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**EFFECTIVE WATERSHED MANAGEMENT FOR
ENVIRONMENTAL HAZARD CONTROL/
MITIGATION IN NIGERIA**

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**INTEGRATED WATERSHED DEVELOPMENT
AND PLANNING IN SOUTHEASTERN NIGERIA**

PRESENTED

BY

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OUTLINE

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Abstract

Integrated Watershed Development and Planning is a necessity for effective watershed management. It is aimed at drastic reduction of air, soil and water pollution, erosion and flood mitigation, improved soil fertility and crop yield within the watershed. India and Burundi have recorded success stories in watershed development and planning using integrated approach. The two Countries used various approaches which include afforestation involving large hectares of plantations to protect the watershed against erosion and flood and growing of fruits and creation of Community woodlots. The Federal Government of Nigeria set up a Committee that will work modalities to resuscitate our watershed which is currently grossly abused.

1.0 INTRODUCTION

The effective watershed development has become the basis for a sustainable rural economic, infrastructural and human transformation in developed Countries. The hydrologic cycle can provides fresh water for cosmetic consumption, irrigation and a increase yield for food security while the water land resources provides raw materials for a rapid industrialization and reduced unemployment.

Negligence and poor management of our watershed has led to its degradation. This is evidence in erosion, flooding, pollution of land, water and air and total loss of revenue. This negligence take forms such as poor farming system, deforestation and other land use activities which undermine the long term sustainability of ecosystem and human existence within the watershed.

Activities within watershed that accounts for degradation include: Deforestation, Removal of marginal lands, improper crop rotation, wrong application of fertilizer, pests and diseases, Over pumping of groundwater, poor land use and oil and natural gas exploration and exploitation. These activities degrades the watershed and the effect of the degradation within watershed include Soil Erosion, flooding, soil, water and air pollution, eutrophication, Stalinization and Nutrient loss, decline in soil fertility, acid rain deposition.

2.0 DEFINITION OF CONCEPT

A watershed represents the land area within the total catchment area of a major river system. Thus it represents the soils, rivers, water bodies and the vegetation within the given catchment area (Federal Ministry of Water Resources). Watershed Development and Management varies from one school of thought to the other. However, there is common denominator in their concept. Here are some definitions.

- Watershed management may be defined as

an integrated approach of greenery for a better environment (Murty J.V.S., 2004).

- According to watershed planning and Advisory council (WPAC), 2008, Watershed management is an adaptive, comprehensive, integrated multi – resource management planning process that seeks to balance health, ecological economic and cultural/social conditions within a watershed.
- Watershed Management as the process of implementing land, Use practices and water management practices to protect and improve the quality of water and other natural resources within the watershed by managing the use of those land and water resources in a comprehensive and the sustainable development exploitation of other natural resources (DEEP, 2015).

The latter is a more preferable definition because it clearly spells out the goal of watershed management/development, itemizes the specific task to execute and the stakeholders involved and the operating philosophy that will successfully drive this process.

However, the concept is also defined as the process of implementing land use practices and water management practices to protect and improve quality air/water and the sustainable development/exploitation of natural resources within the watershed by managing the use of those land and water resources in a comprehensive manner

3.0 DEDUCTIONS

The overall goal of watershed management is to improve the quality of the soil, air, water resources (surface or groundwater) and other natural resources (bio-diversity)

- Any management that does not improve and promote clean and green environment should be discouraged.
- Any management that is not sustainable should be discouraged (Fishes today, Fishes tomorrow, clean Water today)

clean Water tomorrow, a clean Air today, clean Air tomorrow).

Our watershed management Action Plans should influence our land use and water management practices/activities

- Cattle Rearing along river banks should be discouraged.
- Emission of untreated sewage directly into our water body should be discouraged.
- Approval of Mining License for companies without ensuring an Active HSE Department should be discouraged.
- Direct discharge of waste into borrow pits without properly constructed sanitary blindfold should be discouraged.

Our Management effort should be Multi-stakeholder/ Multi-Disciplinary.

- Everybody is a Stakeholder when it comes to watershed management.

4.0 STRATEGIC ACTIONS FOR CONSIDERATION

1. Research should be initiated with a view to having a better understanding of our watershed. We should:
 - Know the boundaries of our watershed, sub-watershed and catchment areas.
 - Have a robust understanding of the resources (land and water) within our watershed.
 - Keep an inventory of pollution sources, both point and non-point outlets.

These pieces of information should be presented in digitized form and must be readily accessed by the public in the form of delineated watershed, land use and land cover, Erosion distribution, soil and mineral resources maps.

2. We should build consensus and establish sustainable networks that will yield positive results.

- These networks should be both local and international such as : land owners, Federal, State, Local Government and even communities, Professional Associations and Civil Societies, Agricultural uses, Recreation users to mention but a few.

3. Determine priorities for Action.

- Identify resources and wildlife habitat restoration.
- Identify and evaluate opportunities for flood/erosion protection efforts.
- Identify areas for open space acquisition, green ways planning and the establishment of vegetation buffers along wetlands areas.

Improving waste management, pollution prevention, and recycling efforts at urban facilities and business within the watershed.

4. A robust public enlightenment program should be maintained.

- The use of mass media, community based campaigns, road show, etc. are vital for this course

5.0 SUCCESSFUL CASE STUDIES:

About 58% of the World's food basket is serviced by the utilization of 80% agricultural land in watershed/Rain-fed farming zones (Raju et al, 2008). However, with the increase in population and scarce resources, inhabitants within watershed zones are living below societal expectations.

5.1 A case study of Kothapally Watershed in Andhra Pradesh, Southern India:

Pre Development Stage:

Despite the fact that most watershed regions constitutes about 60% of the total arable

land in India, they have been characterized with low productivity, income, employment and a high incidence of poverty.(Joshi et al.,2008)

Actions:

Watershed Development/Management started during the 1970s. It was sponsored and implemented by the Government between 1970s and 1980s with no major success. The straight jacket to-down approach accounted for its inability to yield desired results, but needed to be spiced with a mix of individual and community based interventions (Multi stakeholder/ Multidisciplinary approach).

Success:

When the recommendations were implemented and approach adopted, the following results were evidenced:

- Groundwater recharge increased from 7% to 32%.
- Outflow reduced from 37% to 9% of total rainfall.
- Crop yield increased from 200% to 500% within a season.
- Irrigation potential increased from 13% to 31% compared to pre-development stage.
- Average household income increased by 50% higher than adjoining areas where there were no such interventions.

The program significantly increased crop production, reduced poverty, increase employment generation, and become a site for learning to farmers, researchers and policy makers (Wami and Garg. 2009)

5.2 Burundi Watershed Management Case Study

This is a better success for consideration since it is within the Africa. It was sponsored by African Development Bank.

Specific Activities:

- Creation of 15,000 hectares state plantations to protect hillsides against erosion at the request of the inhabitants for a better management.
- Creation of 1,800 hectares of community woodlots
- Erosion control works (Contour bounds, erosion hedges, stone works, vegetated ditches, etc.) were built on slopes and farmlands threatened by erosions totaling 600,000 linear meters.

Success:

Promotion of income generation activities such as bee keeping, market gardening, and fruit growing. The project contributed 3,750 hectares of private plantation which met the local population forest product needs.

- 145 hectares hedgerows and sowing of 3,000 hectares multipurpose fodder species to improve 5,800 hectares natural pastures in the project area.
- Reduction of soil degradation along cattle tracks and improvement of soil fertility.

CONCLUSION

Integrated watershed development and planning remains an effective antidote to the variety of problems facing Nigerian Watershed. We strongly recommend the constitution of Integrated Watershed Development and Planning Committee by the Federal Government. The Committee should be charged with the responsibility of working out modalities to ensure effective watershed management in Nigeria.

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