Journal of Applied Knowledge and Research (JAKR) DOI 10.5281/zenodo.10503400

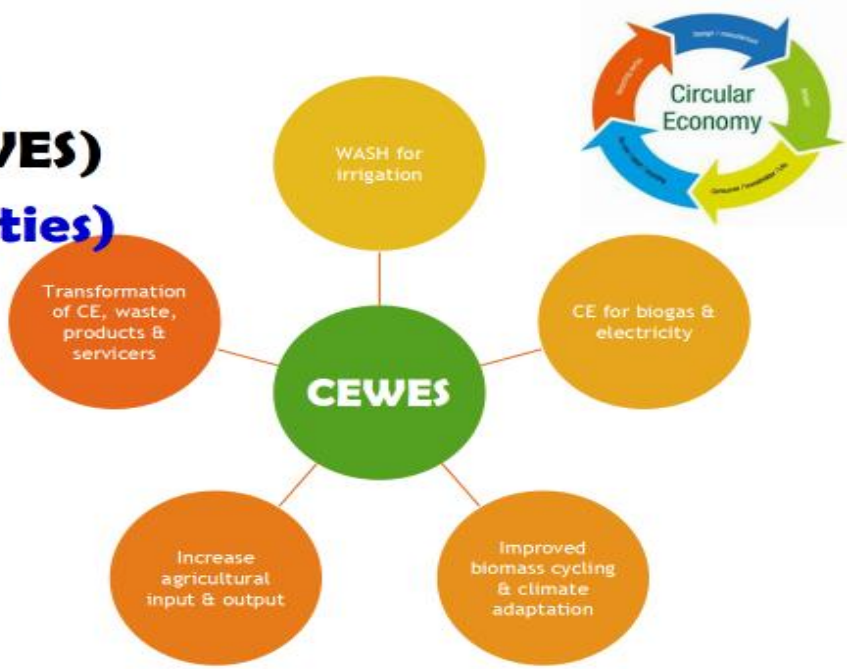
https://qdigisol.wixsite.com/jakrghanacu/services-9 ISSN: 2961-0206 PRINT & 2961-0214 ONLINE

Circular Economy, Water and Environmental Sustainability (CEWES)

(Target market-schools & communities)

Rev. George Kwasi Agbenyegah
Ghana Christian University College, Ghana
gagbenyegah@ghanacu.edu.gh&fogeorgeg oodteam@gmail.com

Dr. Kofi Ampomah-Benefo
University of Ghana, Ghana
kabenefo@gmail.com



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Company Profile :

Circular Economy, Water and Environmental Sustainability (CEWES) is a Research Consultancy established in 2023 under Research and Publication Department of Ghana Christian University College It provides training and construction of renewable energy technology systems such as biogas system, solar PV systems amongst others by using Circular Economy (CE) processes and approaches. CE is defined as "an industrial economy that is restorative by intention and design "(MacArthur, 2015) . CE serves as driving waste management market with proactive government and private measures to decrease dumping, adopt sustainable waste and practice of 5 Rs (Refuse, Reduce, Reuse, Rot, and Recycle) for service delivery and revenue generation.

CE approach aims at mitigating of climate change and calls for actions to transform the dominant linear economy (LE) economic system currently in Ghana that encourages massive consumption and environmental pollution thereby leading to socio - economic un sustainability (Dahmen, 1950; Costanza, et al. 1997; Daly, 1991) .

Our research interest are, but not limited to: Renewable energy (biomass) research that promotes low carbon development technologies as climate change mitigation action using locally available resources

Company Profile (Cont'd) . Area of expertise and scope of engagements:

- Design, construction & analysis of low carbon systems as alternative technologies & climate change mitigation actions
- Transition to carbon neutrality through power supply from renewable energy sources
- Wastewater treatment systems for domestic households and institutions
- Biogas industry promotion and management for developing countries
- Environmental assessments: sites and impact
- Private sector capacity building on renewable energy and climate change strategies
- Design optimization and testing of efficiencies of biogas systems and biomass cookstoves
- Landfill gas management systems
- Calibration of scientific equipment

Problem-Innovation fit: Insights driving the innovation

- Ghana's domestic solid waste is estimated 12,710 tons daily (organic matter = 61%, plastics = 14%, others = 25%)
- Only 10% collected and processed
- **The challenge:** Limited infrastructure and resources
- **The opportunity**: 25 CE SMEs recycle 320 tons at the value of EUR 44,100 daily and pays EUR 1.15 million to waste collectors
- We seek to apply circular economy-KEEPING MATERIALS IN USE FOR LONGER CYCLES through RO-R9 through limiting environmental impact and waste of resources through creating jobs at all stages

Ten Strategies

RO-Refuse
R1-Rethink
R2-Reduce
R3-Reuse
R4-Repair
R5-Refurbish
R6-Remanufacture
R7-Repurpose
R8-Recycle
R9-Recover

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CIRCULAR ECONOMY OPPORTUNITIES IN GHANA

Waste & CE in Ghana, 2016

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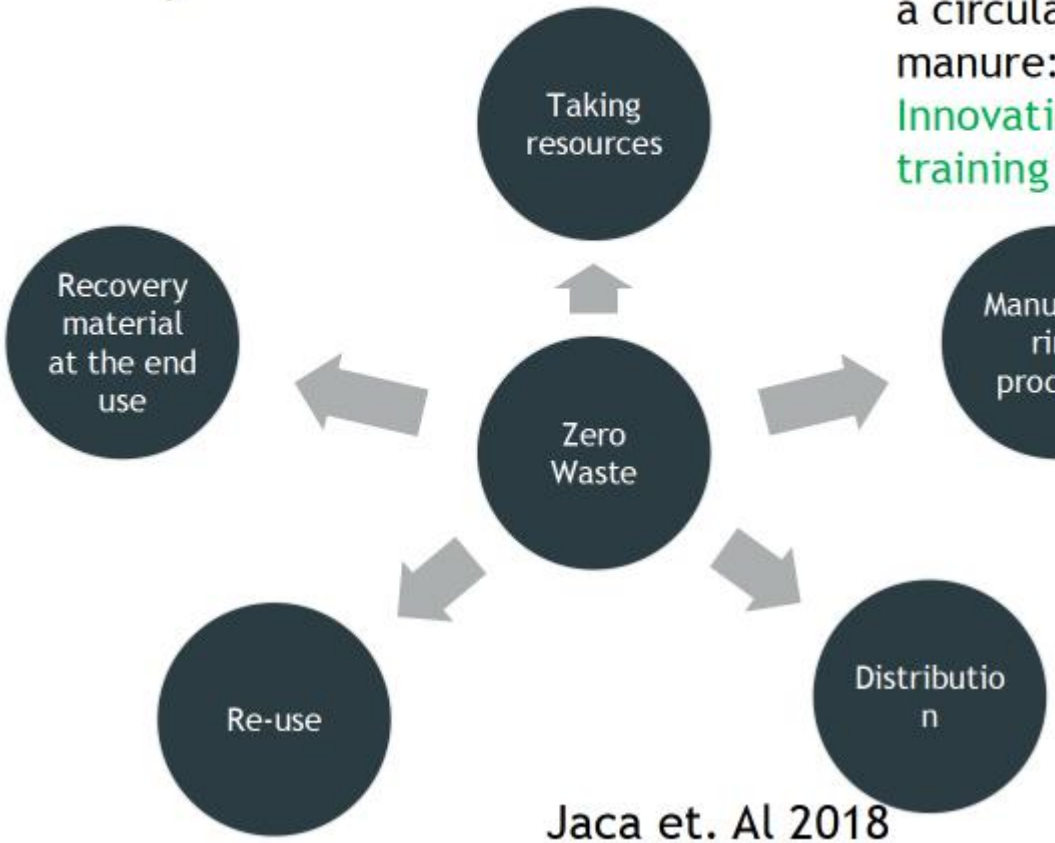
How the innovation works. IP (would register it as utility model)

A process which brings hydrocarbon waste into a circular economy into biogas, fuels, light and manure: WASTE-ENERGY-WATER-AGRIC NEXUS

Innovation projects done for schools and training of over 200 CE waste entrepreneurs



Jaca et. Al 2018

Marketing strategies

Website, emails, brochure, newsletter, FB, WhatsApp, webinars, workshops, customer data profiling, automated messaging, rewards & incentives, In-person visits, community, durbar & gatherings, PHAST-community driven approach

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Revenue generation & cost structure

- Sale of RE (biogas-cooking & cars, power-light & cars), manure & irrigation for agric.
- Sales of waste & sanitation equipment
- Grants & incentives
- Carbon credit
- Maintenance fee
- Consulting services
- Subscription of training of artisans & CE-waste entrepreneurs

TOTAL COST=USD100,000

Operational Costs USD 84,000

- Internal planning & resource allocation USD1,200
- Marketing & Sales: Online (website, webinar, FB) & Offline (brochures, fairs) cost USD14,000
- Software (acquisition, subscription, data storage & retrieval) USD1,800
- Communication , Utilities, Rent, Office Supplies & Regulatory fees USD5,000
- Capacity Development on CE Technologies cos USD28,000
- Professional fees USD3,500
- Accommodation , Travel & other Logistical costs USD9,000
- Product & Network Development to connect trainees directly with their clients USD5,000
- Report Generation & Dissemination expenses USD10,000
- Repair & Maintenance USD1,000
- Employee costs (salaries, wages & compensations) USD5,500

Research & Development USD 16,000

- Market Research: Competitors Intelligent Analysis & Desk Review USD4,300
- Lab Tests and Collaborative Studies USD2,500
- Monitoring, Evaluation & Learning USD7,200
- Facility Management fees USD2,000

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The Product

Design A produces 0.16 to 0.24 cubic meter of biogas daily

Design B produces 0.3 to 0.4 cubic meter of biogas daily

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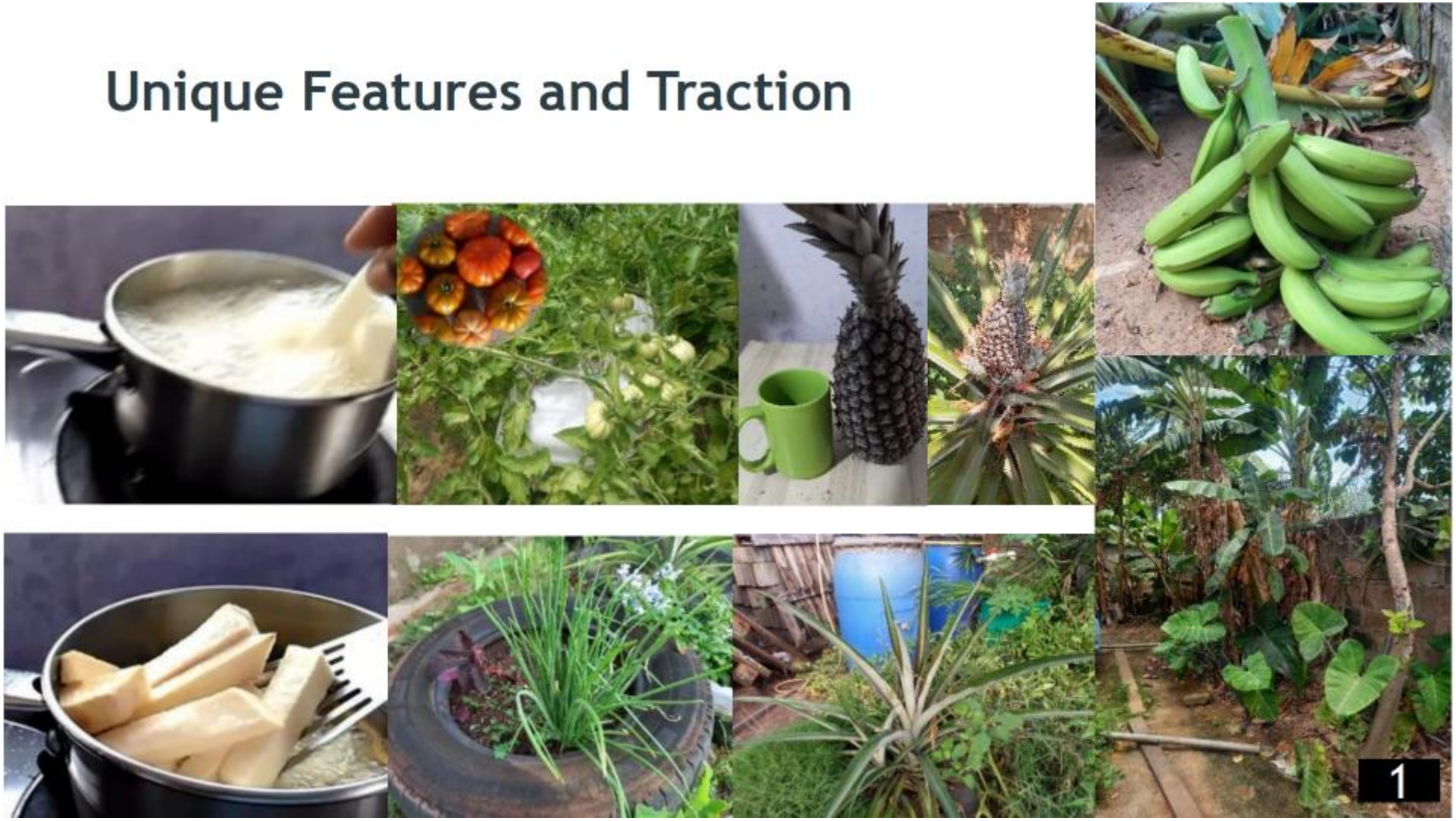

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Sustainability Drivers: Social, environmental, job creation (specialist/general) as aligned with SDGs

Environmental

- Transitioning from linear to circular economy by conversion through creating smaller circular steps closer to higher resource recovery rate (10% to 80% recovery) i.e.. non fossil fuel feedstock as resource encourages creation of jobs
- CE leads to redesigning of waste manufacturing processes that enhance products longevity, reusability and waste prevention thereby contributing to massive job creation
- Adopting physical and regulatory measures to support CE business technologies deployed.

Social

- Avoidance of environmental pollution, conservation and efficiency initiates leading to reduce energy consumption creates jobs additional incomes for poverty reduction
- Production of hazardous wastes should be regulated to create clean environment
- SDGs :Goal 1 (Poverty reduction), 2(Ending of hunger) 3 (Ensure healthy lives) 6 (Water and Sanitation), 7 (Modern energy), 8 (Productive employment), 9 (Resilient Infrastructure) and 13 (Combatting of climate change).

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