

DEVELOPMENT OF HYBRID, *BACILLUS AMYLOLIQUEFACIENS* COATED FERTILIZERS FROM SLUDGE WASTES

FOR FOOD CROPS WITH MAXIMUM 120 DAYS TO MATURITY

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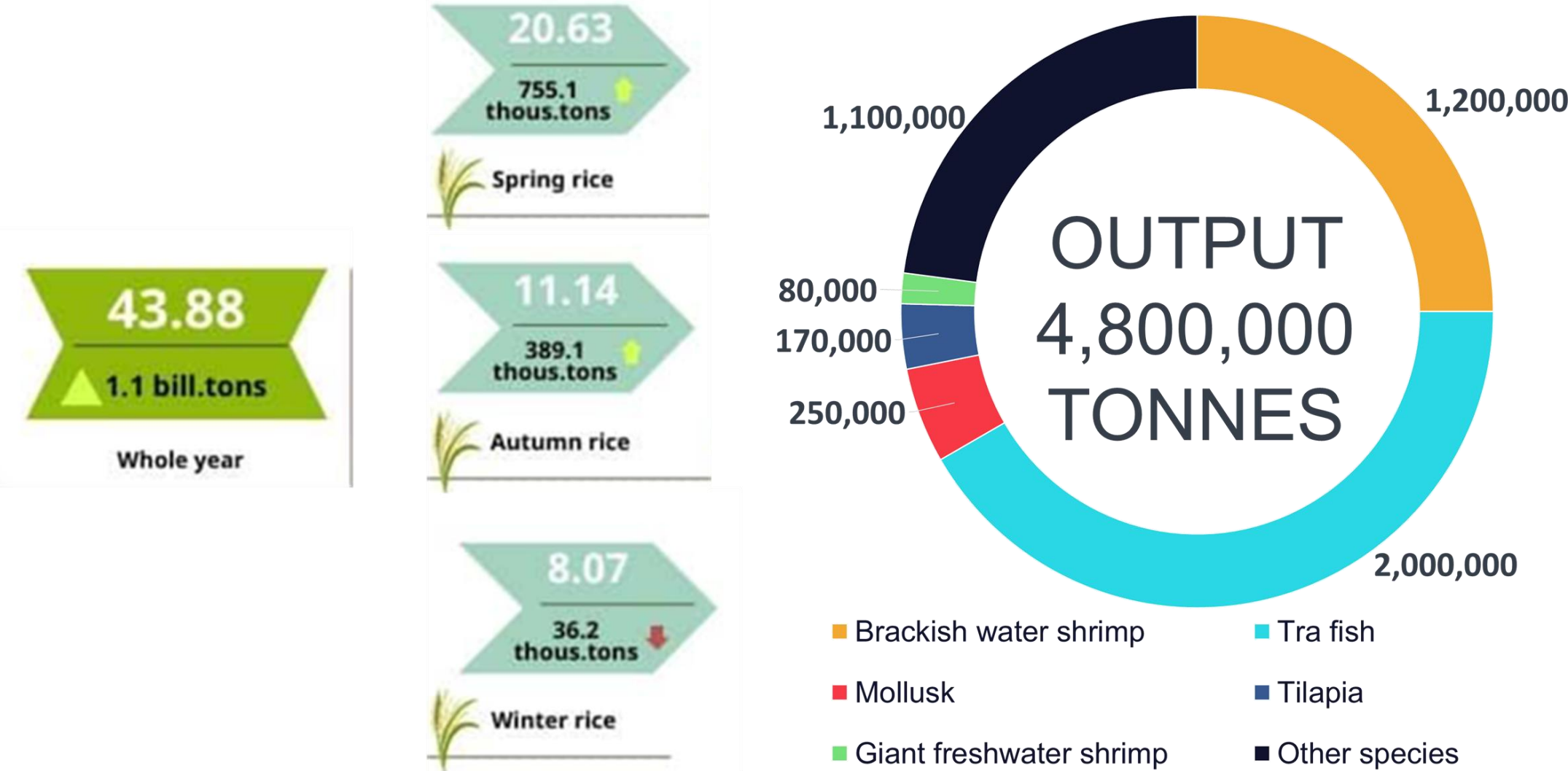
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MOTIVATION & SIGNIFICANCE

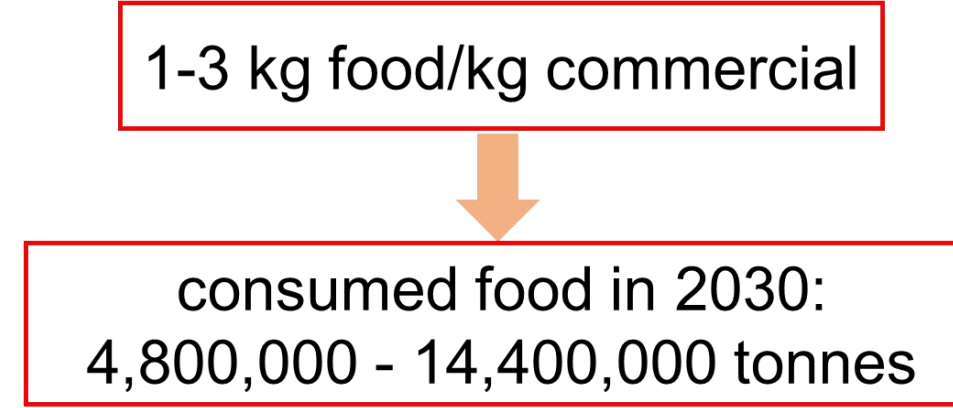
Vietnam Mekong Delta (VMD): a hotspot of aquaculture and a center of agriculture production

AGRICULTURE & AQUACULTURE by 2030



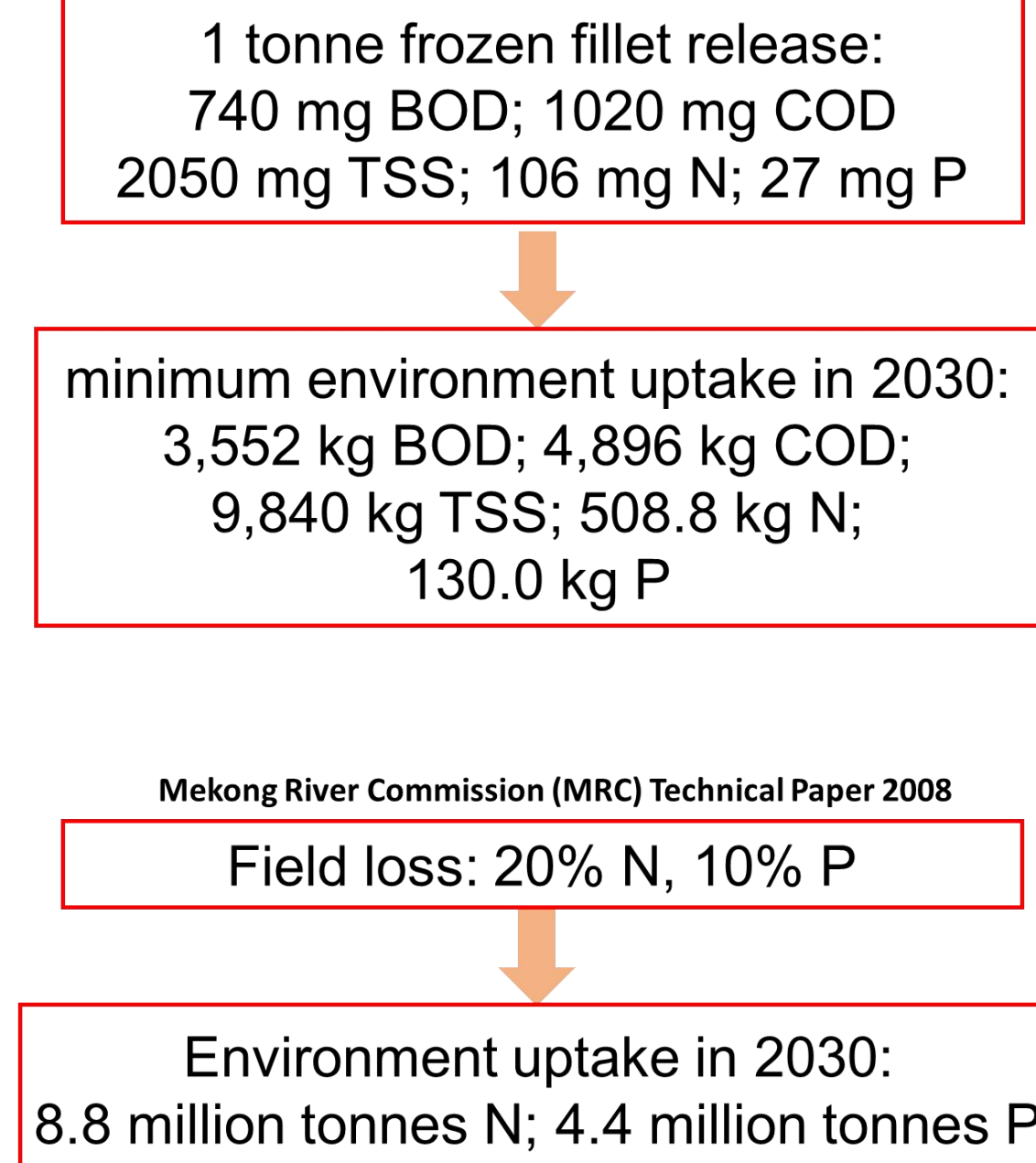
Vietnam Mekong Delta (VMD): biodiversity, food safety and human well-being are pushed to its most serious crisis

FOOD CONSUMPTION FOR AQUACULTURE by 2030



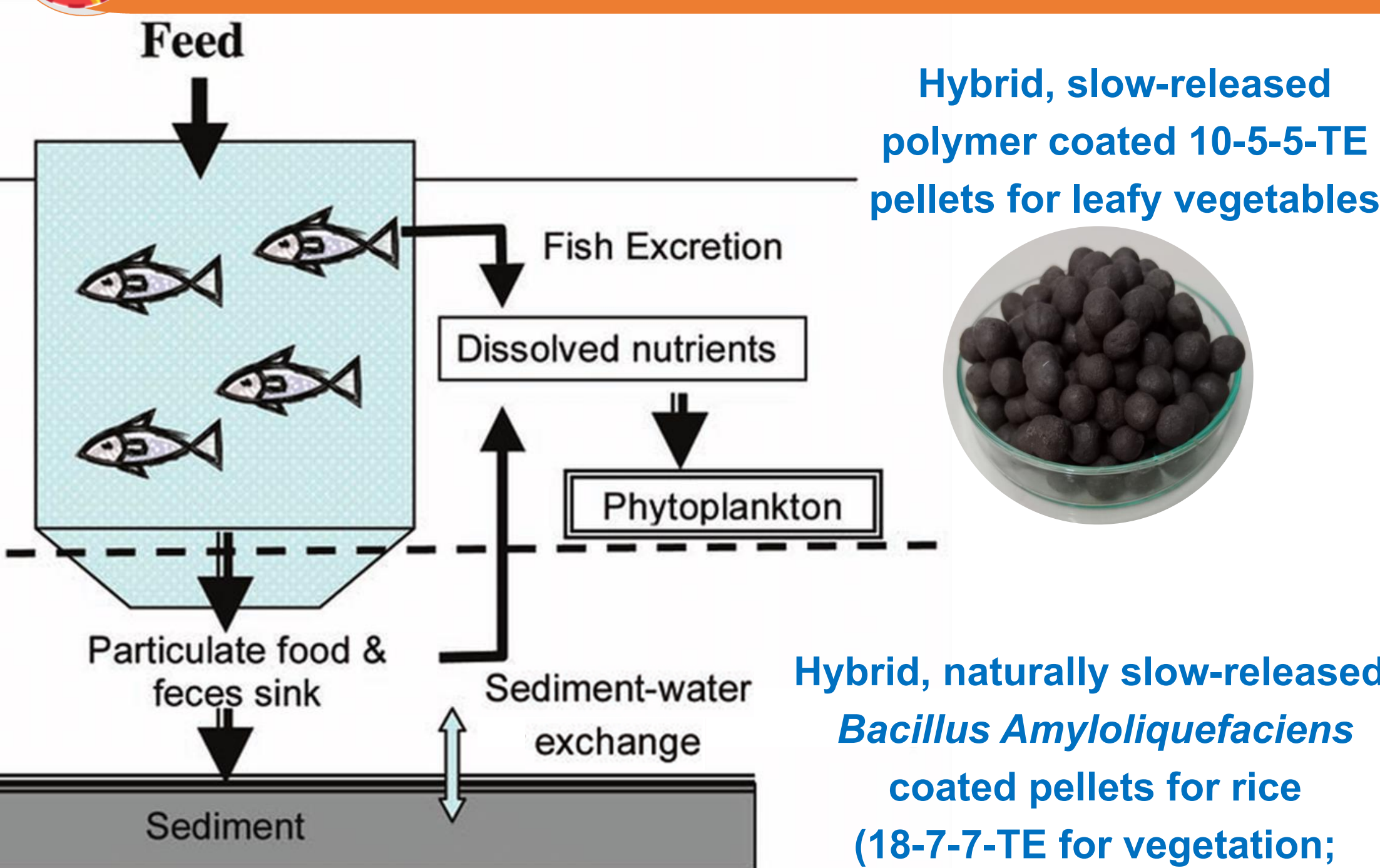
NUTRIENT LOSS TO ENVIRONMENT in 2030

Anh P.T. et al. Agricultural Water Management 97(6), 2010, 872-882



Source: Ministry of Agriculture and Rural Development, Directorate of Fisheries, Decision No.3550/QĐ-BNN-TT, August 12th, 2021

HYBRID, SLOW-RELEASED FERTILIZERS FROM SLUDGE WASTES



MUSTARD GREENS	Fertilizer rate (kg/ha)			Yield (T/ha)	NUE (%)	Soil fertility					
	N	P ₂ O ₅	K ₂ O			NPK extractables (ug/g)			Beneficial micro-organisms community (x 10 ⁵ CFU/g)		
						NH ₄ ⁺	PO ₄ ³⁻	K ⁺	N-fixed	P-solubilized	K-solubilized
Control (traditional fertilizers)	75	25	25	33.75	39 ± 3	18 ± 5	3.7 ± 1.4	1.9 ± 0.7	33 ± 11	8 ± 4	1.3 ± 0.8
Sample (studied fertilizers)	51	16	16	31.11	54 ± 4	36 ± 13	9.1 ± 3.8	4.9 ± 2.5	107 ± 23	19 ± 2	7 ± 3

RICE	Fertilizer rate (kg/ha)			Yield (T/ha)	NUE (%)	Soil fertility					
	N	P ₂ O ₅	K ₂ O			NPK extractables (ug/g)			Beneficial micro-organisms community (x 10 ⁵ CFU/g)		
						NH ₄ ⁺	PO ₄ ³⁻	K ⁺	N-fixed	P-solubilized	K-solubilized
Control (traditional fertilizers)	90	75	75	11.21	24 ± 8	10 ± 7	2.5 ± 1.1	1.3 ± 0.8	27 ± 9	5 ± 3	0.5 ± 0.5
Sample (studied fertilizers)	78	66	66	10.39	67 ± 5	47 ± 11	11.3 ± 3.4	7.6 ± 2.1	122 ± 18	16 ± 5	9 ± 3

- Water content: 81 ± 4%
- pH: 7.2 ± 0.5
- Total N (mg/kg): 1912.8 ± 75.8
- Total P (mg/kg): 532.5 ± 87.9
- Total K (mg/kg): 7666.7 ± 334.7
- Clay (wt.%): 30.1 ± 3.7
- CEC (meq+/100gr): 18.9 ± 4.7

1. Able to produce fertilizers with various NPK-TE compositions directly from sludge wastes

2. Able to control rate of releasing nutrients

3. Enhance yield and nutrient gain in vegetables and rice; Improve soil fertility

CONCLUSIONS



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