

ABRIDGE REPORT OF WASTE TO WEALTH PROJECT AT ADO EKITI

By

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Introduction

In line with the quest to address environmental management-related issues, the National Environmental Standards and Regulations Enforcement Agency (NESREA) formulated and gazetted various sectoral regulations, one of which is the *Environmental Sanitation and Waste Control Regulation, 2009*. In order to operationalize these Regulations, the Agency selected Ado Ekiti in Ekiti State, Southwest Nigeria to carry out Demonstration Waste Control Pilot Project on waste control. The initiation of this project was aimed at showcasing the possibility of achieving a zero waste disposal and waste to wealth concept. In order to achieve the objectives of the project, the project was outsourced to NESREA accredited consultant (**DOTECON Nigeria Limited**). Our Company is an environmental consultancy firm that is accredited by all regulators in both the environmental and Oil and Gas business and also has the capacity to offer consultancy services in training and technology as well as Health and Safety, Environmental Studies and Waste Management.

Project Concept

The concept of this project is based on the following;

- Reduction of waste generation and segregation of waste at source
- Zero waste discharge or disposal therefore achieving cleaner environment
- Creating wealth from waste and creating self employment job opportunities
- Poverty alleviation (by providing food and revenue)

Project Area Description

The project was executed at the Ado Ekiti GRA and Erifun Compost Center, Ado Ekiti, Ekiti State, Southwest Nigeria. It was carried out in collaboration with Ekiti State Waste Management Board and Ekiti State Ministry of Works and Housing.

Project Resources

Both skilled and unskilled manpower resources were employed. The unskilled resources involved in waste collection and segregation at various receptacles including the Composting Stage whereas the skilled human resources were employed for both awareness and skill acquisition training in the course of the project.

Enlightenment, Awareness and Training

The enlightenment involved development of training strategy, procurement of sensitization materials such as posters, bill boards and media advertisement. Awareness on the need/importance of the project as well as the benefits was disclosed using professional consultants. The training was conducted for the public for general awareness and for the waste handlers for specific skill acquisition in both wastes segregation, reduction, reuse and recycle as well as compost production. Aggressive house to house sensitization was done during bin distribution. The trainees were equipped with personal protective equipments (PPEs) as well as training manual for the operations. Hand bills, material translation, coloured coded bins, bill boards, PPEs, training package and materials etc. were used to facilitate the training, awareness and enlightenment in the pilot project geographical areas.

THE COMPOSTING TECHNIQUE AND PROCESS

The biodegradation was carried out by micro and macro organisms. The organisms which play a stabilizing role during manure maturity were naturally occurring bacteria and fungi which are present in the soil and air. The technique used was a modified thermo aeration biodegradation process which was carried out under greenhouse conditions to avoid unnecessary interference with climatic factors. The organic waste consisted of both green and brown wastes mixed at DOTECON's ratio to achieve the carbon nitrogen ratio using DOTECON catalyst to enhance and facilitated microbial degradation of the organic waste during compost production. The process involved the following stages:

Stage 1. Mesophilic Stage (7-14 days)(DOTECON's Days 1-4)

- Microorganisms; Temp <40 °C; Low pH:

Stage 2. Thermophilic Stage (14-42 days)(5-11)

- Spore forming bacteria & fungi.
- Temp between 40 °C to 60 °C : > 60 °C - Actinomycetes

Stage 3. Cooling down Stage (28-96 days)(12-17)

- Bacteria and fungi again; between 60 °C to 37 °C

Stage 4. Maturation Stage (60- 180 days)(18-22°C)

- Normal atmospheric temperature.
- Residual organic matter converted to Humus.

The following strategies were employed during the composting process:

- Collection and concentrate of waste materials
- Transportation of wastes to composting site
- Segregation of the wastes
- Weighing of organic wastes
- Layering of organic waste materials
- Aerating/watering/turning
- Temperature reading
- Air drying
- Sieving
- Weighing/bagging/sealing

Project Deliverables

DOTECON Nigeria Limited deliverables included and were not limited to;

- Aggressive propagation and enlightenment campaign on the 3 Rs, reduce (recover), recycle and reuse.
- Effective capacity development in waste segregation at source through waste color coded bins distribution
- Construction of compost plant and equipping of compost plant
- The management of compost production (2 ton capacity) for a month before handover
- Development of skills and composting technology transfer to nominated waste handlers (trainees)
- Packaging and labeling of produced compost
- Provision of PPE s and incentives for the waste management trainees
- Preparing IEC Materials for capacity building and awareness campaign
- Production, packaging and demonstration of efficacy of the produced compost
- Preparation of final report including photos and films documented during the project

Conclusion

Obviously, several methods of composting exist; the Indore method (thermo-aerobic technology) which shown a positive result in terms of cost, time, quality and quantity was modified and employed. Although the technology is simple and can be easily replicated with minimal cost and in turn, turning waste to cash while making the environment cleaner. The initiative of NESREA to ensure a cleaner and healthier environment by turning house hold organic wastes to compost, awarding the execution to competent consultants, involving the state government, training young men and women, encouraging house owners/occupants to segregate wastes at source and eventually selling compost to farmers to improve farm yield is laudable and DOTECON Nigeria Limited has shown that it is realizable as it has demonstrated as confirmed and commissioned by the Honourable Minister of Environment. DOTECON Nigeria Limited achieved a turnover of this technology in one third of the planned normal turnover time.

PICTORAL PRESENTATION



Indiscriminate waste dumping on unapproved dumpsites



Initial blocks layering



DOTECON's consultant with a house owner (GRA)



Storage area of the 750 color coded bins in NESREA office



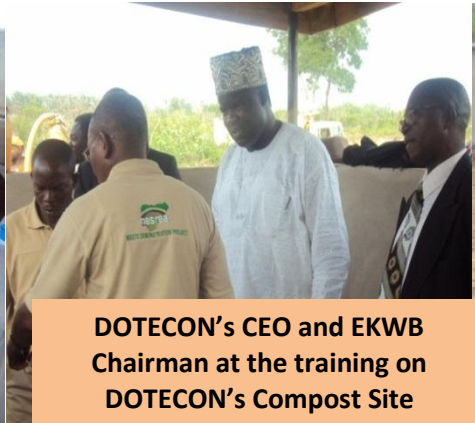
Vegetable waste mixing with chopping



Layering and seeding of wastes in cells



Regular turning of wastes to redistribute heat and enhance Aeration



DOTECON's CEO and EKWB Chairman at the training on DOTECON's Compost Site



Spreading to hasten drying



A consultant sealing compost bags



DOTECON staff ensuring proper arrangement of the compost



Commissioning of DOTECON's Project Site by the Hon. Minister