The Carbon Footprint of Rice Harvesting from Foulis to Seafield Village in Guyana

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The challenge with increasing food production is that it can generate environmental concerns such as high energy impacts and greenhouse gas emissions. Environmental impacts of rice *(Oryza sativa)* production over the years have not received much attention from researchers in Guyana. Biodiesel development is an important field of research because of increasing fuel prices and its potential environmental rewards. This study investigated fuel consumption and the resulting carbon dioxide (CO_2) emissions for one harvesting cycle at rice farms from Foulis to Seafield Village, Mahaica-Berbice (Region V), Guyana. Twenty (20) questionnaires comprising twenty-one (21) questions were developed to evaluate the fuel consumption rate of rice farms from their mechanical processes in the rice industry. The research also assessed farmers' knowledge and awareness of biodiesel, while seeking their opinion on biofuel. The mean total fuel consumption from the entire land preparation and harvesting was 4.35 gal/ac (SD = 5.95), with corresponding total CO_2 emissions of 96.71 lbs/ac. The highest fuel consumption and carbon emissions recorded was from harvesting at 1.45 gals/ac and 32.19 lbs/ac, respectively. Ploughing consumed 1.20 gal/ac and CO_2 rates of 26.7 lbs/ac, followed by chipping with 1.11 gal/ac and 24.62 lbs/ac. The farming activity that recorded the lowest fuel consumption and CO_2 emissions was from dragging at 0.59 gals/ac and 13.18 lbs/ac, respectively. The study showed that 43.8% of farmers were aware of biodiesel, and 68.8% of rice farmers would consider using biofuel as an alternate fuel source given its effectiveness. Farmers indicated that biodiesel could be implemented in the rice farming industry with the support of the government. More studies are needed for the reduction of GHG emissions, and implementation of biodiesel programs is necessary to promote renewable energy in the rice industry.

Keywords: Rice, Fuel consumption, Carbon dioxide, Biodiesel