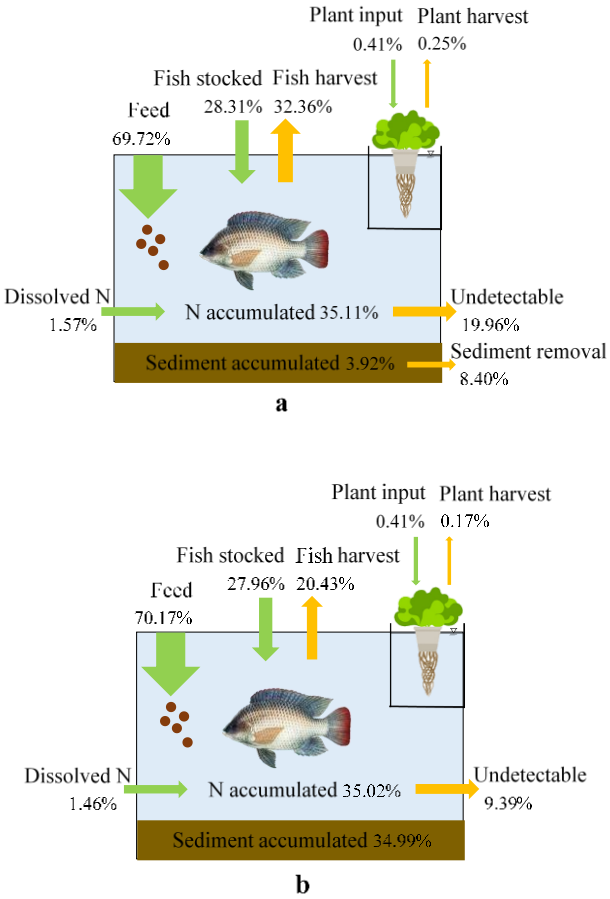


**Fig. S1.** Schematic flow diagram of the nitrogen mass balance in the APS of the (a) control, a typical APS system with a filtration unit and a nitrifying biofilter, and (b) the simplified APS treatment system. Green arrows indicate the input nitrogen and orange arrows indicate the output nitrogen. The thickness of the arrow represents the percentage of nitrogen content.

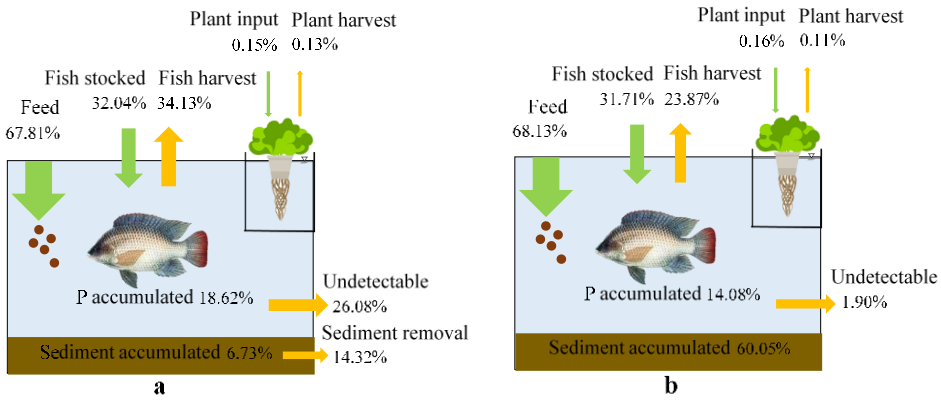


**Fig. S2.** Schematic flow diagram of the phosphorus mass balance in the APS of the (a) control, a typical APS system with a filtration unit and a nitrifying biofilter, and (b) the simplified APS treatment system. Green arrows indicate the input phosphorus and orange arrows indicate the output phosphorus. The thickness of the arrow represents the percentage of phosphorus content.

**Table S1.** Cost of the Experimental RAS and APS Components in this Study

| System | Approximate Cost of Each Component (USD) | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Aquaculture tank** | **Filtration unit** | **Treatment tank** | **Nitrifying biofilter** | **Hydroponic unit** | **Others (pipe and pump)** | **Total** |
| | | | ***RAS*** *(section 2.1):* | | | | |
| Control | 84.75 | - | 84.75 | - | - | 34.28 | 203.78 |
| T1 | 84.75 | 26.26 | 84.75 | - | - | 34.28 | 230.04 |
| T2 | 84.75 | - | 84.75 | 191.88 | - | 34.28 | 395.66 |
| T3 | 84.75 | 26.26 | 84.75 | 191.88 | - | 34.28 | 421.92 |
| | | | ***APS*** *(section 2.2):* | | | | |
| Control | 84.75 | 26.26 | 84.75 | 191.88 | 8.28 | 34.51 | 430.43 |
| Treatment | 84.75 | - | 84.75 | - | 8.28 | 34.51 | 212.29 |

Note Approximate costs were converted from THB at the rate of 1 THB = 0.032 USD.