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## Maintenance of School Plant Landscaping in Secondary Schools in Arid Regions of Africa: Role of School Administrators

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### **Abstract:**

*A significant portion of the African landmass lies within the arid tropical region that is currently threatened with desert encroachment, drought and other climatic hazards. The planting and maintenance of trees, flowers and grasses especially in secondary school environments are very critical in sustaining a conducive teaching and learning environment. Inadequate water supply, lack of facilities and poor maintenance culture are among the challenges affecting landscaping in secondary schools in Africa. School administrators should carefully plan landscape maintenance operations, put in place relevant policies and seek the cooperation of all stakeholders to ensure effective maintenance of landscape operations in secondary schools in Africa.*

**Keywords:** School plant, landscaping, maintenance, arid regions, school administrators

### **1. Introduction**

Africa is a continent that is known for its wide variety of landscape, ranging from the Mangrove Forests, Tropical Rain Forests, Deciduous Forest, Guinea Savannah Grasslands, Sudan Savannah and Sahel Savannah as well as desert vegetation especially in the arid regions of the Sahara. Trees and grasses constitute a very important part of African environment, most especially as over 70% of Africans live in the rural areas that are predominantly agrarian. Over the years, the vegetation of Africa has suffered a lot of damage largely from human activities of indiscriminate bush burning, lumbering activities, road construction, farm clearing urbanization, use of firewood for domestic fuel, among others. This situation is complicated by global warming which has resulted in desert encroachment and severe draughts in many parts of Africa and the consequent loss of many species of plants in the African environment. This situation has necessitated the need for constant replanting of trees and flowers as an integral part of landscaping of the environment particularly in schools in arid regions of Africa. Countries such as Nigeria, Mauritania, Mali, Niger, Chad, Sudan, Algeria, Libya, Egypt and Ethiopia among others suffer from the effect of drought and desert encroachment. Thus, they have a critical need to focus on school plant landscaping for the improvement of the learning environment especially at the secondary school level.

This paper is based on the input- process-output theoretical model of school plant management and school effectiveness by Sani (2007:109), which views the planting of trees and flowers or landscaping as part of the physical inputs in a school. It views the maintenance of school plant landscaping as part of the process that will lead to the creation of a conducive physical environment as part of managerial output. When schools are constructed, a lot of natural vegetation is destroyed in order to create space for erection of school buildings, provision of playgrounds, and other school infrastructures. In most cases, little or no effort is made to re-plant trees and flowers in order to maintaining a desirable landscape that will create a beautiful and conducive environment for effective teaching and learning. Poor landscaping has exposed school buildings to climatic hazards of wind and rains. In the light of this situation therefore, this paper examines the importance of landscaping, types of maintenance activities required for proper landscaping, problems affecting maintenance of landscaping and recommends ways of improving the maintenance of landscaping in secondary schools in Africa.

### **2. Concept of Landscaping**

The concept of landscaping could be viewed in various perspectives depending on professional inclination. According to Turner (1998), the word landscaping is used to mean a good outdoor place, useful, beautiful, sustainable, productive and relating. Thales an early Greek philosopher known for his views that "all is water" spent considerable time thinking about the nature and scope of landscaping (Sharma & Thyland, 1994). He believed that in order for human activity to be considered landscaping, it must be directed towards modifying the physical features of the land itself, including the cultivation and manipulation of plants or other flora. This paper narrows down the concept of landscaping to focus on the systematic planting and maintenance of trees, flowers and grasses in a school environment.

### 3. Importance of Landscaping of Secondary Schools in Africa

One of the reasons for school plant landscaping is to beautify the school environment. For this reason, a school should not be seen without trees and beautiful flowers. Just as a woman should not be seen without make up. According to Lowe (1990), there is a significant and positive relationship between landscaping, the beauty of the school environment and student's academic performance. He found that secondary schools in Texas that were beautifully landscaped, attracted higher rates of school's attendance with corresponding better academic performance than those that were not beautifully landscaped. He maintained that the beauty of a school largely depends on the quality of landscaping.

In a reference study, Sani (2007) conducted a study on the interrelationship among building characteristics, plant layout, landscaping and student academic performance in Kebbi State Secondary Schools, Nigeria. He used a descriptive research design of the co-relational type conducted ex-post-factor. He used 26 secondary schools and 500 teachers as respondents. He used an observation inventory and a school plant construction, utilization maintenance and school effectiveness questionnaire and applied Pearson Correlation Co-efficient to test his hypothesis. He found that school plant landscaping was significantly, positively correlated to students' academic performance, students' conduct and school community relationship, with correlated value of .96, .98 and .97 at 0.5 level of significance respectively.

According to the International Society for Arboriculture. (I.S.A.) (2005), woody plants, most especially trees and shrubs are planted in cities, communities and schools to serve many purposes. Trees and flowers make the school environment more pleasant because apart from enjoying the shade of trees and admiring their beauty, students, teachers and the general public feel serene, peaceful, restful, a tranquil in a grove of trees. It was noted that hospital patients have been shown to recover from surgery more quietly when their hospital rooms offered a view of trees. In addition, there appears to be a strong tie between people and trees as is evident in the resistance of community residents to remove trees to widen the streets. Even though trees may be school property, their size often make them part of the community as well. According to Mahmud, (2013) school trees, shrubs and flowers often serve several architectural and engineering functions. They provide a solid and beautiful fence that protect the privacy of a school, emphasize attractive views and at the same time screen out objectionable views. Trees reduce the glare and reflection of the sun's rays. Flowers direct pedestrian traffic and colourfully enhance the architectural beauty of school buildings. In another perspective, Olaoti (2005) observed that by planting of trees and shrubs in the school environment we return to a more natural environment, whereby birds and other wildlife are attracted to the area. The natural cycles of plant growth, reproduction and decomposing are again present both above and below the ground. Thus, natural harmony is restored to the school environment. Kim (1996) listed the benefits of trees, flowers, shrubs and grasses in the community as a whole and the school environment in particular to include the following:

- **Temperature Control:** Trees reduce temperature by shading surfaces, dissipating heat through evaporation and controlling air movement for natural ventilation of school buildings. Temperatures in the vicinity of trees is cooler than away from trees and the larger the trees, the greater the cooling. Labman (1999) found that extreme temperature conditions which are far above 74°F or far below that level, significantly and negatively influence task performance and overall academic performance of students;
- **Shade:** Trees and shrubs provide shade in a school environment. In tropical Africa where there is abundant sunshine, the shade of trees in a school provides a comfortable atmosphere where students and teachers can come out, to rest and recreate in the afternoon;
- **Wind Shield:** Trees help to reduce 80% of wind speed. Trees can be planted to buffer wind away from school area. This is because both vertical and horizontal concentration of foliage can modify air movement patterns, by altering wind velocity and direction;
- **Air Quality:** Trees help to control air pollution in a school environment by acting as biological and physical nets which intercept particulate materials such as dust, ashes, pollen and mold spore, as well as desorbing gasses through uptake to inner leaf surfaces. Pollutants controlled by trees include nitrogen oxides, carbon monoxide, and ozone, among others;
- **Glare Reduction:** Trees help to control light intensity and modifies predominant wavelengths on a school environment. Trees block and reflect sunlight and artificial light to minimize eye strain and enhance visibility;
- **Food:** Trees, flowers, legumes and other plants provide fruits, vegetables and spices in the school environment. For example, fruits in Africa include mangoes, oranges, guava, bananas, cashew, coconut, etc.;
- **Medical Purpose:** Plants are used to manufacture drugs, syrups, antiseptics, oils, mouth wash, teas, dyes, and pesticides; and
- **Soil Protection:** The intricate roots of trees, carpet grass, flowers and creeping plants bind the soil particles together and provide resistance to soil erosion from wind and running water.
- **Perfumes:** Leaves and bark of trees provide raw materials for the manufacture of scents which are commercialized to generate income. Scents are also needed to eliminate body odour as they can be sprayed on clothes and also used as room fresheners.
- **Beauty:** Trees, flowers, shrubs and carpet grass make the school environment more beautiful, attractive, colourful and peaceful.

Based on the numerous advantages of landscaping examined, it is imperative for school administrators to re-focus on landscaping as a crucial strategy for improving the quality of the school environment in secondary schools in Africa.

#### 4. Planning of Landscape Maintenance Operations in Secondary Schools in Africa

Activities for landscaping involve many experts and professionals such as town planners, designers, architects, engineers, artists, cartographers, farmers, labourers etc. Maintenance of school plant landscaping requires careful planning and sustained efforts by secondary school administrators in Africa. In a school, there should be landscapes where children can work in safety, pick fruits, cycle, listen to birds and enjoy cool shade. When constructing a school, landscaping should serve to conserve the natural vegetation and remake the countryside (Lackney, 1994). Listed basic maintenance operations for effective landscaping in secondary schools in Africa include the following:

- School Heads must evolve a clear policy that deliberately makes regular planting maintenance of trees, flowers, and other fauna in their school a top priority. Policy making on school landscaping should be a collective and democratic process that emphasizes participatory decision making;
- For effective landscaping a careful study of the environment in which a school is located should be conducted. The climatic and soil conditions of the school environment should be determined so as to ascertain the types of plants that can best survive in the area. The type of natural vegetation prevalent in the area should also be studied so as to determine the variety of trees, shrubs, grasses and flowers that exist in the environment;
- In constructing new schools, the site plan and building specification should make adequate provision for conservation of the natural vegetation and blending it with the buildings and infrastructures in such a way that each building, ground and space should contribute to the overall urban or rural landscaping;
- The entire school environment should be mapped so as to pinpoint where trees, shrubs, flowers and grasses should be planted for optimum beauty, comfort and convenience of facilities. School mapping is necessary in order to ensure that variety of trees and flowers are planted in an orderly way at entrances, walkways and in strategic places in school environment. This will make it possible for landscaping to project a positive image of the school as a public facility that symbolizes the community's heritage;
- Funds need to be generated to finance landscaping expenses. Money is needed to purchase seedlings and flowers, transport plants to the school, and pay for the services of florists, labourers and other experts involved in landscaping activities. An adequate budget must be made to also purchase the necessary tools needed for planting, weeding, trimming, transplanting, watering and other maintenance operations. Also, protective devices such as wire nets, nails and baskets need to be budgeted. There is also the need to purchase seedlings, plants, working tools such as hoes, cutlasses, diggers, wheel barrows, rakes, clippers, forks, water storage tanks, watering cans, buckets and fertilizers. There is also the need for construction of wells or boreholes, connecting the school with community pipe-borne water supply or purchase of water tankers for fetching water;
- A team of experts and labourers must be hired to handle various aspects of land preparation, planting of seeds, transplanting, fixing of protective fences, weeding, watering, pruning and trimming among others.
- A duty roster for daily execution of maintenance operations must be drawn. A school plant landscaping committee should be appointed for regular inspection or supervision maintenance operations. Problems affecting the maintenance of landscaping are noted, reported and prompt action taken by the school administrator to address them; and
- Periodic evaluation of landscape maintenance operations is required in order to determine areas that need improvement and possible innovations that might be required;

#### 5. Problems of Maintaining Satisfactory Landscaping in Secondary Schools in Africa

Maintenance of flowers, shrubs and grasses is not an easy task in the dry zones of Africa. Among the challenges faced by school administrators in sustaining plants in secondary schools were identified by Alaoti, (2005), Kim (1996) and Lowe (1990) to include the following:

- Inadequate Water Supply: Many countries in Africa especially those in the Savannahs and deserts have the perpetual problem of water shortages. The problem is more acute in the dry season when most plants shed their leaves and many flowers dry up and die. Due to poor level of infrastructural development, many secondary schools in Africa do not have functional pipe borne water supply. Some schools depend on wells and boreholes which some time dry up in the dry season when the water table goes lower. Most schools do not have functional water tankers or vehicles to fetch water from streams and dams to the schools. Without adequate water supply it is extremely difficult to maintain plants in arid zones (Alaoti, 2005)
- The Cost of Landscaping Facilities: The digging of boreholes, purchase of vehicles, water storage tanks, water pumping machines, pipes and other essential equipment connected with landscaping options are too expensive for schools to afford. Poor budgeting allocation to education from the government coupled with meager funds generated by schools from other sources. all affect the amount of funds that can be channeled to maintenance of landscaping in schools (Kim, 1996)
- Lack of Administrative Will: Most school administrators do not make maintenance of landscaping their priority. Apart from lack of interest in landscaping they are mostly discouraged by the problem of getting steady water supply for the plants. Their efforts are also crippled by lack of funds to execute maintenance operations to sustain the plants. Many schools' administrators also lack maintenance culture;
- Pests and diseases: Schools in Africa have to battle constantly with pests and animals such as goats, sheep, cattle that eat up the plants especially in dry season when there are no green grasses for grazing. Some plants and flowers are also destroyed by pests and diseases. Many schools do not have sprays and insecticides to combat plant

diseases. In some cases, they do not have funds to provide wire netting to fence and protect the plants. In addition, many school heads do not liaise with agricultural experts to combat the menace of pests and disease Lowe (1990)

- Lack of landscaping policy: Many secondary schools in Africa do not have a clear landscaping policy that makes it compulsory for schools to emphasize the maintenance of landscaping was part of their administrative responsibility. Many school head do not other to generate and enforce internal policies on landscaping to sustain the execution of maintenance option in schools Lackney, (1999)
- Negligence of duty: Some labourers assigned with the responsibility of planting, watering and trimming of plants do not perform their duties correctly and regularly. Sometimes where landscaping committee exists, members do not pay serious attention to inspect or supervise the activities of staff in charge of maintenance. In some cases, the heads of schools do not sanction and punish those found wanting in the discharge of their responsibility with regards to maintenance of school landscaping operations; and
- Lack of aesthetic value: Many school administrators tend to lack aesthetic value or love for beauty. In addition, they tried to have little or no appreciation of the immense value of trees and flowers in the school environment. Thus, even when favourable opportunities for maintenance of school landscaping exist, they are deliberately ignored. (Sharma & Thyland, 2004)

## 6. Role of School Administrators in Landscape Maintenance

School administrators in secondary school in Africa have an important role to play in the maintenance of school plant landscaping. According to Manga (2015) these includes

- Planning: They device on what maintenance activities are to be carried out in their schools to ensure that landscaping in their schools remain in good condition.
- Assignment of responsibilities: They assign staff duties to determine who is to be held responsible for carrying out specific tasks for the maintenance of landscaping in the school.
- Developing work schedules: They determine when each maintenance activities is to be carried out and the regularity with which the activity is to be sustained.
- Set standards: They set standards of maintenance activities that are expected to be carried out to ensure that school plant landscaping is of the highest quality.
- Supervision: They supervise staff and student to ensure that they participate actively in conducting maintenance activities that help to keep trees and flowers in good condition.
- Coordination: They coordinate all the maintenance activities to ensure that the goals and objectives of landscaping are attained.
- Tools provision: They provide tools and finances required for the smooth operation of landscape maintenance activities in their schools.
- Evaluation: They evaluate and access the quality of maintenance activities so as to determine the progress and challenges for further improvement of landscaping situation in schools.

## 7. Recommendations

Based on the problems raised in this paper, the following recommendations are provided as necessary strategies for improving landscape maintenance in secondary schools in Africa:

- School administrators should seize the opportunity to make optimum use of rain water during the rainy season to plant their trees and flowers. The Ministries of Education and other relevant authorities should locate schools where there is source of water supply within or near the school. The school heads should optimally utilize all sources of water supply such as Wells, boreholes, streams, dams and other sources during the dry season so as to keep the plants alive.
- Governments should emphasize the provision of adequate water supply facilities and infrastructure in schools. Each school should not only be connected with pipe- borne water supply, but should also be provided with wells, boreholes, vehicles and water storage tanks. In addition, landscaping equipment and working tools should be supplied to schools. In addition to government efforts, all stakeholder and philanthropic organizations should also contribute to complement government efforts at funding landscaping operations in schools.
- Maintenance culture should be emphasized in schools. This will help to strengthen administrative will and interest towards ensuring high quality landscaping in schools.
- School administrators should solicit the support and cooperation of Agricultural Extension Officers and other experts to combat the menace of pests and diseases that destroy plants in the school environment. Adequate provisions should be made to store insecticides and provide wire netting to protect flowers in the school.
- The Federal and State Ministries of Education should come up with policies that will make it mandatory for all schools to emphasize landscape maintenance operations. School administrators should generate policies that will constantly mobilize staff to take an active part in maintaining school plant landscaping activities.
- Any staff that is negligent of his duty in the discharge landscape maintenance operation should be penalized accordingly. At the same time diligent staff should be commended and rewarded by the school administrators.
- Aesthetic value and appreciation of the value of planting trees and flowers should be inculcated to staff and students through intensive enlightenment programmes. To this end, regular seminars and workshops specifically on landscaping should be organized to enlighten all stakeholders on the need for collective responsibility in maintaining landscaping operations in secondary schools in Africa.

## 8. Conclusion

Secondary schools in the dry zones of Africa are threatened with climatic hazards. School plant landscaping should be seen as a necessary strategy to improve the quality of the school environment for effective teaching and learning. In addition, all stakeholders should be enlightened and mobilized to ensure the sustenance of landscaping maintenance operation in secondary schools for the development of a child friendly environment for the present and future generations.

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