Table 7. Two-Way ANOVA and main effects by fertilization type and supplementary feed on water quality parameters and plankton densities **(**cells/m^3) for all treatments of fertilizations and supplementary feed during the experimental period in earthen ponds (in 180 days).

Items	Water temp (^{0}C)	DO (mg/l)	pH	PO_4 (mg/l)	NO_2 (mg/l)	NO_3 (mg/l)	NH_4 (mg/l)	T.Alkalinty (mg$CaCO_3$/l)	Chll."a µg/l	Phy.St.crop (No.org./m^3)	Zoo.St. crops (No.org./m^3)	Net product. ($mgO_2/m^2/h$)	Gross product. (mg $O_2/m^2/h$)
ANOVA models:													
Sign	ns	**	**	*	*	**	**	**	*	**	**	*	*
r^2	0.22	0.47	0.35	0.16	0.11	0.19	0.33	0.47	0.22	0.30	0.19	0.27	0.39
Source of variation:													
Supplementary feed	ns	**	ns	ns	ns	*	*	**	*	*	*	ns	ns
Organic fertilizer	ns	ns	ns	ns	*	*	*	*	*	*	**	ns	ns
Chemical fertilizer	ns	ns	*	*	ns	**	**	**	**	**	**	*	**
Org.+ chemical fertilizers	ns	**	ns	ns	ns	*	*	**	*	*	**	*	*
Org.+Ch. + Suppl. feed	ns	**	*	*	*	**	**	**	**	**	**	**	**

Sign. = Significance level * $P \leq 0.05$, ** $P \leq 0.01$, ns: Not significant, r^2 determination coefficient.

Table 8. Two-Way ANOVA and main effects by fertilization type and supplementary feed on growth performance and economics efficiency for all experimental treatments during the experimental period(in 180 days, Mean±SE).

ANOVA models	Tilapia Kg/fedd	C. carp Kg/fedd	Gray mul. Kg/fedd	G. carp Kg/fedd	S. carp Kg/fedd	Total production Kg/feddan	SGR	FCR	K	Total cost	Eco. Effici	Net return (LE)	Net Revenue (%)
Sign	**	**	*	ns	*	*	**	**	**	*	ns	*	*
R^2	0.73	0.84	0.56	0.37	0.33	0.73	0.51	0.50	0.61	0.55	0.41	0.64	0.62
Source of variation:													
1-Fertilization	**	**	*	Ns	**	**	*	Ns	*	**	Ns	*	*
2-Supplementary feed	Ns	**	*	Ns	Ns	**	Ns	*	*	*	Ns	*	*
3-Fertil.* Suppl. Feed	*	*	*	*	**	**	*	*	*	*	*	*	*
Main Effects													
1-Supplementary feed	799.8^{ab}	1167.2^{a}	169.3^{ab}	114.1^{b}	167.8^{ab}	2418.2 ±11.89^{c}	0.73^{b}	1.73^{a}	1.62^{b}	5924.6^{a}	1.22	1330.0^{ab}	22.45 ±0.011^{bc}
2-Fertilization :													
- Cow manure	582.6^{c}		123.7^{c}	88.1^{c}	108.6^{c}	1558.8 ±19.63^{d}	0..71^{b}	0.0	1.46^{c}	3725.5^{ab}	1.15	561.2^{c}	15.06 ±0.009^{c}
- Chemical fertilizer	691.2^{b}	655.8^{b}	158.6^{b}	112.5^{b}	148.4^{b}	1617.5 ±17.47^{cd}	0.68^{c}	0.0	1.52^{ab}	3607.0^{c}	1.35	1245.5^{b}	34.53 ±0.022^{bc}
3-Fertil.* Suppl. Feed	988.2^{a}	506.8c 1310.6^{a}	210.6^{a}	146.2^{a}	199.6^{a}	2855.2 ±22.92^{a}	1.14^{a}	1.33^{b}	2.36^{a}	3654.7^{b}	3.12	7766.1a	212.50 ±0.225^{a}

Sign. = Significance level * $P \leq 0.05$, ** $P \leq 0.01$, and Ns: Not significant. r^2: Determination coefficient.
Means with different letter in the same column in each main effect are significantly different (Duncan's multiple range test at $P<0.05$).

Table 6. Economic efficiency of experimental fish species for all treatments of fertilizations and supplementary feed during the experimental period in earthen ponds (in 180 days, mean).

Treatments	Total yield (Kg/Feddan)	Total return (L.E)	Total costs (LE)	Cost/kg fish (LE/kg fish)	Eco. Effici.	Net return (LE)	Net Revenue* (%)
T1(feed)	2418.2	7254.6	5924.6^{a}	2.45^{ab}	1.22	1330.0	22.45
T2(Org.)	1558.8	4286.7	3725.5^{ab}	2.39^{b}	1.15	561.2	15.06
T3(Ch.)	1617.5	4852.5	3607.0^{b}	2.23^{c}	1.35	1245.5	34.53
T4(O.+Ch)	2159.0	6477.0	3022.6^{c}	2.40^{b}	2.14	3454.4	114.29
T5(Or.+f)	2330.3	6990.9	3658.6^{ab}	2.57^{a}	1.91	3332.3	91.08
T6(Ch+f)	2657.7	7973.1	3455.0^{bc}	2.30^{bc}	2.31	4518.1	130.77
T7(O.Ch+f)	2855.2	11420.8	3654.7^{ab}	2.28^{bc}	3.12	7766.1	212.50

Means with different letter in the same column in each main effect are significantly different (Duncan's multiple range test at $P<0.05$).

- Net Revenue: Net Return (LE)/ Total costs

Table 5: Growth and Production parameters of wild mixed-sex *Tilapia* species(*O. niloticus* and *O. aureus*), Common carp(*C.carpio*),gray mullet (*M.cephalus*), Grass carp (*C. idella*) and Silver carp (*H. molitix)* for all treatments of fertilizations and supplementary feed during the experimental period in earthen ponds (in 180 days, mean±SE).

Treatments	Av.Initial wW. g/fish	Av.Final wW. g/fish	Av.Net wW.Gain g/fish	SGR %WG/day	FCR	Cond. factor K	Production Kg/feddan	T. production Kg/fedd.
T1 :				0.72^{bc}	1.73^{b}	1.62^{bc}		2418.2 ± 11.89^{c}
Tilapia sp.	17.6 ± 2.27^{a}	133.3 ± 2.91^{ab}	105.7 ± 9.35^{ab}	0.58^{ab}	-	1.3^{ab}	799.8	
Common carp	26.3 ± 1.33^{a}	583.6 ± 3.42^{c}	557.3 ± 11.22^{c}	0.75^{bc}	-	1.6^{bc}	1167.2	
Gray mullet	0.9 ± 0.57^{a}	169.3 ± 1.23^{cd}	168.4 ± 2.25^{cd}	1.19^{c}	-	1.4^{ab}	169.3	
Grass carp	33.6 ± 2.39^{a}	228.2 ± 5.38^{cd}	194.6 ± 10.41^{bc}	0.48^{bc}	-	2.1^{ab}	114.1	
Silver carp	27.3 ± 3.18^{a}	335.6 ± 3.44^{cd}	308.3 ± 8.01^{cd}	0.59^{c}	-	2.2^{bc}	167.8	
T2 :				0.71^{bc}	0.00	1.46^{c}		1558.8 ± 19.63^{g}
Tilapia sp.	16.9 ± 2.33^{a}	97.1 ± 1.51^{cd}	80.2 ± 5.75^{cd}	0.47^{c}	-	0.7^{c}	582.6	
Common carp	25.3 ± 1.77^{a}	327.9 ± 4.54^{bc}	302.6 ± 14.28^{bc}	0.84^{ab}	-	1.9^{bc}	655.8	
Gray mull.	0.9 ± 0.06^{a}	123.7 ± 1.71^{cd}	122.8 ± 3.67^{cd}	1.17^{c}	-	1.1^{c}	123.7	
Grass carp	34.2 ± 1.45^{a}	176.1 ± 2.61^{c}	141.9 ± 15.81^{c}	0.42^{c}	-	1.8^{c}	88.1	
Silver carp	28.1 ± 2.27^{a}	217.2 ± 4.25^{bc}	189.1 ± 12.67^{bc}	0.63^{bc}	-	2.3^{ab}	108.6	
T3 :				0.68^{c}	0.00	1.52^{c}		1617.5 ± 17.47^{f}
Tilapia sp.	16.3 ± 1.79^{a}	115.2 ± 1.76^{bcd}	98.9 ± 6.27^{bcd}	0.55^{bc}	-	1.1^{bc}	691.2	
Com. carp	25.3 ± 1.87^{a}	253.4 ± 3.33^{d}	228.1 ± 9.21^{d}	0.69^{c}	-	1.4^{c}	506.8	
Gray mull.	0.9 ± 0.09^{a}	158.6 ± 1.55^{d}	157.7 ± 2.61^{d}	1.22^{bc}	-	1.3^{ab}	158.6	
Grass carp	32.6 ± 3.12^{a}	214.9 ± 3.05^{cd}	182.3 ± 7.68^{cd}	0.44^{c}	-	1.9^{c}	112.5	
Silver carp	28.7 ± 2.44^{a}	296.8 ± 4.11^{d}	268.1 ± 11.21^{d}	0.48^{d}	-	1.9^{c}	148.4	
T4 :				0.85^{b}	0.00	1.71^{b}		2159.0 ± 12.78^{e}
Tilapia sp.	18.1 ± 2.55^{a}	140.5 ± 1.92^{c}	122.4 ± 7.94^{bc}	0.54^{bc}	-	1.2^{bc}	903.0	
Com. carp	27.2 ± 2.77^{a}	393.8 ± 5.91^{b}	366.6 ± 17.07^{b}	0.99^{b}	-	2.5^{b}	787.6	
Gray mull.	0.9 ± 0.07^{a}	173.5 ± 1.97^{ab}	172.6 ± 4.28^{ab}	1.44^{ab}	-	1.5^{b}	173.5	
Grass carp	34.2 ± 2.55^{a}	257.2 ± 6.25^{b}	223.0 ± 11.25^{b}	0.57^{b}	-	2.5^{b}	128.6	
Silver carp	27.9 ± 2.11^{a}	332.6 ± 5.01^{b}	304.7 ± 17.88^{b}	0.73^{ab}	-	2.6^{b}	166.3	

Means in the same column having the same letter were not significantly different ($P \leq 0.05$).

Cont. Table 5

Treatments	Av.Initial wW. g/fish	Av.Final wW. g/fish	Av.Net wW.Gain g/fish	SGR %WG/day	FCR	Cond. factor K	Production Kg/feddan	T. production Kg/fedd.
T5 :				0.89^{ab}	1.83^{a}	1.84^{ab}		2330.3 ±15.29^{d}
Tilapia sp.	20.4±2.54^{a}	150.7±1.09^{ab}	130.3±10.36^{ab}	0.67^{b}	-	1.6^{a}	904.2	
Com. carp	28.5±1.55^{a}	512.4±3.65^{bc}	483.9±14.47^{bc}	0.89^{ab}	-	2.4^{ab}	1024	
Gray mull.	0.9±0.06^{a}	181.5±1.87^{cd}	180.6±3.08^{cd}	1.69^{b}	-	1.7^{b}	181.5	
Grass carp	35.1±2.97^{a}	205.3±5.08^{bc}	170.2±8.77^{bc}	0.49^{bc}	-	2.2^{ab}	102.7	
Silver carp	27.5±2.26^{a}	235.8±3.95^{ab}	208.3±15.05^{ab}	0.69^{ab}	-	2.4^{ab}	117.9	
T6 :				0.84^{b}	1.53^{c}	2.12^{b}		2657.7 ±10.15^{b}
Tilapia sp.	19.1±2.01^{a}	158.9±1.21^{b}	139.8 ±11.45^{b}	0.57^{ab}	-	1.4^{ab}	953.4	
Com. carp	28.4±1.37^{a}	602.6±5.37^{ab}	574.2±15.71^{ab}	0.91^{ab}	-	2.3^{ab}	1205.2	
Gray mull.	0.9±0.09^{a}	190.4±1.27^{bc}	189.5±4.09^{bc}	1.27^{bc}	-	1.4^{ab}	190.4	
Grass carp	35.6±2.57^{a}	273.7±4.51^{ab}	238.1±9.01^{bc}	0.55^{ab}	-	2.4^{b}	136.9	
Silver carp	28.4±3.34^{a}	353.5±6.62^{c}	325.1±16.84^{c}	0.89^{b}	-	2.1^{bc}	171.8	
T7 :				1.14^{a}	1.33^{d}	2.36^{a}		2855.2 ±22.92^{a}
Tilapia sp.	19.8±2.92^{a}	164.7±1.99^{a}	154.9±12.91^{a}	0.81^{a}	-	1.7^{a}	988.2	
Com. carp	27.2±2.69^{a}	655.3±6.58^{a}	628.1±17.22^{a}	1.48^{a}	-	3.4^{a}	1310.6	
Gray mull.	0.9±0.08^{a}	210.6±1.74^{a}	209.7±5.55^{a}	1.73^{a}	-	1.7^{a}	210.6	
Grass carp	34.9±2.39^{a}	292.3±5.06^{a}	257.4±14.11^{a}	0.65^{a}	-	2.6^{a}	146.2	
Silver carp	28.3±3.51^{a}	399.4±7.43^{a}	371.1±18.71^{a}	0.97^{a}	-	3.2^{a}	199.6	

Table 3: Monthly average of water quality parameters and plankton densities(cells/m^3)for all treatments of fertilizations and supplementary feed during the experimental period in earthen ponds (in 180 days, Mean± SE).

Parameters	T1 (feed)	T2 (org.)	T3 (Ch)	T4 (org+Ch)	T5 (org+f)	T6 (Ch+f)	T7 (org+Ch+f)
Water temp.(^{0}C)	27.3±0.21^a	27.8±0.04^a	27.2±0.33^a	27.9±0.11^a	28.2±0.06^a	27.7±0.77^a	28.5±0.91^a
DO (mg/l)	5.8±0.39^b	5.4±0.55^{ab}	6.9±0.27^b	6.3±0.95^a	5.6±0.98^{ab}	7.1±0.11^{ab}	7.3±0.37^a
pH	8.1±0.67^b	8.1±1.72^b	8.4±1.39^{ab}	8.2±0.98^a	8.1±2.51^a	8.5±1.58^{ab}	8.6±2.11^a
PO_4	0.07±0.06^b	0.09±0.99^b	0.17±0.27^{ab}	0.13±0.14^{ab}	0.11±0.39^b	0.16±0.11^{abc}	0.17±0.07^a
NO_2 (mg N/l)	0.03±0.92^b	0.05±1.38^{ab}	0.02±1.02^b	0.04±0.86^{ab}	0.06±0.77^b	0.01±0.55^b	0.07±1.76^a
NO_3 (mg N/l)	0.13±0.67^c	0.16±0.98^{ab}	0.18±1.16^a	0.17±1.19^{ab}	0.15±1.55^{ab}	0.18±1.36^{ab}	0.19±2.57^a
NH_4 (mgN/l)	0.26±0.25^b	0.22±1.76^b	0.30±0.38^{ab}	0.27±0.06^b	0.25±1.22^b	0.32±0.79^a	0.36±0.33^{ab}
Total alkalinity ($mgCaCo_3$/l)	217±5.81^{ab}	230±3.25^b	299±4.45^c	314±4.78^b	255±5.58^{ab}	362±4.29^b	399±6.17^a
Chlorophyll a (µg/l)	33.7±5.27^c	41.2±3.52^{ab}	52.1±2.99^{ab}	56.4±6.18^a	44.7±3.11^{ab}	61.3±4.59^{ab}	67.2±2.19^a
Phyt.stand.crops (No.x10^7org./m^3)	199±322^c	238±213^{bc}	414±255^{ab}	403±366^{ab}	295±411^{bc}	451±297^a	512±371^a
Zoopl.Stand. crops (No.x10^5org./m^3)	85±115^c	94±59^c	125±64^{bc}	153±53^{ab}	118±71^{bc}	177±68^b	184±122^a
Net productivity (mg O_2/m^2/h)	0.108±2.81^b	0.11±2.81^c	0.141±2.81^c	0.151±2.81^b	0.128±2.81^a	0.165±2.81^{ab}	0.179±0.64^a
Gross productivity (mg O_2/m^2/h)	0.315±0.86^c	0.403±0.98^b	0.512±0.47^b	0.463±0.35^{ab}	0.429±0.72^b	0.614±0.56^{ab}	0.701±0.97^a

Means in the same column having the same letter were not significantly different (P≤0.05).