SUSTAINABLE DEVELOPMENT ACTION PLAN (SDAP)

"SECURING THE FUTURE FOR THE NEXT GENERATION OF GHANAIANS"

NATIONAL PROGRAMME ON SUSTAINTABLE CONSUMPTION AND PRODUCTION (SCP) FOR GHANA (2011-2016)

VOLUME 1

FINAL REPORT

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List of Abbreviations

AGI	Association of Ghana Industries
ALA.	Agricultural Land Area
ARSCP	African Roundtable Sustainable Consumption and Production
BOD	Biological Oxygen Demand
BOPP	Benso Oil Palm Plantation
CH_4	Methane
CNG	Conpressed Natural Gas
CO	Carbon Monoxide
CO_2	Carbon Dioxide
COD	Chemical Oxygen Demand
CP	Cleaner Production
CWSA	Community Water and Sanitation Authority
DAs	District Assemblies
ECOWAS	Economic Community of West African States
EDIF	
EET	Energy Efficiency Technologies
EF	Energy Foundation
EMPs	Environmental Management Plans
EPA	Environmental Protection Agency
EPRD	Environmental Performance Rating Disclosure
GCPC	Ghana's Cleaner Production Centre
GDP	Gross Domestic Product
GHGs	Green House Gases
GIPC,	Ghana Investment Promotion Council
GLSS	Ghana Living Standards Survey

GOPDC	Ghana Oil Palm Development Corporation
GPRS	Ghana Poverty Reduction Strategy
GWCL	Ghana Water Company Ltd
HDI	Human Development Index
HVAC	Heating Ventilation Air Condition,
LNG	Liquified Natural Gas
LPG	Liquefied Petroleum Gas
MDBS	Multi Donor Budgetary Support
MoFEP	Ministry of Finance and Economic Planning
MWRWH	Ministry of Water Resources, Works and Housing
NCPCs	National Cleaner Production Centre
NDPC	National Planning Development Council
NES	National Electrification Scheme
NOPL	
NOx	Nitrous Oxides
PM	Particulate Matter
PURC	Public Utility Regulatory Commission
SCP	Sustainable Consumption and Production
SDAP	Sustainable Development Action Plan
SHEP	Self-Help Electrification Programme
SMEs	Small and Medium Enterprises
SO_X	Sulphur Oxides
TLA	.Total Land Area
TOPP	Twifo Oil Palm Plantation
TSS	Total Suspended Solids
TUC	Timber Utilization Contract
UNEP	United Nations Environment Programme

VAT	Value Added Tax
VOCs	Volatile Organic Compounds
VRA	Volta River Authority

CHAPTER I

SUSTAINABLE DEVELOPMENT ACTION PLAN (SDAP)

NATIONAL PROGRAMME ON SUSTAINABLE CONSUMPTION AND PRODUCTION

(SCP) – 2011 - 2016

NATIONAL PROGRAMME ON SUSTAINABLE CONSUMPTION AND PRODUCTION (SCP) – 2011-2016

CHAPTER 1

1. INTRODUCTION

1.1 Background

In every society, there is the need to manage production and consumption and investment patterns in relation to environmental, economic and social elements of sustainability. The way we consume and produce affect natural resources. Footprint and Human Well Being (2007) a report on African's Ecological Footprint shows that the impact of the average African to be low by western standards. The report also reveals that a growing number of African countries are now depleting their natural resources or will shortly be going faster than they can be replaced.

Currently Ghana's footprint is at 1.0 out of a total biocapacity of 1.3gha/person. Ghana's footprint change per person was 36 percent. The human index in 2003 was 0.53 with a change in the human development index (HDI) of 18percent between 1975-2003. The stress on blue water resources is 1 percent. The situation is made worse in many regions of the world. In 1998 the average African household consumed 20 percent less than 25years before.

A growing number of countries are striving to make sustainability an integral part of their development strategy. Businesses are also charging the way they operate to reduce their impact on the environment and to be more socially responsible in the setting of economic goals. Consumers also are showing increased preference for eco-friendly products. Green markets are considered to be the markets of the future.

Pressure on resources in developing and emerging economies call for more linkage between ecological, economic and social goals, with industrialized countries are transforming their economies from high to low carbon and sustainable economies

The situation requires rethinking of the way we buy and organize everyday life to live in balance within with the natural environment. We can make choices in terms of energy use, transport, food, waste and communication.

It is for this reason that a Sustainable Development Action Plan (SDAP) which is also the National Programme Consumption and Production (SCP) is being prepared based on the concept of sustainable consumption and production (SCP). The aim is to maximize the efficiency and effectiveness of products, services and investments along the entire life cycles so that the needs of society are meet without jeopardizing the ability of future generations to meet their needs. The choice of SCP is due to the cross-cutting nature of the concept and ability to embrace all segments of society (individuals, companies (firms), communities, cities and different generations, children, youth and the aged). The National Programe (SCP) will be anchored and integrated into existing policies. It is a visionary exercise which will be communicated widely to ensure a long term and sustained process. To realize this objective a background situation is provided on consumption patterns in Ghana.

Agenda 21 – The Programe of Africa for Sustainable Development provides guiding principles to countries on the path to sustainable development.

Principles Four (4) states that 'in order to achieve sustainable environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it'

Principle Eight (8) says 'to achieve sustainable development and higher quality of life for all people states should reduce and eliminate unsustainable patterns of production and consumption and promote demographic policies'

The major cause of the continued deterioration of the global environment is the unsustainable pattern of consumption and production. The demand for natural resources generated by unsustainable consumption and to the efficient use of those resources consistent with the goal of minimizing depletion and reducing pollution. Unsustainable lifestyles also place immense stress on the environment.

Changing consumption patterns will require a multi-programme strategy focusing on demand, meeting the basic needs of the poor and reducing wastage and the use of finite resources in the production process.

Overview of Sustainable Consumption Issues in National Policies, Plans and Programmes.

What is Sustainable Consumption and Production?

Sustainable consumption and production (SCP) provides a holistic perspective on how society and economy are better aligned with the goals of sustainability. SCP is defined as:

"the production and use of goods and services that respond to basic needs and bring a better quality of life, while minimizing the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardize the needs of future generations:.
source: norwegian ministry of environment, oslo symposium 1994

SCP is a practical implementation strategy to achieve sustainable development, which address economy, society and environment. SCP is about technological and social innovation, it is also cross-cutting in character; SCP needs an active involvement of all stakeholders and a wide range of locally-adapted policy response. Some key SCP policy challenges currently include achieving decoupling of economic growth from environmental degradation meeting basic needs, and preventing the rebound effect, where growing consumption outstrips technology improvement and efficiency gains. A key element of the SCP approach is the use of a range of public policies, private sector actions and investment which influence both the supply of and demand of goods and services, thus reducing impacts of both their production and consumption in an integrated manner.

SCP is an overarching objective of an essential requirement for sustainable development. The Johannesburg plan of Implementation (JPol) from the World Summit on Sustainable Development (WSSD) highlighted the importance of changing unsustainable consumption and production patterns alongside other issues like poverty eradication, protecting and managing natural resources globalization and health.

Sustainable Production

There is the need to promote sustainable production which includes the application of technological innovation in the design and improvement of products and/or production process such as the promotion of industrial ecology and life cycle approach. Sustainable production practices need to be mainstreamed in all sectors including the increasingly important service sector. Cleaner production, pollution prevention, eco-efficiency and green productivity are all preventative environmental approaches.

Sustainable Consumption

The goal of sustainable consumption takes into account the complete product lifecycle making more efficient use of renewable and non-renewable resources. This means adoption of an alternative way of consumption that result in reduced material and energy intensity per unit of functional utility. Government, industry and private household are all consumers. Actions to foster sustainable consumption include recycle, waste minimizations and resource efficiency measures.

In the developing world at least two billion people need to increase their consumption in a sustainable manner to escape poverty. In contrast, millions of new consumers in developing countries like their counterparts in the development regions – need to reorient their consumption patterns toward sustainability. For the developing world, it can mean both more and less (or more sustainably) consumption. Countries in the developing world like Ghana have the opportunity to meet its increasing consumption and production needs in a more sustainable manner than the developed countries have done in the past.

Ghana's Sustainable Development Action will focus on sustainable consumption and production (SCP). This is because SCP is cross-cutting and embraces all segments of society in the country, from individuals, firms, communities, cities, different generations – children, youth and the old are involved in consumption and production and production of goods and services to address unprecedented environmental challenges. Sustainable consumption and production is also related to climate change.

Ghana is endowed with renewable and non-renewable resources. Renewable resources (soils, forests, water, coastal and marine) are under serious threat while non-renewable (minerals and recently oil and gas) would not last forever. Ghana therefore has to lay the foundation for a sustainable future.

Sustainable consumption and production (SCP) should be a priority for all stakeholders; SCP is directly linked with many other development priorities such as economic growth and competitiveness, environmental protection, water and energy security, poverty alleviation, health and education.

Individual initiatives will not bring about wholesale changes in consumption and production patterns without a national integrated strategy to promote SCP using a range of policies.

What is the cost of unsustainable consumption and production patterns in Ghana or what the cost of delayed action is:

- Wasted natural resources from manufacturing
- Energy efficiency can be increased if all known cost effective actions are taken by businesses and individuals
- Economic benefits of waste recycling
- Cost of traffic congestion

The World Summit on Sustainable Development (WSSD) held in Johannesburg, South Africa in 2002 called for a ten-year framework of programmes in support of national and regional initiatives to accelerate the shift towards sustainable consumption and production. To fulfill this call the Marrakech Process' was launched in Marrakech Morocco in 2003. The process includes regular global and regional meetings, informal expert task forces, and other activities to promote and coordinate efforts task forces, and other activities to promote and coordinate efforts toward more sustainable consumption and production. A 10-year framework was prepared as a result.

In response to the decision of the Johannesburg summit. Africa prepared the African 10 year Framework Programme on Sustainable Consumption and Production. A number of African experts meetings have been held on the 10 year Framework of Programme. The first meeting held in Casablanca, Morocco 19-20 May 2004 identified the key priorities that could be undertaken under the thematic areas of: energy, water, urban development, and industrial development. Each thematic area was considered in the context

of New Partnership for Africa's Development (NEPAD) Environmental Action Plan and regional poverty reduction priorities. The following priority areas with specific actions were proposed:

Priority areas on energy

- Assessment and identification of best practices on renewable energy used along the life cycle of agriculture including policy analysis and recommendations
- Implementation of projects on renewable energy technologies in rural agriculture, by providing direct assistance to local communities.
- Promoting and development of mini hydropower for small rural enterprises.
- Promote and support increased utilization of improved wood for stoves by households with appropriate financing mechanisms
- Promote the use of energy efficient light bulbs and electric appliances through affordable prices and information to consumers.
- Develop campaigns on environmental education and information for sustainable use of energy through schools and other institutions in cooperation with NGOs

Priority areas on water and sanitation

- Knowledge management of best practice in Africa
- Technology transfer in water and sanitation
- Regional awareness raising and education on SCP in water and sanitation
- Replication of successful experiences in safe reuse of waste water.
- Promoting the implementation of integrated water resource management ensuring the inclusion of LCA and SCP

Priority areas habit and sustainable urban development

- Integrated solid waste management (ISWU)
- Sustainable urban mobility
- Reduction of vehicular emissions
- Sustainable urban development

Priority areas on industrial development

- Strengthening the capacity of the African Roundtable on Sustainable Consumption and Production (ARSCP) and its members
- Explore the expansion value chains for agricultural production and by-products by expanding their industrial uses.
- Improve markets for sustainable goods and services to ensure competitiveness irrespective of destination market.

Also three concept notes were developed through sub-regional and regional technical consultation forums:

- Mainstreaming sustainable consumption and production in Lake Victoria Region as a pilot project on mainstreaming sustainable consumption and production in regional development programmes.
- Sustainable consumption and production of plastics in Africa as a demonstration of integrated solid waste management in Africa
- Regional training and awareness programme on Life Cycle Analysis as a planning and decision-making tool.

The preparation of the Sustainable Development Action Plan (SDAP) as the national programme on sustainable consumption and production for Ghana is a response to the global and regional imperatives to mainstream sustainable consumption and production.

1.2 Purpose and Benefits of SCP Programme

Sustainable Consumption and Production (SCP) has a number of merits and qualities:

- Crucial for sustainable development
- Offers a coherent strategy for resources efficiency
- Integrates supply and demand site activities and can support market strategies
- Makes use of life cycle assessment, avoiding problems and linked to other areas and sectors
- Help to alleviate poverty and create jobs and business opportunities
- Seeks to achieve win-win solutions and outcome.

The key element of SCP is that it is:

- A highly flexible approach
- Need to link long-term vision to medium-term targets and short-term actions.
- Process of continuous improvement

The key principles are:

- National commitment and leadership
- Multi-stakeholder process
- Comprehensive and reliable analysis
- Defined objectives, targets and indicators
- Build on existing national policies
- Integrate with existing national strategies
- Develop sectoral action plan
- Management and coordination of the process (political, technical, participation and mobilization resources)

In addition, SCP helps ensure the realization of the goal of sustainable development and also the efficient use of resources which are finite. SCP can help in the reduction of poverty and creation of job and business opportunities which will be beneficial to developing countries like Ghana. Poverty is the result of unsustainable livelihoods and SCP tries to meet basic needs by addressing poverty.

SCP is

- About resource efficiency
- Cross-cutting in character
- Active involvement of all stakeholders
- Wide range of locally adapted policy responses
- Meeting basic needs in a sustainable manner degradation
- Decoupling of economic growth from environmental

1.3 Strategic Priorities of the SCP Programme

The SCP programmes focus on the following priority areas:

- Education and transfer of information
- Food and Agriculture
- Waste and recycling
- Water
- Transport

- Energy use
- Local initiatives
- Social needs
- Production eco-efficiency.

1.4 Methodology and Reports Production

The Ghana National Programe on Sustainable Consumption and Production also termed Sustainable Development Action Plan (SDAP) started with the preparation of a road map. This was followed with the composition of thirteen working groups initially for whom an inception workshop was held 1-2 October 2009. Later a forestry and wildlife working group was added. At the inception workshop, the terms of reference for the working groups were presented and clarification provided on concerns.

A second workshop in 4-5 November 2009 was held on capacity building and awareness raising. Mr. Luc Reuter from UNEP, Paris was the resource person with key note speech by a representative of the Minister of Environment, Science and Technology. The workshop covered the following subjects:

- Objectives and expectations
- Overview of workshop
- UN's role in SCP
- National process to develop SCP programe.
- Environment in the changing world –setting the context
- The international context
- National SCP programmes - why develop national SCP programe

  -Key elements for an effective natural SCP programme

  -Mainstreaming develop new SCP programe
- P4C and Green Economy
- Planning for Change – introduction to guidelines
- Plan – Planning the develop of SCP programes

  - Step 1: Establish an Advisory Group
  - Step 2: Conduct Scoping Review
  - Step 3: Set an institutional framework

- Plan for Change
  - Step 4: Select priority areas
  - Step 5: Define objectives and set targets
  - Step 6: Select policies and initiative

- Implement
    - Step 7: Official approval of the programe
    - Step 8: Implement SCP programme

- Plan for Change: Monitor and Evaluation of National SCP programmes
    - Step 9: Document, monitor evaluate
    - Step 10: sustain and improve

- Planning for change : Feedback of planning for change
  Ghana's perspective Working group session

- Follow up activities Next Steps

A third workshop was held for the presentation and validation of report of the working groups.

CHAPTER II

OVERVIEW OF HOUSEHOLD CONSUMPTION PATTERNS

2.0 OVERVIEW OF HOUSEHOLD CONSUMPTION PATTERNS

2.1 Poverty Trends

The Ghana Statistical Service (2007) report on Pattern and Trends of Poverty in Ghana 191-2006 provides insight into the nature of patterns of consumption and production in Ghana. The report provides three different dimension of poverty: consumption poverty, lack of access to assets/service and human development. The data is from the Fifth Ghana Living Standards Survey (GLSS) which is a multipurpose survey of households in Ghana, providing different dimensions of living conditions including among others, education, health and employment. The GLSS provide information on estimates of total consumption of each household, covering consumption of both food and non-food items (including housing). The survey shows an impressive decline in poverty incidence which led to lowering of the absolute numbers of poor from around 7,931,000 individuals in 1991/92 to 7,203,000 in 1998/99 and 6,178,000 individual in 2005/6. This can be enhanced with the implication of sustainable consumption and production principles.

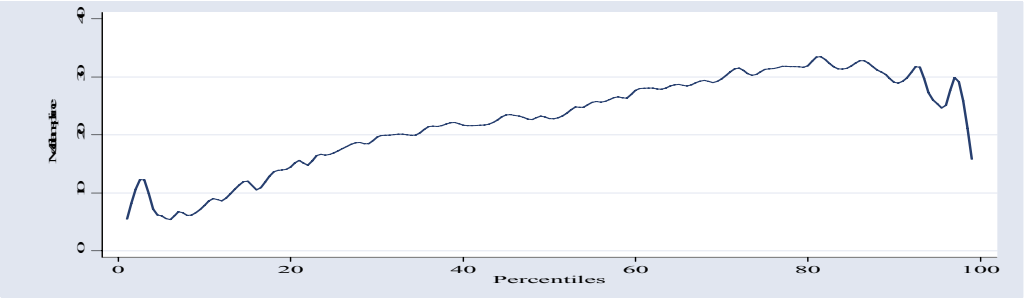
Household in the forest ecological zone experienced the largest decline in poverty during the 1990's with the coastal areas benefitting the most of Ghana's economic growth since the late 1990's. The surveys showed that poverty in Ghana remained a disproportionately rural phenomenon with eighty-six percent of the total population living below the poverty line in Ghana were living in rural areas.

In 2005/06 poverty was highest among food crop farmers. Public sector employees and farmers (both export and food crop farmers) experienced the largest reductions in poverty. Poverty fell among both wage employees in the public sector and the non-farm self employed. The reduction in the incidence of poverty at the national level as well as in the urban/rural areas in an indication of the growth in mean consumption.

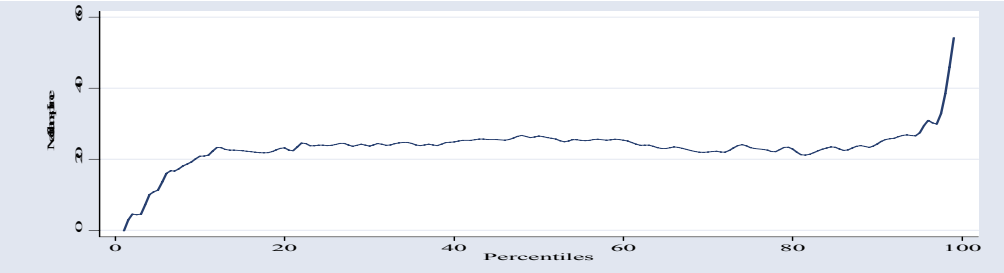
Figure 1 indicates growth rates in consumption were higher in the upper part of the population, especially in the 1990's.

Figure 1 Growth Incidence Curves, national level

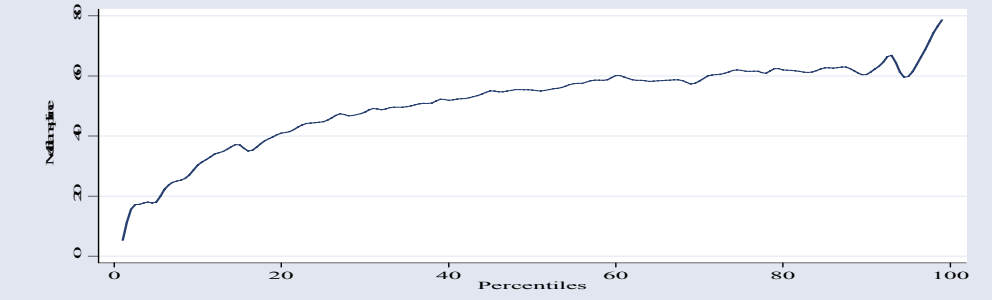
1991/92 to 1998/99



1998/99 to 2005/06



1991/92 to 2005/06



Source: Computed from the Ghana Living Standards Survey, 1991/92, 1988/1999 and 2005/06.

The data shows that from 1998/99 to 2005/06 the upper echelons of the population benefitted from very large gains in consumption while the very poor had lower gains that the rest of the population.

2.1.1 Household Assets

Poverty of households is also measured based on ownership of key consumer durable goods. The survey findings indicate that the proportion of households owing most of the durable goods showed large increases between 1991/92 and 1998/99 and further increases in 2005/06. The increases in both urban and rural areas were higher for wealthier groups, with urban households showing greater disparity. Ownership of durable goods was lower in rural areas than urban areas even in the case of households of similar overall living standards. The assets in question are refrigerators, video recorders, radios, television, electric irons and mobile phones. Ownership of radio sets and mobile phones show large increases in both rural and urban areas but in urban areas other items like video recorders, television sets and cooking stoves show significant increases in their ownership. This reflects higher incomes in urban areas and supply factors including wider access to electricity and liquefied petroleum gas.

These items most of which are second-hand items will come to their end of life within a short period and affect the waste composition of the country especially electronic waste which contains hazardous substances which will have implications for health and the environment.

Figure 2: Percentage of households owning different household assets, Urban Areas

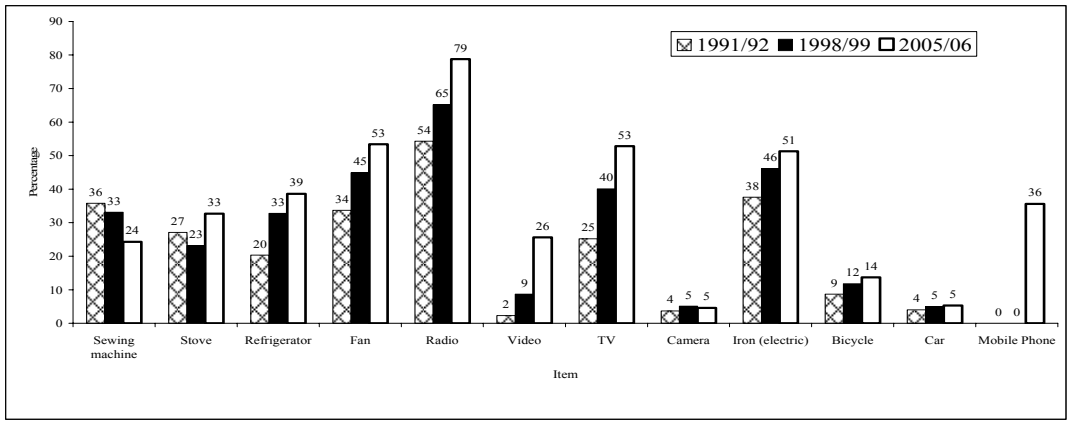
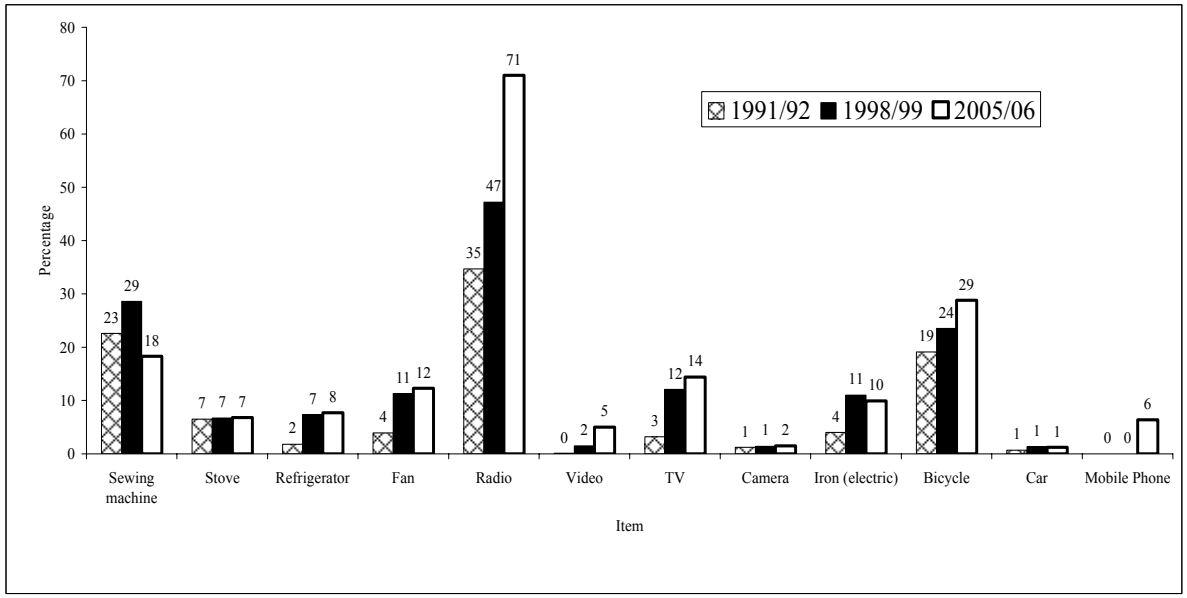


Figure 3: Percentage of households owning different household assets, Rural Areas



Source : **Ghana Statistical Service – April 2007-Pattern and Trends of Poverty in Ghana 1991-2006**

Table 1: **Percentage of households owning different physical assets, by locality, 1991/92 to 2005/06**

1991/92 **Appendix**

	Accra	Urban Coastal	Urban Forest	Urban Savannah	Rural Coastal	Rural Forest	Rural Savannah	All
Sewing machine	36.8	35.5	40.2	23.2	22.2	27.2	15.6	27.2
Stove	34.6	24.0	26.0	19.1	8.1	6.9	4.6	13.7
Refrigerator	33.1	16.2	18.0	5.2	1.5	2.8	0.4	8.2
Fan	46.8	31.8	30.3	14.9	5.3	5.5	0.2	14.3
Radio	62.1	48.7	56.4	43.3	32.2	38.9	29.9	41.5
Video	4.1	1.1	2.5	0.5	0.0	0.1	0.0	0.9
TV	39.0	22.0	22.3	7.2	4.3	4.1	0.8	10.9
Camera	5.0	2.7	3.7	2.6	1.0	1.5	0.7	2.0
Iron (electric)	50.5	38.4	33.8	14.4	4.5	5.8	0.7	15.7
Bicycle	2.4	4.3	6.8	38.1	8.4	9.1	44.0	15.5
Car	6.3	2.3	4.1	2.1	1.0	0.7	0.7	1.9
Mobile Phone	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Computed from the Ghana Living Standards Survey, 1991/92.

1998/99

	Accra	Urban Coastal	Urban Forest	Urban Savannah	Rural Coastal	Rural Forest	Rural Savannah	All
Sewing machine	33.5	30.3	33.8	34.7	26.5	34.9	19.3	30.3
Stove	35.6	18.2	16.8	15.8	8.0	7.8	2.8	12.8
Refrigerator	44.7	26.1	30.8	14.7	7.0	10.5	1.1	16.6
Fan	61.5	33.0	40.6	26.5	13.0	15.7	1.5	23.6
Radio	75.4	55.7	60.0	64.8	40.7	50.5	46.6	53.8
Video	13.5	4.5	8.7	2.0	0.4	2.3	0.5	4.1
TV	51.7	35.2	36.6	25.5	13.4	16.4	2.4	22.4
Camera	8.0	3.8	3.2	3.8	1.5	1.6	0.7	2.7
Iron (electric)	63.1	33.7	43.9	22.1	11.7	15.2	1.9	23.8
Bicycle	7.5	6.0	8.3	43.7	10.6	13.2	52.8	19.2
Car	9.8	2.0	3.4	0.0	1.3	1.6	0.6	2.6
Mobile Phone	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Computed from the Ghana Living Standards Survey, 1998/99.

Table 2: Percentage of households owning different physical assets, by locality, 1991/92 to 2005/06

2005/06

	Accra	Urban Coastal	Urban Forest	Urban Savannah	Rural Coastal	Rural Forest	Rural Savannah	All
Sewing machine	23.0	22.8	26.7	22.3	15.6	21.9	14.7	20.9
Stove	45.3	31.2	29.6	9.3	8.5	8.0	3.9	18.0
Refrigerator	49.1	32.6	37.6	20.3	10.5	9.2	3.3	21.0
Fan	65.9	46.8	49.2	40.7	16.0	14.6	6.0	30.0
Radio	82.6	77.6	77.9	72.1	67.6	74.0	68.7	74.3
Video	30.9	21.8	25.4	16.0	5.5	6.1	2.8	13.9
TV	68.9	44.4	48.0	34.8	18.0	17.8	6.6	31.0
Camera	6.8	3.8	3.5	2.8	2.1	1.6	1.1	2.8
Iron (electric)	62.8	49.8	50.4	23.6	12.3	12.5	4.2	27.8
Bicycle	4.9	9.2	11.9	50.9	12.3	15.6	61.5	22.3
Car	8.9	2.9	4.0	2.3	1.1	1.5	0.8	2.9
Mobile Phone	48.1	29.6	33.5	15.5	7.5	8.0	2.9	19.0

Source: Computed from the Ghana Living Standards Survey, 2005/06.

2.1.2 Access to Services

The report also assessed household's access to some essential services; access to potable water, using adequate toilet facilities and access to electricity. The findings showed that a large majority of households in urban areas have access to potable water i.e. reliance on all services apart from wells or natural resources.

The proportion of households in urban areas having access to electricity is nearly three times that of households in rural areas. The disparity varies sharply among households with different standards of living. The situation showed a reduction in the gap between the income groups in urban areas between 1998/99 and 2005/06. Generally there was significant improvements over the fifteen years period in the number of households obtaining there drinking water from a safe source, using adequate toilet facilities and having access to electricity.

Table 2: Main source of drinking water of households by locality

1991/1992

	Accra	Urban Coastal	Urban Forest	Urban Savannah	Rural Coastal	Rural Forest	Rural Savannah	All
Inside pipe	59.8	36.2	29.3	15.5	2.7	3.3	1.4	15.1
Water vendor	0.7	2.1	0.2	22.7	1.0	0.1	0.4	1.5
Neighbour/Private	38.2	15.8	19.8	1.0	7.4	0.6	1.1	9.2
Public standpipe	1.3	30.3	12.8	5.2	18.6	4.9	5.9	10.2
Borehole	0.0	0.2	3.9	9.8	2.7	28.8	24.6	14.6
Well	0.0	7.8	18.1	22.2	18.5	14.1	17.1	14.1
Natural sources	0.0	7.6	15.9	23.7	49.2	48.2	49.6	35.2
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Computed from the Ghana Living Standards Survey, 1991/1992.

1998/1999

	Accra	Urban Coastal	Urban Forest	Urban Savannah	Rural Coastal	Rural Forest	Rural Savannah	All
Inside pipe	50.3	23.1	30.7	13.6	4.2	4.6	0.0	14.7
Water vendor	12.9	4.5	3.0	3.3	3.3	0.5	2.3	3.6
Neighbour/Private	35.1	32.0	22.7	23.3	5.6	8.0	0.8	14.1
Public standpipe	0.8	21.9	23.1	15.9	26.7	9.8	0.0	12.3
Borehole	0.0	1.1	1.7	5.6	15.0	31.0	36.0	18.5
Well	0.0	11.6	10.3	16.2	19.7	10.1	17.7	12.0
Natural sources	0.9	5.9	8.5	22.1	25.5	36.0	43.2	24.9
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Computed from the Ghana Living Standards Survey, 1998/19

2005/2006

	Accra	Urban Coastal	Urban Forest	Urban Savannah	Rural Coastal	Rural Forest	Rural Savannah	All
Inside pipe	50.8	32.1	27.6	13.6	4.2	2.0	2.2	16.3
Water vendor	5.8	8.8	2.4	0.8	2.4	0.1	.	2.2
Neighbour/Private	37.6	24.5	20.0	24.3	11.4	2.9	2.5	14.3
Public standpipe	4.5	16.2	21.0	28.2	14.6	7.2	1.2	10.7
Borehole	0.1	4.3	8.8	16.6	27.7	55.5	53.4	30.4
Well	1.1	11.5	17.2	8.8	10.2	11.9	8.7	10.3
Natural sources	0.1	2.7	3.0	7.7	29.5	20.3	32.0	15.8
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Computed from the Ghana Living Standards Survey, 2005/2006.

Table 3: Toilet facilities used by households by locality
1991/1992

	Accra	Urban Coastal	Urban Forest	Urban Savannah	Rural Coastal	Rural Forest	Rural Savannah	All
Flush toilet	30.7	18.3	10.4	2.6	1.4	1.9	0.6	7.1
Pit latrine	13.7	32.8	39.3	36.1	56.2	81.8	32.8	50.2
Pan/Bucket	29.2	18.3	26.3	26.3	3.5	5.4	2.1	11.3
KVIP	13.3	9.9	16.8	6.7	6.2	3.2	2.3	6.8
Other	13.1	20.6	7.2	28.4	32.7	7.6	62.2	24.6
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Computed from the Ghana Living Standards Survey, 1991/1992.

1998/1999

	Accra	Urban Coastal	Urban Forest	Urban Savannah	Rural Coastal	Rural Forest	Rural Savannah	All
Flush toilet	28.5	6.6	11.2	3.3	2.1	1.5	0.3	6.6
Pit latrine	21.6	10.9	16.8	24.7	47.5	60.7	16.7	35.4
Pan/Bucket	15.2	11.5	12.7	5.5	4.5	4.7	0.3	6.8
KVIP	30.7	53.7	56.1	40.2	23.0	23.3	11.2	29.1
Other	4.0	17.3	3.2	26.2	22.9	9.8	71.5	22.1
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Computed from the Ghana Living Standards Survey, 1998/1999.

2005/2006

	Accra	Urban Coastal	Urban Forest	Urban Savannah	Rural Coastal	Rural Forest	Rural Savannah	All
Flush toilet	33.4	22.9	17.6	5.1	1.4	1.1	0.7	10.2
Pit latrine	5.0	22.7	23.3	11.6	43.5	57.6	20.8	31.5
Pan/Bucket	57.2	42.3	52.8	65.5	27.2	33.5	9.2	37.4
KVIP	3.2	1.5	3.2	0.3	0.1	0.3	0.3	1.3
Other	1.1	10.6	3.0	17.4	27.8	7.5	69.0	19.6
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Computed from the Ghana Living Standards Survey, 2005/2006.

Table 4: Percentage of households using electricity, by locality

	Accra	Urban Coastal	Urban Forest	Urban Savannah	Rural Coastal	Rural Forest	Rural Savannah	All
1991/92	89.5	60.8	70.2	35.1	10.3	11.0	3.6	29.8
1998/99	89.5	68.2	83.4	45.8	27.4	24.9	3.9	41.4
2005/06	88.3	74.3	76.2	64.6	29.1	32.4	17.0	49.2

Source: Computed from the Ghana Living Standards Survey.

2.1.3 Human Development

The health and education status of people are directly linked to the general state of development of a country. The survey findings showed enrolment rates in primary and secondary school have improved over the fifteen years period. These findings have implication for sustainable consumption and production in the country, in terms of lifestyle which will reflect the type and quantities of items produced and consumed.

Table 5: Type of health personnel consulted by ill or injured individuals, by locality, 1991/92 to 2005/06

1991/1992

	Accra	Urban Coastal	Urban Forest	Urban Savannah	Rural Coastal	Rural Forest	Rural Savannah	All
Doctor	47.8	27.3	32.0	32.7	47.0	34.9	22.3	41.4
Nurse, midwife	6.5	4.7	0.9	3.4	4.0	6.2	1.4	3.4
Medical assistant	6.5	8.6	9.9	5.7	3.7	8.9	13.7	4.4
Pharmacist	2.2	0.8	4.1	3.4	3.7	1.4	2.2	3.8
Other	0.0	4.7	6.8	4.2	7.8	2.1	5.8	6.6
Did not consult	37.0	53.9	46.4	50.6	33.9	46.6	54.7	40.5
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Computed from the Ghana Living Standards Survey, 1991/92.

1998/1999

	Accra	Urban Coastal	Urban Forest	Urban Savannah	Rural Coastal	Rural Forest	Rural Savannah	All
Doctor	44.6	30.9	34.6	21.9	17.7	15.4	7.7	19.8
Nurse, midwife	2.3	9.1	5.3	6.4	11.5	7.7	9.4	8.0
Medical assistant	3.1	3.0	2.4	6.9	6.5	8.5	13.1	7.6
Pharmacist	10.0	1.9	6.7	3.6	2.2	1.0	0.5	2.6
Other	2.3	4.3	4.7	7.0	8.4	5.0	7.9	5.9
Did not consult	37.7	50.8	46.3	54.1	53.7	62.4	61.4	56.2
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Computed from the Ghana Living Standards Survey, 1998/99.

2005/2006

	Accra	Urban Coastal	Urban Forest	Urban Savannah	Rural Coastal	Rural Forest	Rural Savannah	All
Doctor	49.2	38.3	33.7	24.4	21.6	18.9	11.5	23.6
Nurse, midwife	2.5	3.2	7.2	7.5	8.3	8.0	13.4	8.3
Medical assistant	0.9	2.6	2.9	4.8	5.2	5.0	7.1	4.7
Pharmacist	8.9	11.8	27.2	31.0	14.7	24.3	18.4	20.8
Other	0.7	1.6	1.8	3.1	3.3	2.3	3.4	2.4
Did not consult	37.9	42.6	27.1	29.2	46.9	41.6	46.3	40.1
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Computed from the Ghana Living Standards Survey, 2005/06.

2.2 Household Patterns – Living Conditions of Households

The household is used as a key socio-economic unit to provide valuable insights into living conditions in the Ghana Living Standards Survey – Round Five (GLSS 5). Information collected in the survey covered demographic characteristics of respondent and all aspects of living conditions including health, education, housing, household income, consumption and expenditure credit, assets and savings, prices and employment.

2.2.1 Demography

The mean household size for Ghana is 4 compared to 5.1 in the 2000 Population and Housing Census with the Upper West Region having the highest of 6.5 and Greater Accra region, the lower of 3.4. Ghana's population is still young with females forming 51.5 percent of the population.

2.2.2 Education

About 31 percent of all adults have never been to school, less than one fifth (17.1%) attend school but did not obtain any qualification. At the time of the survey (2005/2006) school attendance rate of school going age persons at all levels of education in Ghana is 86 percent.

The average annual expenditure incurred by a household on a person at school or college is GH¢88.65 with a higher figure in Accra (GH¢280.81) than in other urban and rural areas. The survey results indicate that 51 percent of adults are literate in English or a local language. Almost 70 percent of adults in urban areas are literate as against 40 percent of adults in rural areas.

This will be a challenge for sustainable lifestyle change and acceptance of the principle of sustainable consumption production.

2.2.3 Employment

Seven out of every ten of the adult population aged 15-64 are economically active. Males recorded a slightly higher economic activity rate (54.9%) than females (53.4%).

The population of the working population is employed in agricultural activities (55.5%) followed by trading (15.2%) and then manufacturing (10.9%). The unemployment rate is 3.6 percent which is more pronounced in urban areas (6.3%), Accra (8.9%) than in rural areas (1.6%). The mainstreaming of sustainable consumption and production will provide opportunities for employment in new areas like recycling and green jobs

Table 6: Distribution of the currently employed population aged 15 - 64 years, by industry group, locality and sex (percent)

Industry	Urban			Rural			Ghana		
	Male	Female	All	Male	Female	All	Male	Female	All
Agriculture	20.8	16.6	18.6	79.4	71.3	75.3	59.1	52.7	55.8
Fishing	1.3	0.2	0.7	2.9	0.6	1.7	2.3	0.5	1.4
Mining	1.3	0.6	0.9	0.9	0.2	0.6	1.1	0.3	0.7
Manufacturing	16.3	16.9	16.6	4.3	11.4	7.9	8.5	13.3	10.9
Electricity	0.9	0.1	0.5	0.1	0.0	0.0	0.3	0.1	0.2
Construction	6.8	0.2	3.5	1.8	0.0	0.9	3.5	0.1	1.8
Trade	18.4	42.1	30.4	3.2	11.0	7.2	8.4	21.6	15.2
Hotel and restaurants	1.0	5.1	3.1	0.5	2.1	1.3	0.6	3.1	1.9
Transport and communication	10.4	1.1	5.7	2.5	0.1	1.2	5.2	0.5	2.8
Financial services	1.4	0.3	0.8	0.1	0.0	0.0	0.5	0.1	0.3
Real estates	3.4	0.7	2.1	0.2	0.1	0.2	1.4	0.3	0.8
Public administration	5.5	1.8	3.7	0.4	0.0	0.2	2.1	0.6	1.4
Education	5.8	5.3	5.6	2.4	0.7	1.5	3.6	2.3	2.9
Health and social work	1.6	1.7	1.7	0.5	0.3	0.4	0.8	0.8	0.8
Other community services	4.2	6.4	5.3	0.8	1.9	1.4	2.0	3.4	2.7
Activities of private households	0.7	0.7	0.7	0.2	0.1	0.1	0.4	0.3	0.3
Extra territorial organizations	0.2	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Ghana Statistical Service September 2008

2.2.4 Migration and Tourism

Survey results provide information on domestic and out bound visitors, purpose and mode of travel, sponsorship, type of accommodation and duration of stay within and outside Ghana. Persons aged 25 to 44 constitute about 38 percent of domestic tourists, 46 percent of those who travel outside Ghana and 54 percent of all travelers within and outside Ghana. Road is the most popular mode of travel for both domestic and outbond tourists.

Kakum National Park and Kumasi Zoo are the most patronized tourist's sites.

2.2.5 Housing

The 2000 Population and Housing Census report showed that Ghana had 3.88 million dwellings and 3.7 million households. The report indicates that the number of households will increase from 3.7 million in 2000 to 6.0 million by 2025, that is at a growth rate of about 1.97 percent per annum which is less than the rate of population growth of 2.7 percent. Most households in Ghana (79%) live either in rooms in compound houses or other types of rooms. About 45 percent (26% in urban areas and 59% in rural areas) of the households own the houses they live in. About 73 percent of urban households have access to pipe-borne water compared to only 14 percent in rural household. Almost 79% of households in urban areas have electricity for lighting as against 27 percent of households in rural areas. Charcoal is the most common source of cooking fuel for urban households (52.6%) whereas firewood is the main source of cooking for rural households (80.2%). One out of every ten households in Ghana (22.2 percent in urban and 1.1 percent in rural) had access to flush toilet.

The continued use of charcoal and firewood in both urban and rural areas will put pressure on the nation's finest resources and will impact on health especially women and children due to indoor air pollution in the use charcoal and firewood.

2.2.6 Non-Farm Enterprises

Nearly three million two hundred thousand households representing 46 percent of all households in Ghana operate non-farm enterprises with women operating 72 percent of these businesses. Some 52 percent of the households operating non-farm enterprise are found in urban localities. Almost half (49.5%) of all business involve trading and most of the rest are in some kind of manufacturing.

Table 7: Expenditure on input to non-farm enterprises by principal activities

	Average annual expenditure on input per enterprise				Estimated annual value of inputs (million GH¢)			
Expenditure item	Type of business activity (GH¢)			All non farm enterprises	Type of business activity			All non farm enterprises
	Manufacturing	Trade	Others		Manufacturing	Trade	Others	
Taxes on product	29.25	69.05	75.98	60.90	5.20	30.50	9.40	45.10
Articles for resale	984.38	4,026.77	1567.64	3613.13	14.90	1084.20	74.80	1173.90
Rents on assets/land and building	449.32	78.51	1159.03	386.08	15.50	8.70	53.20	77.40
Raw materials	1,220.89	1,688.19	1027.23	1253.91	555.40	143.40	125.10	823.90
Traveling and Transport	102.19	183.72	147.61	157.31	37.60	155.20	33.50	226.30
Fuel and lubricants	183.32	131.47	1590.64	534.99	33.90	9.00	146.90	189.80
Electricity	100.43	83.18	102.25	92.71	7.90	10.40	8.50	26.90
Water	26.48	129.25	370.17	154.04	4.00	17.00	64.00	84.90
Telephones	62.15	71.98	141.66	92.50	1.20	3.50	4.70	9.40
Printing/Stationery/Postage/Packaging	176.77	37.24	127.50	91.40	4.60	3.20	3.80	11.50
Spare parts	37.71	1,084.47	441.12	410.80	1.10	10.70	15.30	27.00
Repairs/Maintenance of fixed assets	23.17	41.00	329.25	129.60	1.50	1.10	16.70	19.30
Lease of machinery or transport equipment	281.12	0.00	170.19	253.56	2.10	0.00	0.60	2.80
Advertising/Computer service	131.07	48.90	20.82	62.57	0.30	0.20	0.10	0.60
Bank charges (excl. bank int. change)	7.78	29.80	32.11	28.55	0.00	0.10	0.10	0.30
Training	55.13	34.64	15.30	30.74	0.10	0.00	0.10	0.20
Treatment/Disposal of waste product	17.91	52.73	152.65	53.71	0.10	0.20	0.20	0.50
Uniform and clothing	27.75	3.58	21.10	18.41	0.40	0.00	0.30	0.70
Accident claims	32.98	0.00	224.61	138.02	0.00	0.00	0.60	0.60
Other	54.86	63.64	172.52	79.18	6.10	4.10	8.80	18.90
Total expenditure	4,004.64	7,858.10	7889.38	7642.10	691.80	1481.50	566.60	2,740.00

2.2.7 Household Expenditure

Average annual household expenditure in Ghana is GH¢1,918.00 whilst the mean annual per capita consumption expenditure in Ghana is GH¢644.00. Food expenditure accounts for two-fifth of total household expenditure. Expenditure on housing averages 2.4 percent of the total household expenditure.

Ghanaian households were spending an average almost GH¢2,680million per annum with food (including non-alcoholic beverages) representing about a third of the total expenditure while non-food expenditure represented about 70 percent of the total household expenditure. Transport contributes the highest of 16.7 percent to the total expenditure within the non-food expenditure group. Housing, water, electricity and gas (7.9%), recreation and culture (6.1%) and education (5.3%) are the next most important expenditure groups.

Sustainable consumption and production measures should be introducted in the transport sector to reduce the level of expenditure.

Table 8: Average annual household cash expenditure by locality and expenditure group

Expenditure group	Average annual cash expenditure (GH¢)			Per cent of total		
	Urban	Rural	Ghana	Urban	Rural	Ghana
Food	**986**	**657**	**810**	**39.8**	**48.2**	**43.2**
Food & Non Alcoholic beverage	986	657	810	39.8	48.2	43.2
Non-Food	**2,635**	**1,237**	**1,870**	**60.2**	**51.8**	**56.8**
Alcoholic Beverage & Tobacco	136	103	111	1.0	3.1	1.8
Clothing & Footwear	184	116	145	8.0	9.8	8.7
Housing , Water, Electricity & Gas	325	128	212	11.3	6.9	9.5
Furnishings, Household equipment & Maintenance	113	98	104	3.8	7.4	5.2
Health	113	80	93	1.8	2.5	2.1
Transport	766	219	447	8.8	5.2	7.3
Communication	128	63	104	2.7	1.0	2.0
Recreation & Culture	200	103	164	1.4	1.6	1.5
Education	230	77	143	10.7	6.3	8.9
Restaurants & Hotels	177	83	127	7.0	4.6	6.0
Miscellaneous Goods & Services	263	166	219	3.7	3.5	3.6
Total	3,620	1,894	2,680	100.0	100.0	100.0

Table 9 Average annual household expenditure, per capita expenditure and estimated total national expenditure, by subgroup of expenditure

Group (item)	Average annual household cash expenditure (GH¢)	Average annual per capita expenditure (GH¢)	Total annual cash expenditure (million GH¢)	Percentage distribution
1. Food & Non Alcoholic beverage	**810**	**278**	**3,694**	**43.2**
Bread and cereals	161	54	834	9.8
Meat	95	30	334	3.9
Fish and sea food	167	57	812	9.5
Milk, Cheese and Eggs	42	16	145	1.7
Oils and fats	38	12	175	2.1
Fruits	29	12	92	1.1
Vegetables	99	33	484	5.7
Sugar, Jam, Honey, Chocolate	17	6	77	0.9
Food products n.e.c.	110	36	556	6.5
Non Alcoholic Beverages	52	21	185	2.2
2. Alcoholic Beverage & Tobacco	**111**	**44**	**157**	**1.8**
Alcoholic Beverages	69	29	138	1.6
Tobacco	42	16	19	0.2
3. Clothing & Footwear	**145**	**48**	**745**	**8.7**
Clothing Materials	116	39	604	7.1
Footwear	29	10	141	1.7
4. Housing, Water, Electricity & Gas	**212**	**71**	**814**	**9.5**
Actual Rental for housing	18	8	90	1.1
Maintenance and repair of dwelling	86	25	151	1.8
Water supply and miscellaneous services to the dwelling	32	11	164	1.9
Electricity , Gas and other fuels	76	26	409	4.8
5. Furnishings, Household equipment & Maintenance	**104**	**37**	**446**	**5.2**
Furniture and furnishings, Carpets and floor coverings	4	2	1	0.0
Household Textiles	10	3	32	0.4
Household Appliances	7	2	5	0.1
Glassware , Tableware and Household Utensils	12	4	39	0.5
Tools and equipment for house and Garden	6	2	26	0.3
Goods and Services for routine household maintenance	65	23	343	4.0
6. Health	**93**	**32**	**179**	**2.1**
Medical products, appliances and Equipment	33	11	126	1.5
Out-patient services	18	6	40	0.5
Hospital Services	43	15	13	0.2
7. Transport	**447**	**142**	**624**	**7.3**
Operation of personal transport Equipment	329	97	204	2.4
Transport Services	119	45	420	4.9
8. Communication	**104**	**45**	**172**	**2.0**
Postal Services	20	10	2	0.0

Telephone and Telefax Equipment	14	4	1	0.0
Telephone and Telefax Services	70	31	169	2.0
9. Recreation & Culture	**164**	**55**	**127**	**1.5**
Audio Visual, Photographic and Information equipment	17	7	5	0.1
Other Major durables for recreation and Culture	35	17	1	0.0
Other Articles and equipment of luxury	30	6	24	0.3
Recreational and Cultural Services	32	12	44	0.5
Newspapers, Books and stationery	18	6	47	0.6
Packaged Holidays	32	8	6	0.1
10. Education	**143**	**31**	**764**	**8.9**
Education	143	31	764	8.9
11. Restaurants & Hotels	**127**	**65**	**517**	**6.0**
Catering services	127	65	517	6.0
12. Miscellaneous Goods & Services	**219**	**76**	**309**	**3.6**
Personal care	49	18	216	2.5
Personal effects n.e.c.	14	5	40	0.5
Social protection	16	6	3	0.0
Insurance	39	15	22	0.3
Financial services n.e.c.	80	23	21	0.3
Other services n.e.c.	21	9	5	0.1
Total	**2,680**	**923**	**8,547**	**100.0**

Table 10: Proportion of households owning various assets and consumer durables by locality (percent)

Group (subgroup)	Locality							
	Urban			Rural				
	Accra (GAMA)	Other Urban	All Urban	Rural Coastal	Rural Forest	Rural Savannah	All Rural	Ghana
Furniture	68.4	69.8	69.3	65.9	53.2	30.9	49.2	57.9
Sewing machine	25.2	26.8	26.3	16.7	24.1	15.3	19.9	22.6
Stove (kerosene)	10.2	8.6	9.1	5.6	4.6	3.0	4.3	6.4
Stove (electric)	5.1	2.3	3.2	0.5	0.7	0.1	0.5	1.7
Stove (gas)	38.1	20.2	26.1	4.4	3.9	1.4	3.2	13.1
Refrigerator	49.3	32.5	38.0	9.8	8.7	3.0	7.2	20.5
Freezer	13.7	7.1	9.3	2.9	2.3	1.0	2.0	5.2
Air conditioner	1.8	0.1	0.7	0.2	0.1	0.1	0.1	0.4
Fan	69.4	49.3	55.9	16.9	15.7	6.4	13.2	31.6
Radio	38.2	44.2	42.2	52.3	59.6	51.9	55.7	49.9
Radio cassette	38.5	41.3	40.3	28.9	34.3	34.8	33.3	36.3
Record player	3.3	4.9	4.4	3.7	2.0	2.1	2.4	3.3
3-in-one radio system	26.5	14.3	18.3	6.0	5.1	1.7	4.3	10.3
Video player	32.8	23.5	26.6	6.0	6.3	3.0	5.2	14.4
Desktop computer	6.6	2.8	4.1	0.2	0.9	0.3	0.6	2.1
Laptop computer	1.9	0.6	1.0	0.1	0.1	0.1	0.1	0.5
Printer	1.8	0.5	1.0	0.1	0.1	0.2	0.1	0.5
Computer accessories	2.3	0.5	1.1	0.1	0.3	0.1	0.2	0.6
Camcorder/video camera	0.8	0.2	0.4	0.0	0.0	0.1	0.0	0.2
Satellite dish	0.7	0.1	0.3	0.0	0.1	0.1	0.1	0.1
Washing machine	1.9	0.2	0.8	0.1	0.0	0.1	0.1	0.4
TV	72.9	47.9	56.2	19.9	19.7	7.0	15.9	33.3
Camera	7.0	3.9	4.9	2.2	2.1	1.1	1.8	3.2
Iron (electric)	66.3	47.5	53.8	12.9	13.8	4.4	10.8	29.3
Bicycle	5.4	19.1	14.5	14.0	18.3	65.7	31.7	24.3
Motor cycle	0.8	3.6	2.7	0.6	1.1	6.9	2.7	2.7

Car	9.5	4.1	5.9	1.2	1.7	0.9	1.4	3.3
House	14.1	19.2	17.5	43.3	40.9	56.1	46.0	33.7
Land/plot	8.6	21.5	17.2	32.4	32.3	29.4	31.5	25.3
Shares	1.4	1.8	1.6	0.5	0.7	0.4	0.6	1.0
Boat	0.0	0.1	0.0	0.3	0.0	0.4	0.2	0.1
Canoes	0.2	0.6	0.5	1.0	0.2	4.3	1.6	1.1
Outboard motor	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1
Microwave	4.4	0.8	2.0	0.0	0.2	0.0	0.1	0.9
Food processor	3.3	1.2	1.9	0.1	0.2	0.1	0.2	0.9
Box iron	6.1	15.3	12.3	25.1	23.7	11.7	20.4	16.9
Mobile phone	50.1	30.1	36.7	8.0	8.4	3.0	6.7	19.7
Generator	0.5	0.3	0.3	0.6	0.8	0.9	0.8	0.6
Jewellery	15.2	11.8	12.9	17.4	5.3	2.6	7.1	9.6

2.2.8 Household Income

The average household income is US$1,327 and the average per capita income is US$433. The three main sources of household income are from agricultural activities (35%) wage income from employment (29%) and income from self employment (25%).

2.2.9 Agricultural Inputs

More than half a million of the households that harvested crops purchased seed, bags insecticides containers herbicides, strings and fertilizers. 89 percent (GH¢312.5 million) was spent on crop inputs with as much as 19 percent of the amount was spent on inorganic fertilizers alone.

CHAPTER III

STATUS OF CONSUMPTION AND PRODUCTION PATTERNS

3.0 STATUS OF CONSUMPTION AND PRODUCTION PATTERNS

3.1 Energy

Electrification is viewed mainly in the context of providing electrical energy to urban households and industries. Its demand was projected to increase from 6.58 TWh in 1997 to about 20 - 21 TWh by 2020. Volta River Authority (VRA) projects 16 TWh as the low growth scenario. Average demand growth has been between 6-8% per annum for VRA and about 7% per annum for Electricity Company of Ghana (ECG). The Government plans to expand the power system in order to meet this projected demand.

The present power sector is dominated by hydropower on the Volta River – Akosombo (1020 MW) and Kpong (160 MW); which constitutes about 65% of the nation's installed capacity. To meet the growing demand for electricity, the thermal power capacity at the Takoradi plant is expected to be upgraded from 550MW to 660 MW.

Natural gas as a fuel for electricity is expected to replace light crude oil by 2010 should the West African gas pipeline project commence delivery of gas as planned and is projected to overtake hydro as the dominant primary fuel for power generation by 2010. However, depending on natural gas from the West African gas pipeline alone could put the nation's energy security at risk.

Universal access to electricity was initiated in 1988 as the National Electrification Scheme (NES) and has resulted in connecting all regional and district capitals to the national grid system. As a complementary activity to the NES, the Self-Help Electrification Programme (SHEP), which aims at assisting rural communities to obtain access to grid power has been initiated.

It has been estimated that around 23% of the population would still have no access to electricity by 2020. Ghana is therefore seeking to develop all the available sources of energy for electricity generation by opening up the way for private sector investment. Various forms of energy enhancement measures are also being considered and notable among them are:

i. the Energy conservation programmes
ii. expansion of VRA's thermal plant at Aboadze
iii. installation of new thermal power plants at Tema
iv. the construction of the 400 MW Bui project

v. harnessing the renewable energy resources of the country.

This brings into focus the role the renewable energy technologies could play in rural electrification. Particularly, it could guarantee sustainable development by reducing the generation of carbon dioxide emissions in the country.

There had been in existence various energy conservation efforts since the early 1990s, but the aftermath of the 1998 energy crisis spurred the adoption of energy conservation as an important scheme to help alleviate the national energy crunch. Building power plants faces time constraints and requires substantial financial commitments. The least expensive route was identified with energy conservation programmes which will reduce peak levels and curtail waste.

There are a number of programmes already in place for the promotion of Energy Efficiency Technologies (EET). The Energy Foundation (EF) has been liaising with organizations for the energy conservation programmes. The Energy Foundation collaborates with the private sector, government institutions, regulatory bodies and donor agencies to implement specific programmes and projects as energy consumption patterns.

The annual growth in the demand for fuel wood and charcoal is estimated at 3% in tandem with population growth and urbanization. Electricity demand, on the other hand, is growing at about 8% annually while consumption of petroleum products is estimated at about 5% per annum. The end-use wastage of energy of about 30% in electricity sector also contributes to increasing our energy requirements. The current and projected levels of growth in energy demand pose serious difficulties for the national economy to meet demand reliably and raising the need to manage consumption judiciously.
In recent times there has been a renewed vigour towards improving energy efficiency and conservation in the economy with the passage of legislations on minimum energy efficiency standards for some appliances. The National Energy Policy seeks to build on these efforts.

Most of Ghana's petroleum products consumption is attributable to the transportation sector. Implementation of efficiency and conservation measures in the transportation sector will ensure management of the growth in petroleum product consumption and oil imports. Government, being one of

the biggest consumers of energy (electricity and petroleum products for transportation by the Government agencies), will be a principal target for the energy efficiency and conservation drive.

3.2 Land use and Crop production

Agricultural land in Ghana represents about 57.1% of the total land area, out of which 30.4 % under cultivation with only 0.14% irrigated. The major crops include industrial **(c**ocoa, oil palm, coconut, coffee, cotton, kola, and rubber), starchy staples (cassava, cocoyam, yam, maize, rice, millet, sorghum, plantain), and fruits and vegetables (pineapple, citrus, banana, cashew, pawpaw, mangoes, tomato, pepper, okro, egg plant, onion, Asian vegetables).

The table below gives a picture of landuse in Ghana as far as agriculture is concerned

Table 11 Land Use (Specific to Agriculture)

Type of Land Use	**Hectares**	**%**
Total Land Area (T.L.A.)	23,853,900	100.0
Agric. Land Area (A.L.A.)	13,628,179	57.1
Area under cultivation (2007)	7,248,000	30.4
Total area under irrigation (2007)	33,778	0.14
Area under inland waters	1,100,000	4.6
Others (forest reserves, savannah woodland, etc)	9,125,721	38.3

Sources: The Ghana Survey Dep't and MOFA, Accra <u>Note:</u> Percentages will not add up to 100, because area under cultivation is part of agric. land area, while area under irrigation is part of area under cultivation.

3.2.1 Land area and production patterns

Considering Table 12b and 12d below, the growth rate of selected crop indicates that the land area for cultivation is increasing but there is corresponding decline in food production. This could be associated with decline in soil fertility, poor extension services and impropriate management systems.

Table 11 2a Area Planted to Selected Food Crops ('000 ha.)

Source: Statistics, Research and Information Directorate (SRID), MoFA.

Crop	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Maize	697	697	695	713	940	792	733	740	793	790
Millet	181	186	208	193	198	207	182	185	200	163
Rice	130	105	115	135	123	118	119	120	125	109
Sorghum	332	312	289	329	337	346	298	305	320	208
Cassava	630	640	660	726	794	807	784	750	790	801
Cocoyam	218	372	247	262	282	277	270	255	260	258
Plantain	246	253	244	265	277	286	281	290	299	305
Yam	211	243	261	287	300	321	311	300	325	324
Total	**2,645**	**2,808**	**2,719**	**2,910**	**3,251**	**3,154**	**2,978**	**2,945**	**3,112**	**2,958**

Table 12b Mean Annual Growth Rates for Area Planted to Selected Food Crops

CROP	Average Area ('000 ha)		Growth Rate (%)*	Average Area ('000 ha)		Growth Rate (%)*
	1996 - 1998	1999 - 2001		2002 - 2004	2005 - 2007	
Roots & Tubers						
Cassava	643.3	675.3	1.62	795.0	780.3	-0.62
Cocoyam	279.0	293.7	1.71	276.3	257.7	-2.32
Yam	238.3	254.0	2.13	302.7	281.3	-2.44
Plantain	247.7	254.0	0.84	281.3	285.7	0.52
Cereals						
Maize	696.3	701.7	0.26	815.0	821.7	0.27
Millet	191.7	190.0	-0.30	193.7	195.7	0.34
Sorghum	311.0	310.0	-0.11	337.3	327.0	-1.03
Rice	116.7	118.3	0.45	125.3	120.0	-1.44

Source: Based on Table 4.1.2 *The average of 2002 to 2004 compared with average of 2005 to 2007 and average of 1996 to 1998 compared with average of 1999 to 2001

Table 12c Production of Selected Food Crops ('000 Mt)

Crop	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Maize	1,015	1,015	1,013	938	1,400	1,289	1,158	1,171	1,189	1,220
Millet	162	160	169	134	159	176	144	185	165	113
Rice (paddy)	281	210	215	253	280	239	242	237	250	185
Rice (milled)	169	126	129	152	168	143	145	142	150	111
Sorghum	355	302	280	280	316	338	287	305	315	155
Cassava	7,172	7,845	8,107	8,966	9,731	10,239	9,739	9,567	9,638	10,218
Cocoyam	1,577	1,707	1,625	1,688	1,860	1,805	1,716	1,686	1,660	1,690
Plantain	1,913	2,046	1,932	2,074	2,279	2,329	2,381	2,792	2,900	3,234
Yam	2,703	3,249	3,363	3,547	3,900	3,813	3,892	3,923	4,288	4,376
Total	**15,347**	**16,660**	**16,833**	**18,032**	**20,093**	**20,371**	**19,704**	**20,008**	**20,555**	**21,302**

Source: SRID Note: Milled rice is estimated to be 60% of paddy

Table 12d Mean Annual Production Growth Rates of Selected Crops

CROP	Average Production ('000 Mt)		Growth Rate (%)*	Average Production ('000 Mt)		Growth Rate (%)*
	1996 – 1998	1999 - 2001	1996 - 2001	2002 - 2004	2005 - 2007	2002 - 2007
Roots & Tubers						
Cassava	7,708	8,306	2.49	9,903	9,808	-0.32
Cocoyam	1,636	1,673	0.75	1,794	1,679	-2.21
Yam	3,105	3,386	2.89	3,868	4,196	2.71
Plantain	1,964	2,017	0.89	2,330	2,501	2.36
Cereals						
Maize	1,014	989	-0.83	1,209	1,282	1.95
Millet	164	154	-2.10	156	160	0.84
Sorghum	312	287	-2.78	311	314	0.32
Rice	141	136	-1.20	154	152	-0.44

Source: Based on table 4.1.5

****The average of 2002 to 2004 compared with average of 2005 to 2007 and average of 1996 to 1998 compared with average of 1999 to 2001.***

TABLE 13*:* Estimated Levels of Per Capita Consumption of Selected Food Crops.

Commodity	Kg/head/year*					
	1980	**1985**	**1990**	**1995**	**2000**	**2005**
1. **Roots & Tubers**	145.2	146.3	148.0	149.7	151.4	152.9
Cassava	44.2	43.8	43.3	42.8	42.3	41.9
Yam	-	-	54.0	55.0	56.0	57.1
Cocoyam	82.2	82.5	83.0	83.5	84.0	84.8
2. Plantain						
3. **Cereals**	38.4	39.2	40.3	41.4	42.5	43.8
Maize	12.4	12.7	13.3	13.9	14.5	15.1
Rice (milled)	8.5	9.4	5.1	12.6	9.0	6.4
Millet	13.0	14.4	9.3	21.7	14.8	10.1
Sorghum	-	-	-	-	8.0	8.0
Wheat	-	-	23.6	24.2	27.0	30.2
4. **Fish**	-	-	8.0	6.3	6.7	7.1
5. **Meat**						

***In the absence of a household consumption survey, these estimates have been based on food available for human consumption from both domestic and import sources. For fish, imports amounting to 100,000 Mt were considered .For meat, bush meat consumption of 40,000 Mt and import amounting to 20,000 Mt has been considered. Dashes indicate cells for which information was not available**.*

3.2.2 Production and supply pattern of food crops

In Ghana, there are a number of gaps along the value chain that reflect in the production and supply patterns of food crops. The information available as indicated in table 13 reveals that some selected food crops such as maize which is an important staple crop in the country had a total production 1,220MT in the year 2007 and the human was 853MT, however the country had a deficit of 118 MT. The short fall in

the overall consumption may be associated with a number of factors. This may be due to the fact that some were made available for livestock and post harvest losses etc. The production supply pattern is also affected by importation of food crops.

Table 14 Domestic Food Supply and Demand Position (2007)

Crop	Total Domestic Production ('000 Mt)	Production Available for Human Consumption* ('000Mt)	Per Capita Consumption (kg/Annum)	Estimated National Consumption ('000Mt)	Deficit/Surplus ('000 Mt)
Maize	1,220	853	43.8	971	-118
Rice (Milled)**	111	89	15.1	335	-246
Millet	113	79	6.4	142	-63
Sorghum	155	109	10.1	224	-116
Cassava	10,218	7153	152.9	3391	3,761
Yam	4,376	3501	41.9	929	2,571
Plantain	3,234	2749	84.8	1881	868
Cocoyam	1,690	1352	57.1	1266	86
Groundnut	302	257	12	266	-9
Cowpea	119	101	5	111	-10
Total	**21,537**	**16,242**		**9,517**	**6,724**

Source: SRID Notes: Estimated Population for 2007, based on 2000 census figure (18.9 m) and a growth rate of 2.7 % = 22.18 m. * 70% of Domestic production for maize, millet, sorghum and cassava; 80% for rice, yam, cocoyam; 85% for plantain, groundnuts and cowpea. Livestock feed, wastage and seed account for the discount.

***** 60% of paddy rice which stood at 185,000 MT for 2007.***

Table 15 Quantity and Value of Cereal Imports (1999 – 2007)

Year0	Wheat	Rice	Maize	Sorghum
1999 Quantity (Mt)	181,645	241,610	201.21	-
Value $ million	102.7	95	0.07	-
2000 Quantity (Mt)	196,700	187,256	5,050	819
Value $ million	72.03	65.03	0.73	1.18
2001 Quantity (Mt)	168,816	311,513	10,589	4,040
Value $ million	64.25	72.46	1.52	2.75
2002 Quantity (Mt)	182,681	296,953	10,470	5,135
Value $ million	78.59	68.85	2.08	2.25
2003 Quantity (Mt)	147,779	797,705*	163	193
Value $ million	50.7	124.66	0.07	0.002
2004[a] Quantity (Mt)	247,991	253,905	140	2.6
Value $ million	84.32	119.15	0.086	0.77
2005[a] Quantity (Mt)	369,733	484,513	54,965	n.a.
Value $ million	99.69	138.94	12.31	n.a.
2006[a] Quantity (Mt)	254,052	389,660	6,572	0.58
Value $ million	46.37	159.47	1.43	n.a.
2007[a] Quantity (Mt)	332,299	442,073	596	n.a.
Value $ million	111.38	157.86	0.21	n.a.

Source: Ministry of Trade & Industry, Accra. [a] Figures from GSS.

**** Part of this amount may have been trans-shipment to neighboring countries. However, this could not be ascertained from the MOTI, PSI.***

Table 16 Production of Industrial Crops (Mt.)

Year	Cocoa[1]	Coffee[1]	Sheanut[1]	Seed Cotton[2]	Tobacco[3]	Oil Palm[4]
1997	322,490	2,880	21,504	24,953	2,020	55,505
1998	409,360	8,370	34,886	33,803	2,390	1,022,010
1999	397,675	3,965	17,465	38,127	2,556	1,031,919
2000	436,634	1,956	30,771	35,503	2,457	1,066,426
2001	389,591	1,379	19,882	17,506	1,233	1,586,500
2002	340,562	1,464	27,160	22,851	2,155	1,612,700
2003	496,846	338*	n.a.	16,822	2,150	1,640,100
2004	736,975	477*	n.a.	20,155	2,359	1,686,800
2005	599,318	270*	30,000	21,000	1,350	1,712,600
2006	740,458	164*	n.a.	n.a.	n.a.	1,737,900
2007	614,532	304*	n.a.	n.a.	n.a.	1,684,500

Sources: 1. COCOBOD, 2. Agricultural Development Bank. 3. British American Tobacco Co. 4. Oil Palm Companies (GOPDC, TOPP, BOPP, NOPL) and Individual Plantations. *Values updated with more current and complete information. n.a.: Not Available

3. 2.3 Livestock Sub-sector

Livestock production in Ghana has a number of challenges. The concentration had been in the production of poultry which is done on commercial basis. Cattle are normally on free range system, they are challenged with issues such as unavailability of water sources and fodder or silage during the dry seasons. The cattle production areas have not been able to establish fodder banks to feed the animals, therefore the need to explore in that area. Cattle rearing are dominantly confined in the north of the country and are kept as wealth. Other dominant livestock are sheep, goat, cattle, and pigs. The importation of chicken parts, pig feet and turkey tails into the country may have impacted on the production pattern of livestock, since these parts are very affordable and highly consumed by the public. Even though there is no guinea

fowl and ducks in the information provided, there is the opportunity to promote their production and consumption in the country. Rabbits and grasscutter production are limited to the urban and peri-urban areas.

From the analysis below, with the exception of poultry, the other livestock production has not been significant.

Table 17 Livestock Population ('000)

Type of Livestock	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Cattle	1,260	1,273	1,288	1,302	1,315	1,330	1,344	1,359	1,373	1,392	1,407
Sheep	2,496	2,576	2,658	2,743	2,771	2,922	3,015	3,112	3,211	3,314	3,420
Goats	2,659	2,792	2,931	3,077	3,199	3,230	3,560	3,925	3,923	3,997	4,196
Pigs	347	339	332	324	312	310	303	297	290	477	491
Poultry	15,888	17,302	18,810	20,472	22,032	24,251	26,395	28,727	28,386	34,030	37,038

Source: Veterinary Services Directorate, MoFA, Accra

Table 18 Meat Production

	Domestic Meat Production (Metric Tons)									
	1997	1999	2000	2001	2002	2003	2004	2005	2006	2007
Cattle	17,160	18,029	18,570	19,053	18,288	18,486	18,686	18,874	19,140	19,346
Sheep	10,886	11,940	12,298	12,780	13,149	13,568	14,004	14,450	14,913	15,390
Goats	9,879	11,216	11,552	12,037	12,597	13,884	15,308	15,300	15,588	16,364
Pigs	11,360	11,173	10,056	9,653	10,416	10,181	9,979	9,744	16,027	16,498
Poultry	11,104	14,534	13,807	14,580	19,401	21,116	22,982	22,709	27,224	29,630
Total	**60,389**	**66,892**	**66,283**	**68,103**	**73,851**	**77,235**	**80,959**	**76,582**	**92,893**	**97,229**

Source: Estimated from Table 4.2.1 based on information and criteria in Appendix

Table 19 Imports of livestock and poultry products

CATEGORY	2000	2001	2002	2003	2004	2005	2006	2007
BOVINE:								
BEEF	631.6	73.2	901.3	1,112.4	2,586.8	6,331.7	10,585.5	16,250.4
BUFFALO	237.9	81.0	162.2	249.6	1,169.2	2,257.1	4,717.3	8,109.0
SUB-TOTAL	**869.5**	**154.2**	**1,063.5**	**1,362.1**	**3,756.0**	**8,588.8**	**15,302.8**	**24,359.4**
POULTRY:								
CHICKEN	9,160.0	6,731.5	19,986.0	32,939.0	39,088.6	40,591.0	44,757.7	63,276.3
TURKEY	385.9	74.1	766.3	1,164.5	1,268.7	1,697.2	3,030.3	3,514.7
DUCK	2.1	2.0	0.0	4.1	0.0	0.0	6.1	0.0
SUB-TOTAL	**9,548.0**	**6,807.6**	**20,752.3**	**34,107.6**	**40,357.3**	**42,288.2**	**47,794.1**	**66,791.0**
OTHER:								
CHEVON	74.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MUTTON	237.4	478.2	1,285.0	2,122.3	2,053.4	3,640.8	4,839.2	6,887.1
PORK	358.1	1,166.1	7,737.5	9,882.3	7,756.4	10,286.8	13,290.5	10,551.5
PROCESSED MEAT	106.8	80.4	133.9	0.0	256.2	270.4	0.0	0.0
SUB-TOTAL	**872.7**	**3,273.2**	**10,021.9**	**12,353.9**	**10,269.3**	**15,753.1**	**18,129.7**	**17,438.6**
MILK	96.0	1,548.5	865.5	349.4	203.3	1,555.1	1,044.2	2,659.9
GRAND TOTAL	**11,290.2**	**10,235.0**	**31,837.7**	**47,823.5**	**54,382.6**	**66,630.1**	**82,270.8**	**111,248.9**

Source: veterinary Services Directorate

3.2.4 Soils as supply component of the production pattern

The soils are predominantly light textured and sandy loams. The loamy soils are common. Many soils contain abundant coarse material either gravel and stone, or concretionary materials which affect their physical properties, particularly their water holding capacity. The rate of erosion in the country is very significant, causing the country about 2% of it GDP. The main source of soil nutrition is through the application of inorganic fertilizers. The application of organic fertilizers is not intensified. The regular burning of vegetation on farmlands also affects the status of nutrition and soil health. Improper drainage on irrigated fields has resulted in extensive soil salinity problems.

3.2.5 Fisheries supply and production pattern

The main types of fish production for the country is **Capture fisheries (**Industrial, semi-industrial, artisanal/canoe fisheries), and **Aquaculture (**intensive, semi-intensive, and extensive).

Aquaculture potentials however are not fully explored. The breeding sites for fish stock are not well identified and protected, affecting natural restocking. The potential to improve breeding stock especially for inland waters have not been adequately explored. The inappropriate harvesting methods (e.g. unapproved nets, chemicals, powerful lights) impact on the fish stock. Inadequate landing and storage facilities affect the operations of fishermen.

Table 20: Annual Fish Production by Source (Mt.)

Source	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Marine	396,000	376,000	333,000	380,000	366,000	290,000	331,412	352,405	322,790	315,530	293,398
Inland	72,000	76,000	89,000	88,000	88,000	88,000	75,450	79,000	82,654	83,168	84,757
Total	**468,000**	**452,900**	**422,000**	**468,000**	**454,000**	**378,000**	**406,862**	**431,405**	**405,444**	**398,698**	**378,155**

Source: Ministry of Fisherie

3.3 Existing Economic Instruments in Ghana

Even though most of the existing tax instruments are not well defined in environmental context for sustainable production and consumption which will be essential in controlling production and consumption, when well fashioned to achieve this goal. Despite the fact that the tax instruments are mainly to raise revenue to support the national budget, some are able to change the behaviour of Ghanaians towards environmental protection for sustainable development, especially the vehicle taxes, fuel taxes, the product taxes, the charges, levies and fees. Since direct and the indirect tax system in the country can incorporate environmental tax measures, it is important to discuss the status of all the tax instruments used in Ghana.

3.3.1 Taxation of Road Transport and Fuels

Road transport is subject to different taxes in Ghana. Existing taxes apply primarily to motor vehicles and to the fuels they consume. There is considerable scope for environmental objectives to be reflected through restructuring of existing taxes rather than the introduction of wholly new ones.

3.3.2 Fuel/Petroleum Taxes

Fuel has been subjected to a number of different taxes in Ghana which include general consumption or VAT taxes, excise taxes, storage and security levies and environmental taxes. Excise taxes on the principal forms of petroleum products - gasoline, kerosene and LPG - have risen steadily since 1989. Until 2009 fuel/petroleum products attracted ad-valorem excise duty on ex-refinery price. Beside excise tax, fuels were also subject to a number of special taxes / quasi-excises. For instance it was proposed that a special VAT of 2.5 percent be levied on fuels. The other special taxes/quasi-excises imposed included exploration levies, debt recovery levy (GH¢0.0640 per litre of petroleum products), road levy/fund (GH¢00.40 per litre of petroleum products) strategic stock levy (GH¢0.0030 on every litre of petroleum product), Energy Fund and LPG promotional levy. The Government earned substantial revenue from the pure petroleum/fuel excises and the quasi-excises. The pure petroleum excise contributed over 60 percent of the revenue from all the categories of petroleum excises. Petroleum excises began with a modest contribution of 9 percent of total revenue in 1986 but then peaked at 22.3 percent in 1993.In 2002 however, it fell to 11.7 percent. Other energy sources also attract tax. For instance electricity attract power factor surcharge of 1 percent.

3.3.3 Vehicle-Related Taxes

Motor vehicles in Ghana are taxed according to their physical, age, fuel use characteristics, and/or the use to which they are put. These taxes are primarily revenue-raising measures. However, vehicle-related taxes, including negative taxes (tax expenditures) relating to commuting expenses do have the potential to alter behaviour for environmental purposes for sustainable development, particularly when tied to infrastructure reform. Existing vehicle-related taxes include: import duties, VAT, special tax, ECOWAS levy, EDIF, vehicle examination fees and processing fee. Almost all motor vehicles imported into the country attract import duty with the exception of ambulance, hearse, tractors (with HS code 8710.10, 8710.20 and 8710.90), special purpose vehicles (e.g. workshop vans) motor-bikes and bicycles.

Over-aged vehicles (vehicles aged more than 10 years) imported into the country attract a penalty depending on the age of a vehicle from the date of its manufacture, the use to which the vehicle is to be put, model or the cylinder capacity of the motor vehicle.

Quite apart from the taxes, fees and levies, vehicles are also subjected to other forms of fees. There are also recurrent vehicle examination (roadworthy certificate) fees, which ranges between GH¢ 2.00 and GH¢20.00. Vehicle owners must replace vehicle certificate or stickers every year. Other recurrent fees levied in the country include change of vehicle ownership charge. Possibilities exist for the differentiation of the fees for registration according to the environmental attributes of the different vehicles.

3.3.4 Environmental Taxes on Goods and Services/Product Taxes

To help encourage production and consumption for sustainable development, excise taxes are levied on certain goods and services in the country. Excise taxes ranging between 5% and 140% are charged on malt drinks (5%), aerated and mineral waters (20%), beer (50%) and tobacco products (140%). These products also attract 12.5% VAT on the retail price or wholesale price. A concessionary duty rate of 10% is granted to hotels and restaurants under the Ghana Investment Promotion Centre Act 1994 (Act 478) on items like refrigerators and furnishing (i.e. carpets, radio sets, crockery, television sets, and air conditioners).

To enhance the competitiveness of local industry, the Government of Ghana on February 27, 2003 raised import duty from 10 per cent to 15 per cent on imported finished products. To support and make

domestic production more competitive, it is proposed that the duty on rice imports be increased to help increased production of local rice.

3.3.5 Enforcement Incentives

Non-compliance fees and reclamation/performance bonds are the two most important enforcement incentives used in Ghana. The non-compliance fees are the charges and fines levied on non-compliant polluters. For instance a holder of logging license who transfers or assigns his timber rights under the Timber Utilization Contract (TUC) contrary to the logging regulations commits an offence and is liable on summary conviction to a fine of not less than 300 percent of the annual rent payable (Forestry Commission of Ghana, 2004). The mining and logging companies in Ghana are also required by law to post reclamation/performance bonds to the appropriate authorities before they start their operations. By July 2003, mining companies had posted reclamation bond/performance bonds of US$1.5million and US$ 240 million in cash to the appropriate authorities (Ghanaian Chronicle, v.11, No 125, Wednesday July 16, 2003).

3.4. Human Settlement, Housing and Construction

3.4.1 General Characteristics of Buildings

The building industry has improved tremendously in respect of design, construction methods and application of technology to meet the expanding demands of a growing economy and social class. The challenges of rapid urbanization and globalization have enabled buildings that are increasingly complex multi-storied structures and industrial facilities with pre-fabricated elements. The social character of most urban housing estates have become more communal but less homogenous. There is a lot more attention to design purpose and application of best practice to the industry. Most buildings also have the benefit of several support systems that together make them function more efficiently. These are mainly power, water, voice and data systems, heating ventilation air condition (HVAC), safety and security systems, ventilation, temperature and solar control, access and circulation systems, landscaping and ambience, which make the demanding daily life schedule a lot more comfortable. Urban regeneration schemes have also ensured significant increases in higher occupancy densities and increase in cost of space.

3.4.2 Supply Side of Housing and Infrastructure Production (Housing Stock)

The 2000 Population and Housing Census records total stock of houses for the country as 2,181,975, two-thirds (65.9%) of which are in the rural areas. While the rural stock increased by 53.1% from 1984, the urban stock increased by 159.4% within the same period. The stock of houses represents an increase of 77.5% over the recorded stock in 1984, much more than the increase in population (53.8%) over the same period. The annual housing requirement is estimated at between 110,000 and 140,000 units but current production is only about 35,000 units per annum. The country has a total backlog of above 500,000 units.

A total of 3,877,418 dwelling units were also recorded. In terms of construction, mud brick or earth (50.0%) and cement or concrete (39.1%) are the two main materials for outer wall. Corrugated metal sheets (60.3%), thatch (18.6%) and slate (12.9%) are the main material used for roofing collectively, accounting for 91.8% of all materials used. In terms of quality and durability, it would appear that about one-fourth of dwelling units are not adequately roofed: this may pose difficulties and inconveniences during bad weather.

The 2000 Population and Housing Census records a total of 3,701,241 households of which over half (57.4%) claimed ownership of dwelling units they occupied, while 41.6% lived in rented premises, either free or for a fee. The results indicate that ownership of living units is mainly by private individuals. Only 2.0 percent of households reported that their dwellings units were public property; private employers owned an additional 4.5%. This means that dwelling units were either owned by occupants (58.5%) or private individuals (35.0%).

More than half (57.4%) of the national housing stock is owner-occupied; rental units represent 22.1% of the stock; rent-free is 19.5% and perching 1.0%. Quite a number of the houses in which people live in are rent-free. These are what the Akans call “ebusua fie” (family roots home) usually for the extended family long after the original owners have died. A large number of extended family members and even some ‘strangers’ live rent-free in these homes.”

The records further shows that about 38% of households have one room, with an additional 23.8% having 2 rooms; on the other hand, almost (49.9%) have one sleeping room and 21.5% have 2 sleeping rooms.

3.4.3 Demand Side of Consumption Patterns of the Sector

Housing, with respect to the demand side of the consumption patterns of the sector, is an indispensable basic need in every society. It invariably constitutes a major component of household wealth, especially for low-income households, for many households, it is the most important form of savings as home ownership is considered as a hedge against inflation in the medium term. It is also utilized as collateral for borrowing by homeowners to rake in funds for other investments and wealth creation. These may account for the increasing demand for housing. In the world today the demand for cheap and affordable housing is on the increase. According to the Ghana Investment Centre, the housing deficit is about 700,000 with an estimated cost of US$7 billion[1]. However, the ability of government to provide the population with affordable houses remains woefully at best inadequate.

According to the 2000 Population and Housing Census as reported by the Bank of Ghana in its June 2007 Policy Brief, there is an average household size of 5.1 persons with about 1.7 households per house, and total housing units of 2,181,975 nationwide. This number of housing units compared with number of households, indicated overcrowding conditions in most houses. On the average, about 8.7 persons live in each house in Ghana. Geographically the Ashanti Region recorded the highest percentage of housing stock in the country (15.1%) which corresponds to its high population. Although Greater Accra recorded a lower share of housing stock (13.2%) compared with Kumasi, its urban share of housing stock was about 80%. Against this backdrop and given the intercensal population growth rate of 2.7% per year, it is projected that Ghana's population could swell with an additional 5,773,522 persons between 2000 and 2010. Assuming an average household size of 5.1 persons and that a separate unit of housing is required for each 1.7 households, then, it is expected an additional 665,920 houses would be required to meet the population's demand for the same period. Therefore, the required increment in housing needs for each respective year would be as estimated in Table 21 below;

[1] Charles Benon Okine, Housing deficit increases, Daily Graphic Saturday January 16, 2010.

Table 21: Estimated Housing Stock and Deficit[2]

YEAR	ESTIMATED POPULATION	NUMBER OF HOUSEHOLDS	HOUSING REQUIREMENT	INCREMENTAL REQUIREMENT
2001	19,422,705	3,808,374	2,240,220	58,896
2002	19,947,118	3,911,200	2,300,706	60,486
2003	20,485,690	4,016,802	2,362,825	62,119
2004	21,038,804	4,125,256	2,426,621	63,796
2005	21,606,852	4,236,638	2,492,140	65,519
2006	22,190,237	4,351,027	2,559,428	67,288
2007	22,789,373	4,468,505	2,628,532	69,105
2008	23,404,686	4,589,154	2,699,502	70,970
2009	24,036,613	4,713,061	2,772,389	72,887
2010	24,685,601	4,840,314	2,847,244	74,855

Source: 2000 Population Census and Bank of Ghana

It should be noted that the housing demand is also fueled by a rapidly growing middle-class, increased urbanization and of late discovery of oil in the country, which is expected to attract a lot of ancillary jobs, which will require houses for staff and offices. On the whole, the demand side of consumption patterns of the sector with respect to housing revolves around three factors namely;

a) The distribution of households income

b) Availability and terms of housing finance

c) Government programmes providing direct subsidies to households.

In a nutshell, inability of the housing delivery system to meet effective demand over the years has created strains on the existing housing stock and infrastructure, especially in urban areas. The housing needs of urban inhabitants are often restricted to sub-standard structures and unsanitary environments in squatter and slum communities.

[2] Bank of Ghana, The Housing Industry in Ghana: Prospects and challenges, Policy Brief June 2007 www.bog.gov.gh.

3.4.4 Domestic Materials Consumption

Building materials constitutes between 60% - 70% of most construction costs. Domestic building materials consumption in Ghana has gone through a lot of changes over the years. Whiles efforts were made to ensure that locally available and climatically acceptable materials were consumed alongside locally developed technologies during the colonial and pre-independence period, current domestic consumption have transformed drastically in Ghana.

Materials consumption patterns used to be the development and use of locally available materials for housing in the various geographical zones in Ghana. Even though the use of wood cuts across all geographical zones of the country, thick mud walls painted with cow dung has been used in the northern Ghana for walls, with wooden-reinforced earth or thatch as roof. Timber and wood branches were used in the Western and Central regions while stones which were available in abundance had been used in the Akwapim and Kwahu areas for building construction. These were localized materials which were readily available and performed the basic functions of providing appropriate protection against the locals of each area. Clay brick both grey and burnt has been used over the years within areas where clay deposits were found to be available, whiles wood was used extensively for roofing, suspended floors, railings, balusters, doors, windows and furnishing.

These methods and pattern of material consumption has however not been developed or sustained. This would have ensured that locally available technologies and materials flourished and would have further ensured easy and affordable provision of housing.

Consumer preferences, tastes, public perceptions, compounded with the influx of foreign materials and inputs in housing construction have led to a complete shift in material consumption in Ghana. Especially in the area of finishes, fitting and components, various types of cement, glass, synthetic alloys, fibre glass, gypsum, paper, aluminium, plastic, steel, cultured marble, PVC, ceramics and porcelain are currently the most widely consumed materials in the shelter industry. Even though some of these materials may save the environment by replacing some of the naturally occurring raw materials, their production processes are mostly harmful to the environment than the exploitation of the naturally occurring materials.

Ghana's domestic materials consumption over the years has also been over reliant on the forest. Roofs, furnishings, doors, windows, scaffoldings and formworks, railings stairs and fences have all been widely

produced in timber. There is the need to identify and develop locally available alternatives to timber products, and also to aggressively rejuvenate most of the forest with most of the widely used timber species for sustainability.

3.5 Manufacturing Industry

Ghana's industrial sector is made up of four main subsectors namely: manufacturing, mining, electricity and water, and construction. The manufacturing sub-sector accounts for over 36% of the total industrial output and has a contribution of 9% to gross domestic product (Medium Term Development Plan - NDPC, 2009).

Ghana has a relatively broad and diverse industrial base, covering a wide range of sectors. In 2003, the year of the most recent industrial census, there were some 23,800 manufacturing companies in Ghana, with nearly 117,000 employees.

After mining, manufacturing is the main target sector for foreign investors in Ghana. Accumulated foreign investment in manufacturing amounted to US$2.3 billion between 2001 and 2006, generating some 16,400 jobs (GIPC, 2007). Nearly 90% of foreign investment projects in manufacturing are located in the Greater Accra area. Specific difficulties encountered by the manufacturing sector include power cuts, and access to and conditions of financing (AGI, 2007). The manufacturing sub-sector is broadly classified into textiles, food and beverages, paints and chemicals, pharmaceuticals, pulp and paper, wood and wood processing, metals, glass, cement, ceramics and tiles, thermal power plant and oil and gas refinery. Aluminum smelting, sawmills, agro-processing, cement and breweries are the major activities in the manufacturing sub-sector.

The manufacturing industry sector of Ghana has over the years implemented a number of sustainable consumption and production initiative. Among the initiatives implemented include current development of the Trade Policy, the implementation of pollution prevention measures that include the implementation of cleaner production measures in the manufacturing sector. The Environmental Protection Agency (EPA) is in the final stages of the establishing a cleaner production centre in Ghana.

The GPRS I & II and the long term development plan all outline strategies to ensure the growth of the sector in a sustainable manner. Both the energy and water policies are aimed at ensuring efficient use of

energy and water respectively in the various sectors including the manufacturing sector. This will require the implementation of various strategies to ensure the efficient use of energy and water in the manufacturing sector to ensure sustainability.

Over the years, the focus of the manufacturing sub-sector has been:

- Processing of raw material for export
- Use of raw material for local production
- Import of raw materials for manufactured exports

3.5.1 Activities Implemented under Sustainable Consumption and Production

In her quest to ensure environmentally sustainable industrial development, Ghana has implemented a number of cleaner production programmes. These include

CP Demonstration Project

Between September 2001-September 2002 a Cleaner Production Demonstration Project was sponsored by the Government of Norway and implemented by UNIDO and EPA-Ghana, with IVAM Environmental Research of Holland as the external consultants. The objectives of the project included:

- Demonstrating the applicability of CP in Ghanaian industry
- Building capacity in CP assessment at the enterprise and consultants level
- Reducing industrial waste-water discharged into Korle and Chemu II Lagoons of Accra and Tema respectively.

The fifteen (15) industries selected for the pilot project demonstrated both economic and environmental advantages of cleaner production through process efficiency, raw material utilization to enable industries manufacture products with minimal waste generation. Some local consultants were recruited and trained to facilitate the programme implementation. At the end of the project two hundred and ninety-seven (297) CP options were identified. This is made up of the following: input change- 2%, product change- 11%, management -22%, process optimisation -17%, equipment modification -4%, technology change-12%, waste reuse/recycling -13% and training/instruction -19%. the CP options per cost level identified were (a) zero or low cost -48%, (b) medium cost -29% and (c)

high cost- 23%. The payback (PB) periods of 48 options requiring investments (excluding zero and low cost options) are PB < 1 year 51%, 1 < PB < 3 year 40% and PB > 3 years 9%.

The preliminary results indicated the following:

- 200,000 USD total investment were committed as at September 2002
- 830,000 USD annual savings generated
- Considerable reduction in biological oxygen demand (BOD), chemical oxygen demand (COD), total suspended solids (TSS), etc
- A total of forty five (45) people comprising eight (8) local consultants, thirty (30) company staff and about seven (7) EPA staff were trained in CP assessment.
- Prior to the beginning of the pilot programme, the fifteen (15) companies together generated approximately 2.7 million m^3 of industrial wastewater per annum in 2000. Upon completion of the programme industrial wastewater generation among the fifteen (15) companies had reduced considerably to 0.8 million m^3 per annum
- Reduction of solid waste as well as efficient use of raw material and utilities within the fifteen (15) companies was also achieved.

The demonstration project was successful and found to be feasible. To sustain the project, it was recommended to establish a cleaner production centre with a network of stakeholders to propagate the CP concept in the country.

3.5.2 National Roundtable on Sustainable Consumption and Production and Institutionalization of National Cleaner Production Centre

In February 2005, the first National Roundtable on Sustainable Consumption and Production (NRSCP) under the theme "Institutionalization of Ghana Cleaner Production Centre (GCPC) for Promotion of SCP in West African Sub-region" was organized by the Environmental Protection Agency, Ghana in collaboration with the United Nations Environment Programme (UNEP) and in consultation with Africa Roundtable on Sustainable Consumption and Production (ARSCP). The Roundtable participants were drawn from industry, ministries, departments and agencies (MDAs), research institutions, financial institutions, media houses, multilateral institutions (UNIDO, UNEP), and other African NCPCs namely

Uganda Cleaner Production Centre and Cleaner Production Centre -Tanzania. A number of presentations were made including:

- SCP awareness creation and dissemination of African countries experience (Uganda, Tanzania, Ghana)
- Awareness creation on the concept of SCP as a programme for sustainable development
- Application of CP Strategies and Beneficial Outcomes: Regional and National Experience on Application of Cleaner Production

The Roundtable learned lessons from the experiences of established African NCPCs, namely Uganda and Tanzania regarding the need of demand-driven programme delivery to industry for sustainability of the Centre and the nature of cooperation between principal stakeholders and NCPCs to ensure sustainable financing and operation of National Cleaner Production Centre was also made clear to industry participants.

The Roundtable also achieved a major milestone by reaching consensus on the nature of institutional arrangement of the Ghana Cleaner Production Centre. The EPA was selected as the host institution. Some institutions representing governmental agencies and departments, non-governmental organizations, civil society groups, research institutions, and universities were proposed to serve on the Advisory Board of GCPC. Some institutions were also proposed to serve on the Executive Board of the Centre.

The Roundtable welcomed the establishment of National Cleaner Production Centre for Ghana as a legally constituted autonomous institution. They noted that the GCPC would play a significant role in promoting SCP in Ghana and the sub-region.

In addition, potential national and sub-regional SCP projects were identified for development and implementation towards ensuring energy, water and food security, and waste minimization for breaking poverty cycles towards sustainable national development. The potential projects for SCP discussed include:

- Biogas generation technology transfer
- Bio-diesel and organic fertilizer production as a potential regional SCP project for energy, food security and poverty alleviation

- Technology transfer for conversion of plastic waste recycling products to biodegradable plastic packaging to minimize the environmental hazards and health-related impacts associated with plastic waste in Africa.

3.5.3 Akoben Environmental Performance Rating and Public Disclosure (EPRD)

A pilot Environmental Performance Rating and Public Disclosure (one of the programmes to facilitate the uptake of CP in Ghana) with the support of the World Bank has been undertaken to increase compliance with environmental regulations and to create incentives for companies to take voluntary incentives for pollution prevention. Eighteen (18) mining industries and thirty-two (32) manufacturing industries participated in the Pilot Phase I of the EPRD in 2005 for the award of EPA's Annual Continual Environmental Improvement Award. Based on lessons learnt from Pilot Phase I, the Akoben EPRD (which is an improvement of Pilot Phase I) was initiated in 2009 and covered fifty (50) companies throughout the country. The Akoben EPRD has been institutionalized into the day to day programmes of the Agency. To this end the existing environmental laws and regulations are being critically examined in terms of their adequacy to support the Akoben EPRD concept.

3.5.4 Capacity Building

Two hundred and fifty (250) participants have been introduced to CP in five zonal workshops organized by the EPA (EPA, Annual Report, 2006), particularly the benefits of integrating CP in enterprise management and mandatory Environmental Management Plans (EMPs). Sixty (60) SMEs have participated in National CP Workshops and National Roundtable on Sustainable Consumption and Production (NRSCP) and have endorsed the establishment of Ghana's NCPC and pledged their patronage of the Center when established. Of this number, twenty-six (26) have participated in CP demonstration projects.

3.6 Tourism Sector

Tourism currently plays a relatively moderate but growing role in the economy of Ghana. It is currently considered to be the fourth largest source of foreign exchange earnings (estimated at US$1.4 million in 2008), and contributes approximately 7% to the country's GDP. In terms of its contribution to formal

employment, the tourism industry employs an estimated 150,000 – 300,000 people directly and indirectly.

Tourist arrivals in Ghana have steadily increased over the past 15 years from approximately 145,000 in 1990 to 700,000 in 2008. Ghana receives visitors from various parts of the world. The principal source markets in order of importance are Ghanaians abroad, the West African sub-region (Nigeria, Togo, Cote d'Ivoire), Northern Europe (UK, Germany, France, The Netherlands), and North America (mainly US). The majority of visitors tend to be business travellers and those visiting friends and relatives (VFRs). Ghana is also attracting visitors through promoting itself as homeland for the African Diaspora.

All tourism indicators show a consistent trend of growth; in terms of contribution to GDP, in contribution to foreign exchange earnings, in the number of visitors, in total tourism receipts, number of hotels, number of rooms, number of beds, hotel occupancy rates, number of restaurants, car hire companies, and tour and travel operators. Tourism is currently the fastest growing sector of the Ghanaian economy (The real tourism GDP which grew by 10.3% in 2004 is currently provisionally estimated at 12.28% in 2005).

In spite of the substantial growth of the tourism industry recorded over the past 15 years, the true wealth-creating and poverty reducing potential of the sector is not really fully grasped by policy-makers. Unless tourism is seen as strategically important to the development of Ghana and the necessary plans, policies, actions and resources to support this sector are put in place, tourism will remain a missed opportunity. Research has confirmed the fact that timber is very difficult to renew and gold is a non-renewable resource. Besides, only about 20% of the export earnings from gold come back to Ghana. Additionally, cocoa production is subject to major price fluctuations and requires large tracts of forest land and its demand may fall rapidly when the artificial substitute begins to compete with cocoa fully. Remittances from Ghanaians abroad will most likely decline as future generations become more removed from their motherland. Given the above expectations, sustainable tourism which incorporates SCP may be the answer, as it is showing a continuous growth both worldwide and in Ghana.

3.7 Transport

3.7.1 Road Transport

Road transport is by far the dominant carrier of freight and passengers in Ghana's transport system. It carries over 95% of all passenger and freight traffic and reaches most communities, including the rural poor.

Ghana's road network is about 62,954 kilometers as at the end of 2007. Improvements in improving road conditions have been gradual. As at 2007, the road condition nationwide is 43.4 percent good, 26.9 percent fair, and 29.6 percent poor as compared to the desired condition of 70 percent good, 20 percent fair, and not more than 10 percent poor. The road condition mix for the trunk road network constitutes 57% good 17% fair and 26% poor. In 1997 it was projected that by 2002 the roads could be improved to 70% good, 20% fair and less than 10% poor. However this target was not achieved as at 2006 due to inadequate funding, unplanned expansion and local construction capacity and skills.

The feeder road network has a road condition mix of 34% good, 51% fair and 28% poor. Urban areas need special attention. Roads are heavily congested yet there is the need to create greater carrying capacity. For example cars and taxis take up 55% road space and carry 26% passengers. Trotros and buses take up 32% of road space and carry 68% of passengers.

The situation can be reversed if SCP is mainstreamed by placing emphasis on public mass transport. A pilot is being implemented in Accra under the Urban Transport Project with support from the Global Environment Facility (GEF) The World Bank and the French Government.

3.7.2 Maritime and Inland Water Transport

Ghana's Maritime and Inland Water Transport sector is made of the following providers: Ghana Ports and Harbors Authority in charge of the two sea ports at Takoradi and Tema. The development and maintenance of ports infrastructure is the responsibility of Ghana Ports and Harbours Authority as well as regulation and licensing of operators associated with ports in Ghana. The Volta Lake Transport Company Ltd is responsible for water transport on the Volta River, while the Ghana Maritime Authority is responsible for regulating the operations and safety in marine and inland water ways, the Ghana Shippers Council is responsible for the welfare of shippers. Maritime transport constitutes about 80% of the country's total international trade.

3.7.3 Rail Transport

Ghana's railway network is 947 kilometers of mostly single track rail of 1.067m (3′ 6″) gauge located in the southern part of the country. In 1965, it carried 2.3 million tons of freight and 8 million passengers. The performance of the Company has continued to decline and by the year 2007 with only the western line partially operational for freight, is traffic fell to 121,437 tons. Currently with only the suburban trains located in Accra operating, passenger traffic has also declined to 26,000 as at 2007. With lower revenues and increasing labor costs, the rail operation could not support modernization and sustain its maintenance programme. The worsening financial situation of the railway resulted in the usual vicious cycle faced by many railroads: default on loan payments with resulting effects being poor maintenance, drop of service quality, loss of customers and more drops in revenues.

There are efforts to revive rail transport to take the pressure off the roads in the transport of goods and bully commodities and reduce pollution from transport.

3.7.4 Aviation

Ghana's aviation sector is managed by the Ghana Civil Aviation Authority whose functions comprise: policy formulation, technical (safety) and economic regulation and air space management and the Ghana Airport Company Ltd which is responsible for the infrastructural development, operations, maintenance and management of airports and aerodromes.

There is only one international airport located in Accra with regional airports in Kumasi, Takoradi, and Sunyani and Tamale with paved runways. Apart from Wa, which is a paved airfield, there are other airstrips with short unpaved runways at Yendi, Paga, Obuasi, Ho, Tarkwa, Kete-krachi, Bimbilla, Saboba, Mole Game Reserve and Salaga which provide for medical and other emergency services.

Kotoka Airport handles about 800,000 passengers and 50,000 tons of freight annually. Passenger traffic has generally increased in recent years, growing at an average of 7 percent annually over the past five years.

The recent growth in passenger and airline traffic is a reflection of Ghana's economic growth in recent years. Compared to other West African countries, Nigeria shows greater increases in traffic growth considering passengers between the United Kingdom and the three West African countries as shown in Figure 4.

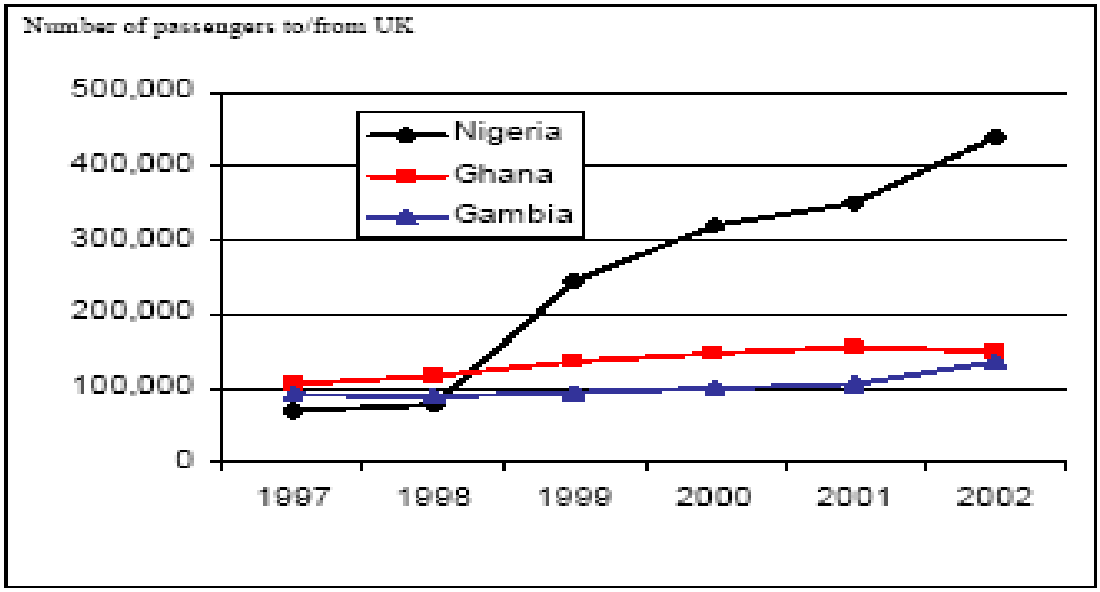


Figure 4: Passenger Traffic from UK to West Africa

3.7.5 Unsustainable Consumption and Production Patterns and Issues in the Transport Sector in Ghana

In Ghana issues of concern for developing a sustainable transport system must take into account the following:

- Transport related atmospheric emissions/pollution
- Noise nuisance
- Transport energy demand
- Transport safety and security
- Integrated transport system
- Land use planning and transport integration
- Poor transport infrastructure and services

Transport related Atmospheric Emissions/Pollution

The transport sector is a dominant source of local and global air pollutants (PM, SOx, NOx, CO, CO_2, VOCs, O_3) that are responsible for adverse health impacts and contribution to global climate change. In Ghana total emission levels increased linearly from 32,222.78t in 2000 to 52,666.17t in 2005. The rise is estimated to be about 16.67% per annum depending especially on the commensurate increase in fleet numbers and fuel consumption. There is a direct link between vehicular emissions, fuel consumption and fleet population as demonstrated in figure 5. below. It is projected that fleet population will rise at 6.9% and even more in the coming years, and road transport activities intensified, total vehicular emission is likely to build-up from the current 52,666.17t to 71,652.78t in five years, 111,652,.58t in ten years, and 151,65.38t in 20 years respectively .

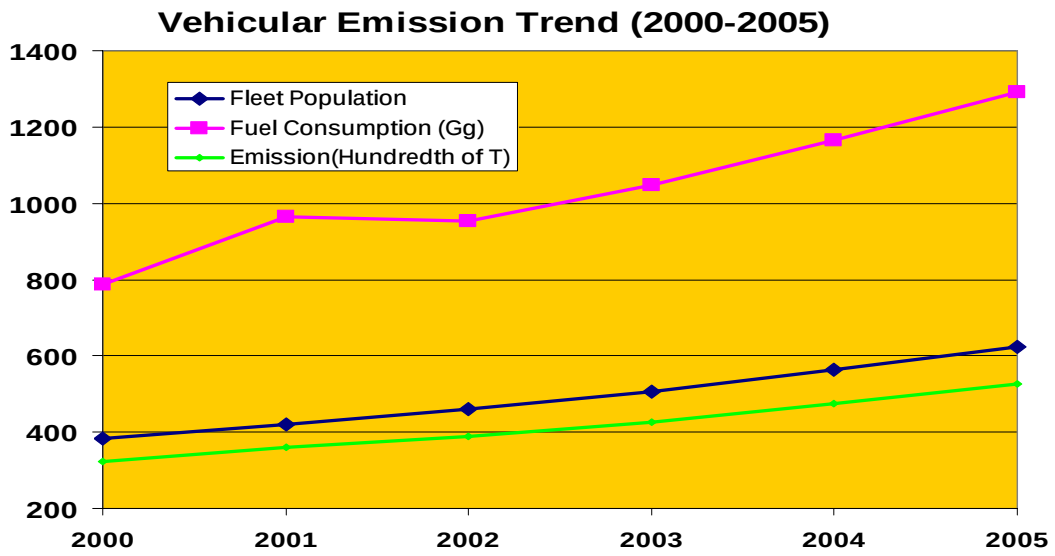


Figure 5: Total Vehicular Emission Trends (2000-2005)

Vehicular emission from urban roads accounted for an average of 71 percent between 2000 and 2005. Urban source emissions increased marginally by 6.6% between the study periods. The remaining 29 percent was distributed 20.28 percent and 8.72 percent accordingly among rural and highway road classes.

The average distribution of total emission is influenced largely by the high fleet population density especially in the urban areas where traffic movement is relatively around slow and fuel consumption high. The dominance of low capacity buses, mainly second-hand imported van conversions and minibuses and use of old commercial vehicles for passenger transport results in adverse environmental impact due to frequent break downs and poor engine maintenance.

Passenger vehicles account for about average 69.7 percent (430495) of total fleet stock in the country between 2000 and 2005. Forty-eight percent of these were manufactured before 1993 (Conventional), thirty-seven percent manufactured after 1992 and before 1996 (Euro 1), totaling 85 percent. Eight percent were produced after 1996 but before year 2000 and six percent manufactured after 2000 and 2005. Table 22 below shows the distribution of emissions and passenger fleet numbers for the various years.

Table 22: Passenger Vehicle Emission by Year of Production

Emissions From Passenger Vehicles							
% of total Emissions	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**% Emission**
	70.10	70.61	70.04	70.02	70.04	70.04	
Conventional	17875.21	19624.90	21544.51	23621.03	26293.19	29189.62	78.78
Euro I	3753.40	4122.96	4526.16	4957.42	5516.68	6134.05	16.54
Euro II	681.65	1433.76	821.54	900.09	1001.88	1113.31	3.45
Euro III	277.12	304.28	334.02	365.89	407.27	452.66	1.22

Source: SEA of National Transport Policy Report (2006)

Emissions from passenger vehicles account for 70 percent of total emissions in the country. (SEA of Transport 2006). Passenger vehicles are therefore a major emission category source among the sub-classes. The remaining 30 percent are from light duty, heavy duty and others etc. In terms of emissions, mopeds and motorcycles contributed 0.001 and 2.5 percent of the total vehicular emissions.

It was estimated in 2006 that total greenhouse gases from the road transport increased by 24.5 percent from 2547.11Gg in 2000 to 4201.73Gg in 2005. CO_2 constituted average of 96.2 percent of the total greenhouse gases between 2000 and 2005. The remaining 3.36 and 0.42 percents were accounted for by CO_2 equivalent of the non-CO_2 , namely, CH_4 and N_2O respectively. The amount of CO_2 is largely dependent on initial carbon content of the fuel stock and fuel consumption level. This factor greatly influenced the level of greenhouse emission since CO_2 concentrations forms a major part of the whole GHGs. Therefore the dip in the chart in 2000 in fuel consumption in the country had a consequential impact on the amount CO_2. This anomaly reflected in the total greenhouse gas level in 2002. Figure 6 below shows the trend of GHGs between 2000 and 2005. The transport sector is responsible for over 60% of non-biomass carbon dioxide and over 50% of nitrogen oxide emissions.

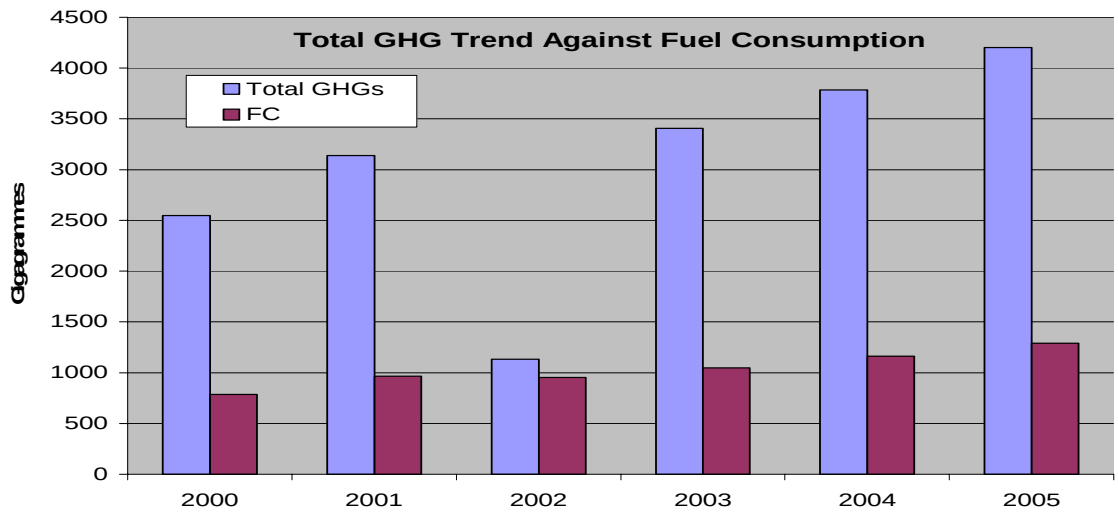


Figure 6: GHGs and Fuel Consumption

Increasing Transport Energy Demand

Ghana has been experiencing increasing fuel consumption levels since 2000. There was a steady increase from 787.02Gg in 2000 to 1292.15Gg in 2005. (see table 3 below).

Table 23: Fuel Consumption Trend

Year	Fuel Consumption (Gg)
2000	787.02
2001	964.52
2002	953.43
2003	1047.74
2004	1164.21
2005	1292.15

Source: SEA of National Transport Policy Report (2006)

The transport sector alone accounts for 99.7% of gasoline consumption in the economy and almost all of that fuel is consumed by road transport. Fuel consumption in urban areas was relatively high (55%) as compared to rural (22%) and highways (23%) respectively. The implication of these increases for the national economy as well as the country's environment is enormous.

The country's fuel import bill is increasing and attempts to get sustainable supply of fuel are becoming difficult in view of foreign exchange challenges. It is important that transport energy demand is controlled for economic as well as environmental reasons. In addition to the increasing fuel consumption the quality of transport fuels must also be improved in order to improve air quality. Improvements in fuel quality can contribute to better air quality if they are closely coordinated with improvements in vehicle technology. After the phase out of leaded gasoline in Ghana, the next step is to shift from the use of methyl cyclopentendiayl manganese tricarbonyl (MMT) to non metallic additives in the production of gasoline.

At the same time, it is important to address other fuel parameters that may have adverse health impacts. There is the need for the Tema Oil Refinery and oil marketing companies (OMCs) in collaboration with Ministry of Energy, Ministry of Transportation, Environmental Protection Agency and other stakeholders to put in measures to reduce the sulphur content of diesel from the current levels of between 5000 – 10000 ppm to below 500 ppm for locally produced and imported diesel. The reduction of sulphur content in diesel and the use of non metallic additives in gasoline should receive highest priority in the development of medium- and long term strategies for fuel standards.

There is the urgent need to consider the use of alternative transport fuels such as compressed natural gas (CNG), liquefied natural gas (LNG) and liquefied petroleum gas (LPG). For the long term, the use of other fuel alternatives such as bio-diesel, methanol, ethanol, vegetable oils; synthetic liquid fuels derived from coal and various fuel blends, such as gasohol; electricity; and hydrogen should be considered. SCP principles can help address problems facing the transport sector.

3.8 Waste management

The problem of waste in Ghana is a direct result of a rapidly growing urban population, the changing patterns of population and consumption, the inherently more urbanized life-style and the consequent industrialization. Increasing amounts of waste emanating from residential, commercial and industrial areas and the changing nature of waste over time have become a cause for concern for most District Assemblies (DAs).

The major causes of these problems include the following:

- Poor planning for waste management programmes;
- Inadequate equipment and operational funds to support waste management activities;
- Inadequate sites and facilities for waste management operations;
- Inadequate skills and capacity of waste management staff;
- Negative habits, uncoordinated attitudes and apathy of the general public towards the environment.

In an effort to address these problems, Government has over the years put in place adequate national policies and regulatory frameworks. These policies and regulatory frameworks include:

- National Environment Policy, 1991.
- Local Government Act, 1990 (Act 462)
- Environmental Protection Agency Act, 1994 (Act 490)
- Water Resources Commission Act, 1996 (Act 522).
- National Building Regulations, 1996 (LI 1630)
- Environmental Sanitation Policy, 1999
- Environmental Assessment Regulations, 1999 (Li1652)

3.9 Water and Sanitation

3.9.1 The Urban sub sector

In 1948, the ratio of the urban population to the total population for Ghana stood at 13%. This increased in 1984 to 32%, and in 2000 it further increased to 44%. The number of urban localities rose from 39 in 1948 to 188 in 1984 and 364 in 2000; about 34% of the urban population live in the 5 largest cities, namely Accra, Kumasi, Sekondi -Takoradi Tamale and Tema. While it took 36 years for urban y localities to increase by149 in 1984, it took only 16 years for the figure to double in 2000 this implies that, Ghana would have more of its population living in the urban areas much earlier than the estimated 2025.[3] Water and sanitation services are already overstretched, and could worsen without adequate steps to meet the ever growing demand. The urban population using an improved water supply declined from 86% in 1990 to 79% in 2006 as investment was not sufficient to cater for population growth. Service failures occur frequently. It was established from a strategic investment study undertaken in 1998 that for GWCL to be able to meet the demand in urban water supply by 2020, the company required an investment of about USD1.6 billion. A sector programme document prepared by GWCL in 2006 indicated that the company still required USD 1.49 billion to meet urban water demand by 2020 (Source: GWCL at a Glance, 2008). The total population covered by GWCL is estimated at about 10 million people, with a total daily demand of about 1,101,032 m3/day for the year 2008. (Source: GWCL presentation to CONIWAS at AVRL conference room, 2009.)

[3] B. Abeiku Arthur, Presentation at Urban Platform at the Institute of Local Government Studies, Accra, 2009

Table 24: POPULATION & WATER DEMAND PROJECTIONS

	Projected Population		Projected Water Demand (m^3/Day)	
Year	2015	2025	2015	2025
Greater Accra	4,929,335	6,941,016	650,849	937,561
Ashanti	1,767,045	1,977,830	190,461	280,625
Brong Ahafo	670,678	901,471	58,867	87,669
Central	1,306,158	1,643,406	89,474	125,869
Eastern	831,064	1,070,214	73,569	108,444
Northern	673,219	921,905	58,689	88,735
Upper East	189,636	262,376	21,210	31,789
Upper West	111,652	157,496	12,840	19,687
Volta	697,380	901,458	54,517	78,444
Western	658,925	810,953	48,378	63,984
Total	12,045,878	16,234,446	1,258,854	1,822,806

Source: GWCL, 2009

The national sanitation situation is even grimmer, with a coverage rate of about 40%. Most of the poor areas in cities / towns do not have access to any municipal waste management. Diarrhea accounts for 25% of all deaths in children under 5 according to UNICEF. Within the context of the WASH services delivery to poor urban populations, the key problems which justify the project's proposed interventions are as follows:

The last five years have seen a growing priority given to pro-poor water supply and sanitation services delivery in a number of recent pilot projects. However, these projects have suffered from a number of constraints which have prevented widespread uptake of their results.

The Ministry of Finance and Economic Planning (MoFEP) provides the finance to support the delivery of WASH infrastructure as well as the operational and capital expenditure budgets of the sector institutions. Most development assistance from donors is channeled through the ministry. As the figures

illustrate, the sector relies substantially on donor funds, given the relative sizes of Government and donor contributions. Based on the specifics of loan or grant agreements, funding from development partners (DP) may be transferred directly to the District Assembly for procurement of goods and services while other transfers may be done through MWRWH or CWSA for small town water project.

MoFEP often 'writes off' the debts of the company by converting these into equity. It is also significant to note that in recent years the Ministry provides a budget line for subsidies paid to the utility companies, including GWCL. The availability of information on subsidies to GWCL provides a good indication of actual costs of service delivered by GWCL, as returns sent to PURC in support of tariff applications.

The country has as yet not adopted a sector-wide approach to WSS financing, even though attempts have been made to realize this. The sector remains essentially project-driven. In recent years many donors provide budgetary support through the Multi-Donor Budgetary Support arrangement (MDBS), allowing Government to decide the allocation of funds between sectors. This is in addition to projects that they fund at the sector level. At the level of the WASH sector, the proliferation of individual projects, rather than funding from a common basket, still persists.

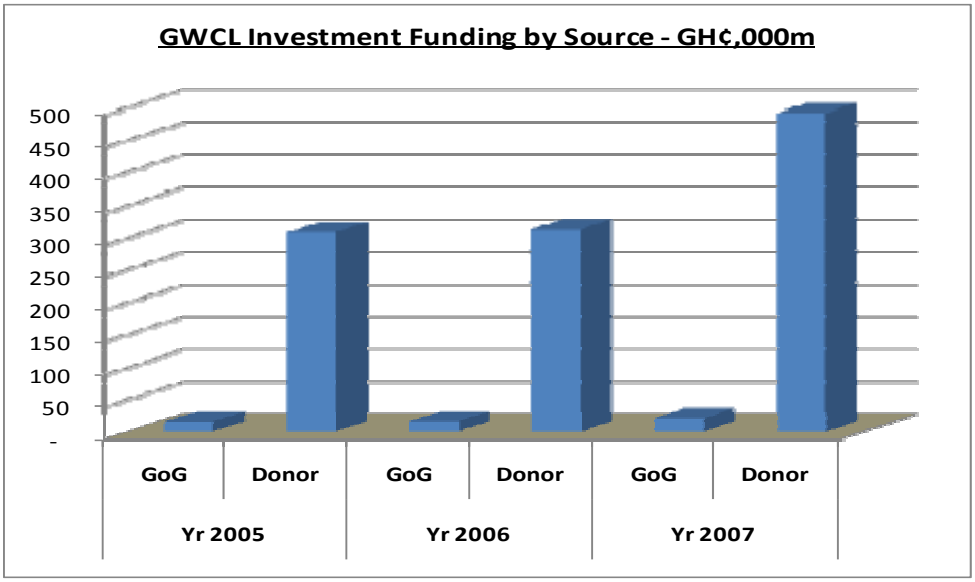


Figure 6: GWCL Investment Funding by source

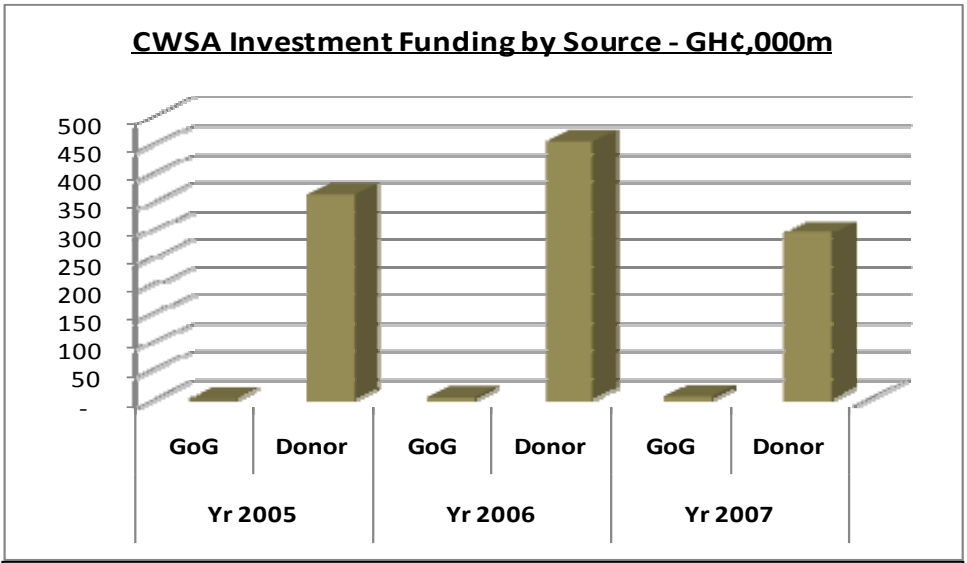
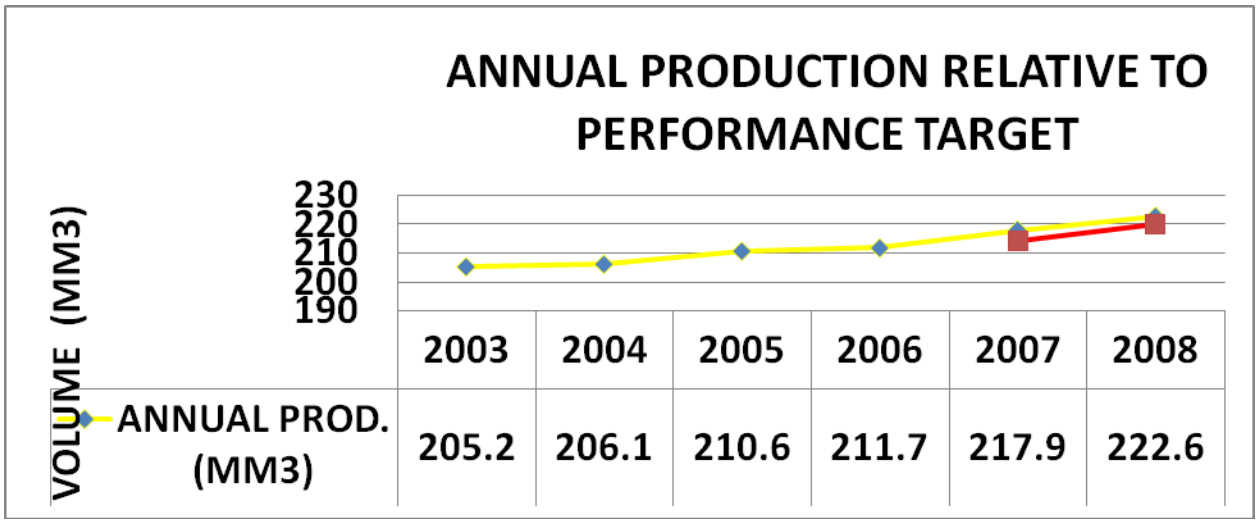


Figure 7: CWSA Investment Funding by source

3.9.2 Status of Urban Water Supply

Rising population and poverty in urban areas exceed the capabilities of GWCL to provide water and sanitation services due to inadequate infrastructure, under investment and managerial inefficiencies. GWCL has responsibility for the production, distribution and conservation of water for public, domestic, commercial and industrial use in urban areas of Ghana. GWCL's supply area constitutes about 50% of the population in the country. In 2009, urban coverage stood at 59%. GWCL operates 81 pipe-borne systems with a total installed capacity of about 949,000m3/day. Production is about 646,494m3/day while demand is 1,101,032 m3/day for the year 2008. Current capacity utilization is 75%. Average monthly sales is 900,000 m3/day which translates into a monthly billing of GH¢ 8.42million. Out of this an average monthly collection of GH¢ 7.64million is made. Customer strength is currently 400,410 of which 72% are billed and 28% are unbilled. To balance the shortfall in supply, the company embarks on rationing programmes which is negatively affecting socio-economic growth of cities and towns.

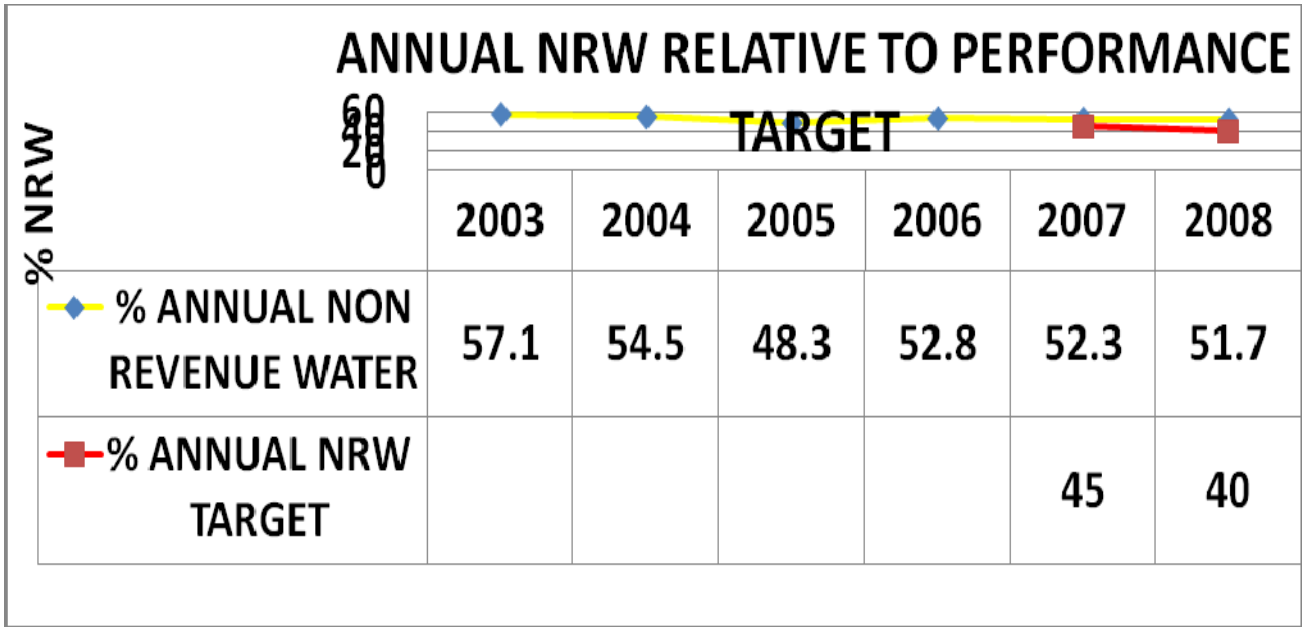
Table 25: Water production, 2003 - 2008



Source: GWCL, 2009

% Non Revenue Water 2003 -2008

Table 26



Source: GWCL, 2009.

Table 27: Regional Coverage in Urban Water Supply (2008)

REGION	POPULATION	DEMAND (m^3/day)	SUPPLY (m^3/day)	COVERAGE %
ASHANTI	2,000,728	187,118	91,500	49
BRONG-AHAFO	602,840	48,125	14,385	30
CENTRAL	1,129,733	90,225	38,415	43
EASTERN	1,015,155	77,995	21,470	28
GT.- ACCRA	3,837,236	532,570	401,800	75
NORTHERN	560,820	44,449	20,375	46
UPPER-EAST	172,168	13,239	5,665	43
UPPER-WEST	106,735	8,539	1,180	14
VOLTA	575,287	43,974	17,115	39
WESTERN	694399	54,799	34,535	63
NATIONAL	10,689,366	1,101,032	646,494	59

Source: GWCL, 2009.

Less than 30% of people with piped water supply have water supply every day. About 60% of population (GWCL estimate 2003) have no direct access to piped water, but rely on tertiary vendors. 71.1% of medium wealth and 94.8% of high wealth households have indoor pipe connection. Only 28.8% of poor households have indoor pipe connections (Boadi2004). The poor pay much more for water than the rich (sometimes 10 to 12 times as much) because they get most of their supply from water vendors. The current tariff structure, in which unit cost of water increases with quantity consumed, means that poor people who live in compound housing and use shared connection pay more for unit of water consumed. The gap between supply and demand SCP can help reduce the gap between supply and demand.

Table 28: SUPPLY/DEMAND GAP FOR 2008

Regions	Actual Production (m^3/Day)	Demand (m^3/Day)	Gap (m^3/Day)
Greater Accra	368,239	476,593	108,354
Ashanti	97,356	139,434	42,078
Brong Ahafo	14,699	40,766	26,067
Central	42,987	66,355	23,368
Eastern	14,604	52,381	37,777
Northern	16,967	41,096	24,129
Upper East	6,958	15,228	8,270
Upper West	1,320	9,073	7,753
Volta	18,905	37,472	18,567
Western	24,169	38,039	13,870
Total	**606,204**	**916,437**	**310,233**

Source: GWCL, 2009

The following linkages were identified to exist between the Water and Sanitation sub-group

Agriculture

Agriculture tends to pollute the ecosystem including the water resources downstream of the activity. Pesticides, herbicides and other toxic substances leached from the agricultural activity mainly because of improper use by the vastly illiterate administers of these substances end up in the river/stream systems. Agriculture also uses substantial quantities of water and when this is extracted from rivers/stream, create problems of equity in the distribution of the resource. Improper drainage of agricultural land create logging conditions that promote the proliferation of water-borne diseases. The practise of harvesting rainwater and flood water could go a long way in addressing some of the negative attributes of mechanise agriculture and put to use water that could rather have gone waste.

a. Waste Management

Waste management is a global problem in the Ghanaian context. Communities tend to site waste disposal sites too close to water bodies and solid waste as well as polluting leachates end up in the water bodies, silting and contaminating the resource. In the urban areas, landfill facilities not only spew toxic leachates into nearby communities and water bodies, but also cause extensive and pervasive stench around surrounding communities.

b. Human Settlement (drainage planning, rainwater harvesting)

The development of settlements have been fraught with poor planning. Drainage, open spaces etc are neglected to the detriment of water bodies. These water bodies face the onslaught of reclamation with the result of dwindling streams and ponds. Water channels are block thus preventing the smooth flow of water. The lack of a rainwater harvesting policy also means that all the hard surfaces resulting from the development of settlements concentrate rainwater that would have infiltrated the soil and this water ends up flooding the same or other settlements.

c. Transport

The transport sector introduces some challenges to the sustainable development of the water and sanitation sector. Hydrocarbon spills from ill-conditioned vehicles, garages and washing bays are sources of pollution to river resources including flora and fauna. A large number of garages and washing bays are located close to or directly in water courses and are a constant source of pollution into them.

d. Energy

The high dependence on fuel wood is having a heavy toll on forest cover and especially on water catchment areas with the result that flows in these rivers are constantly degrading. Runoffs are steadily increasing with the result that moisture infiltration into deeper soil layers is reducing. Additionally the bare earth resulting from deforestation is leading to increased solar absorption / reflection that promote adverse climate change impacts. Water detention on land is reduce due to eroded soils, reduced organic matter in topsoil and increased solar radiation incidence.

e. Tourism

Nature and recreational tourism has a negative impact on the fragile ecosystem leading to disruption and degradation of river catchments and the ecosystem. Additionally recreational activities in rivers result in pollution due to excessive pressure from tourists.

f. Manufacturing

Effluents of manufacturing industries are the main polluting agents of river ecosystems. Heavy use of water by manufacturing industries is additionally a source of concern as far as equitable water distribution goes. Industries could take advantage of their large roof surface areas to harvest and use rainwater for substantial portions of their water demand.

g. Chemicals

Chemical spills, improper disposal of wastes and incorrect use of substances are main areas that affect sustainable water exploitation.

h. Research and Education

Research could provide solutions for resource conservation, efficient use of water, better and cheaper methods of waster disposal, cleaning etc that could help with sustainable water use. Proper education of the populace on the right way of resource conservation, waster management and general ecosystem management could bring about proper attitude for sustainable resource use.

i. Economic Instruments

Economic instruments mainly focus on deterrents however the institution of incentive packages that spur people on to do the right thing could help achieve the aim of sustainable exploitation of resources for increased development. This could be applied across all the sub-groups which could lead to more water and sanitation services.

j. Mining

Mining tends to pollute rivers and the ecosystem. River flow is disrupted and vegetative cover, the main protection of water resources is removed en masse creating heavy disruptions of the entire ecosystem. Reclamation activities only barely recover the natural state of the ecosystem.

k. Consumer Behaviour (changing negative attitudes and behaviour)

Human attitudes and behaviour is the major culprit on sustainable development. Excessive consumption generates large quantities of waste that is difficult to manage and which affects the environment. Negative attitudes create problems regarding the sustainable use of resources. Pollution, waste disposal, abiding by the law, care of the environment etc are all issues that consumer behaviour can help address.

Table 29: ON GOING / COMPLETED PROJECTS: 2009

Project Title	Installed Capacity (m^3/day)	Additional Production Capacity (m^3/day)	Targeted 2020 Population	Project Cost (€)	Yrs	Source of Funding	Start Date	Comp Date
CAPE COAST	27,300	30,000	510,360	36,970,000	2	NETHERLANDS	Nov-05	Jan -08
BAIFIKROM	2,270	11,400	120,771	25,763,000	2½	NETHERLANDS	Apr-06	Oct-08
TAMALE	19,550	25,000	757,233	45,000,000	2	NETHERLANDS	Aug-06	Aug-08
EAST WEST	204,545	66,000	877,654	25,000,000	18mth	GHANA	Mar-07	Oct -08
KOFORIDUA	5,450	19,200	206,618	35,500,000	2½	BELGIUM	Aug-06	Feb-09
BAREKESE	95,000	27,200	1,455,577	37,426,000	2½	NETHERLANDS	Jan-07	Oct-09
SUNYANI	6,800	44,000	266,567	65,384,615	2	U.S.A	Dec-09	Jan-11
WA	2,800	15,000	124,441	35,000,000	2½	AUSTRIA / ITALY	Dec-09	Jul-12
KPONG	220,450	186,000	683,339	152,307,692	4	CHINA	Dec-09	Jan-14
KWANYAKU	14,000	21,000	724,830	24,136,000	2½	NETHERLANDS	Jan-05	Jul-07
Urban Water Project				57,000,000	5	W/B, Nordic fund, GoG	2004	2009
TOTAL	598,165	471,800	5,727,390	539,500,000				

Source: GWCL, 200

3.10 Mining

Overview of the Minerals Sector in Ghana

After four decades of stagnating fortunes due to economic, financial, institutional and legal problems that impeded investment in the sector, mining in Ghana began a steady and impressive growth with the launch of the Economic Recovery Programme (ERP) in 1983. Currently, mining contributes significantly to the country's export earnings (US$2.32 billion in 2008), government revenues and employment opportunities. In terms of total merchandise exports, the proportion accounted for by minerals rose from under 20% in the mid 1980s through 35.21% in 1991 to 45% in 2008 (Min.Com, 2009).

The formal mining sector employed 15,000 workers whilst it is estimated that about 500,000 people were engaged in small-scale and artisanal operations in gold, diamond, sand winning, quarrying etc in 2004 (Min Com, 2004). The minerals industry is a significant private sector supplier of social infrastructure including schools, clinics and other essential facilities in the host communities.

Ghana is ranked eleventh in global output of gold (2,796,955 oz in 2008) and second to only South Africa in production on the continent (Minerals Commission, 2009). Ghana also produces manganese, diamonds and bauxite, although their contribution to the national economy and government revenue is much smaller. Total production of manganese, bauxite and diamonds was worth US$30.2 million, US$10.6 million, and US$26.0 million respectively in 2004 (Chamber of Mines, 2004). Limestone, sand and gravel as well as salt are all produced but in smaller quantities. Others produced are industrial minerals (silica sand, brown clay, quartzite, aggregate and dimension stone, kaolin, limestone, mica, etc.) as well as clam shells and lime (oyster shell).

Small-scale mining of precious minerals currently contributes significantly to Ghana's foreign exchange earnings. By 2007 total gold production of the country by small-scale miners had risen from 2.2% in 1989 to 12.1%. For diamonds, small-scale mining was responsible for 894,225 cts out of a total of 967,864 cts (92.4%) in 2006 (Minerals Commission)

3.10.1 Legislative Framework and Policy

The country's policy objective in the minerals sector is premised upon the need to establish a legal and macroeconomic environment that would attract investments in new exploration and encourage further investments and expansion of existing mines. To this end a number of legal instruments, institutions and

regulations have been carved out to guide the administration and management of the minerals and mining sector in Ghana. These are:

- Minerals and Mining Act (Act 703), 2006,
- Draft National Mining Policy of Ghana, 2007,
- Draft Minerals and Mining Regulations,
- Minerals Commission Act (Act 450), 1993,
- Ghana Environmental Action Plan I(GEAP I), 1991
- Ghana Environmental Action Plan (GEAP II), 1994
- Environmental Protection Agency Act (Act 490), 1994,
- Environmental Assessment Regulation LI 1652, 1999
- Ghana Poverty Reduction Strategy II Vol. I (GPRS II), 2005
- Guidelines for Mining in Production Forest Reserves, 2004
- Water Resources Commission Act (Act 522), 1996

The Fundamental principles of the minerals sector policy are:

- Ensuring that Ghana's mineral endowment is managed on a sustainable economic, social and environmental basis
- Ensuring an equitable sharing of the financial and developmental benefits of mining between investors and all Ghanaian stakeholders
- Achieving a socially acceptable balance between mining and the physical and the human environment and ensuring that internationally accepted standards of health, mining safety and environmental protection are observed by all participants in the sector
- Promoting additional and alternative livelihoods in rural areas and supporting the development of Ghanaian mining skills, entrepreneurship and capital by encouraging and facilitating the orderly and sustainable development of small-scale mining in precious and industrial minerals

On its turn, the principles of the National Environmental Policy as contained in GEAP I are:

- Optimum sustainable yield in the use of resources and ecosystems
- Use of most cost-effective means to achieve environmental objectives
- Use of incentives in addition to regulatory measures
- Delegation of decision-making and action to the most appropriate level of government
- Polluter pays for the cost of preventing and eliminating pollution and nuisances caused
- Public participation in environmental decision-making
- International co-operation

3.10.2 The Supply Side of the Production Process

The constituents of production in the mining sector of Ghana are: land, labour, consumables and other resources such as water and power.

3.10.3 Land Area

As at September 2009 the area of land for mining activities totaled 70,898.85km^2. Table 1 gives the breakdown.

Table 30: Land Area for Mining Activities

Type	Land Area (km^2)
Reconnaissance License	31,425.25
Prospecting License	35,733.93
Mining Lease	3,260.60
Industrial Minerals	479.07
-Sand	
-Kaolin	
-Limestone	
-Quarry	
Total	**70,898.85**

It may be noted that the issue of land take from farming areas leads to reduced food security in mining communities

3.10.4 Labour

The statistics on labour employed in the mining sector specifically in the gold, bauxite, manganese and diamond exploitation from the year 2004 to 2008 for Ghanaian senior and junior staff and expatriate staff is presented in Table 2 and Chart 1.

Table 2: Labour Statiatics in the Mining Sector (2004-2008)

Year	*Expatriate Staff*	*Ghanaian Senior Staff*	*Ghanaian Junior Staff*	*Total Staff*	*Expatriate Staff/ Ghanaian Senior Staff*
2004	166	1,736	13,622	15,525	9.6%
2005	181	1,905	13,310	15,396	9.5%
2006	363	3,291	15,088	18,742	11.0%
2007	356	2,734	16,150	19,240	13.0%
2008	408	3,211	15,098	18,717	12.0%

Chart 1: Labour Statiatics in the Mining Sector (2004-2008)

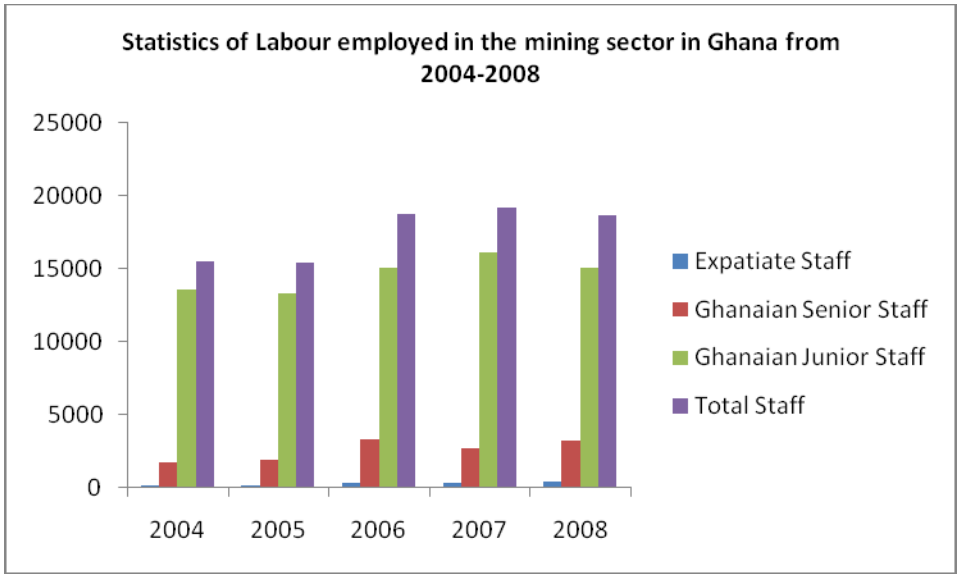


Table 3: Consumable and Utility Consumption Summary 2nd Quarter 2009

Consumable and Utility Consumption Summary 2nd Quarter 2009					
Consumable/Utility	**Major Country(s) of Origin**	**Consumption**	**Foreign Component (US$)**	**Local Component (US$)**	**Total (US$)**
Activated Carbon(t)	Philippines, Australia, Netherlands, United Kingdom, Ghana	550.90	79,165,332.31	36,210.00	79,201,542.31
Caustic Soda (t)	Australia, United Kingdom, China, Belgium	823.32	973,302.02	-	973,302.02
Cement (bags)	Ghana	192,135.00	-	1,428,773.14	1,428,773.14
Explosive (kg)	Ghana	3,241,315.38	214,724.91	3,046,063.36	3,260,788.27
Explosive (m)	Spain	14,650.00	4,816.30	-	4,816.30
Explosive (pieces)	Spain, Ghana	113,053.00	345,002.12	187,373.00	532,375.12
Floculant (t)	India, United States, Ghana, South africa	383.05	2,454,281.76	62,752.86	2,517,034.62
Fuel (Diesel) (l)	Ghana	30,631,134.54	-	21,421,878.82	21,421,878.82
Hydroclolic Acid (t)	South Africa, Ghana, Belgium, United Kingdom	-	-	-	-
Hydrogen Peroxide (t)	Italy, Germany, South Africa	-	-	-	-
Lime (t)	Ghana, United Kingdom	7,637.00	3,671,148.00	3,274,250.24	6,945,398.24
Lubricant (l)	Ghana	202,779.90	534,714.77	462,706.10	997,420.87
Power :self generated (kwh)	Ghana	1,210,838.00	-	668,024.76	668,024.76
Power : national grid (kwh)	Ghana	275,093,691.90	3,395,387.19	47,558,677.59	50,954,064.78
Sodium Carbonate: Soda Ash (t)	Ghana, Belgium	12.85	4,628.40	3,283.08	7,911.48
Sodium Cyanide (t)	Belgium, Australia, United Kingdom, Australia, Germany	4,704.66	11,795,613.53	-	11,795,613.53

Steel Balls (t)	South Africa, Ghana, China,	7,209.49	7,719,312.53	1,870,682.97	9,589,995.50
Telecommunication	Ghana	-	206,500.20	194,834.99	401,335.19
Water : national grid (gal)	Ghana	24,169.18	-	49,823.59	49,823.59
Water : self generated (gal)	Ghana	318,015.04	217,003.93	293,997.56	511,001.49
		Total	**110,701,767.97**	**80,559,332.06**	**191,261,100.03**

The labour employed in the mining sector over the past five years points out that a greater percentage of total labour can be found in the junior staff category. The availability of cheap unskilled labour in and around the environs of the mining companies might have accounted for its greater number over the past five years. In 2005 there was a slight decrease in the number of junior staff employed in the sector whiles 2006 and 2007 experienced an increase, followed by another fall in 2008. Ghanaian senior staff saw an increase in 2005 and 2006 then a fall in 2007. The number employed increased by 557 in 2008 as compared to the previous year.

3.10.5 Consumables

Activated carbon, cement, explosives, flocculants, fuel, hydrochloric acid, lime, steel balls water and power are some consumables employed in the mining sector.Other consumables including some of those mentioned above are imported to complement those already available in the country.

The consumables needed for the sector generated both foreign and local components amounting to US$ 191,261,100.03 all contributing to the Gross Domestic Product (GDP) of the nation. The local component forms forty two percent (42%) of the total amount.

It may be noted that the use of chemicals presents high risk because of accidental spillages. Most chemicals are also harmful to the environment.

3.10.6 The Demand Side of Consumption Patterns of the Sector

The major minerals are gold, diamond bauxite and manganese. Clam shells and lime (oyster shells) and other industrial minerals like mica, limestone, kaolin, salt and many more minerals are also exploited in

the country. The industrial minerals are mainly for local consumption and gold, diamond, bauxite and manganese are predominantly for the international market.

The mainstreaming of SCP principles in the mining sector, especially in the use of water and energy and local materials will help poverty reduction efforts in mining areas.

3.11 CONSUMER BEHAVIOUR

Current consumption in Ghana causes environmental damage at rates that are unsustainable. Consumer behaviour is key to the impact that society has on the environment. The actions that people take and the choices they make to consume certain products and services rather than others or to live in certain ways all have direct and indirect impacts on the environment, as well as on personal (and collective) well-being.

The growth pattern is defined by the sum of production and consumption patterns. Sustainable consumption can be an opportunity for improving the eco-efficiency of economic growth. Changing production patterns has taken a very good speed and cleaner production is relatively enhanced by various governmental initiatives throughout the country. Enhancing the consumption patterns of the society needs to be taken more seriously now, when the countries are setting up their development patterns, since this is directly reflected and has strong impact on the lifestyle and forming consumer behaviour. Demand side management is emerging as a tool with critical importance that can regulate and stimulate sustainable consumption. The role of the public sector is to create a conducive environment for more investments necessary to provide for sustainable consumption choices and in applying demand side management with the active support of citizens groups and the civil society.

As economic growth continues, demand for basic services such as transportation, safe drinking water, energy and housing rapidly increase. One particular case acutely highlighting this issue is urbanization. Many towns in Ghana are experiencing rapid urbanization. Urbanization poses a serious challenge to policy makers on how to meet exploding demands arising from large population congregated into a compact space of a city.

Ghana has to look into the issue of how to manage and control exploding demands arising from rapid economic growth. In managing demands, regulatory measures such as efficiency standards as well as market instruments can be used.

Improving the eco-efficiency of demand is crucial for improving the eco-efficiency of economic growth pattern, which is determined by the eco-efficiency of the production and consumption patterns. Eco-efficiency of production side generally improves as economic growth continues. Consumers have to be educated on the need to adopt SCP principles in their decisions

3.12 Forestry and Wildlife

Sustainable development in the Ghanaian forestry and wildlife sector targets the maintenance of environmental quality and perpetual flow of optimum benefits to all segments of the society. In protecting the forest and wildlife resources, the biodiversity strategy of the nation is committed to ensuring that, no species are threatened with extinction, areas critical for the conservation of biodiversity are properly conserved, there is active participation of all stakeholders, the use of components of biodiversity are done in sustainable manner considering sharing of benefits arising from use of resources and it also ensures that the public is sensitized on their rights and responsibilities.

The demand for natural resources generated as a result of high population growth, unsustainable consumption, and inefficient use of those resources as well as unsustainable lifestyles place immense stress on the environment.

Historically, forests have been cleared both to provide timber for export and local usage but also to create space for agriculture. Extraction of timber took place without concerns about replacement planting because supplies were seen to be more than sufficient to meet the demand at the time. Some agricultural processes have tended to rely on opening up new areas, while leaving behind older farming communities with depleted resources and less productive lands. The illegal extraction of timber, due to weak governance and practical constraints on enforcement in remote areas, coupled with bush fires and droughts have contributed to the degradation of our forest resources. In all of these cases of unsustainable development a number of common causes can be identified. These include: commercial overexploitation, individual self interest, ineffective and weakly implemented policies, laws and regulations, and incentive structures that foster free-for-all open access to natural resources.

Ghana's ecological footprint is estimated at 1.0 with a total biocapacity of 1.3 and thus having an ecological reserve of 0.3 gha/person. The footprint change person between 1975-2003 was 1% while biocapacity change per person was 36%.

Over the last two decades, deforestation has continued (at around 2% a year), and much of the off-reserve forest has been harvested. The forest reserves are now under threat. Some have been completely degraded. During the 1960's-1980's many of the forest reserves in the transition zone were very badly damaged by bush fires. Only 16% of forests are considered to be in a "healthy" state. The few intact high forest reserves in south west Ghana are at high risk from illicit over harvesting for the remaining high value hardwoods and bush meat.

Production and Consumption Patterns

Available data[4] indicates that between 1990 and 2010, the forest cover of Ghana reduced from 7.448 million hectares to 4.940 million hectares, implying a loss of 33.7%. The total forest cover is made up of

[4] Oduro et al (2010): Structure of Forestry Statistics Handbook

1.124 million hectares that can be classified as closed productive forest, 3.464 million hectares of open forests and the remaining 0.353 million hectares as unproductive forests. The total growing stock (of timber) by 2010, was estimated as 291.1 million cubic metres over bark. The total above-ground biomass for the same year was estimated at 653.7 million metric tonnes oven-dry weight, and a below-ground biomass of 156.9 million metric tonnes.

Demand side of consumption patterns of the sector.

With increasing population and the modest boost in the national economy, demand for lumber, especially for housing is steadily increasing. However policies to supply lumber to the domestic market have not been too successful. Demand for lumber on the local market is also compounded by illegal overland exports to neighbouring countries. The current housing policy, whereby most people strife to put up their own buildings does not augur well for judicious use of our timber resources (not to mention the phenomenal wastage in land-use). A major area of concern is the lack of standardization in sizes/dimensions of wooden members of housing and the lack of coordination between lumber producers and the building industry. A typical example is the mis-match between dimensions of mill products and sizes prescribed or specified by architects in the building industry. All this leads to a lot of wastage. Again the wrong use of wood products and improper treatment (seasoning or chemical treatment) result in early deterioration of wooden members, necessitating more frequent replacement and therefore more use of wood.

The need for improved production and conversion devices for wood energy has already been indicated above. Suffice it here to mention that coupled with the promotion of more efficient devices, there should be massive public education on sustainability and efficiency issues and practices.

Timber Harvest

Data from the Forestry Commission indicates that (official) total timber harvest within the last two decades was highest in the early 90's peaking at about 1.8 million cubic metres in 1992. This dropped to about 1.0 million cubic metres in 2004, peaking again in 2005 at about 1.7 million cubic metres before dropping again to about 0.75 million cubic metres in 2008. The average annual harvest (of timber) by the informal sector (chainsawn lumber) between 1996 and 2005 was estimated at 1.7 million cubic metres, round wood equivalent. Available data puts total woodfuel consumption for 2006 at 33 million cubic metres.

Wildlife Resources

Whilst it is difficult to have accurate figures on wildlife resources in the country, it is estimated that the annual wild meat production is between 220,000 and 380,000 tonnes. In 2004 and 2005 alone, a total of 1,890 permits were issued for the export of live wild fauna. The tables below give estimated numbers of

various wildlife species as in 1992 and information on threatened wildlife species; for comparison purposes, the total number of plant species that are threatened has also been given.

Number of Wildlife Species in Ghana

Species	Number
Mammals	220
Birds	721
Butterfly	850
Marine Turtle	5
Higher Plants	3,725

Source: WCMC, 1992; Groombridge, 1993,

Threatened Species in Ghana

Threatened Species	Number
Plants	34
Mammals	17
Birds	10
Reptiles	5
Butterflies	1
Higher Plants	103

Source: World Bank Study (1992)

Waste Management

Reducing of all forms of waste/Discards.

1. Solid Waste – Organic → Composting
   Inorganic → Recycling of Discards (Sachet, other plastics, broken chairs and tables in pallets)
2. Liquid Waste – To be treated using an Integrated Waste Management Technology through promotion of the following;
   - Biogas Technology as can be found at the Valley View University Accra, the Presidential Palace, Accra Mental Hospital etc.

- Bi-kube Technology at the Kofi Anan Peace Keeping Centre, Teshie in Accra.

CHAPTER IV

STRATEGIC FRAMEWORK AND INSTRUMENTS OF IMPLEMENTATION OF SUSTAINABLE CONSUMPTION AND PRODUCTION PROGRAMME

4. Strategic Framework and Instrument of Implementation of the Sustainable Consumption and Production Programme

The National Environment Policy seeks to improve the surroundings, living conditions and quality of life of the entire citizenry both present and future. This is in consonance with the principle of sustainable consumption and production.

There are a number of laws with relevance to sustainable consumption and production. The laws provide framework for each sector. For example the Environmental Protection Agency Act seeks to control the values, types, constituents and effects of waste discharges, emissions, deposits or other sources of pollutants and / or substances which are hazardous or potentially dangerous to the quality of life, human health and environment through the issuance of environmental permits and pollution abatement notices.

The existing laws are inadequate to provide a comprehensive and integrated policy on SCP. There is a near total absence of legislation on SCP specific issues. There is need for harmonization of responsibility and this call for strengthening in capacity of the key sectors. The multi-sectoral nature of SCP calls for coordination but this will be difficult due to the inadequate data and information on SCP. A suitable and effective management framework for SCP should be developed.

A multi-stakeholder committee is proposed to oversee the implementation of the SDAP (natural SCP programe). The composition should be made of the following:

- Environmental Protection Agency (serve as secretariat for SDAP)
- National Development Planning Commission
- Ghana Statistical Service
- Ghana Chamber of Mines
- Ghana Chamber of Commerce and Industry

- Association of Ghana Industry
- Private Enterprise Foundation
- Water Resources Commission
- Forestry Commission
- Energy Commission
- Minerals Commission

The committee will coordinate, integrate and give direction to sector regional and district level actitivies. This committee will report to the Environmental and Natural Resources Advisory Council (ENRAC)

Regional and District Committees should be set up to oversee implementation of sub-national levels. Also sector level teams should be set up to develop strategies for sector led policies and programmes.

Principle 10 of Agenda 21 indicates that environmental issues are best handled with the participation of all concerned citizens at the relevant level.

The national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision making process.

A communication and awareness raising strategy should be pursed through the production and airing of television and radio spots for raising public awareness on sustainable consumption and production for instance in the following areas.

(i) One minute television spot in the form of conservation between two generations which explains the underlying environmental degradation is unsustainable consumption and production.

(ii) Four 15 seconds television spots to sensitize the public on energy saving, water saving, minimization of wastes and efficient energy use.

(iii) Jingles

(iv) The above spots should be aired in English and the six(6) main local languages: Akan, Dagbani, Ewe, Ga, Hausa and Nzema to reach a greater percentage of the population.

CHAPTER V

PROJECTS WITH THE SUSTAINABLE CONSUMPTION AND PRODUCTION PROGRAMMES AND ACTION PLAN

Table 1 Pilot Projects for the Manufacturing Sector

Project	**Implementation Agency(ies)**	**Measurable Outputs**	**Priority** **Urgent : 0-1 yr** **High : 0-3 yrs** **Medium > 3 yrs**	**Output**
Reduction of water consumption in Breweries	EPA, Breweries, MOTI, AGI,	Reduction in hectoliters of water use per litre of product Reduction in volumes and load of wastewater discharged	High	Water consumption reduced Wastewater volume and load reduced
Reduction of water consumption in Soft Drinks Bottling Plant	EPA, Drink Bottling Plants, MOTI, AGI, Soft	Reduction in m^3 of water use per m^3 of product	High	Water consumption reduced Wastewater volume and load reduced
Reduction in energy consumption from the national grid through the use of biomass for firing boilers/furnaces in the wood processing sector	EPA, MOE, Wood processing companies	No. of wood processing companies using wood off cuts and saw dust for firing boilers Saved Energy from National grid made available for other users	Medium	Consumption of renewable energy sources increased GHGs emission and other air pollutants reduced Dependence on conventional energy reduced
Energy use efficiency improvement	EPA, MOE, EF, Steel Plants, Aluminium plants, AGI, Oil Palm Processing Plants, Industrial Boilers, Cement production etc	No. of industries participating Total amount of energy saved High energy demand areas and alternatives for reduction/change over identified	Medium	High energy demand areas and alternatives for reduction/change identified and implemented Best available technologies identified and transferred GHGs emissions reduced

		Amount of GHGs and other air pollutants reduced		
Renewable energy use from biomass for generation of electricity in the Oil Palm Processing Industry	EPA, MOE, Energy Foundation, Oil Palm Processing Industries	No. of oil palm processing companies using biomass to generate electricity Saved Energy from National grid made available for other users	Medium	Consumption of renewable energy sources increased GHGs emission and other air pollutants reduced Dependance on fossil fuels for energy generation reduced
Reduction in fish waste generated by fish processing companies	EPA, AGI, Fish processing companies	Quantity of fish waste sold to third parties Reduction in pollution load of effluent	Medium	Effluent load from fish processing companies reduced Reduction in solid waste generated
Use of renewable energy sources for industrial boilers	EPA, industries, oil palm processors, AGI	Number of industries using renewable energy sources e.g. biomass for firing boilers	Medium	Consumption of fossil fuel reduced GHGs emission and other air pollutants reduced
Capacity building on SCP in the manufacturing sector	EPA, industries, MOTI, MEST, AGI	Number of industries and industrial workers aware of SCP benefits	High	Awareness of SCP created SCP implemented in manufacturing sector
Mandatory water efficiency audits for high water consuming manufacturing users.	EPA, GWCL, Industries, AGI	No. of big manufacturing consumers conducting Water Audits Water Consumption	Medium	Water audit conducted Water consumption reduced

		reduction among big manufacturing water users		
Mandatory energy efficiency audits for high energy consuming manufacturing industries.	EPA, MoE, Energy Foundation, Energy Commission, NGOs	No. of big consumers conducting Water Audits Water Consumption reduction among big water users	Medium	Energy audit conducted Energy consumption reduced
Sustain a national awareness campaign on water savings	EPA, MoWRWH, GWCL, NGOs	Public Attitude towards water savings through surveys % Reduction in Average industry and employee water consumption	High	Attitude of public on water savings changed Average industry and employee water consumption reduced
Sustain a national awareness campaign on energy savings	EPA, MoE , Energy Foundation, Energy Commission, NGOs	Public Attitude towards energy savings through surveys % Reduction in Average household and employee energy consumption	High	Attitude of public on energy savings changed Average industry and employee energy consumption reduced
Development of a national eco-design and labeling framework with a focus on manufacturing sector	EPA, MEST, MOTI, AGI, Consumer Associations, NGOs	Development of national guidelines for eco-design and label of manufactured products Number of manufacturing industries implementing eco-design and label guidelines Consumer demand for	High	Guidelines for eco-design and labeling developed Eco-design and label guidelines for manufacturers implemented Demand for eco-designed and labeled products increased

		eco-designed and labeled products		
Establishment of industrial enclave in all major cities in Ghana	MOTI, EPA, MoLGRD, MMDAs, MEST, AGI, NGOs		Medium	Impacts of manufacturing industries localised

EXCHANGING/EXPORTING SKILLED LABOUR FOR SUSTAINABLE DEVELOPMENT

Policy	Objective	Activities	Results	Target groups /section
Training and exchanging or exporting skilled labour for international labour market	To identify skill labour of high demand in international labour market and train youth to respond to such demand through exchange programmes.	• Identify skill labour in short supply in some African and Western countries. (nurses, science, maths and English teachers • Develop additional appropriate international labour market demand-driven professional programmes. • Increase enrolment on relevant professional programmes in appropriate educational institutions. • Establish bilateral linkages with appropriate countries to facilitate labour exchange or export. • Develop a policy on international labour exchange/export.	• Reduction in illegal immigration. • Decrease in 'brain drain'. • Labour exchange/ export policy established. • Increase number of labour exchange/ exports approved and recognized by GOG in international labour market. • Increase in foreign exchange earning to GOG from international labour exchange/export.	• African countries • Western countries • Asian-Pacific countries

Policy/pilot Activity	Implementing Institutions	Veritable indicators	Possible source of funding
Training and exchange/export skilled labour for international labour market	• Tertiary Educational Institutions (e.g. Universities, Polytechnics, colleges of Education, Nursing Training Colleges, etc.)	• International labour exchange or export policy developed. • Number of experts officially exchanged/exported by	• Local/National • Bilateral/Development partners

	• Ministry of Education • NCTE • National Accreditation Board • Ministry of Foreign Affairs • Ministry of Manpower Development and Employment	G.O.G. • Foreign exchange earned from labour exchange/export on bilateral agreements.	• Multilateral/International

ACCELERATING THE PACE TOWARDS ACHIEVING UNIVERSAL BASIC EDUCATION FOR SUSTAINABLE DEVELOPMENT

Policy	**Objective**	**Activities**	**Results**	**Target groups/section**
Accelerating the pace towards achieving universal basic education.	To rapidly increase access to quality basic education for children everywhere in the country.	• Improve the quality of classroom building and other teaching and learning facilities in deprive rural areas in both the northern and southern sectors of the country. • Introduce incentives that will attract and retain teachers in deprive rural areas in both the northern and southern sectors of the country. • Introduce/enhance and increase access to facilities that attract and retain pupils in basic schools in the deprived and rural areas (capitation grant, school feeding programmes. • Introduce measures that will encourage or compel parents to send their children to school.	• Increased number of good quality basic school classrooms in both urban and rural areas in both the northern and southern sectors of the country. • Improved TLM and classroom environments in both urban and rural areas. • Increased enrolment and retention of pupils in both rural and urban basic schools • Increased number of trained teachers in deprived and rural areas in both northern and southern sectors of the country	Rural areas • Deprive urban communities • Northern sector of the country.

Policy/pilot Activity	Implementing Institutions	Veritable indicators	Possible source of funding
Accelerating the pace towards achieving universal basic education.	• Ministry of Education • Ghana Education Service • Ministry of Finance	• Percentage increase in number of children enrolled in basic schools in rural and deprive urban communities in both northern and southern sectors. • Percentage increase in number of good basic schools in rural and deprive communities. • Percentage increase in number of trained teachers in rural basic schools both northern and southern sectors.	• Government of Ghana • GETfund • Municipal/District Assemblies • Bilateral/Development partners • Multilateral/International

Research and Education

Promoting Distance Education for Sustainable Development

Policy/ pilot activity	Objective	Activities	Result/Outcome	Target groups/sectors
Enhancing and Promoting Distance Education	To vigorously promote distance education	• Identify academic programmes that can be offered by distance education • Commission expects to prepare appropriate modules to facilitate distance learning • Establish distance education study Centers throughout the country for tertiary education • Use multimedia to deliver distance education • Encourage second cycle institutions to access distance education programmes delivered through multimedia	* Number of new academic programmes introduced by distance education * Number of modules published for use * Number of distance education study centers established • Number of distance education programmes offered through the use of multimedia • Increased number of Secondary School students accessing the D.E by multimedia	• Tertiary level students • Second cycle level students • Workers

Promoting Sustainable Consumption And Production Through Non-Formal Education And Mass Communication

Policy /Pilot Activity	Objective	Activities	Results and Outcomes	Target Groups / Sectors
Promote collaboration amongst organizations involved in non-formal education and awareness creation.	To create a common platform for agencies and NGO's involved in non-formal education; and awareness creation on environment and poverty reduction issues to share in ideas on propagating information on sustainable consumption and production.	Identify agencies involved in non-formal education; and awareness creation on development issues. Create a database of organizations involved in non-formal education and awareness creation (environment and development). Organize regular review meetings to foster the sharing of experiences	Information on the activities of organizations involved in non-formal education and awareness creation collected and easily available. Experiences of practitioners shared.	• NFED • EPA • MOFA • Forestry Commission • PPA • NGOs • District Assemblies
Develop teaching and learning materials (TLMs) on sustainable consumption and production.	To make available teaching and learning materials on sustainable consumption and production.	Identify available teaching and learning materials on sustainable consumption and development. Task teams to adapt available TLM's for use in Ghana. Publish TLMs on sustainable consumption and production. Distribute TLMs on sustainable consumption and production.	TLMs on sustainable consumption and production made available for non-formal education and awareness creation.	• NFED • EPA • MOFA • NGOs
Strengthen incorporate sustainable consumption and production issues in non-formal/informal extension education.	To propagate information on sustainable development and production.	Encourage practitioners to use TLMs in their education and awareness creation activities.	Attitudinal change regarding consumption and production, leading to sustainable use of resources.	The general population.
Use public-owned mass-media to propagate sustainable consumption and production issues.	To educate the general population on sustainable consumption and production.	Make available TLMs to public broadcasters. Use TLMs to create content for broadcasting. Broadcast sustainable consumption and production issues using the public-owned media.	Attitudinal change regarding consumption and production, leading to sustainable use of resources.	The general population.

PROMOTING SUSTAINABLE CONSUMPTION AND PRODUCTION THROUGH NON-FORMAL EDUCATION AND MASS COMMUNICATION
(MONITORING)

Policy /Pilot Activity	Implementing Institutions	Verifiable Indicators	Possible Sources of funding
Promote collaboration amongst organizations involved in non-formal education and awareness creation.	• NFED • EPA • MOFA • Forestry Commission • PPA • NGOs	Number of organizations identified. Database of organizations.	Government of Ghana Donor Agencies
Develop teaching and learning materials (TLMs) on sustainable consumption and production.	• NFED • EPA • MOFA • Forestry Commission • NGOs	Teaching and learning materials published and distributed.	Government of Ghana Donor Agencies
Incorporate sustainable consumption and production issues in non-formal/informal extension education.	• NFED • EPA • MOFA • Forestry Commission	TLMs used in education and awareness creation activities by practitioners.	Government of Ghana Donor Agencies
Use publicly-owned mass-media to propagate sustainable consumption and production issues.	• GBC TV • GBC FM stations	Sustainable consumption and production issues broadcast by publicly-owned media. Public awareness of sustainable consumption and production.	Government of Ghana Donor Agencies

Agriculture

- Afforestation for Lake front area protection project
- Orphan crop development project
- Remote sensing and GIS based agricultural Data capture and management project
- Global Navigation Satellite System reference station network Demonstration project for land use (irrigation and agricultural fields, cadastral etc.) survey
- Food and agricultural trade show.

Proposed Project	Objective	Target	Activities	Budget (GHc)	Time frame	Implementing Agencies	Funding sources
Afforestation for Lake front area protection	-Control erosion, pollution and siltation of reservoir. - Enhance incomes of farmers.	5000ha of lake front areas afforested by year 5.	- Stakeholder sensitization. -Procurement of inputs -Establish pilot nursery- Training - Seedling production - Field planting - Monitoring and reporting	1million	5yrs	MoFA, IDA, WRC,EPA and district assemblies	GOG,DPs NGO's,
Remote sensing and GIS based agricultural Data capture and management	-Development of agricultural GIS spatial data. -Develop Remote Sensing and GIS protocol for Agricultural monitoring. -Capacity Building in GIS for agricultural data management.	- Gather baseline agricultural GIS data for the country by year 5. - Develop spatial agricultural information system. Train 40 agricultural officers in Remote	- Identify areas for pilot projects - Procure Remote sensing data and GIS equipment. - Conduct field surveys for the data. -Training in remote sensing data and GIS. Develop spatial data base for agriculture. Develop strategies	6Million	5yrs	SRID-MOFA, Research institutions.	GOG,DP

		sensing/GIS.	for expansion				
Global Navigation Satellite System (GNSS) reference station network Demonstration project for land use plans.	- Install GNSS reference stations in agricultural areas - Demonstrate the use of the system for surveying and mapping - Build capacity for modern surveying technology	- Set up 4 reference stations in demonstration sites. -Establish a control center to distribute GNSS data. - Installation of system applications and coordinate transformatio ns. -Training of officers in system application and field data collection and management.	-Identify demonstration sites. Procure GNSS equipments. -Install reference station equipment. - --- -Operate the equipment. -Monitoring of system	0.6 million	1 yr.	IDA/MOFA,UN, Leica Geo-Systems .	GOG, , Leica Geo-Systems,

Item	Priority areas/Strategies		Specific objectives		Action Details	Target	Indicators	Laws and Regulations	Host agency	Affiliated Agencies
1 .	Enhance productivity of major food crops		Increase per capita protein consumption Establish and implement an effective targeted input subsidy to support food crop production.		- Introduce and promote improved varieties (high yielding, short duration, disease, pest and drought tolerant) and nutrient-fortified -promote good agricultural practices within crop production systems. -Encourage and support the development of lesser known traditional food crops (orphan). Preserve genetic diversity of orphan crops	X number of improved high yielding crops, livestock and fish varieties introduced by year 'Z'. X percentage of farms adopting good agricultural practices by year 'Z'. X number of orphan crops promoted. X number of orphan crops preserved	New varieties adopted by farmers Adopted production practices on X number of farms. Increased Quantity and variety of orphan crops appearing on market. Increased planting stock maintained by farmers. % increase in number of orphan crops on the	FASDEP II GPRS II	MoFA	CRI,IDA,EPA, ARI,FRI, PPRSD Grains dev board.

					Identify, support and develop local crop varieties. -Expand infrastructure for seed/planting materials production, processing, storage and marketing to facilitate private sector involvement.	X number of local crop varieties developed by year 'Z' X number of infrastructure identified and expanded by year 'Z'	market. % increased local crop varieties within the farming community. % increase in number, size and capacity of storage facilities % increase in number, size and capacity of agro-processing plants. % increase in number, size and capacity seed markets available to farmers			
2	Promote and encourage fish culture to argument protein consumption.		Develop inland fishing production systems and improve open sea fishing		-Disseminate existing culture fisheries technological packages in all potential parts of	X number of fishermen adopting new technological packages by year 'Z'	% increase adoption rate of culture fisheries production technologies.	Fisheries Act	Fisheries commission MOFA	GIDA, NGOs and Other private companies

			information systems Promote expansion of inland fisheries development		the country. -establish open sea fishing information system - Train farmers on how to manage disease problems in fish production. - Use mass communication systems and electronic media for culture fish extension delivery -establish FBO to support	X number of information database established by year 'Z'. X number of farmers trained in fish disease management by 'Z'. X number of culture fish farmers informed X number of active FBO's	X number sea fishing information database developed. -Number of fish farmers trained. -% increase in fish harvest. Increased survival rate of fish, Number of farmers that have adopted the technology Increased frequency of electronic extension programmes in the airwaves. -Increased number of active FBOs			

			Support research in inland fisheries dev (especially, lesser known species)		extension delivery -Establish inland fisheries research fund -Build capacity for research -establish demonstration sites	formed to support extension delivery by year 'Z' -Research fund established by year 'Z' -X number of researchers trained by year 'Z' X number of demonstration sites established by year 'Z'	-research fund in place -training reports and manual in place -Number of active demonstration sites established -reports on demonstration sites available			
3	Encourage and promote improved livestock production systems.		Intensify research and development into livestock and poultry breeds Encourage research and development for improved production systems for local poultry Encourage		-Identify, update and disseminate existing livestock technological packages. -Undertake genetic characterisation and improvement of local livestock species		Increased adoption of livestock production technologies within the community Increased number of improved livestock breeds Increased adoption of	FASDEP II Livestock policy	Animal Production Directorate (MOFA)	ARI-CSIR EPA GIDA District Assemblies

			development of improved pastures Demarcation and development of improved rangelands Develop and improve lesser known livestock species (grasscutters, snails, rabbits)		-Introduce improved livestock and poultry breeds. -Use mass communication systems and electronic media for livestock extension delivery that responds to practical gender needs (radio programmes, information vans) -Disseminate extension information through FBOs. -Train community livestock workers to act as service agents		new breeds. Increased frequency of electronic extension programmes in the airwaves. Increased number of active FBOs Increase number of trained service agents.			
4	Establish and support efficient distribution and marketing systems.		To make food available and accessible all year round and at		Establish and manage an effective and efficient food distribution		Number of distribution and marketing systems	FASDEP II	SRID (MOFA)	NGOs PRIVATE SECTOR

			affordable prices.		system Establish a guaranteed pricing mechanism to motivate production of targeted food crops (cereals, grains and legumes). Support the development of food storage infrastructure across country Support improvement and development of road infrastructure. -Identify NGOs in microfinance to promote and sustain community based savings and credit schemes.		established Number and length of roads linking production centres developed			

					-Introduce targeted grants and subsidies on inputs to poor farmers to improve farm level production and marketing activities					
5	Promote and encourage Urban and Peri-urban agriculture		Enhance income level of urban dwellers involved in agriculture		-Liaise with Metropolitan, Municipal and District authorities to zone areas within urban and peri-urban areas for agricultural activities. -Train peri-urban producers in good agricultural practices.		Number of Zoned areas for peri-urban agriculture Increased area of land for peri-urban agriculture. Increased number of trained peri-urban farmers on good farming methods	Local governmen t by-laws	MoFA Metrop olitan assembl ies	GAWU, EPA WRI SRI SARI ARI Affiliated tertiary institutes. TCPD
6	Manage sustainable competing uses of		Promote efficient use of water		-Implement efficient water resources		Increased number of water use	Land Policy Water policy	MOFA/ GIDA	WRC WRI GWCL

	water and land resources		resources.		development -Develop management schemes to improve irrigation efficiencies. -Manage on-farm water activities to overcome water shortages and enhance food security.		efficient systems. Increased irrigation efficiency. Increased cropping intensity Increased production	Irrigation Policy		Land Commission
7	Promote and support viable horticulture industry.		To provide appropriate inputs for enhanced production To reduce post harvest losses		-Acquisition of appropriate planting materials (green procurement) -Establish cold chain handling of commodities -Promote appropriate handling containers for produce, especially		Number/types of appropriate materials being used Percentage reduction in post harvest losses	-FASDEPII -plant variety bill	-PPRSD, horticultural unit, MOFA	tertiary institution Private sector

					tomato. -Train and resource extension staff in post-harvest handling technologies -Train producers, processors and marketers in post-harvest handling. -Improve storage facilities along the value chain. -Promote appropriate transportation systems. -Provide regular market information (deficit/ surplus areas) to improve distribution of food stuffs					

8	Identify and address constraints to cash crop industry		Promote and enhance appropriate inputs for production develop and establish effective quality control systems		-Build capacity of nursery operators in all tree crop growing areas. -Support nursery operators (certify and assist to obtain resources) to expand and improve quality of tree crop seedlings. -Build capacity of certified seed growers and support them (to obtain resources) to expand and improve quality of seed. -Strengthen the capacity of PPRSD for monitoring and certification of seed and seedlings. -Use ICT methods (e.g. DVDs) to		-% of growers using appropriated inputs -Number of quality control systems developed and established -	Cocoa Policy FASDEP II	CRIG OPRI Cotton dev Board MOFA	Research institutes EPA

					extend improved production technologies -Build capacity of cash crop farmers to improve productivity and produce quality. -Link cash crop farmers to credit sources (rural banks, NGOs, outgrower schemes etc.) -Facilitate contractual arrangements between cash crop producers and marketers/industry.					
9	Identify and promote domestic value addition activities		Research into and Develop new products		-Source funds for research into new product development. -Develop products that break bulk, have		Number of new products developed	FASDEPII	MOFA CSIR	GAEC GSB EPA FDB

					long shelf life, are safe and convenient to use. -Institute competitive grant scheme for research into new products. -Identify existing value addition technologies and promote to the private sector. -Assess demand for value addition technologies					
10	Encourage and support agricultural diversification		Promote the development of alternative livelihoods		-Promote the production of "orphan" crops -promote the rearing of small stocks -promote the production of non tree forest products (NTFPs) eg. mushroom, snail, etc		-% Increase in the production of orphan crops -Number of farmers adopting small stocks and NTFPs	FASDEPII	MOFA	NBSSI CSIR

11	Establish and support regulations to improve quality of foods.		-Improve quality and market value of foods		-Commission studies into food regulations. -Develop standard into food quality		-Number of studies commissioned and made available - number of food quality standards developed	FASDEPII	MOFA	MOAP-GTZ
12	Develop efficient pilot value chains selected commodities in each ecological zone.		Mainstream value chain in al productive processes		-Establish and resource regional core teams for value chain development backstopping. -Upscale training in value chain analysis for MOFA and MDA staff. -Identify and build capacity of actors in value chain concept and processes. -Undertake market feasibility studies to determine		-regional core teams established -number of trainings conducted - number of people trained -Number of feasibility studies conducted	FASDEPII	MOFA	Development partners

					available and potential demand for the selected commodities. -Facilitate the linkage to markets for the selected commodities. -Build capacity of actors along the value chain on GAPs, GMPs and HACCPs.		Number of linkages established			

i.	Manage sustainable competing uses of land resources		-promote efficient land use systems		-develop a national land use plan -Research into efficient use of marginal lands for cultivating plants for bio fuels generation - develop production practices to check desertification		-availability of national land use plan Reports on findings on efficient use of marginal lands for cultivating plants for bio fuels generation	FASDEPII AgSLM Strategy and Action Plan	MOFA Min. Lands and natural resources	-Development partners -EPA -CSIR -Lands Commission -Forestry Commission
ii.	Promote the use of improved soil conservation techniques, especially to restore degraded land.		Improve soil health		-Promote appropriate farming systems -Encourage crop livestock integration -Control soil erosion through Soil conservation practices - update soil information		-Number of appropriate farming systems in use -soil conservation practices adopted -reports on soil information available	FASDEPII SLM Plan	MOFA	-SRI -Tertiary -institutions -CERGIS -ARI
iii	Encourage adoption of ecosystem-based farming practices		Promote organic agriculture		-promote conservation agriculture -promote organic agriculture;		Availability of organic products from local sources	-FASDEPII	-MOFA	-CSIR -EPA -WRC -District assemblies

i.	Strengthen adoption of improved technologies by farmers.		-Promote use of efficient technologies in production -build capacity of field officers and farmers		-Conduct participatory research work informed by needs of new technology users along the value chain -Build the capacity of field officers and farmers in use of new technologies. -Conduct on-farm research into low cost appropriate technologies and deliver them as packages. -Support development of private sector input distribution network. -Intensify field demonstrations/field days/study tours to enhance		-Number of participatory research commissioned -Number of field officers trained -number of on-farm research conducted -number of private sector input distribution points. -number of demonstration farms established - % increase in yield of farmers.	FASDEPII	-MOFA	-CSIR -private sector

					adoption of improved technologies.					
ii.	Increased Agricultural research funding.		Avail adequate funding for research		-Dialogue with Development partners and Ministry of Finance to increase funding for agric research. -Dialogue with private sector to fund agricultural research. -Advocate for the establishment of Agricultural Research fund. -Revise the Science and Technology policy in line with current agriculture policy framework.		-Quantum of funds devoted to agricultural research	FASDEPII	MOFA MOFEP	Development partners
i.	Develop Capacity for planning, policy analysis and		Improve inter-sectoral collaboration		-Strengthen plan implementation and monitoring		-Approved sector plans for	FASDEPII	MOFA MOFEP	

	M&E at all levels.				at all levels. -Build M&E capacity at all levels. -Implement programme for participatory M&E and impact assessment. - Establish a clearing house for accepted reports.		monitoring and implementation -Number of M&E capacity built. -number of programmes implemented. -Clearing house for accepting reports established			
ii.	Develop a national communication strategy to link all stakeholders		Promote access to ICT at all levels		-Improve access to ICT. -Develop and implement an intra communications strategy. -Establish a framework for		-ICT equipment available for use. -Established ICT networks -established framework for disseminatin	FASDEPII MoFA ICT policy	MOFA	Min. Of Com CERSGIS

					disseminating agricultural information. - strengthen human resource Capacity in ICT. -Establish ICT based agricultural statistic and information database.		g information -number of staff trained in ICT Established ICT database.			

Chemicals

Policy Mechanisms For Sustainable Consumption And Production Of Chemicals

Policy framework and its verifiable indicators

Policy/Pilot Activity	**Implementing Institutions**	**Verifiable Indicators**	**Possible sources of Funding**
1. Managing the misuse of chemicals	• MoFA (PPRSD) • Fisheries Commission • MEST (EPA, GAEC, Research Inst) • MoE (Academic Institutions) • MoH (GHS, FDB) • Association of Ghana Industries • MoTI (GSB)	• Number of poisoning cases • Number of users of chemicals trained (e.g. Agrochemicals) • Number of cases of faked products reported • Number of samples analysed • Wrong labelling cases reported	• Government of Ghana • Bilateral/Development • Multilateral/international • Grants • Levies • Chemical industry
2. Maintaining quality of chemicals	• MoFA (PPRSD) • MEST (EPA, Research Inst) • MoTI (GSB) • Association of Ghana Industries • MoE (Academic Insts.) • Fisheries Commission	• Number of cases of faked products	• Government of Ghana • Bilateral/Development • Multilateral/international • Chemical industry
3. Creation of Regional & District Poison Centres	• MOH (GHS, FDB) • MoFA (PPRSD) • Fisheries Commission • Minerals Commission	• Number of deaths due to poisoning • Number of poisoning cases reported. • Availability of information(fact sheets, brochures, other publications) on chemical poisoning	• Government of Ghana • Bilateral/Development • Multilateral/international • Chemical industry • Grants

4. Promote synergy between the Stockholm, Rotterdam and Basel Conventions at National and Regional levels.	• MEST (EPA) • MOFA (PPRSD) • MoTI (GSB) • Ministry of Lands and Natural resources • ECOWAS • MOH (GHS)	• Current figures on use of banned chemicals (e.g. POPS) in Ghana • Number of meetings on international conventions.	• Bilateral/Development • Multilateral/international • Grants • Chemical industry
5. Train staff in relevant institutions in the management and control of chemicals	• MEST (EPA, GAEC, Research Inst) • MOFA (PPRSD) • Fisheries Commission • MOTI (GSB) • MOE (Research & Academic Institutions	• Number of trained personnel	• Bilateral/Development • Multilateral/international • Grants • Chemical Industry • Government of Ghana
6. Train policy makers and other law enforcement agencies on enforcement of legislation on chemicals	• MEST (EPA, Research Inst.) • MoE (Academic Institutions) • MoFA (PPRSD) • Ministry of Justice • Ministry of Finance and Economic Planning (CEPS) • Ministry of Interior	• Number of policy makers trained on chemical issues. • Number of culprits apprehended.	• Bilateral/Development • Multilateral/international • Grants • Chemical Industry • Government of Ghana
7. Coordinate activities of relevant institutions of SCP of chemicals.	• MoFA (PPRSD) • Fisheries Commission • MEST (EPA, GAEC, Research Inst.) • MoE (Academic Institutions) • Association of Ghana Industries. • Ministry of Interior • Ministry of Finance and Economic Planning (CEPS) • MOH (FDB, GHS) • MOTI (GSB)	• Number of meetings/workshops between stakeholder organizations. • Number of MoUs signed. • Number of fora held to facilitate information exchange and experiences of management of chemicals.	• Bilateral/Development • Multilateral/international • Grants • Government of Ghana • Chemical industry

8. Awareness creation of Sustainable Consumption and Production of Chemicals.	• MoFA (PPRSD) • Media • MEST (EPA) • Ministry of Information	• Number of awareness creation programs organized. • Number of publications on safe use of chemicals. • Radio/ T.V. Programs on safe use of chemicals.	• Local/national • Chemical industry
9. Increase cooperation with the existing Basel Convention Regional Centres and the FAO Regional Office.	• MoFA (PPRSD) • MEST (EPA)	• Number of technical support from regional centres. • Number of programs organized in collaboration with regional centres.	• Government of Ghana • Bilateral/Development • Multilateral/international • Grants • Chemical industry
10. Promote use of Chemical Information Network (CIEN) among stakeholder institutions.	• MEST (EPA) • MoFA (PPRSD) • Fisheries Commission • MEST (EPA, GAEC, Research) • MoE (Academic Institutions) • Association of Ghana Industries. • Ministry of Interior • Ministry of Finance and Economic Planning (CEPS) • MOH (FDB, GHS) • MOTI (GSB)	• Interactions between stakeholder institutions on chemical issues in terms of experiences and information sharing. • Number of publications on safe use of chemicals.	• Government of Ghana • Bilateral/Development • Multilateral/international • Grants • Chemical industry

Conclusions

To strengthen chemicals management, improve environmental quality and human health, the following steps need to be adopted:

i. Improvement in capacity to collect, collate and disseminate information on chemicals management to facilitate making informed decisions with regard to chemicals management;

ii. Establishment of an Integrated Chemicals Management Information Systems (ICMIS);

iii. Intensification of programmes on education, awareness raising and training;

iv. Enhancement in monitoring capacity, hazard and risk assessment, interpretation and communication;

v. Increase in capacity for implementing and enforcement and compliance in chemicals management;

vi. Strengthening of technical infrastructure of laboratory, capacity of NGOs and training institutes;

vii. Research and development into environmentally friendly alternative chemicals at the local level;

viii. Adoption of suitable strategy for pollution prevention and waste minimization;

ix. Adoption of risk management policy, including evaluation of safer chemical alternatives and non-chemical options;

x. Strengthening of legislation to ensure the availability of safe and effective chemicals for use at all times;

xi. Promotion of cleaner production techniques in industry

xii. Implementation of the Polluter Pays Principle

Policy activities and their expected results

Policy/Pilot Activity	**Objective**	**Activities**	**Results**	**Target group**
1.Managing the misuse of chemicals	Ensure safe use of chemicals	• Areas where there is significant use of chemicals (eg. fishing communities, mining areas, industries). • Training applicators and end users • Public education and awareness creation • Set up facilities where chemical dealers can give information to end users	• Reduced number of poisoning cases • Reduced number of faked products on the market • More people trained in chemical issues • Reduced number of wrong labelling cases.	• Chemical dealers • Farmers • Fisher folk • Hunters • General public • Mining/chemical industry
2. Maintaining quality of chemicals	• Ensure correct labelling and that products meet required standards • Ensure that chemical use	• Set up a well equipped laboratory for quality assessment tests for chemicals. • Train analysts in the area of quality	• Reduced number of fake products • Well equipped laboratories to make quality assessments	• Importers • GSB • PPRSD • EPA • Research Institutions • Academic

	result in increased productivity	assessment • Periodic monitoring/ sampling of chemicals for testing	together with well trained personnel • Improved efficacy of chemicals	Institutions • CEPS
3. Creation of Regional/District Poison Centers	• Create awareness on effects of misapplication of chemicals on human health • Act as a first aid centre where poison cases can be treated before possible onward transfer to hospital depending on severity.	• Organize regular seminars at the regional/district levels on effect of chemicals on human health. • Produce information materials such as leaflets, brochures, posters to disseminate information on chemical poisoning. • Put a standby medical team at post to serve the public on solely poisoning issues	• Number of Poison Centres created. • Reduction in number of deaths due to poisoning	• General public
4. Train staff in relevant institutions in the management and control of chemicals	• Keep personnel abreast with current management and control measures	• Organize capacity building workshops for staff of stakeholder institutions	• More staff of stakeholder institutions trained in management and control of chemicals	• Stakeholder institutions
5. Train policy makers and other law enforcement agencies on enforcement of legislation on chemicals	• Educate policy makers on chemical issues	• Engage policy makers regularly on issues of chemical safety through meetings and seminars	• More policy makers and law enforcement personnel educated on chemical safety issues	• Members of parliament • Law enforcement agencies (CEPS, Police)
6. Coordinate activities of relevant institutions of SCP of chemicals	• Monitor activities of stakeholder organizations to ensure effective management	• Hold appraisal meetings to ascertain current trend of chemical use among other issues.	• More meetings between stakeholders held on chemical issues.	• Stakeholder institutions

	of chemical use			
7. Awareness creation of SCP of chemicals	• Encourage the use of SCP practices nationwide to curb misuse of chemicals	• Organize awareness creation programmes(eg, public seminars etc) • Radio and television programmes to promote awareness.	• More radio and t.v. programmes on SCP of chemicals. • More public seminars and fora organized.	• General public
8. Increase cooperation with the existing Basel Convention Regional Centers and the FAO regional office	• Gain financial and technical support to promote implementation of international chemical conventions	• Hold annual synergy building workshops to share experiences with other African countries.	• More financial support to facilitate implementation of NIP. • More technical support as a result of cooperation.	• MEST (EPA) • MOFA (PPRSD)
9. Promote the use of Chemical Information Network(CIEN) among stakeholder institutions	• Promote information sharing between stakeholder institutions	• Organize training programs for staff of stakeholder institutions on use of CIEN.	• More staff of stakeholder institutions trained on CIEN • Improved information sharing through CIEN • More periodic publications on issues discussed on CIEN.	• Stakeholder institutions

Demonstration Projects

The SCP programme consists of specific strategic project components on various sectors. To facilitate the uptake of sustainable consumption and production by the sectors, a number of projects have been identified. These projects are detailed in the Table 1 below. The potential project areas are many and cover sectors and issues, current government priority and future priority. A number of issues by sectors are identified according to current and future priority.

A. SECTOR AND ISSUES	CURRENT GOVERNMENT PRIORITY	EXPECTED FUTURE PRIORITY
Solid waste management		
-Waste disposal	Development of e	Development of incineration facilities
- Reuse and recycling	Promote recycling of plastic wastes and composting of organic wastes	
- Waste reduction	Sustained public education and awareness	
- Others	Improvement in collection and transport of wastes	
Transport		
- Clean fuels and vehicles	Promoting fuel efficiency, conservation and pollution control measures	• Introduction fuel efficiency devices on vehicles • Limit the importation and increase taxes and duties on vehicles and engines more than ten years old • Use of alternative fuels to supplement petroleum products • Set and enforce emission standards road vehicles
- Public and alternative-transportation	Promote mass transport in urban areas	
- Urban and regional transportation	Ensure provision, expansion and maintenance of transport infrastructure	
Others		
Cleaner production		
- Resource use efficiency	Operationalisation of a Ghana Cleaner Production Centre to provide services to the public on adoption of cleaner production strategies in all sectors	
- Pollution prevention		
- Technology strategies		
Energy efficiency and renewable energy		
- Industrial energy efficiency	• Installation of capacitor banks and high efficiency motors • Promote load management in industry • Promoting the use of energy efficiency bulbs • Promote resource use (including energy use) efficiency in industry	

- Household energy efficiency	• Awareness campaign aimed at promoting household energy efficiency. • Encourage the use of CFL's for lighting, modern fuel for cooking (where applicable) efficient cooking technologies, improved cook stoves. • Use of the appliance label standards for domestic	
- Life-cycle analysis	-	-
- Indicators of sustainability		-
-Technology impact	-	-
- Policy impact assessment	-	-
- Impacts of globalization and	-	-
- Impacts of changes in international markets	-	-
Others		
- Environmental Impact Assessment	EIA requirement for projects likely to have significant impact on the environment	Strengthening the system through on-line registration, follow-ups, etc
Strategic Environmental Assessment	Conduct SEAs of sector policies e.g. energy, agriculture, tourism and transport	Mainstreaming of environment in sector policies, plans, programmes and district plans to ensure sustainability (Under **NREG)**

- Consumer protection policies	Policy in place. Cabinet memo under preparation	
- Polluter-pays principle	Environmental permit fees are based on the scale of impact of the operation on the environment	
- Integrated product policies		
Changing consumer behavior		
-Education and public information	Provided by Ghana Standards Board and Food & Drugs Board	Part of a larger programme
- Consumer information	Provided by Ghana Standards Board and Food & Drugs Board until a Consumer Authority is established	
- Labeling ,eco-labels	Enforced by Ghana Standards Board and Food & Drugs Board	
- Consumer organizations	Consumer Association of Ghana is in place	
- Public procurement policies	Procurement is based on economic considerations	Incorporate sustainable procurement
-Others		
Changing production patterns		
- Regulations of emissions and effluents	Guidelines developed to regulate emissions and effluent discharges	Convert guidelines to standards to enforce compliance
- Charges or incentives of cleaner production	Establishment of a Cleaner Production Centre to promote resource use efficiency in industries and hence cut down cost of production	
- Products standards (e.g. energy efficiency)	Use of appliance label standard for domestic appliances	
- Cleaner production programmes	Dissemination of concept through seminars and workshops	Establishment of a CP centre to promote CP programmes
- (R&D, training, technical assistance)	State institutions like CSIR, GRATTIS, NBSSI, ITTU etc offer such services	Institutional capacity strengthening
- Pollutants reporting and registers	Monthly/quarterly reporting of pollutants by industries to EPA	institutionalize EPRD programme to rate companies based on their pollution impact etc
- Strategic industrial and technology planning		
- Investment incentives		
-Voluntary initiatives and codes of conduct		
- Corporate social/environmental responsibility	Industries determine the kind of corporate service it could offer	
- Improved management accounting		
-Investment analysis		
-Others		
Analytical tools	-	-

	appliances and facing out the use of CFCs in refrigeration	
- Renewable energy markets	Development of RE regulations to promote modern RE market	Increase modern RE to 10% in the energy mix and 5% biofuel in transport fuel
- Others		
Housing and construction		
- Energy efficiency	Use of energy efficient bulbs and equipment	Eliminate importation of old plants and equipment
- Building materials	• Keeping cost low through taxation and efficiency • Offering technical support to firms through research and development	Promote use of local building materials
- Construction standards	• Developing capacity of Building Inspectors • Building capacities of	Enforcement of building control regulations
- Building operations	Adherence to Building Regulation requirements by players	Development of efficient framework for monitoring and control
- Others		
Food clothing		
- Organic products	-	-
Chemical management	Enforcement of pesticides law	Improvement in the legal framework for the control and management of industrial chemicals and hazardous waste
Hazardous waste	Ensure safe disposal of obsolete pesticides and chemicals	

B. POLICY INSTRUMENTS	CURRENT GOVERNMENT ACTVITIES	EXPECTED FUTURE PRIORITIES
General policy instruments		
-Taxes , subsidies	None	Promote full cost recovery
- Preferential tariffs and trade policies	None	-
-Tax reform	• Widening of tax net to cover larger part of informal workers and self-employed workers • Increase efficiency in tax administration	

Water and Sanitation

Proposed Demonstration Projects in Water and sanitation

Background

There are about 70 wastewater (WW) and faecal sludge (FS) treatment plants in the country with a total design capacity to serve about 25% of the urban population but fewer than 10% are operational (IWMI, 2009). Thus, more than 85% of WW and FS that is generated everyday is discharged into the environment without any effective treatment. Achieving environmental and public health benefits of improved sanitation, demands adequate collection, treatment and disposal/end use of the waste to go along with the provision of toilet facilities

Response

One possible solution is to adopt a market and reuse-oriented approach to sanitation to show that effectively capturing and allocating the resource value of WW, FS, and treatment by-products can serve to finance sanitation systems that simultaneously close the water and nutrient loops thereby ensuring environmental and public health

PROJECT 1: REHABILITATION OF SELECTED WASTEWATER TREATMENT PLANTS

Objectives: Rehabilitate the plants towards reuse of WW for irrigation and aquaculture
Activities

- Wastewater quality and quantity monitoring: monitor wastewater flow and identify temporal variations; monitor wastewater quality to determine retention time in treatment system; quantify expected concentration in effluent and resource available for agriculture or aquaculture

- Assess potential for connecting unserved residential buildings in immediate vicinity of WWTPs
- Rehabilitate treatment plants depending on the need; implement conveyance infrastructure from WWTPs to fields/storage reservoirs for use
- Determine size and location/distribution of storage reservoirs
- Train personnel at the TPs and reuse end
- Cost-benefit analysis

Expected Result:

- At least 2 rehabilitated treatment plant tailored for reuse in irrigation and/or aquaculture
- Farmers and/or WWTP operators trained and equipped to conduct routine O&M
- Cost-benefit analysis of incorporating reuse for irrigation compared to baseline of effluent disposal by WWTPs and rain-fed irrigation by farmers;
- Quantification of return of investment/payback time on infrastructure necessary for reuse (e.g., conveyance pipes, storage reservoirs)

  Duration: 2-3 years
  Location: Tema waste stabilization ponds and Roman Ridge, Accra WWTP, Greater Accra
  Budget: GH₵500,000
  Funding Agency: Development partners- AfDB, USAID, World Bank
  Implementing Agencies: Ministry of Local Government and Rural Development (MLGRD) through its Municipal and Metropolitan Waste Management Departments, contracted treatment plant operators, Environmental Health and Sanitation Departments in Tema and Accra, IWMI, etc

PROJECT 2: COMMUNITY BASED PRODUCTIVE SANITATION SYSTEMS

Objectives: Promoting community based productive sanitation systems that enhance synergies between food production, sanitation and bio-energy production. This project will be based on the principle of resource recovery and ecological sanitation for agriculture, horticulture and forestry as possible leverage at household and community scale:

Activities

- Quantify potential biogas generation given selected locations
- Develop a cost-benefit matrix of all biogas collection and end-use options given expected biogas production (e.g., direct use for cooking or water heating, bottling, conversion to electricity, sludge for agriculture)
- Implement a biogas recovery project for various use options

Expected Result

- Comprehensive plan for implementation of cost-effective biogas option
- Transferable guideline for incorporating biogas recovery into sanitation facilities in Ghana, including institutional analysis of all relevant stakeholders (e.g., government agencies, technology suppliers, end users)

  Duration: 3 years
  Budget: GH₵**500,000**
  Funding Agency: Development partners- AfDB, USAID, World Bank
  Implementing Agencies: Ministry of Local Government and Rural Development (MLGRD) through its Municipal and Metropolitan Waste Management Departments, contracted treatment plant operators, Environmental Health and Sanitation Departments in Tema and Accra, IWMI, etc

Demonstration Project – Eco driving

It is proposed that in the short term a demonstration project on Ecodriving should be undertaken with the objective to:

- reduce transport related emissions and
- promote safe driving to reduce transport accidents and fatalities

Ecodriving principally aims at changing drivers' driving style to reduce the amount of fuel consumed and is a low cost policy measure to reduce CO2 emissions from transport. The impact of ecodriving on fuel economy can be considerable and may range between 5-15 percent CO2 emissions reduction in cars, buses, and trucks, with the best drivers achieving up to 50 percent reduction. It covers driving and other related information such as gear shifting, maintenance a steady speed, using the highest gear possible, deceleration techniques, tyre pressure checks, use of in-car devices such as revolution counter, onboard computer, cruise control, shift indicator, tyre pressure monitor, etc., deduction or elimination of idling etc. Ecodriving can be a central part of CO2 emissions reduction strategy.

Proposed Activities

- Development of guidelines and manuals for eco driving
- Create awareness on ecodiving and its benefits
- Engage key stakeholders such as Transport Unions, Driving Schools Associations etc
- Integrate ecodriving training into learner driver training, driving instructor training, and test criteria for commercial and general driver licenses.
- Provide support in the form of Fiscal incentives for starting ecodriving training and installation of in-car instruments and 8th gear technology in cars in both private and commercial drivers.
- Institute an annual national, regional and district award schemes for the best ecodriver
- Monitor the success of the programme,

Expected Outcomes of the Strategy

- Reduced atmospheric emissions
- Reduced fuel consumption and accidents

Target Group/Implementing Agencies

- Ministry of Transport
- Ministry of Roads and Highways,
- Ghana Highway Authority,
- Department of Urban Roads,
- Department of Feeder Roads,
- DVLA, MTTU, MMDA, GRCL, and
- All transport organizations
- Drivers

Monitoring Indicators

- CO2 emissions

Budget

An estimated amount of GH¢100,000 is required to cover the cost of the activities outlines above particularly development of manuals, public education and awareness programmes, support for installation of in-car instruments and 8th gear technology in cars and awards scheme

Cross Secotral Issues

There are critical sectoral issues in view of the linkages between transport and other sectors such as health, energy, tourism, etc which must be considered. These issues include health and safety, gender, energy consumption and climate change issues and land use planning.

Improving the sustainability of transport will require the cooperation of many government departments and agencies, economic sectors and individuals. The Ministry of Transport should play a critical role in promoting institutional collaboration and coordination. Institutional arrangements are required to deliver policy on time and within budget. The development of passenger and freight transport alternatives to road transport need to be undertaken in order to provide citizens with real choices. This is critical for achieving sustainable consumption and production within the transport sector.

Conclusions

There are a number of unsustainable consumption and production practices within the transport sector which have been identified. These include overreliance on a single mode leading to rising congestion on roads that makes journey times ever longer, wastes time, generates stress, diminishes family and community life, fosters obesity, and adds to pollution and costs at many levels among

others, unsustainable energy consumption and associated emissions, lack of integration between transport and land use planning etc.

The key to making transport in Ghana more sustainable is to promote integration of the modes and increase investments in less used and more sustainable modes such as rail and non motorized transport systems, control transport emissions and integrate transport and planning systems. A change in drivers and people's behaviour and some government intervention in the form of increased investments, planning and infrastructure provision are needed to achieve sustainable transport in Ghana

No.	Policy/pilot Activities	Implementing Institutions	Verifiable Indicators	Possible Sources of Funding
1	Reduce vehicular/Aircraft Emissions	Ministry of transport Min of Environment Min of Energy DVLA, EPA, EC, NPA, TOR/GNPC	Octane level of fuel No of vehicles with catalytic convertors or phase out No of vehicles that meet national emission standards Aircraft smoke levels	Local/national Bilateral/DPs
2.	Aircraft Noise Reduction	Ministry of transport Min of Environment GCAA EPA	Level of aircraft noise Age/type of aircrafts using national airspace Level of vibration of aircrafts Level of air traffic density	Local/national Bilateral/DPs
3	Reduction in road traffic and travel times	Ministry of transport Min of Roads and Highway GHA, DUR, DFR, DVLA, MMDA, MTTU, GRCL Transport organizations	Total no of vehicles registered annually Total no of vehicles in the country Increased use of mass transport system	Local/national Bilateral/DPs

No.	Policy/pilot Activities	Implementing Institutions	Verifiable Indicators	Possible Sources of Funding
			Travel time	
4	Improved transport safety	Ministry of transport Min of Roads and Highways GMA, DVLA, VLTC, MMDA, GRCL, GRDA, NAVY, GPHA, NRSC, GCAA,	No of accidents/incidents No of safety surveys carried out per annum Periodic mandatory safety inspections carried out No of competent personnel trained from recognized training schools Road condition mix	Local/national Bilateral/DPs

No	Policy/Pilot Activity	Objectives	Activities	Results/Outcomes	Target Groups/Sectors
1	Reducing vehicular and Aircraft Smoke Emissions	To improve health standards locally To reduce green house gas emissions	Establish national emission control programmme Development of emission standards and regulations Build capacity of relevant institutions to enforce regulations and standards Undertake public awareness programmes Institute quality control programme for certification of fuels Improve traffic control management system Build national capacity to measure	Clean air Improvement in health status leading to increased productivity Reduction in greenhouse gas emissions	Vehicular operators Regulatory Institutions, training institutions Policy making institutions

No	Policy/Pilot Activity	Objectives	Activities	Results/Outcomes	Target Groups/Sectors
			aircraft/marine/vehicular emissions Institute economic instruments to control emissions		
2	Transport Safety	To provide safe and reliable transport services To maintain transport safety standards	Carry out public education and training programmes Build capacity of relevant institutions to enforce transport safety regulations institute non-punitive reporting system improve traffic management system e.g., VTMIS Introduce a certification system for safety compliance Improvement in transport infrastructure	Reduction in transport accidents and associated cost to national economy Improved compliance with transport safety regulations	Vehicle operators Mariners Aircraft operators Transport service providers Regulatory and training institutions Aerodrome operators Port facility operators

No	Policy/Pilot Activity	Objectives	Activities	Results/Outcomes	Target Groups/Sectors
3	Reduction in road traffic and travel times	To facilitate the fast movement of people, goods and services To promote efficient use of transport	Introduce mass transport system Improve land use planning, control and management	Enhance efficiency and increased productivity Reduction in GHG emissions Reduced pressure on health system Reduction in accidents	Road users Transport service operators Land-use planning and development control organizations
4	Transport noise control	To reduce transport related noise pollution To conform to relevant national and international noise standards	Institute a transport noise measurement programme Enforce noise regulations and standards Undertake public education and awareness creation programme Introduce a transport operators certification scheme	Reduction in hearing impairment, noise related stress and nuisance Reduced social conflicts/tension related to noise pollution	Transport service providers Regulators

No	Policy/Pilot Activity	Objectives	Activities	Results/Outcomes	Target Groups/Sectors
5	Inter-modal transport	To integrate the various modes of transport	Implement Ghana Urban Transport Project (GUTP) including the Bus Rapid Transit BRT and school bus system Develop rail-based mass transport system in Accra-Tema and Kumasi-Ejisu and Accra-Nsawam as part of an integrated transport plan Incorporate NMT infrastructure in all road developments. Develop regulatory framework for NMT	Eased congestion Less emissions Reduction in travel time Increased productivity	Transport service providers/users Regulators Policy makers Planners/Engineers
6	Integration of transport and land-use planning	Reduced travel demand	Establish mass transport system Development of transport infrastructure and services; Establishment of the proposed Urban Transport Advisory Committee (UTAC) to offer urban transport sector stakeholders a platform for	Eased congestion Reduced atmospheric emissions Reduced travel times Savings in the cost of transport infrastructure development particularly in terms of the cost of land	

No	Policy/Pilot Activity	Objectives	Activities	Results/Outcomes	Target Groups/Sectors
			effective coordination in the areas of: • Integrating land use and transport planning; • Decentralized Management, Financing and Maintenance • Production of practical guidelines for development and transport planners to facilitate effective integration • Proper acquisition and protection of land for transport infrastructure development • Incorporation into master plans of cities, provision of inter-modal and intra-modal “break-bulk” facilities to improve the transfer of goods and passengers from one mode to another. • Increase collaboration with	acquisition, compensation and protection of right of way (ROW). Improved mobility, accessibility and productivity	

No	Policy/Pilot Activity	Objectives	Activities	Results/Outcomes	Target Groups/Sectors
			MMDAs to ensure the provision of independently managed lorry parks and other transport interchange facilities to encourage competition and improve customer services • Consistent application of the "Road Utility Manual" by passing appropriate legislation.		

Training for Implementation – Hand washing Pilot Project (Schools Health Programme)

S/N	Training of School Health Management Committees & Coordinators under the School Health Education Programme (Installation of Handwashing Facilities in 1000 Pilot Basic Schools in Ghana)	Regions	No. of Basic Schools under Pilot	Consultancy fees (Per Sch.)	Total Consultancy fees (All Schools)	Total DSA for Consultancies (All Schs)	DSA for Consultants (All Schs)	Equipment per School	Total cost of Equipment (All Schs)	Report per Sch.	Reports (All Schs)	Total Amount (GH₵)
1	Procure Consultants to train School Management Teams of Pilot Schools	10	1,000	8,500.00	8,500,000.00	800.00	800,000.00	500.00	500,000.00	250.00	250,000.00	10,050,000.00
2	Procure Consultants to train School Health Coordinators of Pilot Schools	10	1,000	8,500.00	8,500,000.00	800.00	800,000.00	500.00	500,000.00	250.00	250,000.00	10,050,000.00
	TOTAL AMOUNT				17,000,000.00		1,600,000.00		1,000,000.00		500,000.00	**20,100,000.00**

Procurement of Polytanks, etc - – Hand washing Pilot Project (Schools Health Programme)

S/No.	Procurement and Installation of Polytanks/Procurement IEC Materials for High Impact Campaign under the School Health Education Programme in 1000 Pilot Basic Schools in Ghana)	Regions	No. of Basic Schools under Pilot	Number	Cost per Unit	Total Amount (GH₵)
3	Procure 1250 Polytanks (1,000 litres) for Institutional Latrines	10	1,000	1,250	350.00	437,500.00
4	Install 1250 Polytanks (1,000 litres) on concrete platforms in 1000 Basic Schools	10	1,000	1,250	200.00	250,000.00
6	Procure Audio-visual Aids/Information, Education & Communication Materials (Banners, Wooden frames, twine, etc) - Lumpsum	10	1,000	1,000	500.00	500,000.00
7	Prepare and produce awareness creation and user education brochures for Schools	10	1,000	1,000	500.00	500,000.00
8	Implement High Impact Campaign on Handwashing With Soap in Pilot Schs	10	1,000	1,000	1,000.00	1,000,000.00
	TOTAL AMOUNT					**2,687,500.00**

Future Plans and Policy Recommendations

IMPLEMENT AND MONITOR

Policy/Pilot Activity	Implementing Institution	Verifiable indicators	Possible Source of funding
1. Supply-Side: Increase in coverage of potable water	MWRWH: • GWCL • CWSA • WRC MLGRD • MMDA's • CBRDP MEST • CSIR-WRI NGOs Individuals Private firms	No. people with access to potable water Total volume of water produced per day Number of production plants/ Boreholes Capacity utilization of water production plants Number of buildings with rainwater harvesting systems	GoG Budgetary allocation to MMDA's Development partners User fees Water Fund Individuals NGO's

DEVELOP

Policy/Pilot Activity	Objective	Activities	Results/Outcomes	Target Groups/Sector
1. Supply-Side: Increase in coverage of potable water	Increased Access to Potable Water	Increase household connections to mains Increase production capacity (Expansion and Development) Reduce losses at production level Increase efficiency of system Reduce transmission losses Reduce illegal connections Increase revenue collection Increase number of rainwater harvesting systems	Increased coverage/access Reduced water losses Increased revenue Increased investment	Residential homes Industries Utilities Communities Public Government Institutions Individuals

IMPLEMENT AND MONITOR

Policy/Pilot Activity	Implementing Institution	Verifiable indicators	Possible Source of funding
2. Water loss (physical and commercial)	MWRWH • GWCL • CWSA • Water Boards MLGRD • MMDAs	-Percentage of unaccounted for water -Percentage of lost revenue -frequency of pipe-burst -Age of equipment (pipe, pumps, motors etc.) -Length of 'spaghetti' pipes -Number of illegal connections -Number of in-line pumps -quantity of water spilled during tanker services	-Gov. of Ghana (national/local) -Budgetary support -allocation of MDAs -Water Funds

DEVELOP

Policy/Pilot Activity	Objective	Activities	Results/Outcomes	Target Groups/Sector
2. Water loss (physical and commercial)	-reduce losses in water supply -increase water supply -increase revenue collection	-repair leakages at plants -replace aging pipes -attend quickly to burst pipes -retrofit household taps, Pipes -increase revenue collection -meter successfully -institute deterrents for pilfering -encourage people to report and give incentive.	-Minimal or losses during production -leak -proof mains/distribution system -reduced losses during pipe-burst -accrued enough funds fir investment -be informed of the amount of water lost	-Utilities -Household -Industries -other users

IMPLEMENT AND MONITOR

Policy/Pilot Activity	Implementing Institution	Verifiable indicators	Possible Source of funding
3. Access to Sanitation Service	MWRWH • CWSA • Water Boards MLGRD • MMDAs MOH • Public health directorate MOEd • GES – SHEP programme NGO, CBO, FBO Private Sector	-number of waste water treatment plants -number of functioning waste water treatment plants -number of improved latrines -number of public places (lorry parks/markets/schools) with access to improved latrines -distance trekked to access sanitation -number of functioning Sanitation facilities -access to waste disposal sites	-Gov. of Ghana (national/local) -Budgetary support -allocation of MDAs -NGOs -Direct taxes -Private sector support

DEVELOP

Policy/Pilot Activity	Objective	Activities	Results/Outcomes	Target Groups/Sector
3. Access to Sanitation Service	-reduce by half population without safe sanitation by 2015 -develop local market for recycling products	-replace existing pan-latrine with improved -conduct public awareness and education on sanitation. -increased density of improved sanitation facilities -encourage households to promote sanitation -improve solid waste collection infrastructure -provision of recycling and reuse plants	-phasing out of pan-latrines -increased awareness and choice for sanitation facilities -improved access to sanitation services -reduced pressure on existing facilities -increased access to sanitation facilities -improved life-span of sanitation facilities -increased per capita access to sanitation facilities -improved environment -sustained recycling capacity -reduced waste for disposal -Created jobs and capital	-MMDAs -Households -Industries/factories -markets -schools -Hospitals -Churches -communities

IMPLEMENT AND MONITOR

Policy/Pilot Activity	Implementing Institution	Verifiable indicators	Possible Source of funding
4. Water Pollution	MWRWH • WRC MLGRD • MMDAs MOE • Universities MTI • Factory inspectorate department MEST • EPA • CSIR-WRI Communities/Individuals	-number of waste dumps along water bodies -number of development within buffer zone of water bodies -number of factories/industries without wastewater treatment facilities -number of defunct waste water treatment plants -monitor raw water quality -number of factories/industries not meeting emission guidelines -level of pollution awareness -norms of societies regarding water bodies -cost of water treatment	-Gov. of Ghana (national/local) -NGOs -Private sector support -permits -Licensing -Bills -charges/penalties -Budgetary support -allocation of MDAs -Water Funds

DEVELOP

Policy/Pilot Activity	Objective	Activities	Results/Outcomes	Target Groups/Sector
4. Water Pollution	Safeguard and improve the quality of water bodies	-carryout education/awareness on human activities and pollution of water bodies -decongesting/protection of buffer zones -enforcement of EPA bye-laws on effluent discharges -sampling and analysis (monitoring) of raw water quality	-reduced dumping of waste in water bodies -clean buffer zones and easy access to flows -cleaner environment - Cleaner water bodies - higher biodiversity -reduced fish kills -improved livelihood for riparian (rivers)	-Utilities -Household -Industries - MMDAs -Households -Industries/factories -schools -Hospitals -Churches

IMPLEMENT AND MONITOR

Policy/Pilot Activity	Implementing Institution	Verifiable indicators	Possible Source of funding
5. Water Resource Development	MWRWH • GWCL • CWSA MLGRD • MMDAs • Communities • Individuals MoFA • GIDA MES • Universities MEST • CSIR-WRI NGOs, FBOs, CBOs	-number of new recharge systems -number of new domestic rainwater harvesting systems -number of new flood retention reservoirs -number of new dams/dugouts -number of new wells/tube wells/shallow groundwater wells	-Govt of Ghana (national/local) -Development partners -NGOs -individuals -communities -MDAs -Water Fund

DEVELOP

Policy/Pilot Activity	Objective	Activities	Results/Outcomes	Target Groups/Sector
5. Water Resource Development	To increase the per capita quantity of freshwater available	-construct wells/boreholes -construct rainwater harvesting systems -harness flood and runoff waters -construct groundwater recharge systems -construct dugouts/dams	-increased and sustainable volumes of accessible fresh water	-GWCL -CWSA -communities -individuals -farmers -industries/factories

IMPLEMENT AND MONITOR

Policy/Pilot Activity	Implementing Institution	Verifiable indicators	Possible Source of funding
6. Water Resource Management	MWRWH • WRC • GWCL • CWSA MLGRD • MMDAs/Water Boards • Communities • Individuals MoFA • GIDA MEST • CSIR-WRI • EPA MLNR • Forestry Commission NGOs/FBOs/CBOs	-well developed and updated water resources database -number of water resource management programmes -increasing availability of freshwater (spatial and temporal) -number of available basin boards -number of effective basin boards -enhanced ecosystems (rivers, lakes, dams, forests, communities, farmlands, markets) -ecologically responsible and responsive communities / individuals	-Govt of Ghana -Development partners -NGOs -individuals -communities MMDAs -Water Fund

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DEVELOP

Policy/Pilot Activity	Objective	Activities	Results/Outcomes	Target Groups/Sector
6. Water Resource Management	To ensure ecological soundness of resources	-institute water basin boards -collate and document information on water resources -carry out water resources monitoring activities -carry out basin-wide monitoring -create, intensify and sustain awareness on water and sanitation -improve aquatic flora and fauna -improve basin flora and fauna	-improved water resource base (quantity and quality) -enhanced ecological behavioural attitudes of individuals -increased access to reliable and adequate data	-GWCL -CWSA - MMDAs/WRC -communities -individuals/farmers -ecosystems -industries/factories -MWRWH

CHAPTER VI

IMPLEMENTATION PROGRAMME AND RECOMMENDATION

6. Implementation Programme and Recommendation

The benefits of the SCP programme can be most felt at the level of resource users, the implementation programme should involve local level bodies. District Assemblies therefore have a central role to play in the implementation of environment programes in recognition of the fact that national policies and programmes can best be translated into action at the local and district levels.

To ensure that the programmes are sustainable, it is important to forge partnership on horizontal and vertical levels to ensure better decision-making.

A number of actions can be taken:

- A code of environmental stewardship should be instituted at district, regional and national levels.

Sustainable development is about the next generation, so the programme should therefore instill in children and the youth the principles of SCP.

A green and sustainable future is possible if children and youth, the next custodians of our planet are sensitized and educated to support our transition to a low carbon economy.

Schools, colleges, universities and other education institution should play a critical role in shaping the future. A knowledge sharing programme on greening education through ecologizing curriculum, greening of courses and creating low carbon education institutions should be institutional.

Awareness creation and education for policy and decision makers, industry and business, consumers and general public is crucial if the SCP programe is to be successful.

CHAPTER VII

CONCLUSIONS

7. Conclusions

SCP holds great promise in addressing the threats of environmental pollution climate change and a transition to a low carbon economy

The cross-cutting nature of the concept requires that it is integrated into existing natural strategies and public awareness created on the benefits. The selection of a few demonstration projects will help popularize the concept.

CHAPTER VII

ANNEX 1

DEVELOPMENT OF SUSTAINABLE DEVELOPMENT ACTION PLAN FOR GHANA

Terms of Reference for Working Groups

Background

Agenda 21, the Programme of Action for Sustainable Development provides guiding principles to countries on the path to sustainable development and identifies the major cause of the continued deterioration of the global environment to the unsustainable pattern of consumption and production. The demand for natural resources generated by unsustainable consumption and to the inefficient use of those resources. Unsustainable lifestyles also place immense stress on the environment.

At the World Summit on Sustainable Development in 2002, Sustainable Consumption and Production (SCP) became part of the international agenda.

Chapter 3 of the Johannesburg Plan of Implementation (JPOI) is dedicated to changing unsustainable patterns of consumption and production. To achieve this governments have committed themselves to the promotion of the development adopted at the World Summit on Sustainable Development under the commitments to changing unsustainable consumption and production pattern calls for actions at all levels to encourage and promote the development of a 10-year framework of programmes in support of regional and national initiatives to accelerate the shift towards sustainable consumption and production.

To this end, there is the urgent need for Ghana to mainstream sustainable consumption and production (SCP) issues in key sectoral policies, plans, programmes of the ministries, department and agencies (MDAs) as well as in the activities of the private sector to link the promotion of SCP patterns to poverty reduction.

The concept of SCP aims at taking an integrated and coordinated approach towards consumption and production, by seeking positive synergies between different methodologies and tools. The concept can help achieve sustainable development as it provides a holistic perspective on how society and economy are better aligned with the goods of sustainability.

"SCP is the production and use of goods and services that respond to basic needs and bring a better quality of life while minimizing the use of natural resources, toxic materials and emissions of waste and pollutants over the life

cycle, so as not to jeopardize the needs of future generations. SCP is the process of minimizing the direct and indirect impact on the environment (and society) of any action, investment, project, product or service, whether it is initiated in the production side, consumption side, or in any other part of society. SCP aims to maximize the efficiency and effectiveness of products, services and investments along their entire life cycles so that the needs of society are met without jeopardizing the ability of future generation to meet their needs" (UNEP, 2004).

Sustainable production concerns the supply side and focuses on the economic, social and environmental impacts of production processes. Sustainable consumption on the other hand addresses the demand side, and focuses on consumers' choices of goods and services, such as food, shelter, clothing, mobility and leisure. Sustainable consumption pursues the most efficient use of a product or service, combing consumer satisfaction with minimal environmental impacts and does not necessarily translate into consuming less; rather defines a consumption that is more efficient and on that makes better-informed purchases by adopting less resource – intensive consumption and production patterns.

The Ministry of Environment, Science and Technology (MEST) under the Natural Resources and Environmental Governance Programme intends to prepare a Sustainable Development Action Plan (SDAP) under the coordination of the Environmental Protection Agency. The SDAP will be based on SCP concept which is cross-cutting and embraces all segments of society in the country from individuals, firms, communities, cities different generations – children, youth and the old are involved in consumption and production of goods and services to address unpredented environmental challenges. SCP is also related to climate change.

Ghana is endowed with renewable and non-renewable resources. Renewable resources (soils, forest, water, coastal and marine) are under serious threat while non-renewable resources (minerals and recently oil and gas) would not last for forever. Ghana therefore has to lay the foundation for a sustainable future. Effective management of ecological assets can help cycle of poverty and help support changes that can improve the quality of life. Ghana's ecological footprint is estimated at 1.0 with a total biocapacity of 1.3 and thus having an ecological reserve of 0.3 gha/person. The footprint change person between 1975-2003 was 1% while biocapacity change per person was 36%.

The SDAP will focus a number of priority areas (agriculture, energy, transport, tourism, waste management, chemicals and hazardous substances, human settlement, housing and construction, water and sanitation, manufacturing industry, mining, consumer behavior, economic instruments and institutional).

Each priority area will be addressed by a working group drawn from ministries, departments and agencies, research and academic institutions, non-governmental organizations, private sector groups.

Scope of Work

The working group will undertake the following tasks:

1. Propose demonstration projects in your sector according to priorities with rationale for choice and provide
2. Collect and evaluate available data, studies on consumption and production pattern and provide an overview of existing sectoral plans policies programmes and strategies over the last 10 years including the Draft Long Development plan and provide overview of sustainable development practice relevant to SCP for the sector
3. Identify the supply side of production processes in economic, social and environmental impacts
4. Identify the demand side of consumption patterns of the sector
5. Review existing legislation and policies related to sustainable consumption and pattern
6. Propose appropriate frameworks and mechanisms (regulatory instruments, technological innovations, new public services)
7. Define objectives targets and activities required to achieve targets
8. Identify cross-cutting issues and linkages to other sectors
9. Propose concrete activities to guide consumer choices and lifestyles in the areas of communication, marketing and advertising, education and training, social and cultural initiatives
10. Develop future scenarios and policy recommendations
11. Identify agencies to implement plan, time frame, costs and funding to implement
12. Identify the direct and indirect impacts on the environment of actions, investments, projects, products and services
13. Identify indicators for monitoring and implementation

Duration of Assignment

Provision has been made for the working group to meet for six times from 1st October to 30th November 2009. It will be supported by an officer from EPA and members of the group can be assigned specific tasks to ensure completion of the work.

A draft final report will be submitted to EPA by November 30, 2009.

Members of the working group will also be invited to participate in a one-day seminar to review the reports of all the working groups at a later date.

Remuneration

An allowance of GHC 100 will be paid to members of the working group at each of the six meetings to cover allowance, refreshment, light lunch and local transport expenses. The SDAP secretariat will bear the travel and transport (T&T) and overnight expenses of members who attend meetings from outside Accra according to rates approved by the EPA.

In addition to the allowance, each group is allocated one thousand, two hundred cedis (GH¢1,200) for the assignment.

Terms of Payment

50% of the amount for the group will be paid after commencement of the assignment to the team leader for disbursement. The remaining 50% will be paid on satisfactory completion of the entire assignment and submission of vouchers for previous payment.

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9. References

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5. National Programe on Sustainable Consumption and Production (SCP) for Mauritius (2008 – 2013) Volume 1 Final Report August 2008
6. List Working Group Reports.