Supporting information

Table S1: Correlation between target inorganic elements and environmental factors in the sludge.

Sewage sludge

	P	Mg	Fe	Al	K	Ba	Zn	Mn	Cu	Sr	Ga	V	Cr	Pb	Rb	Ni	Mo	Y	Co	As	Cd	Tl	pH	EC	C	N	S	OM
P	1.00																											
Mg	.995**	1.00																										
Fe	-0.40	-0.33	1.00																									
Al	0.67	0.65	-0.61	1.00																								
K	0.27	0.27	-0.53	0.86	1.00																							
Ba	0.43	0.37	-0.86	0.87	0.78	1.00																						
Zn	0.03	0.00	-0.64	0.75	.890*	0.87	1.00																					
Mn	.992**	.986**	-0.43	0.75	0.36	0.51	0.14	1.00																				
Cu	0.01	-0.02	-0.61	0.74	.901*	0.85	.999**	0.12	1.00																			
Sr	.965**	.949*	-0.53	0.84	0.48	0.64	0.29	.987**	0.27	1.00																		
Ga	0.48	0.43	-0.78	.943*	0.88	.977**	.892*	0.56	.879*	0.69	1.00																	
V	-0.80	-0.76	0.71	-0.43	-0.10	-0.46	-0.01	-0.76	0.02	-0.76	-0.40	1.00																
Cr	-0.77	-0.72	0.80	-.894*	-0.61	-.899*	-0.60	-0.82	-0.57	-.897*	-.889*	0.73	1.00															
Pb	0.17	0.15	-0.67	0.79	.969**	0.83	.939*	0.26	.944*	0.39	.889*	-0.15	-0.62	1.00														
Rb	0.71	0.71	-0.60	.971**	0.87	0.79	0.67	0.78	0.67	0.85	.887*	-0.49	-0.85	0.80	1.00													
Ni	0.01	0.00	-0.42	0.75	.933*	0.75	.957*	0.12	.967**	0.26	0.82	0.16	-0.48	.920*	0.69	1.00												
Mo	0.07	0.02	-0.83	0.68	0.81	.912*	.949*	0.16	.939*	0.31	.882*	-0.23	-0.66	.918*	0.63	0.83	1.00											
Y	-0.18	-0.21	-0.56	0.59	0.82	0.77	.977**	-0.07	.980**	0.08	0.78	0.14	-0.43	.892*	0.51	.935*	.926*	1.00										
Co	-0.23	-0.24	-0.34	0.57	0.84	0.65	.935*	-0.11	.948*	0.03	0.70	0.33	-0.30	0.86	0.50	.971**	0.81	.964**	1.00									
As	-0.84	-0.83	0.57	-.964**	-0.72	-0.77	-0.55	-.897*	-0.54	-.948*	-0.85	0.58	.912*	-0.64	-.962**	-0.55	-0.51	-0.36	-0.34	1.00								
Cd	0.04	0.02	-0.66	0.72	.937*	0.82	.967**	0.14	.972**	0.28	0.86	-0.06	-0.55	.989**	0.71	.936*	.945*	.947*	.907*	-0.54	1.00							
Tl	0.09	0.05	-0.73	0.76	.897*	.901*	.989**	0.19	.985**	0.34	.910*	-0.13	-0.64	.964**	0.70	.921*	.979**	.958*	.889*	-0.57	.982**	1.00						
pH	-0.66	-0.68	-0.26	-0.47	-0.11	-0.08	0.08	-0.68	0.08	-0.63	-0.19	0.11	0.36	0.10	-0.42	-0.06	0.27	0.24	0.11	0.58	0.18	0.15	1.00					
EC	-0.61	-0.57	.903*	-0.87	-0.78	-.923*	-0.73	-0.66	-0.71	-0.76	-.925*	0.68	.918*	-0.82	-.883*	-0.61	-0.82	-0.60	-0.47	0.84	-0.76	-0.80	0.06	1.00				
C	0.07	0.04	-0.72	0.73	.922*	0.85	.959**	0.16	.961**	0.31	0.87	-0.13	-0.59	.988**	0.71	.907*	.962**	.934*	0.87	-0.55	.997**	.985**	0.21	-0.80	1.00			
N	0.43	0.39	-0.81	.915*	.894*	.974**	.909*	0.51	.898*	0.64	.994**	-0.40	-0.86	.924*	0.88	0.83	.918*	0.81	0.72	-0.81	.900*	.938*	-0.09	-.940*	.914*	1.00		
S	0.09	0.06	-0.68	0.76	.938*	0.86	.979**	0.19	.981**	0.33	.894*	-0.10	-0.60	.987**	0.73	.941*	.955*	.949*	.903*	-0.58	.997**	.992**	0.14	-0.79	.995**	.926*	1.00	
OM	0.21	0.19	-0.71	0.80	.964**	0.84	.925*	0.29	.929*	0.43	.896*	-0.21	-0.64	.998**	0.81	.896*	.920*	0.87	0.83	-0.66	.982**	.958*	0.10	-0.85	.985**	.933*	.981**	1.00

Strong and non-significant correlation
Strong and significant correlation at 0.01 level
Strong and significant correlation at 0.05 level
No correlatation

**. Correlation is significant at 0.01 level (bilateral).
*. Correlation is significant at 0.05 level (bilateral).

Table S2: Correlation between target inorganic elements and environmental factors in the sediment.

Sediment

	P	Mg	Fe	Al	K	Ba	Zn	Mn	Cu	Sr	Ga	V	Cr	Pb	Rb	Ni	Mo	Y	Co	As	Cd	Tl	pH	EC	C	N	S	OM
P	1.00																											
Mg	.825*	1.00																										
Fe	0.72	.949**	1.00																									
Al	.966**	.862*	0.80	1.00																								
K	0.60	.905*	.979**	0.72	1.00																							
Ba	0.68	0.23	0.01	0.52	-0.16	1.00																						
Zn	.932**	0.67	0.50	.838*	0.34	.869*	1.00																					
Mn	0.75	.983**	.985**	.817*	.968**	0.06	0.54	1.00																				
Cu	0.72	0.28	0.09	0.57	-0.10	.991**	.897*	0.12	1.00																			
Sr	.850*	.981**	.974**	.904*	.924**	0.22	0.67	.979**	0.29	1.00																		
Ga	0.68	0.23	0.02	0.53	-0.16	1.000**	.871*	0.07	.991**	0.23	1.00																	
V	0.70	.948**	.998**	0.79	.987**	-0.02	0.47	.988**	0.05	.969**	-0.02	1.00																
Cr	0.76	.965**	.995**	.842*	.970**	0.07	0.55	.990**	0.14	.988**	0.07	.995**	1.00															
Pb	.864*	0.54	0.33	0.73	0.16	.943**	.974**	0.39	.949**	0.52	.944**	0.29	0.38	1.00														
Rb	0.75	.941**	.980**	.856*	.972**	0.04	0.51	.976**	0.10	.973**	0.04	.982**	.989**	0.34	1.00													
Ni	.979**	.911*	.828*	.985**	0.73	0.55	.877*	.854*	0.59	.931**	0.55	.812*	.865*	0.77	.857*	1.00												
Mo	.971**	0.78	0.65	.926**	0.51	0.76	.978**	0.68	0.80	0.80	0.76	0.63	0.70	.910*	0.67	.952**	1.00											
Y	.820*	.988**	.954**	.883*	.929**	0.18	0.63	.985**	0.22	.980**	0.19	.954**	.971**	0.49	.970**	.909*	0.75	1.00										
Co	.950**	0.67	0.50	.861*	0.35	.869*	.994**	0.54	.893*	0.67	.871*	0.47	0.55	.975**	0.52	.888*	.974**	0.64	1.00									
As	0.59	.897*	.982**	0.69	.995**	-0.17	0.33	.961**	-0.10	.918**	-0.17	.986**	.966**	0.15	.957**	0.71	0.49	.910*	0.33	1.00								
Cd	.955**	.950**	.871*	.966**	0.78	0.48	.846*	.900*	0.53	.959**	0.49	.859*	.904*	0.73	.888*	.994**	.930**	.942**	.851*	0.77	1.00							
Tl	.985**	0.76	0.61	.921**	0.47	0.79	.977**	0.65	.819*	0.76	0.79	0.58	0.66	.937**	0.64	.943**	.984**	0.74	.989**	0.45	.912*	1.00						
pH	0.18	0.28	0.44	0.29	0.40	-0.12	0.14	0.34	-0.01	0.40	-0.12	0.45	0.44	-0.05	0.39	0.27	0.25	0.25	0.08	0.43	0.29	0.11	1.00					
EC	-0.55	-.915*	-.885*	-0.61	-.881*	0.04	-0.43	.924**	-0.01	-.861*	0.04	-.900*	-.887*	-0.27	-.836*	-0.69	-0.55	-.877*	-0.39	-.884*	-0.76	-0.48	-0.35	1.00				
C	0.79	0.37	0.17	0.65	-0.01	.987**	.931**	0.22	.988**	0.37	.987**	0.13	0.22	.978**	0.20	0.67	.847*	0.33	.936**	-0.02	0.61	.878*	-0.06	-0.08	1.00			
N	0.76	0.33	0.12	0.61	-0.06	.993**	.912*	0.17	.992**	0.32	.993**	0.08	0.17	.970**	0.14	0.63	.816*	0.28	.917*	-0.06	0.57	.852*	-0.09	-0.04	.998**	1.00		
S	0.68	0.19	-0.02	0.56	-0.17	.959**	0.81	0.04	.933**	0.20	.959**	-0.05	0.05	.892*	0.06	0.54	0.72	0.18	.836*	-0.20	0.46	0.77	-0.22	0.14	.955**	.955**	1.00	
OM	0.80	0.39	0.18	0.66	0.01	.984**	.939**	0.23	.988**	0.39	.984**	0.15	0.24	.977**	0.21	0.69	.860*	0.34	.941**	0.00	0.63	.883*	-0.02	-0.10	.999**	.994**	.948**	1.00

Strong and non-significant correlation
Strong and significant correlation at 0.01 level
Strong and significant correlation at 0.05 level
No correlatation

**. Correlation is significant at 0.01 level (bilateral).

*. Correlation is significant at 0.05 level (bilateral).

Wastewater and sludge treatment facility.

The only treatment plant for wastewater from Cotonou and surrounding areas (Sèmè-Kpodji and Abomey-Calavi) consists of two series of three waste stabilization ponds receiving effluent from an anaerobic pond (**Fig. S1**).

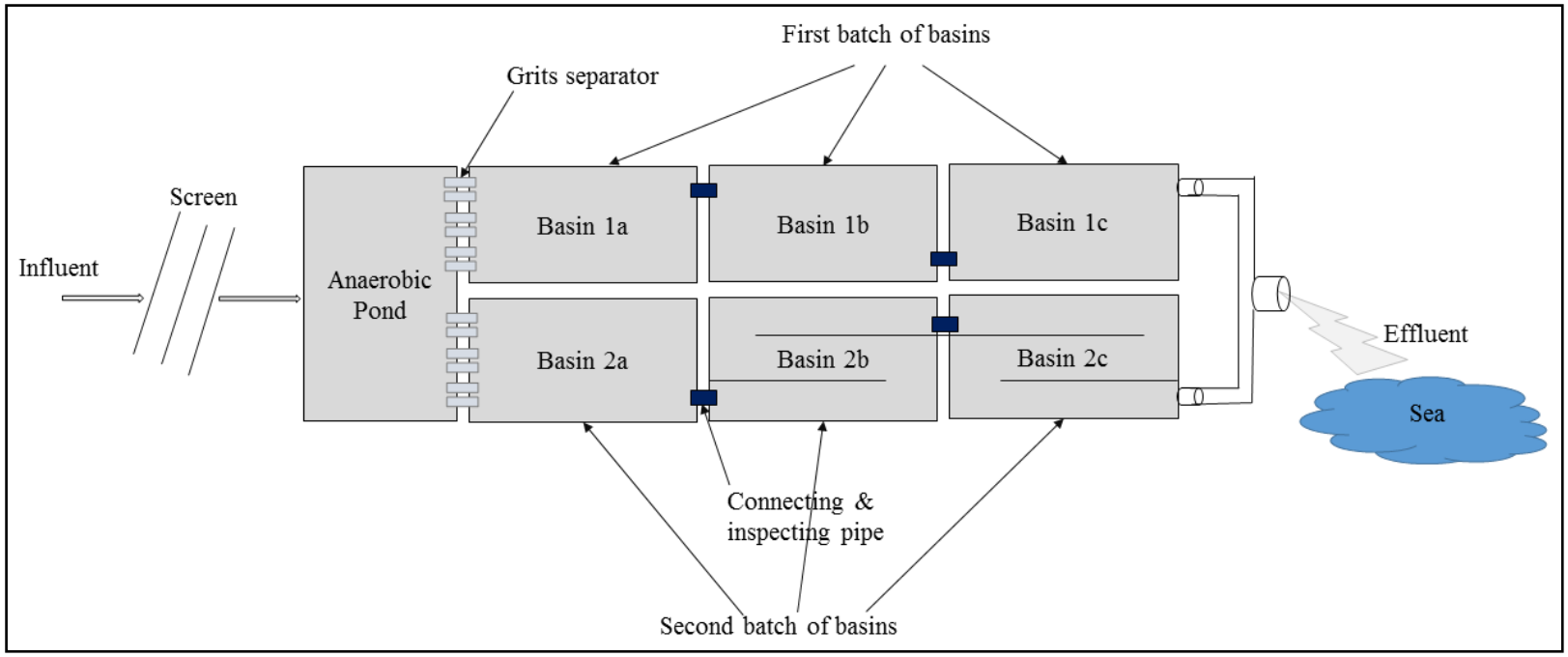

Fig. S1: Schematic diagram of the WWTP Treatment plant.

Description: It consists of a system of aerated basins set up to treat and improve the physical and biological properties of the wastewater. Specifically, two series of three stabilization basins (aerated basins) receiving each effluent from an anaerobic pond, can be identified in the treatment facility. The anaerobic ponds, is used for sanitation and degradation of organic matter, the stabilization basins are used for (i) the removal of BOD and pathogens and (ii) the maturation of the sludge (which consists in effectively reducing the population of fecal bacteria).