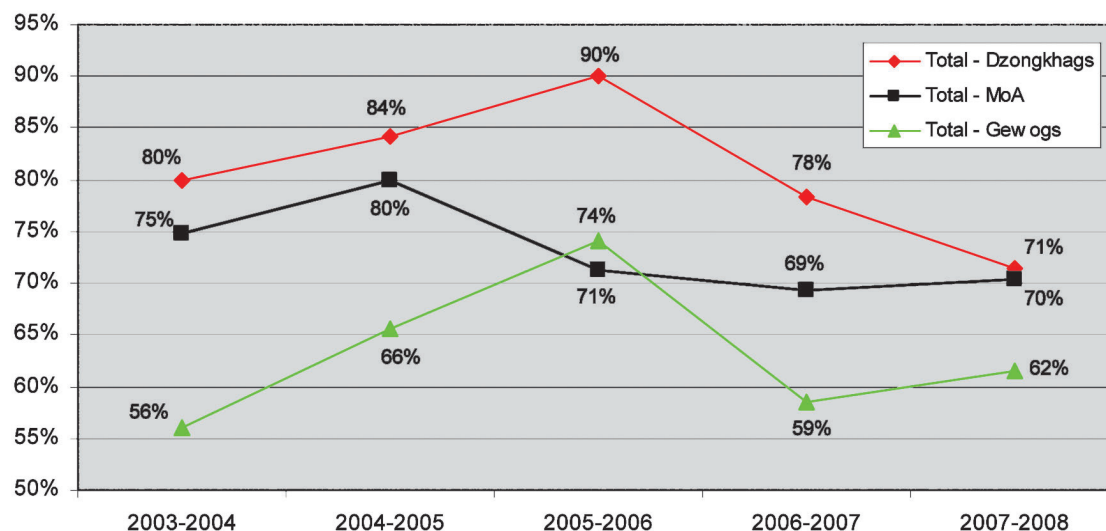


Figure 13 shows that the budget execution rates for the Dzongkhags in most years was somewhat higher than that of the MoA, while the Geogs – except for 2005/06 – had the lowest budget execution rates. The higher budget execution rates of the Dzongkhags is likely due to the fact that half of their total budgets consisted of current expenditures, which generally is utilised to a large extent compared to capital funds. Furthermore, Dzongkhags have given their size more resources and hence better possibilities for developing the necessary implementing capacities for projects which tend to be relatively few but large (compared to the MoA which has a multitude of large and small projects). With regard to the Geogs, the low budget execution rates are due to the fact that 95% of their budgeted funds during the five-year period were for capitals projects while their administrations were established fairly recently and therefore still need to develop and strengthen their implementing capacities.



The RNR sector total expenditures per department (for all three implementing levels) are shown in Figure 14 below.

Figure 14 – RNR Sector Expenditures, 2003/04-2008/09 (Mill. Nu.)

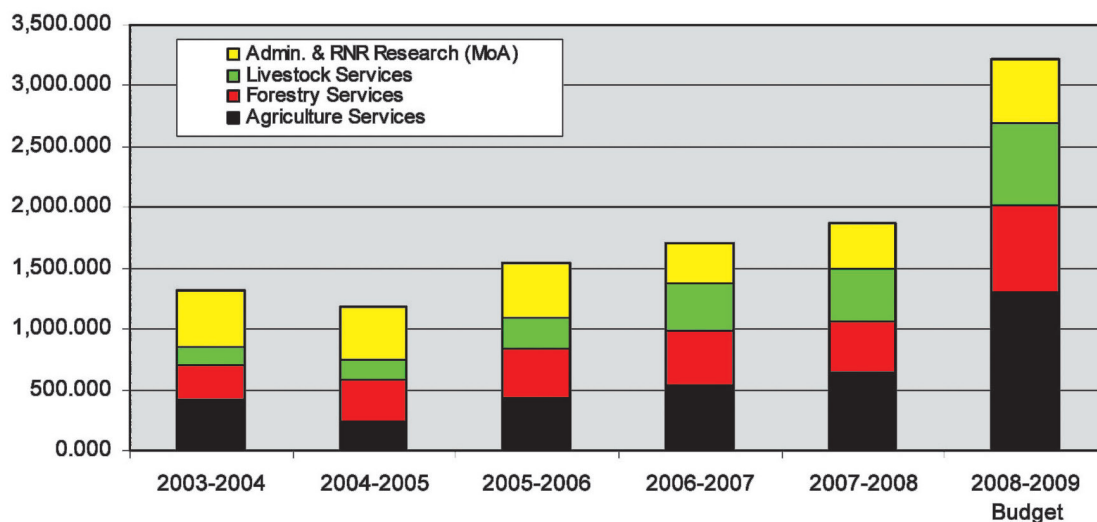


Figure 14 shows that the total expenditures for the RNR sector have increased in all years apart from 2004/05. The budget for 2008/09 would imply a considerable increase in total funding of the RNR sector.

The relative expenditure shares per department (for all three implementing levels) are shown in Figure 15 below.

Figure 15 – RNR Sector Expenditures, 2003/04-2008/09 (%)

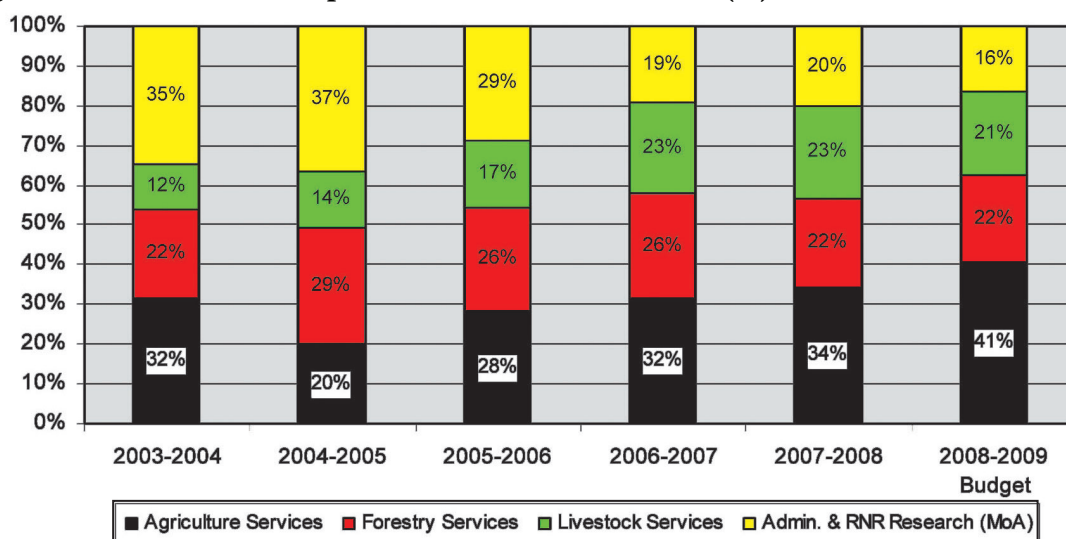




Figure 15 shows that overall during the five-year period, the relative share of Livestock Services has almost doubled, from 12% in 2003/04 to 23% in 2007/08, while the share of MoA's General Administration and RNR Research Services has decreased significantly during the period, from 35% to 20%. The relative size of the Forestry Services has been more or less stable, while that of the Agriculture Services has varied notably during the period; the full implementation of the 2008/09 budget would imply a significant increase of the Agriculture Services.

The budget execution rates for the four departments (covering all three implementing levels) are shown in Figure 16 below.

Figure 16 – RNR Sector Budget Execution Rates, 2003/04-2007/08 (%)

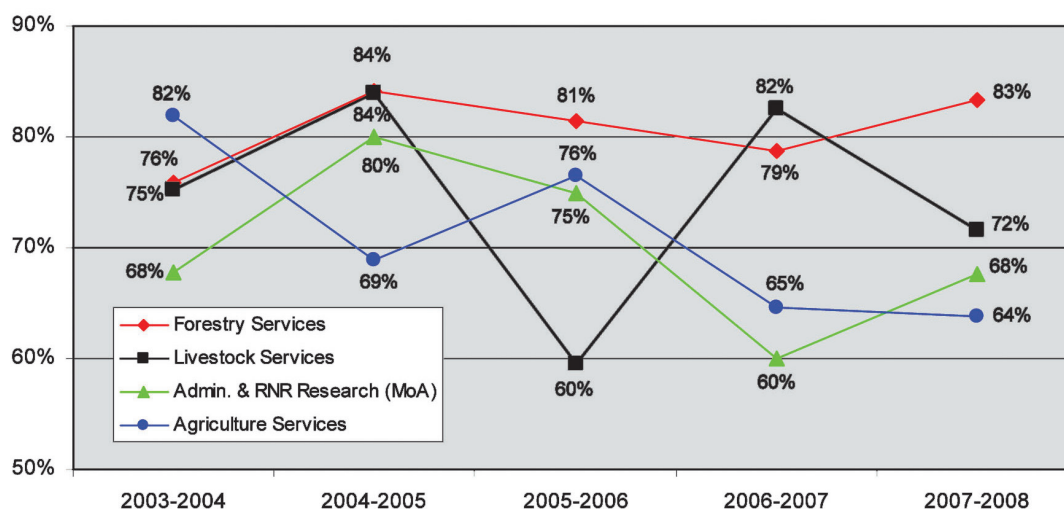


Figure 16 shows that the budget execution rates have fluctuated considerably for all departments, in particular for the Agriculture and Livestock Services. As will be discussed further in sub-section 3.2.2 below, this is related to donor-funded projects.



The MoA's total expenditures (current and capital) per program for 2003/04-2007/08 and the budgeted appropriations for 2008/09 are shown in Figure 17 below.

Figure 17 –MoA Total Expenditures per Program, 2003/04-2008/09 (Mill. Nu.)

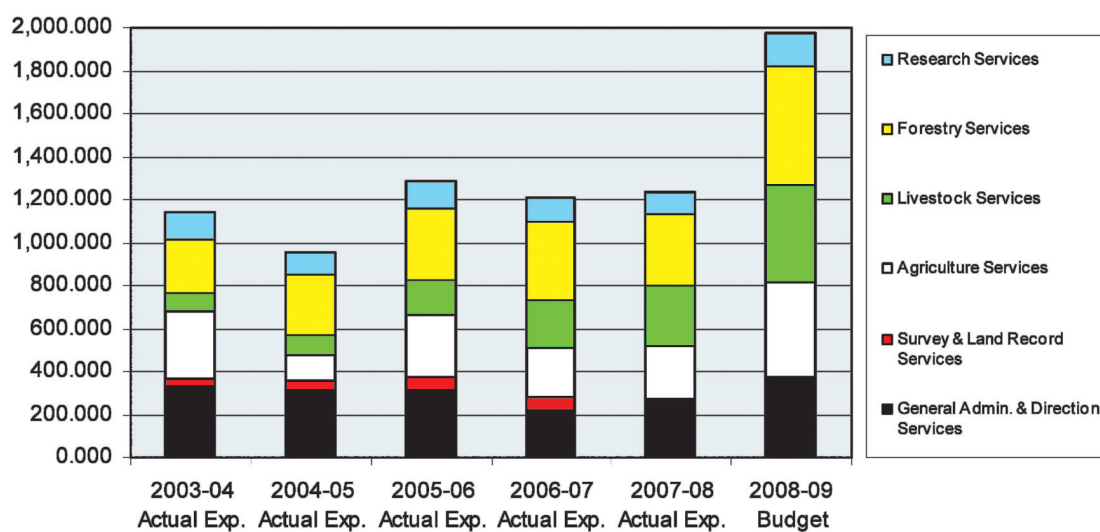


Figure 17 shows that MoA's total expenditures have varied somewhat during the five-year period, but with a roughly constant level from 2005/06 to 2007/08. The total budget for 2008/09 is approx. Nu. 729m (60%) higher than the total expenditures in 2007/08. Survey & Land Record Services were established as an autonomous entity in 2007/08.



The relative expenditure share per program is shown in Figure 18 below.

Figure 18 –MoA Total Expenditures per Program, 2003/04-2008/09 (%)

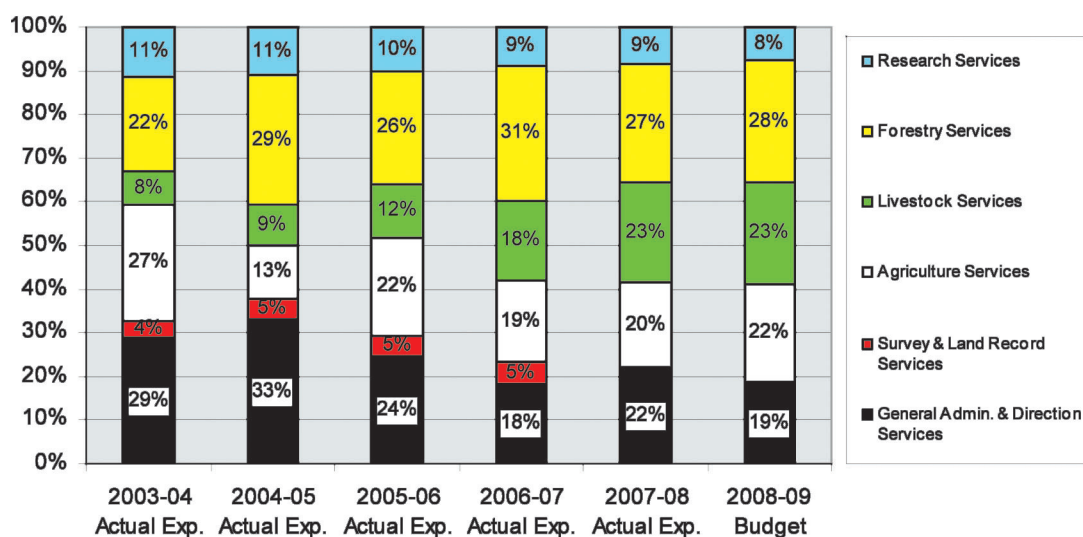


Figure 18 shows that the relative size of MoA's Forestry and Livestock Services increased from 2003/04 to 2007/08, while the General Administration Services decreased. This compares with the RNR sector as a whole where only Livestock Services increased, while Forestry Services was more or less unchanged.



The MoA's expenditures as a share of total central agency expenditures is shown in Figure 19 below.

Figure 19 – MoA's Share of Central Agencies' Expenditures, 2003/04-2008/09 (%)

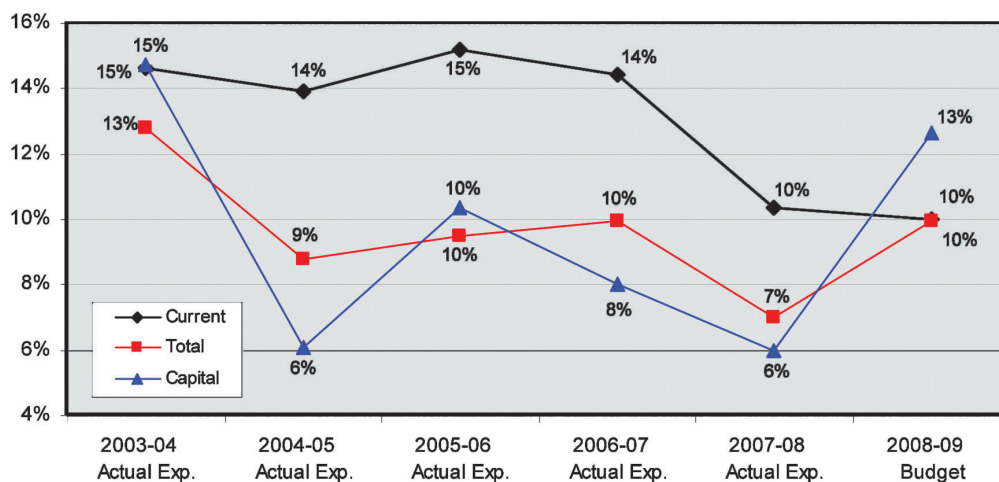


Figure 19 shows that the MoA's expenditure shares have fluctuated widely from 2003/04 to 2007/08, but generally with a decreasing trend, from a total of 13% to 7%. The budget for 2008/09 allocates a total of 10% of the central agency resources to the MoA.

The main current expenditure items of the MoA are shown in Figure 20 below.

Figure 20 – MoA's Five Main Current Expenditure Objects, 2003/04-2007/08 (%)

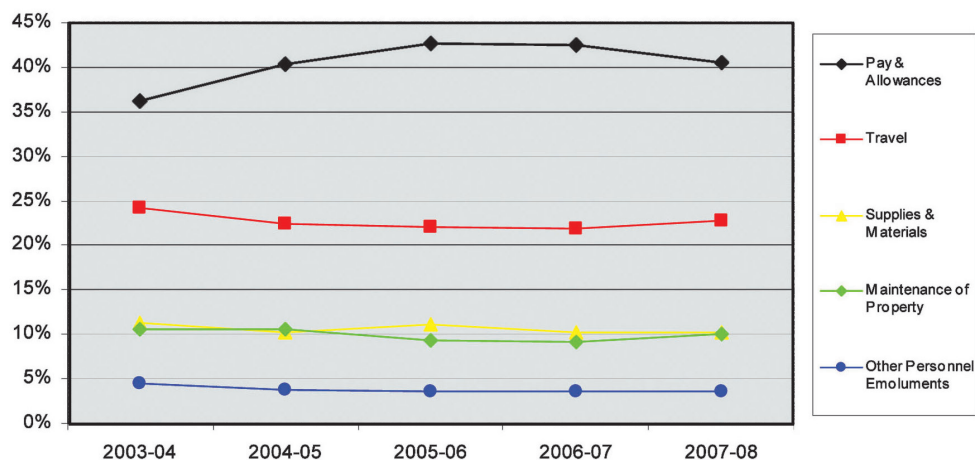




Figure 20 shows that salaries with 36%-43% make up the largest share of expenditures (the RGoB share is 33%-38%), which is relatively low by international standards. Travel, which relates almost exclusively to staff allowances for domestic travel, accounts for 22%-24% (11%-12% for the RGoB as a whole), which reflects that the activities of the MoA are heavily based on field work.

The main capital expenditure items of the MoA are shown in Figure 21 below.

Figure 21 – MoA's Five Main Capital Expenditure Objects, 2003/04-2007/08 (%)

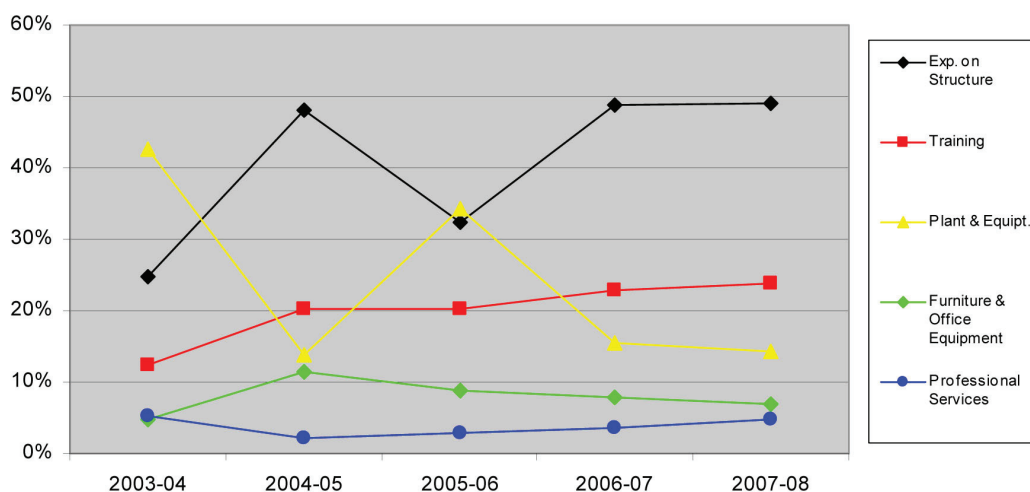


Figure 21 shows that, unlike for the current expenditures, the capital expenditure items fluctuate, especially regarding expenditures on structures (construction of buildings, roads, irrigation channels, drainage systems and plantations) and plant and equipment (for roads and power distribution as well as laboratory apparatus and general tools), which is due to the budget execution problems. For the RGoB as a whole, the main capital expenditure items are expenditures on structures and bridges, while expenditures on training in most years is on a level about similar to that of the MoA.



The execution rates of the MoA and the central agencies for the current and capital budgets are shown in Figure 22 below.

Figure 22 – MoA and Central Agencies' Budget Execution Rates, 2003/04-2007/08 (%)

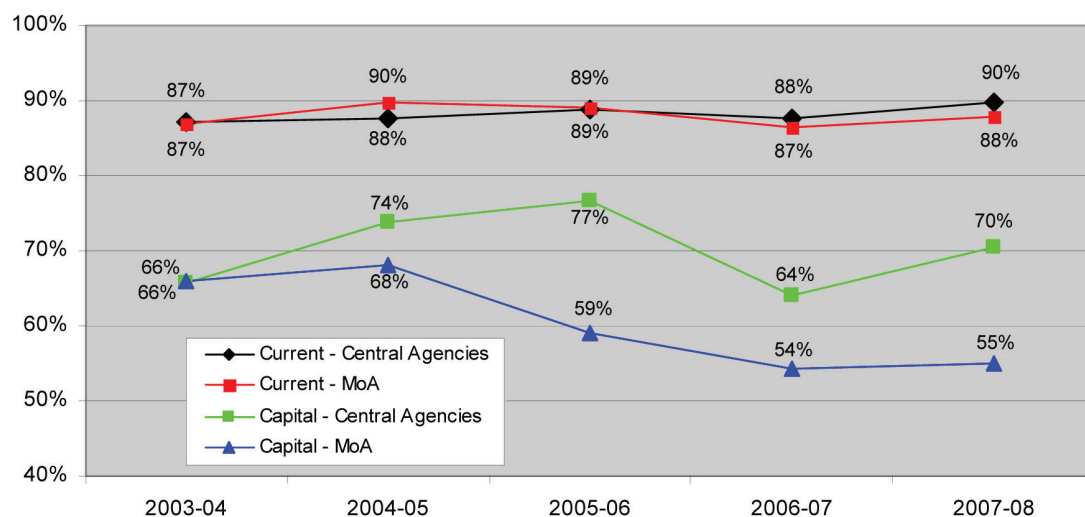


Figure 22 shows that while both the MoA and the central agencies as a whole have had relatively high and stable execution rates for the current budgets, there have been marked and widening differences for the capital budgets. MoA in 2007/08 thus had a capital budget execution rate that was 15%-points lower than the central agencies. This clearly indicates that MoA experiences particular challenges in its implementation of capital projects.

8.3 *Medium-Term Fiscal Framework (MTFF)*

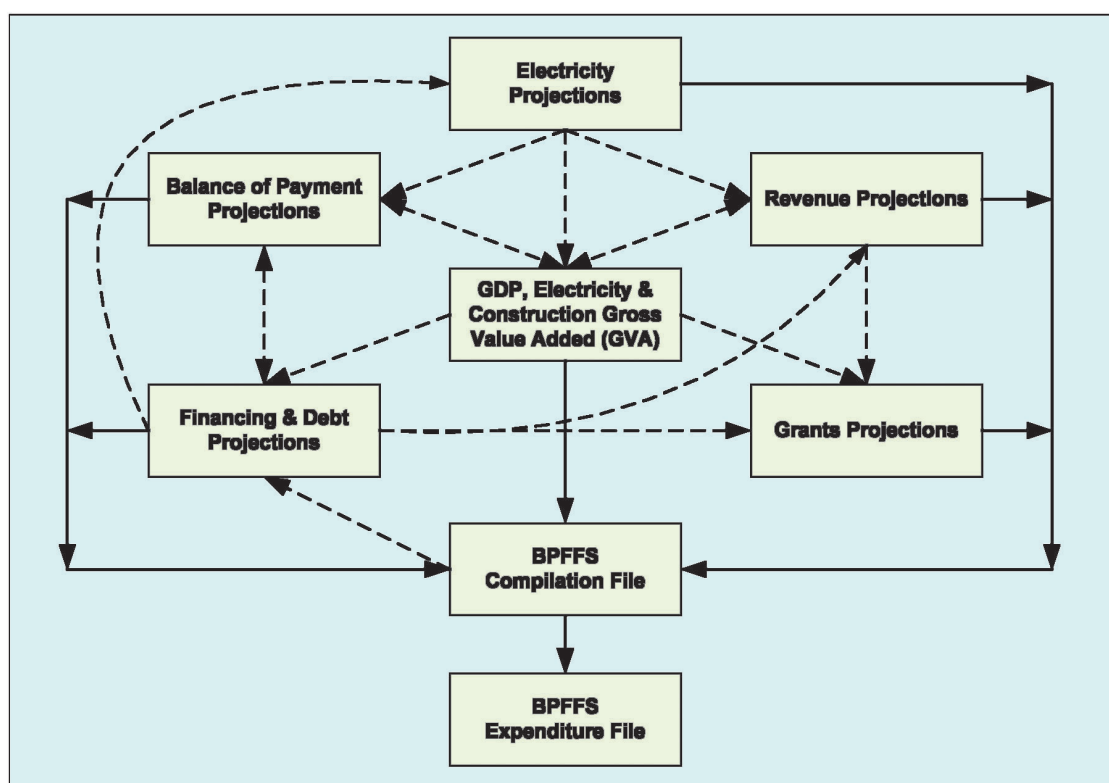
The Ministry of Finance (MoF) in 2005 started with the development of a Medium-Term Fiscal Framework (MTFF) so as to improve forecasting of Government revenues and expenditures for the medium- and longer term period, and to provide qualified inputs for formulation of the fiscal policy. The development of the MTFF was in line with recommendations by the IMF and the World Bank, and technical assistance was provided by the World Bank.

The MTFF overall consists of a set of inter-linked spreadsheets with separate sections for projecting key variables – GDP, Balance of Payments, Financing and Debt, Grants, Revenue,

Trade, Tourism, and Electricity/Hydropower Project Development. The MTFF through a set of integrated macro-economic and fiscal assumptions, targets and projections develops multi-year projections of the overall resource availability (based on tax, non-tax and grants) accompanied by projections of a sustainable path of major fiscal variables (deficit, debt, instruments of financing). This leads to a Budget Policy and Fiscal Framework Statement (BPFES) that establishes the aggregate resource envelop available to the Government in the medium-term within the given macro-economic and fiscal policy framework.

A graphical overview that illustrates the different elements of the BPFES and the data dependencies between them is shown in Figure 23 below.

Figure 23 – Budget Policy and Fiscal Framework Statement (BPFES) Model



Source: RGoB (2007): “Budget Policy and Fiscal Framework Statement – Manual”, January, p. 2.

The RGoB has – in accordance with Article 19 of the Public Finance Act (2007) – established the Macro-Economic Framework Coordination. The purpose of the MFCC is to ensure the soundness of the multi-year projections which necessitates a consistent and coordinated institutional arrangement among the key institutions within the Government.



The MFCC is responsible for collecting inputs from the involved institutions so as to ensure the preparation of a coherent set of macro-economic projections. Each MFCC member is responsible for:

- Updating medium-term projections in their respective files on a monthly basis
- Sharing relevant data with the MFCC members on a monthly basis
- Developing and updating the sectoral data on a quarterly basis
- Identifying emerging policy issues for the Minister of Finance on a quarterly basis

The practical functions are undertaken by the Macro-Economic Framework Coordination Technical Committee (MFCTC).

8.4 Sectoral Medium-Term Expenditure Framework (MTEF)

The RGoB in 2001 with a new Budget Manual introduced the regulatory framework for a three-year rolling budget – a Medium-Term Expenditure Framework (MTEF) – for development planning and aid coordination. The intention was to initiate a process by which the ministries and agencies annually would prepare spending plans for a three-year period – with the first year to be authorized by the National Assembly and the following two years providing indicative allocations – in order to provide a linkage between planning and (annual) budgeting so as to ensure aggregate fiscal discipline and facilitate strategic prioritization. The Budget Manual described the procedure for preparing rolling budgets and included specific budget forms.

However, the process of preparing annual MTEFs as part of the budgeting process was not implemented, apparently due to the lack of an IT-based tool to support the new procedure. The multi-year fiscal planning of the Government has therefore until now consisted of the (intermittent) development of Five-Year Plans, which on the budgetary side include consolidated five-year projections for current and capital outlays with allocations per sector and ministry, and the now regular process of updating and further developing the BPFES to establish the latest aggregate resource envelopes available to the Government in the medium-term. Sector- or ministry-specific multi-year fiscal plans covering details of expenditure items have not yet been prepared, and a budget for the RNR sector that corresponds with and is link to a sector strategy/policy plan does not currently exist.

The BPFES – which is necessary for a proper MTEF process and thus is an essential first step in moving from a needs-based to an availability-based budgeting process – has in recent years been used by the Government to provide inputs for the setting of ministerial budget ceilings within which a bottom-up based budgeting approach can take place. This



has been supported by the DNB which for the 2007/08 budgeting process introduced a formula-based budgeting tool that uses cost benchmarks and activity standards with which the ministries can calculate their current budgets (capital budgets have continued to be based on programs underpinned by projects for which detailed budgets appear to be prepared). A further developed and improved version of the formula-based budgeting tool was developed by the MoF for the 2008/09 budgeting process and is currently being applied by most ministries as a tool for providing guidance on the detailed departmental and section budgets and allocations.

In order to improve the quality and timeliness of financial information for decision-making, the DNB in 2008 commenced with the development of an integrated web-based application software, which will support the introduction of a Multi-Year Rolling Budget (MYRB) process for the ministries. This process, which is supported by technical assistance from the World Bank, includes the development of an IT-based framework for the ministries to annually prepare spending plans for a three-year period as part of the ordinary budgeting process. The DPA is likewise currently in the process of substantively updating and replacing the existing, desktop-based, Budgeting and Accounting System (BAS) with a web-based Public Expenditure Management System (PEMS), which will be developed to interface with the MYRB system as well as with the Planning and Monitoring System (PlaMS) of the GNHC.[□]

8.5 *Resource Allocation*

The sectoral resource allocations of the 10th Five-Year Plan have been determined based on the Plan's strategic priorities. The budget allocation for the RNR sector has remained at around 10% as in the 9th Five-Year Plan, which is in keeping with the macro-economic policy of sustaining the growth in the agricultural sector to help reduce rural poverty to targeted levels. The budget breakdown for the 29 identified programs of the RNR sector is illustrated in the Table 20 below.



Table 22: Program-wise Budget Allocation

(Amount in Million Ngultrum)

Program Code	Programs	Indicative Costs
MoA/01	Commodity/Cereal Development	60.000
MoA/02	Post Harvest Management	99.500
MoA/03	Integrated Pest Management	30.000
MoA/04	Irrigation and Water Management	70.500
MoA/05	Seed and Plant Development	20.000
MoA/06	Horticulture/Casho Crop Development	118.850
MoA/07	Organic/Natural Agriculture	24.500
MoA/08	National Medicinal and Aromatic Plants	40.450
MoA/09	Integrated Soil Fertility & Sustainable Land Management	266.000
MoA/10	Rural Access	516.090
MoA/11	Farm Mechanization	60.696
MoA/12	Extension Coordination and Information Management	12.000
MoA/13	Feed & Fodder Development	23.076
MoA/14	Livestock Health and Laboratory Services	145.492
MoA/15	Livestock Breeding and Input Supply	146.670
MoA/16	Livestock Production	442.640
MoA/17	Targeted Highland Livelihood Support	34.760
MoA/18	Participatory Forestry Management	83.200
MoA/19	Non-wood Forest Resources Development	65.000
MoA/20	Forest Resources Development	89.850
MoA/21	Watershed Management and Plantation	123.000
MoA/22	Forest Protection	243.040
MoA/23	Nature Conservation	190.000
MoA/24	Forestry and Environmental Education	170.550
MoA/25	RNR Research	214.850
MoA/26	Rural Development Training	14.520
MoA/27	Agriculture Marketing	114.870
MoA/28	Bio-security and Quality Assurance	117.185
MoA/29	National Biodiversity Conservation	89.220
	Grand Total	3,626.509

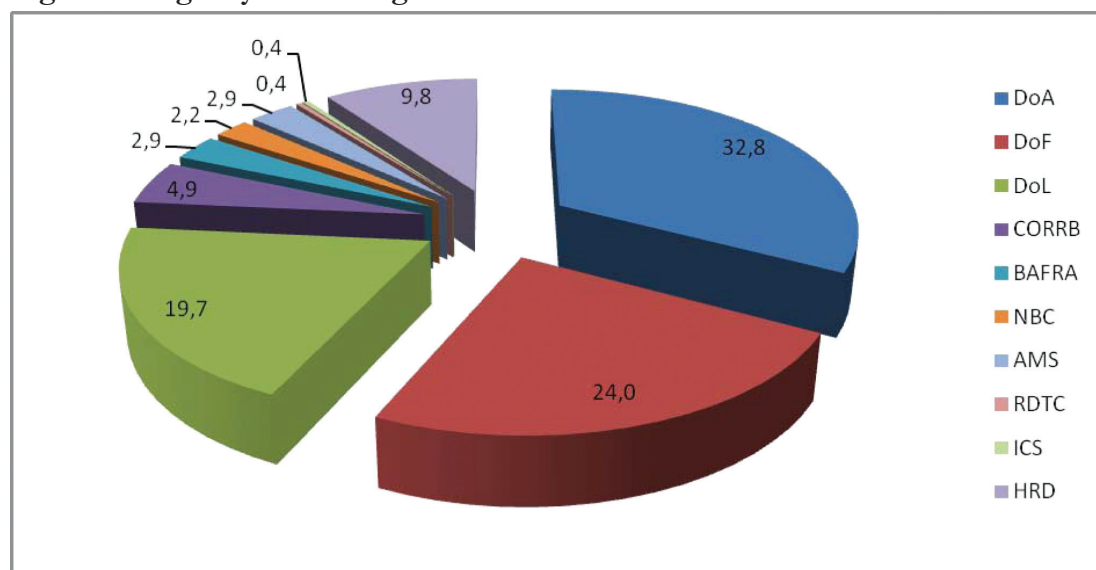


Table 23: Agency-wise Budget Allocation

(Amount in Million Ngultrum)

Sl. No.	Department/Agency	10th FYP Outlay
01	Department of Agriculture (including spillover of farm roads)	1318.586
02	Department of Forest	964.640
03	Department of Livestock	792.638
04	CoRRB	198.650
05	BAFRA	117.185
06	National Bio-Diversity Center	89.220
07	Agriculture Marketing Services	114.870
08	Rural Development Training Center	14.520
09	Information and Communication	16.200
09	HRD	395.000
10	Grand Total	4021.509

Figure 24: Agency-wise Budget Allocation





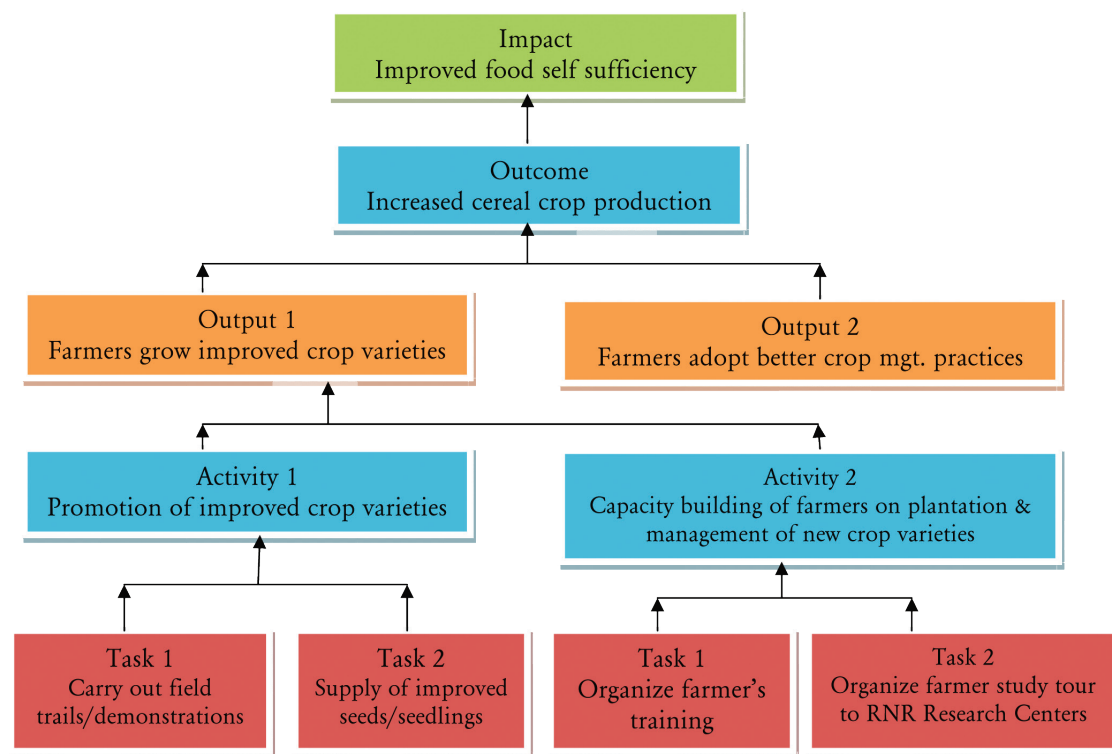
CHAPTER 9: MONITORING AND EVALUATION

9.1 *Introduction*

The need to streamline and institute an effective system for monitoring and evaluation of development plans in the country has been recognized for a long time. In response to this need, Gross National Happiness Commission has developed the National Monitoring and Evaluation System (NMES) as a standard system for monitoring and evaluating the development plans by line ministries, agencies, Dzongkhags and Geogs. The NMES has been developed in close collaboration with the line ministries and agencies. M&E Task Force and Core Working Group from line ministries and agencies were formed to guide the entire process of developing the system.

Gross National Happiness Commission (GNHC) as the central coordinating agency for development planning, monitoring and evaluation has developed a standardized monitoring and evaluation system for efficient and effective undertaking of monitoring and evaluation of development policies, programs and projects. The system has been developed in conformity with the Good Governance Plus Report 2005 which requires GNHC to develop a clear Planning Framework and support Monitoring and Evaluation.

NMES shall adopt the Results based Monitoring and Evaluation Approach based on the principles of Results-Based Management (RBM). RBM is a management approach by which an agency seeks to ensure that its inputs, processes, products and services contribute to the achievement of clearly stated results. A results-based M&E system tracks results at each level of the program or project cycle. It helps to systematically identify and guide the assessment of achievement of macro results and the means for achieving them. The key focus of the Results-Based M&E system is thus the outcomes and impacts of the programs and projects, as well as the means of achieving them through outputs, activities, and inputs.

**Figure 25 : Example of Results Chain**

9.2 Primary M&E Roles and Responsibilities

The RNR-GNH Committee will be the M&E Review Committee at the Central Ministerial level.

- i. Heads of the Departments/Non-Departmental Bodies within the Ministry/Agency will be the members of the GNH Committees.
- ii. The Secretary the Ministry/ and the Head Agency shall chair the Committee meetings.
- iii. The GNH Committees shall meet at least bi-annually to review the progress of the plans within the Ministry/Agency.
- iv. The roles and responsibilities of the M&E Review Committee at the Ministry/Agency level shall include:



- Review and approve the TYRPB and APB of the Departments, Non-Departmental Bodies, Divisions, Regional Centres, Programs and Projects before submitting to Ministry of Finance.
- Review the implementation status of programs and projects within the Ministry/Agency.
- Review the achievements of outputs, outcomes and impacts of programs and projects using GNH indicators as measure.
- Review specific sector policies, strategies and operational issues of programs and projects.
- Issue directives and feedback for readjustment or reprioritization and resolve operational issues of programs and projects.
- Endorse the Sector Mid-Term and Terminal Progress Reports for submission to GNHC.
- Ensure that the implementing entities are accountable for the performance of their respective programs and projects.

9.2.1 Policy and Planning Division (PPD)

The PPD will be designated as the M&E Coordinator for M&E at the Ministry/Agency level. Within the PPD or its equivalent, an M&E Section or Unit shall be established for day to day management and coordination of M&E activities. The key M&E roles and responsibilities of PPD shall be to:

Coordinate with Finance Division/Section¹ during the preparation of TYRPB and APB and verifying the progress data of the Ministry/Agency.

- Institute procedures and requirements prescribed in the NMES within the Ministry/Agency.
- Provide technical guidance and support on M&E to the Program or Project Managers and other implementing entities within the Ministry/Agency.
- Ensure that the implementing entities submit data or progress reports as per the prescribed schedules.
- Verify data submitted by the implementing entities.

1 Finance Division/Section includes Budget and Accounts Officers



- Identify the actual or potential implementation problems and issues encountered by implementing entities for timely remedial actions.
- Analyse and prepare consolidated progress reports and table them to the GNH Committee.
- Record minutes during M&E Review Meetings.
- Communicate directives and recommendations of GNH Committee to the implementing entities and other relevant agencies.
- Take follow-up actions on the directives and recommendations of the GNH Committee.
- Conduct evaluations of selected programs and projects within the Ministry/Agency in accordance with the Evaluation Protocol as and when required.
- Coordinate the preparation of Mid-Term and Terminal Progress Reports.
- Liaise closely with the M&E focal point at the GNHCS on NMES implementation and other related issues.
- Form a Ministry/Agency level MMT and undertake regular field visits to monitor and assess the implementation of programs and projects.

9.2.2 Departments, Non-Departmental Agency, Programs and Projects

The Departments, Non-Departmental Bodies, Divisions, Regional Centres, Programs and Projects shall be responsible for implementing the programs and projects. The main M&E roles and responsibilities of Program or Project Managers and other implementing staff of the Departments, Non-Departmental Bodies, Divisions, Regional Centres, Programs and Projects shall be to:

- Prepare their respective TYRPB and APB and submit to the PPD as per the stipulated dates.
- Collect and record the progress data on a regular basis.
- Liaise closely with the Finance Divisions/Sections for collecting accurate and timely budget and expenditure data.
- Readjust or reprioritize the plans whenever necessary based on the directions and recommendations of the GNH Committee.



The above setup is the minimum requirement for M&E at the Ministry/Agency Level. The Departments, Non-Departmental Bodies, Divisions, Regional Centres, Programs and Projects within the Ministry/Agency may set up appropriate internal management structures and procedures for efficient management of their programs and projects.

The implementing entities may be required to follow the M&E procedures of the donors for externally funded programs and projects. However, donor agencies shall be encouraged to harmonise their M&E systems with NMES to minimize duplications.

9.2.3 Monitoring Procedures At The Central Ministry & Agency Level

Table 24: Synopsis of Monitoring at the Central Ministry and Agency Level

Monitoring Stages	Responsibilities, Schedules and Methods		
	Who	When	How
Stage 1: Data Collection, Verification & Reporting			
1.1 Collect and record physical & financial data of completed activities & outputs that are implemented by Ministry/Agency as per the approved APB	program or project managers and other implementing entities of Ministry/Agency in collaboration with Finance Division/Section	Weekly or monthly as appropriate	Enter the data using the <i>Integrated System</i>
1.2 Monitor & ensure that the implementing agencies enter data in the system regularly	PPD, Finance Sections & Information Management Sections (IMS) within Departments (where relevant)	Monthly (by the 2 nd week of the following month)	
1.3 Verify and update the data submitted by implementing entities	PPD, Finance Sections & Information Management Sections, IMS (where relevant)	Quarterly (by the 3 rd week of the month after each quarter)	Data to be retrieved from the system for verification. Data could be verified by checking procurement & expenditure records, field visits



Stage 2: Data Analysis & Preparation of Progress Reports			
2.1 Analyse the data & prepare consolidated summary progress, reports, detailed progress reports for submission to PPC.	Program/ project managers & other implementing entities of the Ministry/Agency coordinated by PPD with Finance Sections & IMS	Every six months 1 st Semi-Annual Progress Report (July-Dec.) by Jan. 31 st 2 nd Semi-Annual Progress Report (Jan-June.) by July 31 st	The system can be use to do selected data analysis and generate progress reports
Stage 3: Progress Review & Feedback Mechanism			
3.1 Review the Ministry/Agency progress reports	PPC	Every six months 1 st Meeting by March/April & 2 nd Meeting by Sept./Oct.	GNH Committee members deliberate on the issues and make decisions
3.2 Communicate the feedback to the relevant authorities & staff, take follow-up actions	PPD	Within two weeks after the Review Meeting	Through letters, circulars or office memos
Conducting Monitoring Visits for Field Assessments & Supervision			
Conduct monitoring visits to verify data & monitor the implementation progress particularly infrastructure development programs & projects	PPD, Sector <i>Mobile Monitoring Team</i> , Departments	Annually	PPD shall form a team of 3-4 members comprised of Budget Officer and representatives from relevant departments. Visit the sites, interview the beneficiaries & other stakeholders



9.2.4 Basis for Monitoring

- i. The approved Annual Budgets of central Departments, Non-Departmental Bodies, Divisions, Regional Centres, Programs and Projects within the Ministry/Agency for the fiscal year shall form the main basis for monitoring.
- ii. The APB shall be prepared based on the plan priorities of the sector and BPFSS.
- iii. The program or project managers and other implementing entities of central Departments, Non-Departmental Bodies, and Regional centres etc. within the Ministry/Agency shall be responsible for implementing the budgeted activities for the year.

9.2.5 Data Collection, Verification and Reporting

- i. The program or project managers and other implementing entities of central Departments, Non-Departmental Bodies, and Regional Centres etc. within the Ministry/Agency shall be responsible for collecting and recording data on implementation status of their programs and projects.
- ii. The data shall be entered in the system on a regular basis (weekly or monthly as appropriate).
- iii. The data shall include physical and financial data of completed activities and outputs and other related information.
- iv. The implementing entities shall enter the data in collaboration with their Finance Division/Section and Information Management Sections (IMS) where applicable.
- v. The PPD, Finance Division/Section and IMS shall monitor and ensure that the implementing agencies enter the data in the system regularly.
- vi. The PPD, Finance Division/Section and IMS shall verify or check the accuracy of the data by the second week of the month after every quarter.
- vii. The PPD, Finance Division/Section and IMS shall retrieve the data from the system (implementing entities will not be required to submit data in hard copies).
- viii. Data can be verified by checking the procurement records and expenditure records and field visits.
- ix. The PPD shall ensure that all the data in the system are verified and updated the second week of the month after every quarter.



9.2.6 Data Analysis and Preparation of Progress Reports

- i. The PPD and IMS shall process and analyse the data received from the implementing agencies. The system can be used to do the pre-determined data analysis. Additional analysis and interpretations may be done if necessary using the data from the system. The analysed data shall be presented in suitable graphs and tables. The PPD shall also be required to prepare a consolidated summary progress report to be presented to the GNH Committee.
- ii. The implementing entities under the Ministry/Agency shall prepare detailed progress report of their respective sectors every six months. Reports can be generated from the system.
- iii. The semi-annual progress report of each individual Department and other entities within the Ministry/Agency shall present the information as indicated in the box below:

- Implementation status of activities and outputs against indicators and targets planned in the APB.
- Budgets and expenditures against each activity and output for the reporting period.
- Status of achievement or progress towards producing the desired outcomes and impacts (where feasible) especially progress against the GNH indicators.
- Problems and issues encountered during the implementation.
- Remedial actions to address problems and issues.

- iv. The PPD shall ensure that the implementing agencies complete the preparation of progress reports for submission to the GNH Committee on time. The 1st Semi-Annual Progress Report for the period July-December shall be completed by 31st January and the 2nd Semi-Annual Progress Report for the period January-June shall be completed by 31st July.

9.2.7 Progress Review and Feedback Mechanisms

- i. The RNR-GNH Committee shall review the status of plan implementation at the Ministry or Agency level on a semi-annual basis.
- ii. However, the PPDs or Departments and other entities within the Ministry/Agency are recommended to organize internal reviews more frequently (monthly or quarterly) to facilitate efficient decisions-making.
- iii. Ministries and autonomous agencies are recommended to organize the 1st Semi-Annual Review Meeting within March/April and 2nd Semi-Annual Review Meeting



within September/October.

- iv. The Chief Planning Officer of the PPD shall table the progress reports to GNH Committee for review and decision making.
- v. The GNH Committee shall address the following questions given in the box below:
 - ✓ Are inputs (budgets and other resources) available as planned?
 - ✓ Are the activities carried out on schedule?
 - ✓ Are the activities producing the desired outputs?
 - ✓ Are the outputs producing or likely to produce the desired outcomes and impacts (where feasible) especially progress against the GNH indicators?
 - ✓ What are actual or potential implementation problems or issues?
 - ✓ What remedial actions shall be taken to improve the implementation?
- vi. The GNH Committee shall make decisions for correcting problems and issues that are within its authority.
- vii. For those problems and issues beyond its authority (e.g. that require major re-planning or re-designing of programs and projects), the GNH Committee shall refer them to the GNHC through GNHCS.
- viii. The PPD shall record the minutes of the meeting.
- ix. The PPD shall be responsible for communicating the decisions and recommendations of the GNH Committee to the concerned agencies and taking follow-up actions.
- x. The PPD shall circulate the decisions and recommendations of the GNH Committee to the GNHCS and concerned agencies within two weeks after the GNH Committee Meeting.
- xi. The PPD shall form Ministry/Agency level MMT of 3-4 members comprised of professionals from the Departments and other agencies within the Ministry/Agency including the Budget Officer.
- xii. The team shall undertake field visits annually to the sites (selected programs and projects) for data verification and monitoring of implementation progress.



- xiii. The respective Departments shall ensure the quality of infrastructure development programs and projects executed by the Ministry/Agency and will be required to carry out routine on-site supervision and monitoring of infrastructure development activities.

9.3 *Evaluation*

Evaluation is a periodic assessment, as systematic and objective as possible, of on-going or completed development interventions, their designs, implementation and results. Evaluation is a useful management tool for policy-makers, implementers and other stakeholders.

The main purposes of evaluation are:

- i. To determine the relevance, efficiency, effectiveness, impact and sustainability.
- ii. To identify remedial measures to improve the performance of on-going development interventions.
- iii. To provide lessons from the past experience for future planning and decision-making. Evaluations can be conducted for lessons regarding replications or sustainability, identifying what methods and strategies work best over time.
- iv. To ensure accountability. Evaluations may be conducted to account for the use of resources by the implementing entities to the government and funding agencies.

9.3.1 **Types of Evaluations**

Evaluations can be categorized into different types. Generally, evaluations are categorized into three types depending on:

- i. when they take place,
- ii. who conducts them, and
- iii. where they focus.



i. Formative, Summative and Ex-post Evaluations.

Evaluation may be conducted at different times during the planning, and implementation and completion of development interventions. Depending on when they are conducted, there are three main evaluations.

a. Formative Evaluations

Formative evaluations are evaluations that are often conducted during the implementation phase of the programs or projects. They are usually carried out as self-evaluation by people involved in the program or project, supported as necessary by experts in particular aspects of evaluation design, data collection and data analysis.

The main aim of the formative evaluation is to improve the program or project performance by alerting the implementing agencies to problems or unexpected results so that timely responses may be taken. Mid-term evaluations are often conducted to provide the basis for mid-course corrections.

b. Summative Evaluations

Summative evaluations are conducted when the development interventions are completed or have reached a major milestone to determine the extent to which the planned results were produced. Summative evaluations are used to provide information about the worth or appropriateness of the interventions.

Conclusions and recommendations from summative evaluations are intended to help policy makers formulate future policies and plans.

c. Ex-post Evaluations/Impact Assessments

Ex-post evaluations or impact assessments are evaluations carried out at some time after development interventions are completed usually after two or more years. The main aim of the ex-post evaluation or impact assessments is to identify the factors of success or failure, to assess the sustainability of results and impacts. These evaluations are useful for policy makers to assess the extent to which a development intervention has produced the mandated or intended outcomes and impacts, as well as apparent causal factors. Lessons learned can be used as inputs for future decision making and planning.

ssssii. Internal, External and Joint Evaluations

Depending on who conducts evaluations, there shall be three approaches to evaluations: a) Internal Evaluations, b) External Evaluations and c) Joint Evaluations.



a. Internal Evaluations

Internal or self evaluations are evaluations carried out by those who are involved in executing and implementing a program or project. It is often conducted during the implementation phase for timely identification of achievements, problems and improvements of the performance of the program or project.

b. External Evaluations

External or independent evaluations are evaluations that are conducted by agencies that are outside the implementing agencies of programs and projects. There is clear distinction between those who conduct evaluations and those whose programs or projects are evaluated.

Summative evaluations and ex-post evaluations may need to be carried out by qualified external consultants due to the technical knowledge and skills that are needed. However, such evaluations may be complemented by internal self-evaluations by the implementing agencies.

c. Joint Evaluations

Joint evaluations are evaluations where different donor agencies and/or partners participate. Under NMES, joint evaluation shall be defined as collaboration between the PCS (and other national counterparts) and the donor agency for conducting evaluations of programs and projects funded by the donor agency.

iii. Project, Program, Sector, Thematic Evaluations

Evaluations can also be categorized according to the level of focus as given below:

a. Project Evaluations

Project evaluations are evaluations of a set of planned, interrelated activities designed to achieve specific objectives within a given budget and a specific period of time and locations.

b. Program Evaluations

Program evaluations are evaluations of a coherent set of projects or activities within a particular sector, which have a common focus in terms of desired results, eg. primary education program, rural access program, etc.



c. Sector Evaluations

Sector evaluations are evaluations of a sector in terms of sector policies, objectives, strategies and programs. Sector may be defined broadly like education sector, health sector, RNR sector. It may also include sub-sectors like livestock, forestry and agriculture etc.

d. Thematic Evaluations

Thematic evaluations are evaluations of selected aspects or cross-cutting issues in different types of development policies and interventions. They may involve a cluster evaluation of projects or programs, development policies, objectives and strategies addressing a particular theme that cut across sectors or geographical boundaries. Examples: cultural preservation, environment conservation, governance etc.

9.3.2 Identifying Priorities for Evaluation

Conducting comprehensive evaluations of all development policies, programs and projects could be highly complex, time consuming and expensive. Hence, it is important to make strategic choices to undertake selective evaluations that are most useful for learning and decision-making. These choices should be determined by the resources available, issues or areas deemed necessary by the Government. The selection of priority areas for evaluation shall be guided, among other things, by the following factors:

- a. The strategic importance of the sector, development policies/strategies, program or project.
- b. The size of the program or project. The program or project shall be classified as large in terms of costs, geographic coverage, beneficiaries or program or project duration.
- c. The program or project that is multi-sectoral in scope.
- d. Whether program or project shows signs of running into problems. Monitoring data could be used to indicate that the program or project is facing significant problems.
- e. Whether the program or project or any development intervention is innovative and has the potential for replication.