**QUALITY ELEMENTS OF THE NATURALIA PROJECT**

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**ABSTRACT**

Naturalia project is an independent agency in ecology and engineering for all terrestrial and natural environment whose main aim is biodiversity assessment that plays an important role in the economy of a a society by majoring on several domains that includes linear transport infrastructure, renewable energy, natural resources, land use planning and urban ecology and renovation. For it's quality production purposes it applies the four quality elements ;quality planning, quality control, quality assurance and quality improvement that have been achieved via development of three operational units tha include the biodiversity assessment unit involving environmental DNA, environmental permitting, urban ecology and renovation, the earth work unit encompassing ecological engineering, ecological monitoring and environmental coordination and the research and development unit majoring on research. The biodiversity and assessment unit and earth work unit are meant to ensure quality planning, quality contol and quality assurance while the research and development unit majors on quality improvement.

Naturalia project is an independent agency in ecology and engineering for all terrestrial l and aquatic natural environment. It's main aim is biodiversity assessment. Biodiversity plays a role in providing economic, ecological, scientific, cultural and recreational services by providing raw materials required for medical, food, construction and other industries that add to national and local economy( Morton and Hill 2014: Neem et al 1999).This has helped the public and private sector with development plan that focuses on ;

a) renewable energy - it has allowed for efficient energy and nutrient recycling btn the ecosystem providing chemicals that have contributed to ecological services such as green house gas regulations, water purification, nitrogen fixation and plant pollution (Lanham et al 2007 and Neem et al 1999)

b)Land use planning - that has ensured purposeful land arrangements of land use in a balanced, equitable and ordefly manner by application of planning tools such as the smart growth principles tool that involves the following principles ;

i) Mix land uses to provide proximity of residential uses to amenities, jobs, and complimentary uses.

ii) Take advantage of compact, environmentally friendly, and energy efficient building design.

iii) Create a range of housing opportunities and choices.

iv) Create walkable neighborhoods.

v) Foster distinctive, attractive communities with a strong sense of place.

vi) Preserve open space, farmland, cultural resources and critical environmental areas.

vii) Strengthen and direct development toward existing communities and infrastructure.

viii) Provide a variety of transportation choices.

ix) Make development decisions predictable, fair, and cost-effective.

x) Encourage community and stakeholder collaboration.

Land planning has helped to;reducing pollution, providing clean air and water, ensuring flood prevention, maintaing and promoting safe routes for transportation, reducing noise and light pollution, promoting an ecologically-balanced environmen,. protecting endangered specie, re ducing disaster risk, minimizing hazards and protecting public health, maintaining and improving the fiscal health of the community, managing growth.

c) Natural resources - natural resources play an important role in production through production of raw materials. Naturalia project has been involved in guidance of exploitation of these natural resources to prevent consequences associated with it. This consequences includes ;

i) soil degradation that is associated with salinization slowing down crop production , acidification that affects microbe population, land ecosystem productivity and rate of nutrient cycling , low land quality and productivity, loss of biodiversity and desertification.

ii) climatic changes that is associated with change in species and population because as climate changes some adapt by changing their behavior. This may either lead to expansion, reduction or extinction of some populations. Climate change may also change ecosystems interactions and alter ecosystem services eg food supply associated with drought.

**BIODIVERSITY ASSESSMENT UNIT**

Biodiversity assessment has helped determine the richness, evenness, and heterogenicity of an organization area. This has protected and managed vulnerable habitats and wildlife by assesing their status of extinction risks and trends of species population necessary to evaluate efficiency of conservation policies and biodiversity management strategies that help in promoting sustainable development

Biodiversity assessment has been achieved by gathering ecologists in all taxonomic groups of terrestrial and aquatic compartments. Biodiversity assessment unit involves ;

**a) Environmental DNA**

It has offered insights into natural world that were previously unattainable allowing businesses to assess their impact on space they operate. It involves analyzing nuclear or mitochondrial DNA releaesd by organisms into the environment providing an effective way to assess biodiversity within an ecosystem without the need to capture the species. This data is important in business sectors eg construction understanding mitigating ecological impact. Ot has also provided businesses with accurate timely and cost effective means to measure their impact on biodiversity. This data has played a critical role in supply chain management and new product development. eDNA has also been used as a biomonitoring tool for market profit margins by providing depth assessment of various journeys partaing the market and its segments hence offering customer impression on product and service use. Although eDNA is a powerful tool it has also encountered some drawbacks that includes ;

a) expensive nature of interpreting it's data requiring experts.

b) presence of species DNA does not indicate it's current presence.

c) eDNA fades over time depending on the envy affecting accuracy of the results.

d) the analysis may be expensive making it unsuitable for small businesses with limited resources.

e) technological limitations in detecting low abundance species may result in incomplete assessment.

**b) Environmental permitting**

- the project has applied this method to approve and regulate business activities having potential effects on the environment. This tool has ensured that project aligns with environmental regulation and standards. It's significance has been dependent on the ability to balance between human development and natural resource preservation hence safeguarding, preventing harm to the ecosystem, wildlife and public health. Environmental permitting has been applied in different forms that includes ;

1.Air permits that controls and monitor air pollution from industrial emissions promoting sustainable environmental conditions.

2. Water permit that governs wayer usage, discharge and protection from pollution. It also addresses water waste management and water conservation mantaining quality of the ecosystem.

3. Hazard waste permit that covers generation, storage, transport, treatment and disposal of hazardous wastes

4.Land use permit regulating activities that impact land such as construction and changes in land use hence bringing about a balance between environmental conservation and economic development ensuring sustainable land practices.

**c) Urban ecology and urban renovation**

Urban ecology has played an important role in sustaining city design and management through several principles that include ;

1.Cities are ecosystem

2.Cities are spatially heterogenic

3.Cities are dynamic

4. Human and natural processes intact cities.

5. Ecological process are still at work and i important in cities

Urban renovation is an approach adopted by naturalia project with a n ability to merge vision and action to resolve mulfaceted problems to improve life quality through projects such as public parks, transport hubs and economic incentives to encourage businesses activity and energy efficiency. This approach is aimed to;

1. Unlocking potential of deprived areas.

2. Creating opportunities from deprived communities.

3.Making an area attractive to residents and investors.

4.Tackling barriers to growth and reducing low employment.

**EARTH WORK UNIT**

**a) Environmental monitoring**

Ecosystem are dynamic hence monitoring is an important practice of taking systemic, repeated measurements of environmental conditions as it provides long term data to answer specific questions concerning climate change and urbanization. This ensures that sensitive environment are protected, compliance with regulations and quality control measures taken into practice.

**b) Environmental coordination**

Naturalia project has environmental coordinators that implement environmental programs to the project.

**c) Ecological engineering**

Naturalia project has applied ecological engineering in integration of human act in natural environment. It has combined basic and applied science for restoration design and construction of ecosystems. It has enhance restoration of ecosystem substantially disturbed by human activities and developed new sustainable ecosystems having human and ecological value. This has been enhanced by principles that involve ecosystem conservation, conservation of non renewable resources, application of self design and building ecosystem as the acid test for ecological theories.

**RESEARCH AND DEVELOPMENT UNIT**

Naturalia project is involved in researches that involves biodiversity and ecology and research on methodologies on flora and fauna and ecological conservation. This researches have helped in understanding organism communities and optimizing resource allocation.

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