

Land Use and Waste Sector: Land Dedicated to Bioenergy

Nigeria has a reserve of 11 million hectares of forest and woodland, over 340 million assorted animals in 2015 and 28.2 million hectares of arable land, which is approximately equal to 30% of the total land. All these produce in excess of 1.2 million tonnes of biomass per day. Moreover, bio-energy reserves/potential of Nigeria stood at 13 million hectares of fuel wood, 61 million tonnes per year of animal waste, and 83 million tonnes of crop residues.

Energy Crops and Crop Residues

In Nigeria, energy crops that have potential as feedstocks for biofuel production include sugarcane, sweet sorghum, maize and cassava for ethanol, and oil palm, coconut, cotton, sunflower, soy bean and Jatropha for biodiesel. Residues from these crops are as well potential feedstock that could be used to generate bio-energy. Crop residues in Nigeria include straws, leaves and stalk of cereals such as rice, maize/corn, sorghum, and millet, cassava stalk/peelings and cocoa pods, etc.

Animal Manure

Adopting intensive farm practice, animal manure can be effectively collected for energy generation through a more easy to collect and store slurry.

Forest Resources

About 42 t of sawdust is generated every year from 100 t of timber produced with an average of about 4.39 × 106 m3 of log split and plywood processed annually in Nigeria. The potential for sawdust generated can therefore be estimated at 1.8 million tonnes annually. In addition, the most widely available form of forest resources in Nigeria is fuel wood which has an energy content of 6 billion MJ; with only 5–12% of this energy harnessed

Key Interactions

Available energy crops in Nigeria are mainly produced for food consumption and may be in serious competition with those cultivated solely for energy production due to increasing population. Moreover, residues from these crops could be used as feedstock to generate energy. In addition, food wastages can be reduced to ensure food security. The land area needed for livestock and food crops can be reduced using the Farming Yield & Efficiency lever, so as to free it up for forestry and bioenergy. Thus, the total amount of biomass produced in Nigeria is dependent on the amount of land used for growing bioenergy, the crop residue collection system in place and the agricultural yield controlled by the Farming Yield & Efficiency lever.

Level 1

Land dedicated to Arable and Grass land remain the same as at 2015. 37.3% of the total land mass will be dedicated to arable land used for food crops, first and second generation's energy crops. While 33.2% of the total land mass is dedicated as grass land used for second generation energy crops and livestock.. Reforestation of the rain forest zones to improve degraded forestland.

Level 2

This trajectory assumes an increase in the arable land to 40%, with food crop having 20%, first and second generation's energy crops having 10% each. Percentage of land dedicated to grass land will increase by 5%.There is increase in crop residues. Afforestation has reduced the desert land area from 35% in the base year (2015) to 25% of the total mass land area by 2050.

Level 3

This trajectory assumes a further increase in arable land to 45% with food crops, first and second generation's energy crops contributing 19%, 13% and 13% respectively. And a further 5% increase in grassland.

More aggressive afforestation exercise has further reduced the desert land area to 18%..There is upper limit increase in crop residue used for energy

Level 4

This is same as level 3 above except that there is more intensive livestock farm practice and the manure is collected and mostly is used for energy.

Sub Lever	Units	2015	Level 1	Level 2	Level 3	Level 4
Arable Land - Bioenergy	Million hactre	3.4	3.4	7.4	10.8	10.8
Share collected for energy						
Leaves/stalk/peeling/Straw	share	0.19	0.38	0.5	1	1
Manure	share	0.03	0.1	0.3	0.45	0.68

