



TM

**GEODYN**  
SOLUTIONS

# **NATIONAL CIRCULAR BIOFERTILIZER, ORGANIC WASTE-TO-FLUFF & SEED ENHANCEMENT MEGAFACTORY**

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# EXECUTIVE SUMMARY

The Resort has the opportunity to become a Caribbean leader in regenerative luxury hospitality by converting existing and incoming organic waste streams — including beached sargassum seaweed, landscaping biomass, food scraps, and agricultural residues — into high-value agricultural and renewable energy products.

The Geodyn 15 Ton-Per-Hour Circular Sustainability System transforms:

<b>INCOMING MATERIAL</b>	<b>CONVERTED OUTPUT</b>
<i>Food &amp; kitchen waste</i>	Bio-NPK granulated fertilizer
<i>Landscaping &amp; agricultural biomass</i>	Organic fertilizer pellets & carbon soil amendment fluff
<i>Sargassum seaweed from beach cleanup</i>	Nutrient-rich fertilizer input + extract concentrates
<i>Wood, husk, and fiber residues</i>	Biomass energy pellets for boilers and heat systems
<i>Third-party regional organic intake</i>	Recurring revenue via tipping fees

The system operates using non-combustive indirect radiant sterilization, delivering:

- Zero smoke
- Zero odor
- Zero flame
- Zero harmful airborne emissions

Outputs are clean, stable, pathogen-free, and market-ready in under 30 minutes.

This initiative turns waste from a cost center into a multi-stream revenue engine while elevating The Resort's identity as a wellness-forward, ocean-stewardship luxury destination.

# STRATEGIC VALUE TO THE RESORT

<b>STRATEGIC AREA</b>	<b>BENEFIT</b>
Environmental Performance	Removes methane-producing landfill organics & reduces beach sargassum pollution
Ocean & Coastal Stewardship	Active sargassum remediation improves water quality & visitor beach experience
Brand & Guest Experience	Reinforces luxury-wellness positioning with measurable sustainability leadership
Financial Strength	Generates recurring revenue via fertilizer sales + biomass pellet fuel + tipping fees
Operational Efficiency	Reduces waste hauling, landfill fees, and external fertilizer purchases
ESG & Government Alignment	Supports national sargassum mitigation policies & climate resilience goals
Farmer Demonstration Fields	Scalable



# SYSTEM CAPACITY & PERFORMANCE

PARAMETER	SPECIFICATION
Input Material Capacity	300 tons/day organic & biomass feedstock
Output Product Capacity	150 tons/day fertilizer & energy pellets
Processing Time	Continuous < 30 minutes
Pathogen Elimination	100% sterilization via indirect radiant heat
Water Circularity	Clean water reclaimed for irrigation & landscaping
Contamination Safety	Sorting line includes metal detector & magnetic separation
Sargassum Handling	Salt-wash + nutrient stabilization pre-conditioning included



# EXPANDED OUTPUTS

## 1. BIO-NPK GRANULATED FERTILIZER (PRIMARY REVENUE PRODUCT)

COMPONENT	BLEND RANGE	FUNCTION
<i>Organic Carbon Fluff</i>	35–60%	Moisture retention + soil carbon
<i>Urea</i>	8–22%	Immediate nitrogen availability
<i>DAP</i>	10–28%	Phosphorus + pellet structural integrity
<i>Trace Minerals / Humates</i>	1–4%	Nutrient efficiency & plant metabolism
<i>Optional Bacillus spp.</i>	0.1–0.5%	Soil microbiome regeneration

*Format: 3–6 mm granules — storage stable, spreader-ready  
Market Value: \$500/metric ton (baseline wholesale)*

## 2. ORGANIC FERTILIZER PELLETS

*Used in local agriculture, resort landscaping, golf courses, and reforestation projects.*

## 3. SARGASSUM-DERIVED AGRICULTURAL ADDITIVES

*High in potassium, auxin-like plant growth regulators, and marine micronutrients.*

## 4. BIOMASS ENERGY PELLETS FOR BOILERS / INDUSTRIAL HEAT

**Inputs:** *coconut husk, palm fiber, dried sargassum, wood chips, sawdust*

**Usage:** *kitchens, laundry, district hot water heat loops, resort boilers*

**Replaces diesel or LPG fuel consumption**

**Energy Value:** *14–19 MJ/kg*

**Carbon Output:** *Near-carbon-neutral closed cycle*

# EQUIPMENT SCOPE



## **Waste & Sargassum Pre-Processing**

- Feed conveyors
- Trommel separator screen
- Salinity wash + moisture reduction step for seaweed
- Air-knife lightweight material separator
- Magnetic & metal detection safety systems
- High-torque biomass shredder
- Homogenization mill for uniform blending

## **Fertilizer Production & Granulation Line**

- Precision weigh-feeders for fluff + Urea + DAP dosing
- Stainless steel ribbon/paddle blending reactors
- Disc granulator with binder control
- Low-temperature dryer
- Counter-flow cooler
- Vibratory sizing and recycle loop
- Bulk bag & palletizing system

## **Biomass Pellet Manufacturing Line**

- Pellet mill die sets
- Pellet cooling tower
- Hardness integrity roller finishing
- Storage & bulk-handling packaging



# CAPITAL EXPENDITURE

(CAPEX)

ITEM	COST (USD)
Geodyn 15 TPH Conversion System	\$19,470,000
Shipping, Installation, Training, Commissioning	\$1,750,000
Fertilizer Granulation + Sorting + Metal Detection + Biomass Pellet Line	\$5,500,000
Total Project Investment	\$26,720,000

# OPERATING EXPENDITURE (OPEX), ANNUAL

CATEGORY	ANNUAL RANGE (USD)
Labor & Operations	\$480,000 – \$720,000
Utilities & Process Water	\$260,000 – \$410,000
Urea Supply	\$420,000 – \$820,000
DAP Supply	\$390,000 – \$750,000
Trace Minerals & Humates	\$55,000 – \$120,000
Optional Bacillus spp.	\$35,000 – \$95,000
Maintenance & Spare Parts	\$120,000 – \$190,000
Packaging, Bags, Pallets	\$85,000 – \$140,000
Laboratory QC & Compliance	\$45,000 – \$95,000
Insurance & Permitting	\$60,000 – \$110,000
<b>Total Annual OPEX</b>	<b>\$1,650,000 – \$2,100,000</b>





## REVENUE MODEL

REVENUE STREAM	ANNUAL VALUE
Tipping Fees (300 tons/day × \$31/ton × 350 days)	\$3,255,000
Fertilizer Sales (150 tons/day × \$500/ton × 350 days)	\$26,250,000
Biomass Pellet Fuel Sales (energy sector & resort boilers)	\$2,100,000 – \$4,800,000
<b>Total Annual Revenue</b>	<b>\$31.6M – \$34.3M</b>
<b>Net Annual Profit (After OPEX)</b>	<b>\$29.5M – \$32.6M</b>
<b>Payback Period</b>	<b>0.8 – 1.1 years</b>

# IMPLEMENTATION TIMELINE

PHASE	DURATION	DELIVERABLE
Engineering & Site Validation	2–9 weeks	System layout, utilities planning
Fabrication & International Shipping	12–18 weeks	System arrives to site
On-Site Installation & Workforce Training	4–8 weeks	Operators trained & tested
Commissioning & Continuous Production Launch	1 week	Full revenue activation

**Total Time to Operational Launch: ~19–36 Weeks**



*This initiative enables The Resort to:*

- Convert waste and seaweed pollution into profitable commercial output
- Reduce environmental impact while improving beach guest experience
- Lower operating & energy costs through biomass pellet heat
- Strengthen sustainability leadership in the Caribbean luxury sector
- Generate substantial, recurring revenue with rapid payback

Geodyn Solutions provides engineering, installation, training, optimization, and long-term operational support.



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