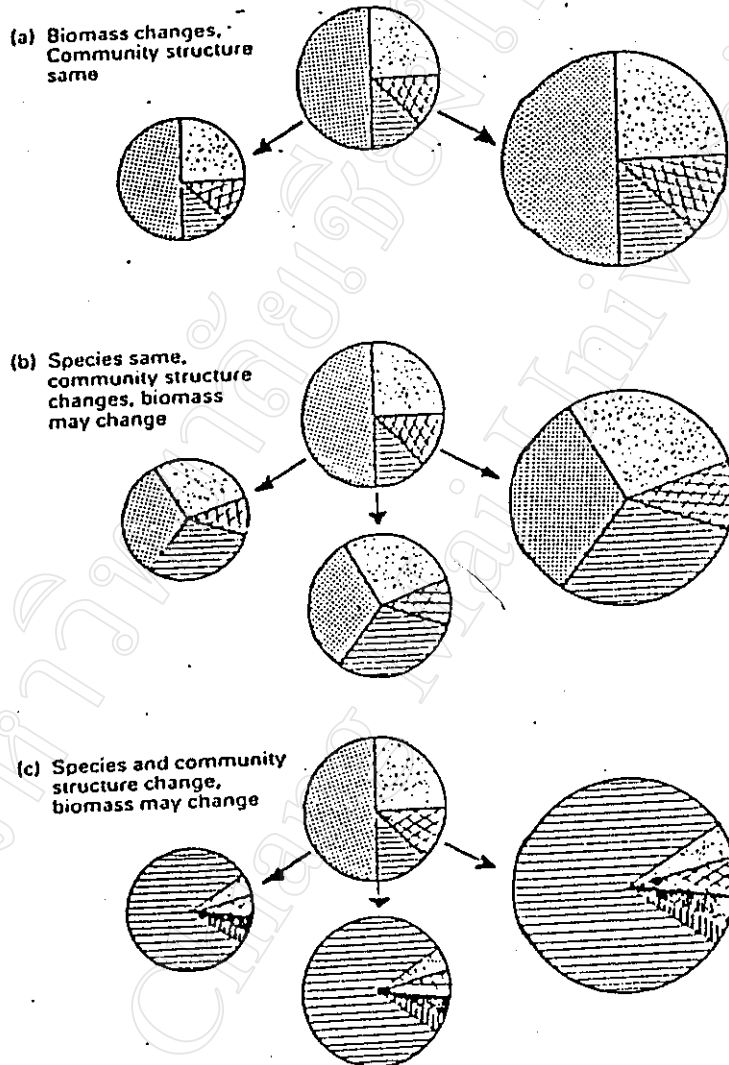
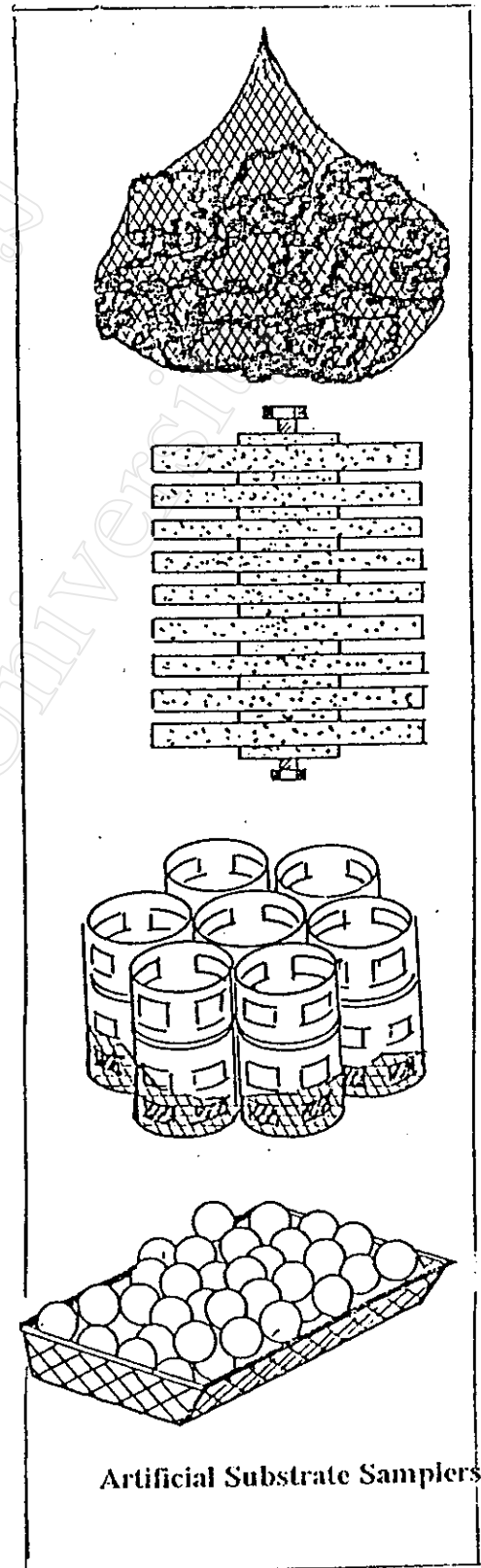
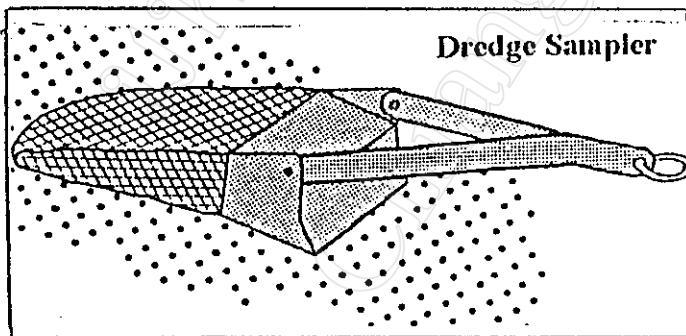
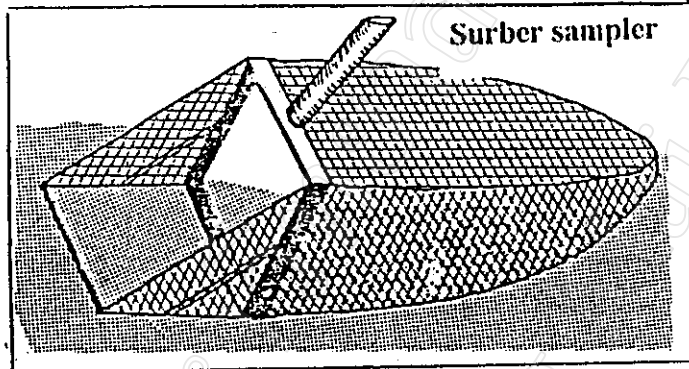
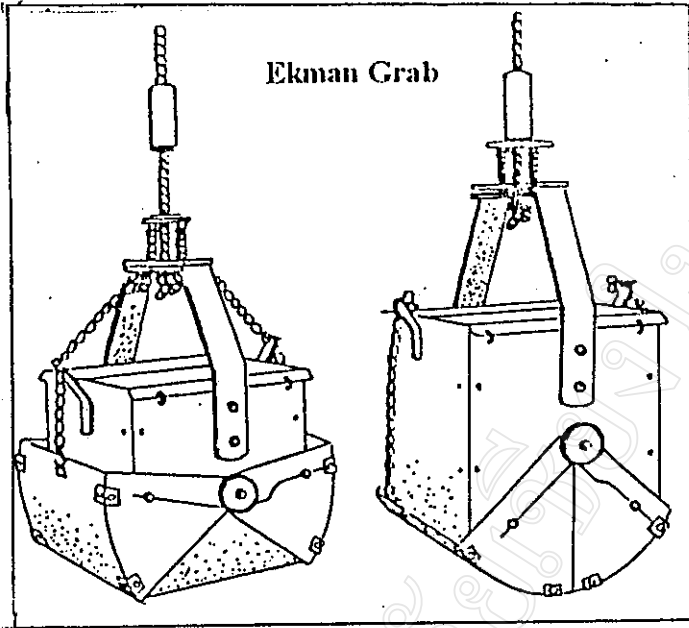


Appendix A 1



Possible responses of a community to environmental change (From Hellawell, 1978)

Appendix A 2



Different types of macroinvertebrates sampling methods

Appendix B 1

Tolerance values (0 - 10) for a family biotic index

MODIFIED FROM HILSENHOFF (1988)

Orders	Families	Tolerance values
Ephemeroptera	Caenidae, Siphonuridae	7
	Baetidae, Ephemeridae, Heptageniidae, Potamanthidae	4
	Baetiscidae	3
	Leptophlebiidae, Isonychiidae, Meteropodidae, Polymitarcyidae, Ephemerellidae	2
Odonata	Coenagrionidae, Lestidae, Libellulidae	9
	Calopterygidae, Corduliidae	5
	Aeshnidae, Macromidae	3
	Gomphidae	1
Plecoptera	Nemouridae, Perlodidae, Taeniopterygidae	2
	Capniidae, Chloroperlidae, Perlidae	1
	Pteronarcyidae, Leuctridae	0
Megaloptera	Sialidae	4
	Corydalidae	0
Trichoptera	Hydropsychidae Polycentropodidae	6
	Molannidae, Hydrotilidae, Leptoceridae, Limnephilidae, Phryganeidae	4
	Helicopsychidae Philopotamidae, Sericostomatidae	3
	Psychomyiidae	2
	Brachycentridae, Lepidostomatidae	1
	Glossosomatidae, Odontoceridae, Rhyacophilidae	0
Lepidoptera	Pyralidae	4
Coleoptera	Dryopidae	5
	Elmidae, Psephenidae	4
Diptera	Psychodidae, Syrphidae	10
	Blood-red Chironomidae	8
	Pink Chironomidae, Ceratopogonidae, Empididae, Simuliidae, Muscidae, Tabanidae	6
	Dolichopodidae	4
	Tipulidae	3
	Athericidae	2
	Blepharicidae	0
Amphipoda	Talitridae	8
	Gammaridae	4
Isopoda	Aeschiidae	8
Oligochaeta	Tubificidae	10
	Naididae, Lumbriculidae	8

Source: Morse et al. 1984

Appendix B2

BMWP Scores adopted for India

Taxonomical class	Taxonomical family	BMWP score
Ephemeroptera	Siphonuridae, Potamanthidae, Heptageniidae, Leptophlebiidae, Ephemerellidae, Ephemeridae	10
Plecoptera	Taeniopterygidae, Leuctridae, Capniidae, Perlodidae, Perlidae	
Hemiptera	Aphelocheiridae	
Trichoptera	Leptoceridae, Goeridae, Lepidostomatidae, Brachycentridae, Sericostomatidae	
Odonata	Lestidae, Gomphidae, Agriidae, Libellulidae, Cordulegasteridae, Aeshnidae, Corduliidae,	8
Trichoptera	Psychomyiidae, Philopotamidae	
Ephemeroptera	Caenidae	7
Plecoptera	Nemouridae	
Trichoptera	Rhyacophilidae, Polycentropodidae, Limnephilidae	
Mollusca	Ancyclidae, Hydrobidae, Neritidae, Viviparidae, Thiaridae, Bithynidae, Unionidae	6
Trichoptera	Hydroptilidae	
Crustacea	Palaemonidae, Atyidae, Gammaridae	
Polychaeta	Neredae, Nephthyidae	
Odonata	Coenagriidae, Platycnemidae	
Hemiptera	Mesovelidae, Hydrometridae, Gerridae, Nepidae, Naucoridae, Notonectidae, Pleidae, Corixidae, Veliidae, Herbridae, Belostomatidae,	5
Coleoptera	Halipidae, Hygrobiidae, Dytiscidae, Gyrinidae, Hydrophilidae, Noteridae, Heleodidae, Dryopidae, Elminthidae, Psepheniidae	
Trichoptera	Hydropsychidae	
Diptera	Tipulidae, Culicidae, Blepharicidae, Simuliidae	
Ephemeroptera	Baetidae	
Mollusca	Lymnaeidae, Planorbidae, Sphaeriidae	3
Hirudinia	Glossophoniidae, Hirudidae, Erpobdellidae	
Crustacea	Asellidae	2
Diptera	Chironomidae, Syrphidae	
Oligochaeta	All families	1

Source : Thorne, 1993

Appendix C 1 : Macroinvertebrates found in Wire mesh cage sampler in dry season (Animals in three wire mesh cages)

Phylum class order	Family	ST1	ST2	ST3	ST4	R1	R2	IC1	IC2	SC1	SC2
Arthropoda Insecta	Baetidae	38	8	13	72	10	2	4	NA	NA	1
	Caenidae	2	4	0	1	0	0	6	NA	NA	0
Ephemeroptera	Heptageniidae	9	2	14	4	0	0	0	NA	NA	0
	Neophemeridae	4	2	0	14	0	2	13	NA	NA	0
	Leptophlebiidae	1	5	3	10	0	1	5	NA	NA	0
	Behningiidae	0	0	0	0	0	0	0	NA	NA	0
	Ephemeridae	0	2	0	0	0	0	0	NA	NA	0
	Tricorythidae	0	0	0	0	1	0	0	NA	NA	0
	Trichoptera	Hydroptilidae	1	2	4	0	0	4	0	NA	NA
	Hydropsychidae	4	0	114	3	3	2	0	NA	NA	0
	Brachycentridae	3	7	15	0	0	1	0	NA	NA	0
	Helicopsychidae	0	4	0	0	0	0	0	NA	NA	0
	Limnephilidae	0	4	7	0	0	0	2	NA	NA	0
	Lepidostomatidae	0	0	0	2	2	0	0	NA	NA	0
	Glossosomatidae	0	0	5	1	0	2	0	NA	NA	0
	Philopotamidae	0	0	0	0	1	3	0	NA	NA	0
Plecoptera	Capniidae	2	0	0	0	0	0	0	NA	NA	0
	Peltoperlidae	0	2	0	0	0	0	0	NA	NA	0
	Perlidae	0	0	0	0	3	1	3	NA	NA	0
Coleoptera	Elmidae	3	6	3	0	0	9	3	NA	NA	0
	Limnichidae	1	0	0	0	0	1	0	NA	NA	0
	Hydrophilidae	1	4	2	2	1	0	0	NA	NA	0
	Gyrinidae	0	1	0	0	0	1	0	NA	NA	0
	Hydraenidae	0	0	2	0	0	2	0	NA	NA	0
	Psephenidae	0	0	1	2	1	3	0	NA	NA	0
	Dytiscidae	0	0	0	0	0	0	3	NA	NA	0
Diptera	Chironomidae	24	22	5	36	2	9	69	NA	NA	1
	Simuliidae	4	2	9	0	2	0	0	NA	NA	0
	Culicidae	0	0	0	0	0	0	2	NA	NA	1
	Tipulidae	0	4	0	6	0	3	0	NA	NA	0
	Psychodidae	0	3	0	0	0	0	0	NA	NA	0
	Ceratopogonidae	0	1	2	0	0	2	0	NA	NA	0
Hemiptera	Naucoridae	4	0	0	0	1	0	0	NA	NA	0
	Veliidae	0	0	0	2	0	1	0	NA	NA	0
Odonata	Gomphidae	2	1	0	0	2	3	0	NA	NA	0
	Lestidae	0	0	0	0	0	2	0	NA	NA	0
	Libellulidae	0	0	2	0	0	0	0	NA	NA	0
	Aeshnidae	0	0	0	0	0	0	0	NA	NA	0
Lepidoptera	Pyralidae	0	0	0	1	0	0	0	NA	NA	0
Crustacea Decapoda	Parathelphusidae	0	0	0	12	0	2	3	NA	NA	0
Annelida	Lumbricidae	0	2	0	1		21	0	NA	NA	0
	Hirudidae	0	0	0	6		32	0	NA	NA	0
Oligochaeta											0
Mollusca -Gastropoda - Bivalvia	Ampularidae	1	0	0	0	0	1	0	NA	NA	0
	Corbiculidae	0	1	0	2	0	7	5	NA	NA	0
	Thairidae	0	0	0	2	34	24	5	NA	NA	1
	Sphaeriidae	0	11	0	0	0	0	0	NA	NA	0
	Viviparidae	0	0	0	0	2	0	0	NA	NA	0
	Buccinidae	0	0	0	0	9	0	0	NA	NA	0
	Planorbidae	0	0	0	5	0	0	0	NA	NA	0
	Lymnaeidae	0	0	0	0	7	0	2	NA	NA	0
Bithynidae	0	0	0	0	0	4	1	NA	NA	0	
Ostracoda	Ostracoda	0	0	0	18	0	0	0	NA	NA	0
Total per site		104	100	201	202	81	145	126	NA	NA	4

Appendix C 2 : Macroinvertebrates found in Wire mesh cage sampler in wet season
(Animals in three wire mesh cages).

Phylum /class / order	Family	ST1	ST2	ST 3	ST 4	R1	R2	IC1	IC2	SC1	SC2
Arthropoda Insecta Ephemeroptera	Baetidae	NA	12	59	NA	14	11	9	22	0	0
	Caenidae	NA	2	11	NA	0	8	0	0	0	0
	Heptageniidae	NA	1	0	NA	0	0	4	2	0	0
	Neophemeridae	NA	3	5	NA	7	3	2	0	0	0
	Leptophlebiidae	NA	0	3	NA	0	0	1	2	0	0
Trichoptera	Hydroptilidae	NA	0	0	NA	0	6	8	18	0	0
	Hydropsychidae	NA	3	71	NA	21	5	231	284	0	0
	Helicopsychidae	NA	0	0	NA	0	0	11	0	0	0
	Phryganeidae	NA	0	2	NA	0	0	0	0	0	0
	Odontoceridae	NA	0	0	NA	0	0	3	9	0	0
	Limnephilidae	NA	0	3	NA	0	2	0	4	0	0
	Lepidostomatidae	NA	1	5	NA	0	0	0	0	0	0
	Philopotamidae	NA	0	0	NA	5	3	0	0	0	0
Plecoptera	Capniidae	NA	1	5	NA	0	0	0	0	0	0
	Peltoperlidae	NA	0	0	NA	0	0	0	0	0	0
	Perlidae	NA	1	17	NA	2	0	3	6	0	0
Coleoptera	Elmidae	NA	1	3	NA	9	2	3	7	0	0
	Limnichidae	NA	0	0	NA	0	0	0	0	0	0
	Hydrophilidae	NA	2	2	NA	0	2	0	0	0	0
	Dryopidae	NA	0	11	NA	1	0	0	0	0	0
	Chrysomelidae	NA	0	0	NA	1	0	0	0	0	0
	Hydraenidae	NA	2	0	NA	0	0	0	0	0	0
	Psephenidae	NA	1	3	NA	5	2	3	0	0	0
	Dytiscidae	NA	0	0	NA	0	0	2	9	0	0
Diptera	Chironomidae	NA	96	80	NA	12	3	12	14	90	137
	Simuliidae	NA	1	36	NA	0	0	17	32	0	0
	Ephydriidae	NA	0	0	NA	1	0	0	0	0	1
	Tipulidae	NA	1	5	NA	0	2	0	0	0	0
	Ceratopogonidae	NA	3	0	NA	0	0	0	0	0	0
Hemiptera	Naucoridae	NA	0	0	NA	0	0	0	0	0	0
	Veliidae	NA	0	0	NA	0	0	0	0	0	0
Odonata	Gomphidae	NA	3	2	NA	7	3	0	0	0	0
	Calopterygidae	NA	1	0	NA	0	0	0	0	0	0
	Libellulidae	NA	0	3	NA	1	2	0	0	0	0
	Aeshnidae	NA	0	0	NA	0	2	0	0	0	0
Megaloptera	Corydalidae	NA	0	6	NA	0	0	0	0	0	0
Lepidoptera	Pyralidae	NA	0	0	NA	0	2	0	0	0	0
Crustacea Decapoda	Atyidae	NA	0	0	NA	2	0	8	7	0	0
	Gammaridae	NA	0	0	NA	0	0	0	0	89	0
Annelida Hirudidae Oligochaeta	Lumbricidae	NA	2	0	NA	0	74	0	0	655	16
	Tubificidae	NA	0	0	NA	0	9	0	0	104	0
	Naididae	NA	0	0	NA	0	0	0	0	18	2
Mollusca -Gastropoda - Bivalvia	Ampularidae	NA	0	0	NA	0	0	0	0	3	0
	Corbiculidae	NA	2	0	NA	4	3	2	0	0	0
	Thairidae	NA	2	0	NA	21	15	259	0	0	0
	Ancylidae	NA	0	0	NA	0	0	5	2	25	0
	Melanoidae	NA	0	0	NA	0	0	40	0	0	0
	Amblymididae	NA	0	0	NA	0	6	0	0	0	0
	Viviparidae	NA	0	0	NA	3	0	0	0	32	0
	Buccinidae	NA	0	0	NA	5	2	15	0	0	0
	Planorbidae	NA	0	0	NA	1	0	0	0	0	4
	Lymnaeidae	NA	0	0	NA	0	0	0	0	3	0
	Bithynidae	NA	0		NA	1	0	6	0	0	0
		planaria	NA	198		NA	0	0	0	0	54
Total per site		NA	339	217	NA	123	167	644	418	1073	160

Appendix C 3 : Macroinvertebrates found in Wooden box sampler in dry season
(Animals in three wooden boxes)

Phylum class order	Family	ST1	ST2	ST3	ST4	R1	R2	IC1	IC2	SC1	SC2
Arthropoda Insecta Ephemeroptera	Baetidae	19	3	21	39	12	1	6	NA	NA	0
	Caenidae	0	2	3	3	0	0	51	NA	NA	0
	Heptageniidae	0	0	5	0	7	0	0	NA	NA	0
	Neophemeridae	10	1	20	4	0	0	52	NA	NA	0
	Leptophlebiidae	1	9	0	39	5	0	9	NA	NA	0
	Behningiidae	3	0	2	2	0	0	0	NA	NA	0
	Ephemeridae	4	4	5	0	0	0	0	NA	NA	0
Trichoptera	Hydroptilidae	3	3	5	0	0	5	0	NA	NA	0
	Hydropsychidae	1	0	41	0	2	2	0	NA	NA	0
	Brachycentridae	6	5	0	0	0	4	0	NA	NA	0
	Helicopsychidae	0	5	1	0	0	0	0	NA	NA	0
	Limnephilidae	0	4	0	3	4	0	2	NA	NA	0
	Rhyacophilidae	0	0	0	0	3	0	0	NA	NA	0
	Beraeidae	0	0	2	0	0	0	0	NA	NA	0
	Odontoceridae	0	0	17	0	0	0	0	NA	NA	0
	Lepidostomatidae	0	0	9	0	1	0	0	NA	NA	0
	Glossosomatidae	0	0	0	0	0	1	0	NA	NA	0
Philopotamidae	0	0	0	0	1	2	0	NA	NA	0	
Plecoptera	Capniidae	2	0	0	0	0	1	0	NA	NA	0
	Peltoperlidae	0	0	0	0	0	0	0	NA	NA	0
	Perlidae	0	0	3	0	2	0	0	NA	NA	0
Coleoptera	Elmidae	11	2	10	2	8	10	3	NA	NA	0
	Limnichidae	0	0	0	0	0	4	0	NA	NA	0
	Hydrophilidae	0	2	0	6	0	0	0	NA	NA	0
	Gyrinidae	0	1	0	0	0	1	0	NA	NA	0
	Hydraenidae	0	0	2	0	0	1	0	NA	NA	0
	Psephenidae	0	0	0	2	1	3	0	NA	NA	0
	Dytiscidae	0	0	0	0	0	0	1	NA	NA	0
Diptera	Chironomidae	33	19	18	52	14	19	314	NA	NA	0
	Simuliidae	3	4	15	0	1	0	0	NA	NA	0
	Tabanidae	0	3	0	0	0	0	0	NA	NA	0
	Nematocera (pupa)	0	2	0	0	0	0	0	NA	NA	0
	Syrphidae	0	3	0	0	0	0	0	NA	NA	0
	Ephydriidae	0	0	0	0	0	0	3	NA	NA	0
	Tipulidae	1	3	6	3	0	1	0	NA	NA	0
	Psychodidae	0	9	0	0	0	0	0	NA	NA	0
	Ceratopogonidae	0	3	2	0	0	0	2	NA	NA	0
Hemiptera	Nancoridae	6	0	0	0	1	0	0	NA	NA	0
	Veliidae	0	0	0	1	0	0	0	NA	NA	0
Odonata	Gomphidae	1	1	0	0	1	1	0	NA	NA	0
	Lestidae	2	0	0	0	0	1	0	NA	NA	0
	Aeshmidae	0	0	0	0	0	0	2	NA	NA	0
Crustacea Decapoda	Atyidae	0	0	1	0	0	1	4	NA	NA	0
Annelida Hirudidae Oligochaeta	Lumbricidae	52	3	2	52	0	14	10	NA	NA	0
	Tubificidae	6	1	0	8	0	21	0	NA	NA	0
	Naididae	0	0	0	0	0	0	0	NA	NA	0
Mollusca -Gastropoda - Bivalvia	Ampularidae	6	0	0	0	0	4	0	NA	NA	0
	Corbiculidae	5	2	0	2	3	6	5	NA	NA	0
	Thairidae	0	0	0	2	32	25	92	NA	NA	0
	Sphaeriidae	0	5	0	0	0	0	0	NA	NA	0
	Ancylidae	0	0	0	0	0	0	15	NA	NA	0
	Buccinidae	0	0	0	0	2	0	0	NA	NA	0
	Planorbidae	0	0	0	4	0	0	0	NA	NA	0
	Lymnaeidae	0	0	0	0	0	0	15	NA	NA	0
Bithynidae	0	0	0	0	0	4	17	NA	NA	0	
Total per site		175	99	190	224	100	132	567			0

Appendix C 4 : Macroinvertebrates found in Wooden box sampler in wet season
(Animals in three wooden boxes)

Phylum class order	Family	ST1	ST2	ST3	ST4	R1	R2	IC1	IC2	SC1	SC2
Arthropoda	Baetidae	NA	45	12	NA	9	11	25	16	0	0
Insecta	Caenidae	NA	6	2	NA	1	6	10	7	0	0
Ephemeroptera	Heptageniidae	NA	1	0	NA	0	0	5	2	0	0
	Neophemeridae	NA	4	8	NA	1	0	2	2	0	0
Trichoptera	Hydroptilidae	NA	0	0	NA	5	3	3	4	0	0
	Hydropsychidae	NA	2	9	NA	3	2	74	42	0	0
	Brachycentridae	NA	0	5	NA	3	0	0	0	0	0
	Helicopsychidae	NA	0	0	NA	0	0	2	0	0	0
	Limnephilidae	NA	0	0	NA	0	0	0	1	0	0
	Odontoceridae	NA	0	0	NA	0	0	5	0	0	0
	Lepidostomatidae	NA	1	0	NA	0	0	0	6	0	0
	Philopotamidae	NA	0	0	NA	12	11	0	3	0	0
Plecoptera	Capniidae	NA	2	3	NA	0	0	0	1	0	0
	Peltoperlidae	NA	0	0	NA	0	0	0	0	0	0
	Perlidae	NA	1	5	NA	6	0	0	0	0	0
Coleoptera	Elmidae	NA	8	9	NA	9	3	21	10	0	0
	Limnichidae	NA	0	0	NA	0	0	4	0	0	0
	Hydrophilidae	NA	5	3	NA	0	0	0	1	0	0
	Chrysomelidae	NA	0	0	NA	0	3	0	0	0	0
	Dryopidae	NA	0	2	NA	0	0	0	0	0	0
	Hydraenidae	NA	0	0	NA	0	0	0	0	0	0
	Psephenidae	NA	0	2	NA	8	2	0	0	0	0
	Dytiscidae	NA	0	0	NA	0	0	3	8	0	0
Diptera	Chironomidae	NA	164	51	NA	14	9	19	16	60	119
	Simuliidae	NA	0	12	NA	0	0	8	4	0	0
	Ephydriidae	NA	0	0	NA	0	0	0	0	0	1
	Tipulidae	NA	1	2	NA	0	0	0	0	0	0
	Ceratopogonidae	NA	3	0	NA	0	0	0	0	0	0
Hemiptera	Naucoridae	NA	0	0	NA	0	0	0	0	0	0
	Gerridae	NA	0	0	NA	1	0	0	0	0	0
	Herbidae	NA	0	2	NA	0	0	0	0	0	0
Odonata	Gomphidae	NA	0	0	NA	5	2	0	0	0	0
	Libellulidae	NA	0	2	NA	1	3	0	0	0	0
Megaloptera	Corydalidae	NA	0	6	NA	0	0	0	0	0	0
Crustacea	Atyidae	NA	0	0	NA	3	0	7	4	3	0
Decapoda	Prathelphusidae	NA	1	3	NA	0	0	0	0	0	0
Annelida	Lumbricidae	NA	1	0	NA	0	9	0	5	518	22
Hirudidae	Tubificidae	NA	0	0	NA	0	3	0	0	158	0
Oligochaeta	Naididae	NA	0	0	NA	0	0	0	0	12	0
Mollusca	Ampularidae	NA	0	0	NA	0	0	0	1	15	0
-Gastropoda	Corbiculidae	NA	1	0	NA	0	0	2	12	18	0
- Bivalvia	Amblymidae	NA	0	0	NA	0	2	0	15	0	0
	Melanoidae	NA	0	0	NA	0	0	13	0	0	0
	Thairidae	NA	2	0	NA	9	36	93	0	0	0
	Ancyclidae	NA	0	0	NA	0	0	7	3	89	0
	Viviparidae	NA	0	0	NA	0	0	0	0	54	0
	Buccinidae	NA	0	0	NA	0	3	4	0	0	0
	Planorbidae	NA	0	0	NA	0	0	0	0	9	2
	Lymnaeidae	NA	0	0	NA	0	33	0	4	21	0
	Bithynidae	NA	0	0	NA	2	5	0	0	0	0
	Planaria	NA	8	0	NA	0	0	0	0	0	0
Colembola	Poduridae	NA	0	0	NA	2	0	0	1	0	0
Total per site		NA	256	89	NA	96	97	311	168	637	106

Appendix C 5 : Macroinvertebrates found in Multi plate sampler in dry season
(Animals in three Multi plate samplers)

Phylum class order	Family	ST1	ST2	ST3	ST4	R1	R2	IC1	IC2	SC1	SC2
Arthropoda	Baetidae	14	6	12	12	8	0	6	NA	NA	0
Insecta	Caenidae	0	0	2	3	0	0	7	NA	NA	0
Ephemeroptera	Heptageniidae	4	3	5	0	0	0	0	NA	NA	0
	Ephemeridae	0	1	1	2	0	0	0	NA	NA	0
	Leptophlebiidae	1	2	2	19	1	1	7	NA	NA	0
	Tricorythidae	0	0	2	0	0	0	0	NA	NA	0
	Neophemeridae	12	6	2	7	0	0	12	NA	NA	0
Trichoptera	Hydroptilidae	0	0	0	0	0	1	0	NA	NA	0
	Hydropsychidae	5	0	57	0	4	1	0	NA	NA	0
	Brachycentridae	7	10	19	0	0	2	0	NA	NA	0
	Helicopsychidae	0	2	0	0	0	0	0	NA	NA	0
	Limnephilidae	0	1	8	0	3	0	0	NA	NA	0
	Glossosomatidae	0	0	4	0	0	1	0	NA	NA	0
	Lepidostomatidae	0	0	5	0	0	0	0	NA	NA	0
	Philopotamidae	0	0	0	0	1	1	0	NA	NA	0
Plecoptera	Peltoperlidae	2	1	0	0	0	0	0	NA	NA	0
	Perlidae	0	0	3	0	1	2	1	NA	NA	0
Coleoptera	Elmidae	3	4	3	3	0	1	1	NA	NA	0
	Hydrophilidae	0	4	0	1	0	0	0	NA	NA	0
	Chrysomelidae	0	0	0	0	0	0	0	NA	NA	0
	Dryopidae	0	0	0	0	0	0	0	NA	NA	0
	Hydraenidae	0	0	6	0	0	1	0	NA	NA	0
	Psephenidae	0	0	0	3	2	1	0	NA	NA	0
	Dyiscidae	0	0	1	0	0	0	1	NA	NA	0
Diptera	Chironomidae	17	5	22	19	2	6	137	NA	NA	0
	Simuliidae	1	7	9	0	1	0	0	NA	NA	0
	Syrphidae	0	2	0	0	0	0	0	NA	NA	0
	Tabanidae	0	1	0	0	0	0	0	NA	NA	0
	Ephydriidae	0	2	0	0	0	0	0	NA	NA	0
	Athericidae	0	0	2	0	0	0	0	NA	NA	0
	Psychodidae	0	1	0	1	0	0	0	NA	NA	0
	Tipulidae	0	2	0	4	0	1	0	NA	NA	0
	Ceratopogonidae	0	0	0	0	0	2	0	NA	NA	0
Hemiptera	velidae	0	0	0	0	1	0	0	NA	NA	0
Odonata	Gomphidae	2	1	2	0	1	1	0	NA	NA	0
	Lestidae	1	0	0	0	0	0	0	NA	NA	0
	Aeshnidae	0	0	2	2	0	0	0	NA	NA	0
Megaloptera	Corydalidae	0	0	0	0	0	0	0	NA	NA	0
Crustacea	Atyidae	0	0	0	2	0	1	0	NA	NA	0
Decapoda	Parathelphusidae	0	0	0	4	0	0	0	NA	NA	0
Annelida	Lumbricidae	0	3	0	0	0	3	0	NA	NA	0
Hirudidae	Tubificidae	2	1	0	0	0	5	0	NA	NA	0
Oligochaeta											
Mollusca	Ampularidae	6	2	0	1	0	2	0	NA	NA	0
-Gastropoda	Corbiculidae	0	0	0	0	2	4	0	NA	NA	0
-Bivalvia	Amblymididae	0	0	0	0	0	0	0	NA	NA	0
	Thairidae	0	0	0	1	22	11	8	NA	NA	0
	Sphaeriidae	0	15	0	0	0	0	0	NA	NA	0
	Ancylidae	0	0	0	0	0	0	59	NA	NA	0
	Viviparidae	0	0	0	0	2	0	0	NA	NA	0
	Buccinidae	0	0	0	0	1	0	0	NA	NA	0
	Planorbidae	0	0	0	5	2	0	0	NA	NA	0
	Bithynidae	0	0	0	0	0	1	6	NA	NA	0
Total per site		82	82	169	95	54	49	245	NA	NA	0

Appendix 6 : Macroinvertebrates found in Multi plate sampler in wet season
(Animals in three Multi plate samplers)

Phylum/class/ order	Family	ST1	ST2	ST3	ST4	R1	R2	IC1	IC2	SC1	SC2
Arthropoda	Baetidae	NA	9	2	NA	12	3	10	11	0	0
	Caenidae	NA	1	0	NA	3	0	0	0	0	0
Insecta Ephemeroptera	Leptophlebiidae	NA	0	0	NA	4	0	0	0	0	0
	Dryopidae	NA	0	2	NA	0	0	0	0	0	0
	Neophemeridae	NA	2	0	NA	4	2	0	0	0	0
	Trichoptera	Hydroptilidae	NA	0	0	NA	0	3	0	4	0
	Hydropsychidae	NA	0	6	NA	11	0	12	35	0	0
	Odontoceridae	NA	0	0	NA	0	0	1	2	0	0
	Phryganeidae	NA	0	2	NA	0	0	0	0	0	0
	polycentropidae	NA	0	0	NA	0	0	1	0	0	0
	Philopotamidae	NA	0	0	NA	3	0	0	0	0	0
Plecoptera	Perlidae	NA	0	2	NA	0	0	1	0	0	0
Coleoptera	Elmidae	NA	1	2	NA	3	0	4	1	0	0
	Hydrophilidae	NA	0	0	NA	0	0	0	1	8	0
	Dryopidae	NA	0	2	NA	0	0	0	0	0	0
	Psephenidae	NA	1	0	NA	0	0	0	2	0	0
	Dytiscidae	NA	0	0	NA	0	0	0	2	0	0
Diptera	Chironomidae	NA	58	11	NA	6	6	4	12	11	17
	Simuliidae	NA	1	20	NA	2	0	12	17	0	0
	Ephydriidae	NA	0	0	NA	0	0	0	0	0	1
	Psychodidae	NA	1	0	NA	0	0	0	0	0	0
	Tipulidae	NA	0	0	NA	0	2	0	0	0	0
	Ceratopogonidae	NA	2	0	NA	0	0	0	0	0	0
Hemiptera	Gerridae	NA	0	0	NA	1	0	0	0	0	0
	Belostomatidae	NA	1	0	NA	0	0	0	0	0	0
Odonata	Gomphidae	NA	1	0	NA	2	2	0	0	0	0
	Calopterygidae	NA	1	0	NA	0	0	0	0	0	0
	Libellulidae	NA	0	0	NA	0	3	0	0	0	0
	Aeshnidae	NA	0	0	NA	0	2	0	0	0	0
Megaloptera	Corydalidae	NA	0	5	NA	0	0	0	0	0	0
Crustacea	Atyidae	NA	0	3	NA	0	0	0	2	0	0
Decapoda	Parathelphusidae	NA	0	6	NA	0	0	2	0	0	0
Annelida	Lumbricidae	NA	5	0	NA	0	17	0	0	136	5
Hirudidae	Tubificidae	NA	0	0	NA	0	11	0	0	18	0
Oligochaeta											
Mollusca -Gastropoda - Bivalvia	Ampularidae	NA	0	0	NA	0	0	0	0	4	0
	Corbiculidae	NA	1	0	NA	0	0	0	1	0	0
	Melanoidae	NA	0	0	NA	0	0	28	0	0	0
	Lymnaeidae	NA	0	0	NA	0	3	7	1	2	0
	Thairidae	NA	1	0	NA	15	9	83	2	0	0
	Hydrobidae	NA	0	0	NA	0	0	0	0	5	0
	Ancylidae	NA	0	0	NA	0	0	4	0	43	0
	Viviparidae	NA	0	0	NA	0	0	0	0	13	0
	Buccinidae	NA	0	0	NA	1	2	9	0	0	0
Planorbidae	NA	0	0	NA	0	0	0	0	9	0	
Collembola	Poduridae	NA	0	0	NA	2	0	0	1	0	0
	Planaria	NA	8	0	NA	0	0	0	0	22	0
Total per site		NA	94	40	NA	69	41	178	101	275	23

Appendix C 7 : Macroinvertebrates found in conventional methods in dry season (Animals per m²)

Phylum/class/order	Family	ST1	ST2	ST3	ST4	R1	R2	IC1	IC2	SC1	SC2
Arthropoda	Baetidae	43	79	69	109	67	11	0	0	0	0
	Caenidae	0	21	16	25	0	0	0	0	0	0
Insecta Ephemeroptera	Heptageniidae	2	28	15	0	0	0	0	0	0	0
	Neophaenidae	12	10	2	17	11	0	22	33	0	0
	Leptophlebiidae	0	25	5	133	122	11	0	0	0	0
	Ephemeridae	0	2	0	10	0	0	0	0	0	0
Trichoptera	Hydroptilidae	5	38	18	0	0	0	0	11	0	0
	Hydropsychidae	87	59	28	15	67	11	0	67	0	0
	Brachycentridae	6	21	12	0	0	0	33	11	0	0
	Helicopsychidae	0	2	0	0	0	0	0	0	0	0
	Rhyacophilidae	0	5	0	0	0	0	0	0	0	0
	Limnephilidae	5	5	0	15	0	0	0	0	0	0
	Odontoceridae	3	0	0	0	0	0	0	0	0	0
	Lepidostomatidae	0	2	0	0	0	0	0	0	0	0
	Glossosomatidae	0	0	2	0	33	11	0	0	0	0
Philopotamidae	21	2	3	0	22	11	0	0	0	0	
Plecoptera	Peltoperlidae	0	7	0	0	0	0	0	0	0	0
	Perlidae	0	8	5	0	22	0	0	0	0	0
Coleoptera	Elmidae	18	38	30	15	33	11	22	11	0	0
	Staphylinidae	0	0	2	0	0	0	0	0	0	0
	Hydrophilidae	0	13	12	5	22	11	0	0	0	0
	Helodidae	0	0	18	0	0	0	0	0	0	0
	Halipidae	0	0	5	0	0	0	0	0	0	0
	Hydraenidae	8	0	16	0	0	0	0	0	0	0
	Psephenidae	0	0	5	0	22	0	11	0	0	0
Diptera	Chironomidae	116	99	44	388	56	133	333	78	656	0
	Simuliidae	21	71	5	0	0	0	0	0	0	0
	Athericidae	0	0	0	7	0	0	0	0	0	0
	Ephydriidae	0	0	5	12	0	0	0	0	0	0
	Tipulidae	0	10	15	20	0	0	0	0	0	0
	Tabanidae	2	0	3	0	0	0	0	0	0	0
	Empididae	0	3	0	5	0	0	0	0	0	0
	Nematocera	0	0	0	2	0	0	0	0	0	0
	Psychodidae	0	2	0	0	0	0	0	0	0	0
Ceratopogonidae	0	7	3	5	0	11	0	0	56	0	
Hemiptera	Belostomatidae	2	2	0	0	0	0	0	0	0	0
	Corixidae	0	0	0	5	0	0	0	0	0	0
	Naucoridae	31	7	2	0	0	0	0	0	0	0
	Veliidae	0	0	0	2	0	0	0	0	0	0
Odonata	Gomphidae	12	3	0	10	22	11	0	11	0	0
	Cordulegestridae	0	0	0	5	0	0	0	0	0	0
	Libellulidae	0	0	0	0	0	0	0	11	0	0
	Aeshnidae	0	2	0	0	0	0	0	0	0	0
Lepidoptera	Pyralidae	0	0	0	2	0	0	0	0	0	0
Crustacea	Atyidae	0	0	2	15	0	0	0	0	0	0
Decapoda	Grapsidae	0	5	0	0	0	0	0	0	0	0
Collembola	Poduridae	0	0	0	2	0	0	0	0	0	0
	Isotomidae	0	0	0	7	0	0	0	0	0	0
Annelida	Lumbricidae	0	56	8	138	22	178	78	11	1900	0
Hirudidae	Tubificidae	0	0	0	67	22	333	0	0	367	0
Oligochaeta	Naididae	0	0	3	0	0	0	0	0	33	0
Mollusca -Gastropoda - Bivalvia	Ampularidae	16	0	0	0	0	33	0	0	278	0
	Corbiculidae	0	0	0	0	22	267	356	244	0	0
	Thairidae	0	0	0	30	67	344	378	644	0	0
	Viviparidae	0	13	0	0	0	0	67	0	33	0
	Buccinidae	0	0	0	0	33	0	0	78	0	0
	Uninoidae	0	0	0	0	0	56	0	78	0	0
	Planorbidae	0	0	0	5	0	0	0	0	0	0
	Lymnaeidae	0	0	0	0	0	67	0	0	122	0
Bithynidae	5	0	0	0	0	0	44	122	0	0	
Ostracoda	Ostracoda	0	0	0	52	0	0	0	0	0	0
Total per station		415	645	357	1126	667	1511	1344	1411	3444	0

(Note: In site ST 1, ST 2, ST 3, ST 4 used Surber sampler and rest of the sites sampled by Ekman grab)

Appendix C 8 : Macroinvertebrates found in Conventional methods - Wet season
(Animals per m²)

Phylum/class/order	Family	ST1	ST2	ST3	ST4	R1	R2	IC1	IC2	SC1	SC2
Arthropoda	Baetidae	92	221	33	22	0	0	11	0	0	0
Insecta	Caenidae	8	13	2	10	0	0	0	0	0	0
Ephemeroptera	Heptageniidae	3	2	3	5	0	0	0	0	0	0
	Neophemeridae	5	5	2	0	0	0	0	0	0	0
	Tricorythidae	5	0	0	0	0	0	0	0	0	0
Trichoptera	Hydroptilidae	2	2	3	0	0	0	11	22	0	0
	Hydropsychidae	20	40	5	30	0	0	22	56	0	0
	Phryganeidae	0	0	0	2	0	0	0	0	0	0
	Helicopsychidae	0	0	0	7	0	0	0	0	0	0
	Odontoceridae	2	0	0	0	22	11	0	0	0	0
	Glossosomatidae	0	2	0	2	0	0	0	0	0	0
	Philopotamidae	0	0	0	0	33	0	0	0	0	0
Coleoptera	Elmidae	7	0	5	5	22	11	11	11	0	0
	Limnichidae	5	0	0	0	0	0	0	0	0	0
	Hydrophilidae	2	0	3	0	0	0	0	0	0	0
	Dryopidae	3	0	13	0	0	0	0	0	0	0
	Psephenidae	2	0	0	0	0	0	0	0	0	0
Diptera	Chironomidae	53	44	10	635	22	33	22	0	89	189
	Simuliidae	20	2	7	188	0	0	0	0	0	0
	Nematocera	3	0	0	0	0	0	0	0	0	0
	Blepharicridae	0	0	3	0	0	0	0	0	0	0
	Tipulidae	5	15	18	42	0	0	0	0	0	0
	Athericidae	0	3	0	0	0	11	11	0	0	0
	Stratiomidae	2	0	0	0	0	0	0	0	0	0
	Psychodidae	0	3	0	5	0	0	0	0	0	0
	Ceratopogonidae	2	0	0	35	0	0	0	0	0	0
Hemiptera	Naucoridae	2	0	3	0	0	0	0	0	0	0
	Belostomatidae	3	0	2	0	0	0	0	0	0	0
	Gerridae	0	0	2	0	0	0	0	0	0	0
Odonata	Gomphidae	5	0	0	7	0	0	22	11	0	0
	Cordulegastridae	8	0	0	0	0	0	0	0	0	0
	Macromidae	2	0	0	0	22	0	0	0	0	0
	Aeshnidae	2	0	0	2	0	0	0	0	0	0
Lepidoptera	Pyrilidae	0	2	2	0	0	0	0	0	0	0
Crustacea	Atyidae	0	2	0	12	0	0	0	0	0	0
Decapoda	Paratheiphusidae	3	5	3	8	0	0	0	0	0	0
Collembola	Poduridae	0	0	0	0	0	0	0	0	0	22
Annelida	Lumbricidae	7	3	2	12	0	289	0	0	1111	22
Hirudidae	Tubificidae	3	0	0	0	0	22	0	0	133	0
Oligochaeta											
Mollusca	Ampularidae	0	0	0	0	0	0	22	0	44	0
- Gastropoda	Corbiculidae	10	0	0	0	33	122	178	89	178	0
- Bivalvia	Thairidae	5	0	0	32	33	244	344	89	22	0
	Ancyclidae	0	0	0	0	56	133	0	0	467	0
	Melanoidae	0	0	0	0	0	0	133	22	0	0
	Viviparidae	0	0	0	2	0	0	0	0	400	0
	Buccinidae	10	0	0	2	0	11	0	0	0	0
	Planorbidae	0	0	0	0	0	0	0	0	0	11
	Lymnaeidae	3	0	0	10	44	111	33	0	467	0
	Bithynidae	2	0	0	0	11	0	0	56	0	0
Total per station		306	364	121	1102	298	998	82	356	2533	244

(Note: In site ST 1, ST 2, ST 3, ST 4 used Surber sampler and rest of the sites sampled by Ekman grab)

Appendix C 9 : Number of macroinvertebrates colonized in Wire mesh cage sampler
(per unit sampler)

Phylum/class/order	Family	Collection week									
		1	2	3	4	5	6	7	8	9	10
Arthropoda Insecta Ephemeroptera	Baetidae	2	7	10	1	3	5	5	14	5	14
	Caenidae	0	1	2	0	1	4	6	3	0	3
	Heptageniidae	0	0	1	0	1	2	0	0	0	3
	Neoephemeridae	2	4	0	1	0	0	6	4	2	1
	Leptophlebiidae	1	6	5	0	1	2	4	7	0	2
Trichoptera	Hydroptilidae	3	2	2	0	2	2	0	4	0	3
	Hydropsychidae	4	19	16	6	11	16	7	9	7	0
	Brachycentridae	0	1	4	0	1	1	3	0	0	0
	Phryganeidae	0	0	0	0	0	1	0	1	0	0
	Limnephilidae	0	0	0	1	0	0	0	1	0	0
	Glossosomatidae	0	0	1	1	1	1	0	0	0	0
	Philopotamidae	1	0	0	8	0	0	0	0	2	12
Plecoptera	Peltoperlidae	0	0	0	0	0	0	2	0	0	0
	Perlidae	0	2	1	0	2	4	4	3	1	0
Coleoptera	Elmidae	1	2	4	1	2	2	4	4	3	2
	Gyranidae	0	0	0	0	0	1	0	1	0	0
	Hydrophilidae	1	4	0	0	0	0	0	0	0	0
	Halipidae	0	1	0	0	0	0	0	0	0	0
	Dryopidae	0	1	12	0	3	5	1	5	0	0
	Limnichidae	0	0	0	0	0	0	2	0	0	0
	Psephenidae	0	0	1	0	0	0	0	1	2	1
	Dytiscidae	0	0	0	0	0	0	0	0	0	1
Diptera	Chironomidae	1	2	2	0	1	2	2	8	4	4
	Simuliidae	0	1	0	0	0	0	0	0	0	0
	Tipuliidae	0	0	0	0	0	0	0	0	0	1
Odonata	Gomphidae	0	0	0	1	0	0	2	3	2	5
	Libellulidae	0	0	0	0	0	0	0	1	0	0
	Aeshnidae	0	0	0	0	1	1	0	1	0	0
Crustacea Decapoda	Atyidae	0	0	1	0	0	0	0	0	0	0
	Grapsidae	0	0	0	0	0	0	0	1	0	0
Annelida Hirudidae Oligochaeta	Lumbricidae	0	0	0	0	0	0	0	0	0	4
Mollusca -Gastropoda - Bivalvia	Tubificidae	0	0	0	0	0	0	0	0	0	0
	Ancylidae	0	0	0	0	0	0	0	0	0	1
	Corbiculidae	1	0	0	0	0	0	0	1	1	0
	Thairidae	4	0	10	4	2	6	5	6	7	8
	Viviparidae	3	0	2	2	1	1	1	0	1	2
Buccinidae	0	0	0	0	0	0	1	0	2	0	
Total No: of animals per week		24	53	74	26	33	56	55	78	39	67
Total No: of families per week		12	14	16	10	15	17	16	20	13	17

Appendix C 10 : Number of macroinvertebrates colonized in Woden box sampler
(per unit sampler)

Phylum /class/order	Family	Collection week									
		1	2	3	4	5	6	7	8	9	10
Arthropoda Insecta Ephemeroptera	Baetidae	4	5	16	1	1	1	4	6	3	1
	Caenidae	1	1	5	0	0	0	1	1	0	1
	Tricorythidae	0	0	0	0	0	0	0	1	0	0
	Heptageniidae	0	1	0	2	0	0	0	0	0	0
	Neophemeridae	4	3	4	0	0	0	2	5	0	1
	Leptophlebiidae	2	4	2	0	0	0	1	2	0	0
Trichoptera	Hydroptilidae	3	2	1	0	1	1	0	2	2	2
	Hydropsychidae	2	19	3	0	1	2	2	6	1	0
	Brachycentridae	0	1	1	0	0	0	1	0	1	0
	Phryganeidae	0	0	1	0	0	0	0	0	0	0
	Lepidostomatidae	0	1	0	1	0	0	0	1	0	0
	Odontoceridae	0	0	0	0	0	0	0	0	0	1
	Glossosomatidae	0	0	2	0	0	0	0	0	0	0
	Philopotamidae	1	0	1	5	1	1	2	13	4	12
Plecoptera	Peltoperlidae	0	1	0	0	0	0	0	0	0	0
	Perlidae	1	1	2	0	0	0	2	0	2	0
Coleoptera	Elmidae	2	1	2	1	2	3	2	5	3	3
	Gyranidae	0	0	0	0	0	0	1	1	0	0
	Hydrophilidae	0	2	0	0	0	0	0	0	0	0
	Halipidae	0	0	0	0	0	0	0	0	0	0
	Dryopidae	0	2	2	0	2	0	0	3	0	0
	Hydraenidae	2	0	0	0	0	0	0	0	0	0
	Limnichidae	0	0	0	0	0	0	2	0	0	0
	Psephenidae	0	0	0	0	0	3	2	2	3	1
Diptera	Chironomidae	1	15	6	3	0	3	3	6	5	3
	Emphididae	0	0	1	0	0	0	0	0	0	0
	Simuliidae	0	0	0	0	0	0	1	1	0	0
Odonata	Gomphidae	0	0	0	0	0	0	1	1	2	2
	Libellulidae	0	0	0	0	0	0	0	1	0	0
Crustacea Decapoda	Atyidae	1	0	0	0	0	0	0	0	1	0
	Grapsidae	0	0	0	0	0	0	0	1	0	0
Annelida Hirudidae	Lumbricidae	0	0	2	0	0	0	0	0	0	2
	Tubificidae	0	0	0	0	0	0	0	0	0	0
Oligochaeta											
Mollusca -Gastropoda - Bivalvia	Ancylidae	0	0	0	0	0	0	0	0	0	1
	Corbiculidae	1	1	1	0	0	0	0	2	1	1
	Bithynidae	0	0	0	0	0	0	0	0	1	0
	Ampularidae	0	0	0	0	0	0	1	0	0	0
	Thairidae	4	0	3	1	2	2	3	1	3	7
	Viviparidae	3	0	1	0	0	0	0	1	0	1
	Buccinidae	0	0	0	2	0	0	1	0	0	0
Total No: of animals per week		32	60	56	16	10	16	32	62	32	39
Total No: of families per week		15	16	19	8	7	8	18	21	14	15

Appendix C 11 : Number of macroinvertebrates colonized in Multi plate sampler
(per unit sampler)

Phylum/class/order	Family	Collection week									
		1	2	3	4	5	6	7	8	9	10
Arthropoda Insecta Ephemeroptera	Baetidae	2	6	10	1	0	0	NA	3	4	4
	Caenidae	0	2	1	0	0	0	NA	1	1	0
	Tricorythidae	0	0	0	0	0	0	NA	0	0	0
	Heptageniidae	0	0	0	0	0	0	NA	0	0	0
	Neophemeridae	1	3	2	0	0	0	NA	3	1	0
	Leptophlebiidae	0	0	1	0	0	0	NA	5	1	0
Trichoptera	Hydroptilidae	2	5	0	0	0	0	NA	2	0	0
	Hydropsychidae	3	13	6	0	1	4	NA	3	4	0
	Brachycentridae	1	0	0	0	0	0	NA	0	0	0
	Phryganeidae	0	0	0	0	0	0	NA	0	0	0
	Lepidostomatidae	0	0	0	0	0	0	NA	1	0	0
	Odontoceridae	0	0	0	0	0	0	NA	0	0	0
	Glossosomatidae	0	0	0	0	0	0	NA	0	0	0
Philopotamidae	0	0	0	2	0	0	NA	1	1	4	
Plecoptera	Peltoperlidae	0	1	0	0	0	0	NA	0	0	0
	Perlidae	1	7	1	0	0	0	NA	2	0	0
Coleoptera	Elmidae	0	0	0	0	1	1	NA	3	1	2
	Gyranidae	0	0	0	0	0	0	NA	0	0	0
	Hydrophilidae	0	1	0	0	1	1	NA	0	0	0
	Halipidae	0	0	1	0	0	0	NA	0	0	0
	Dryopidae	0	1	1	0	0	0	NA	2	0	0
	Hydraenidae	2	0	0	0	0	0	NA	0	0	0
	Limnichidae	0	0	0	0	0	0	NA	0	0	0
	Psephenidae	1	0	1	0	0	0	NA	0	0	0
	Dytiscidae	0	1	0	0	0	0	NA	0	0	0
Diptera	Chironomidae	0	1	1	0	0	0	NA	0	2	2
	Emphididae	0	0	0	0	0	0	NA	0	0	0
	Simuliidae	0	0	2	0	0	0	NA	0	1	0
	Tipulidae	0	0	0	0	0	0	NA	0	0	1
Odonata	Gomphidae	0	0	0	0	0	0	NA	1	1	0
	Libellulidae	0	0	0	0	0	0	NA	1	0	0
	Aeshnidae	1	0	0	0	0	0	NA	0	0	0
Crustacea	Atyidae	0	0	0	1	0	0	NA	0	0	0
Decapoda	Grapsidae	0	0	0	0	0	0	NA	1	0	0
Annelida	Lumbricidae	0	0	0	0	0	0	NA	0	0	1
Hirudidae	Tubificidae	0	0	0	0	0	0	NA	0	0	0
Oligochaeta											
Mollusca -Gastropoda - Bivalvia	Ancylidae	0	0	0	0	0	0	NA	0	0	0
	Corbiculidae	0	0	0	0	0	0	NA	0	0	0
	Ampularidae	0	0	0	0	0	0	NA	0	0	0
	Thairidae	0	3	3	2	0	0	NA	4	5	3
	Viviparidae	0	0	0	0	0	0	NA	0	0	0
	Buccinidae	0	0	0	0	0	0	NA	0	0	0
Total No: of animals per week		14	44	30	6	3	6	NA	33	22	17
Total No: of families per week		9	12	12	4	3	3	NA	15	11	7

Appendix D 1

Number of animals per square meter- Log n transformed data

*** ANALYSIS OF VARIANCE ***

by LOGLN
METHOD
SEASON
SITE

UNIQUE sums of squares
All effects entered simultaneously

Source of Variation	Sum of Squares	DF	Mean Square	F	Sig of F
Main Effects	85.438	13	6.572	11.528	.000
METHOD	19.108	3	6.369	11.173	.000
SEASON	.022	1	.022	.038	.846
SITE	68.176	9	7.575	13.288	.000
Explained	85.438	13	6.572	11.528	.000
Residual	102.045	179	.570		
Total	187.482	192	.976		

241 cases were processed.
48 cases (19.9 pct) were missing.

*** ANALYSIS OF VARIANCE ***

by LOGLN
METHOD
SEASON
SITE

UNIQUE sums of squares
All effects entered simultaneously

Source of Variation	Sum of Squares	DF	Mean Square	F	Sig of F
Main Effects	61.351	13	4.719	10.323	.000
METHOD	18.066	3	6.022	13.173	.000
SEASON	1.065	1	1.065	2.330	.129
SITE	31.525	9	3.503	7.662	.000
2-Way Interactions	38.042	39	.975	2.134	.001
METHOD SEASON	9.822	3	3.274	7.162	.000
METHOD SITE	19.489	27	.722	1.579	.047
SEASON SITE	5.766	9	.641	1.401	.193
Explained	123.480	52	2.375	5.194	.000
Residual	64.002	140	.457		
Total	187.482	192	.976		

241 cases were processed.
48 cases (19.9 pct) were missing.

Appendix D2

Number of animals per unit sampler - Log n transformed data

*** ANALYSIS OF VARIANCE ***

by LOGNVAL
METHOD
SEASON
SITE

UNIQUE sums of squares
All effects entered simultaneously

Source of Variation	Sum of Squares	DF	Mean Square	F	Sig of F
Main Effects	77.247	13	5.942	10.903	.000
METHOD	17.915	3	5.972	10.957	.000
SEASON	.124	1	.124	.227	.634
SITE	60.153	9	6.684	12.264	.000
Explained	77.247	13	5.942	10.903	.000
Residual	97.554	179	.545		
Total	174.801	192	.910		

252 cases were processed.
59 cases (23.4 pct) were missing.

Appendix D 3

Number of animals per square meter- Log n transformed data

- - - - - O N E W A Y - - - - -

Variable	LOGLN					
By Variable	SITE					

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	9	66.3285	7.3698	11.1320	.0000
Within Groups	183	121.1539	.6620		
Total	192	187.4825			

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int	for Mean
Grp 1	21	5.4239	.8801	.1921	5.0233	TO 5.8246
Grp 2	29	5.8406	.7189	.1335	5.5672	TO 6.1141
Grp 3	26	5.4741	.9271	.1818	5.0997	TO 5.8486
Grp 4	17	6.2985	.8254	.2002	5.8741	TO 6.7228
Grp 5	22	5.3210	.6867	.1464	5.0165	TO 5.6255
Grp 6	19	5.7641	.8651	.1985	5.3471	TO 6.1810
Grp 7	22	6.5035	.7100	.1514	6.1887	TO 6.8183
Grp 8	13	6.1495	.7683	.2131	5.6852	TO 6.6138
Grp 9	12	7.4386	.7136	.2060	6.9852	TO 7.8920
Grp10	12	5.0175	1.0513	.3035	4.3495	TO 5.6854
Total	193	5.8640	.9882	.0711	5.7237	TO 6.0043

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
.7965	9	183	.620

- - - - - O N E W A Y - - - - -

Variable LOGLN
By Variable SITE

Multiple Range Tests: LSD test with significance level .05

The difference between two means is significant if
 $MEAN(J) - MEAN(I) \geq .5753 * RANGE * \sqrt{1/N(I) + 1/N(J)}$
 with the following value(s) for RANGE: 2.79

(*) Indicates significant differences which are shown in the lower triangle

		G G G G G G G G G
		r r r r r r r r r r
		p p p p p p p p p p
		i
		0 5 1 3 6 2 8 4 7 9
Mean	SITE	
5.0175	Grp10	
5.3210	Grp 5	
5.4239	Grp 1	
5.4741	Grp 3	
5.7641	Grp 6	*
5.8406	Grp 2	* *
6.1495	Grp 8	* * * *
6.2985	Grp 4	* * * *
6.5035	Grp 7	* * * * * *
7.4386	Grp 9	* * * * * * * * *

Appendix D3

Number of animals per square meter- Log n transformed data

----- ONEWAY -----

Variable LOGLN
By Variable METHOD

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	16.7941	5.5980	6.1986	.0005
Within Groups	189	170.6884	.9031		
Total	192	187.4825			

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean
Grp 1	44	5.6846	.9861	.1487	5.3848 TO 5.9844
Grp 2	42	6.0752	.7974	.1230	5.8267 TO 6.3236
Grp 3	43	5.4217	.8406	.1282	5.1630 TO 5.6803
Grp 4	64	6.1460	1.0775	.1347	5.8769 TO 6.4152
Total	193	5.8640	.9882	.0711	5.7237 TO 6.0043

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
1.7896	3	189	.151

----- ONEWAY -----

Variable LOGLN
By Variable METHOD

Multiple Range Tests: LSD test with significance level .05

The difference between two means is significant if
 $MEAN(J) - MEAN(I) \geq .6720 * RANGE * \sqrt{1/N(I) + 1/N(J)}$
 with the following value(s) for RANGE: 2.79

(*) Indicates significant differences which are shown in the lower triangle

Mean	METHOD	
5.4217	Grp 3	
5.6846	Grp 1	
6.0752	Grp 2	*
6.1460	Grp 4	* *

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G G G G
r r r r
P P P P
3 1 2 4

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Appendix D4

Number of families per unit sampler - Log n transformed data

*** ANALYSIS OF VARIANCE ***
 by LOGLN
 METHOD
 SITE
 SEASON
 UNIQUE sums of squares
 All effects entered simultaneously

Source of Variation	Sum of Squares	DF	Mean Square	F	Sig of F
Main Effects	27.076	13	2.083	12.247	.000
METHOD	3.145	3	1.048	6.165	.001
SITE	21.950	9	2.439	14.341	.000
SEASON	.041	1	.041	.239	.626
Explained	27.076	13	2.083	12.247	.000
Residual	26.019	153	.170		
Total	53.095	166	.320		

213 cases were processed.
 46 cases (21.6 pct) were missing.

Appendix D 5

Number of families per unit sampler - Log n transformed data

----- ONEWAY -----

Variable LOGLN
By Variable SITE

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	9	23.8880	2.6542	14.2675	.0000
Within Groups	157	29.2072	.1860		
Total	166	53.0951			

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int for Mean
Grp 1	13	2.4475	.5643	.1565	2.1065 TO 2.7885
Grp 2	22	2.4413	.4417	.0942	2.2454 TO 2.6371
Grp 3	19	2.3596	.4644	.1065	2.1358 TO 2.5834
Grp 4	13	2.5435	.4476	.1241	2.2730 TO 2.8139
Grp 5	22	2.1689	.4429	.0944	1.9725 TO 2.3652
Grp 6	19	2.4124	.3741	.0858	2.2320 TO 2.5927
Grp 7	22	2.3228	.4031	.0859	2.1441 TO 2.5015
Grp 8	13	2.2105	.4808	.1334	1.9200 TO 2.5010
Grp 9	12	2.0881	.2267	.0654	1.9440 TO 2.2321
Grp10	12	.9536	.3830	.1106	.7103 TO 1.1970
Total	167	2.2354	.5656	.0438	2.1490 TO 2.3218

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
.7997	9	157	.617

----- ONEWAY -----

Variable LOGLN
By Variable SITE

Multiple Range Tests: LSD test with significance level .05

The difference between two means is significant if
 $MEAN(J)-MEAN(I) \geq .3050 * RANGE * SQRT(1/N(I) + 1/N(J))$
 with the following value(s) for RANGE: 2.79

(*) Indicates significant differences which are shown in the lower triangle

Mean	SITE	
.9536	Grp10	
2.0881	Grp 9	*
2.1689	Grp 5	*
2.2105	Grp 8	*
2.3228	Grp 7	*
2.3596	Grp 3	*
2.4124	Grp 6	* *
2.4413	Grp 2	* * *
2.4475	Grp 1	* * *
2.5435	Grp 4	* * *

G G G G G G G G G
 r r r r r r r r r
 p p p p p p p p p
 1
 0 9 5 8 7 3 6 2 1 4

Appendix D 6

Number of families per unit sampler - Log n transformed data

----- O N E W A Y -----

Variable LOGLN
By Variable METHOD

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	3	3.3012	1.1004	3.6022	.0148
Within Groups	163	49.7939	.3055		
Total	166	53.0951			

Group	Count	Mean	Standard Deviation	Standard Error	95 Pct Conf Int	for Mean
Grp 1	44	2.2491	.5203	.0784	2.0909	TO 2.4073
Grp 2	42	2.3397	.4499	.0694	2.1995	TO 2.4799
Grp 3	43	2.0078	.5601	.0854	1.8354	TO 2.1801
Grp 4	38	2.3619	.6714	.1089	2.1412	TO 2.5826
Total	167	2.2354	.5656	.0438	2.1490	TO 2.3218

Levene Test for Homogeneity of Variances

Statistic	df1	df2	2-tail Sig.
2.7080	3	163	.047

----- O N E W A Y -----

Variable LOGLN
By Variable METHOD

Multiple Range Tests: LSD test with significance level .05

The difference between two means is significant if
 $MEAN(J) - MEAN(I) \geq .3908 * RANGE * \sqrt{1/N(I) + 1/N(J)}$
 with the following value(s) for RANGE: 2.79

(*) Indicates significant differences which are shown in the lower triangle

Mean	METHOD	
2.0078	Grp 3	
2.2491	Grp 1	*
2.3397	Grp 2	*
2.3619	Grp 4	*

G G G G
 r r r r
 p p p p
 3 1 2 4

Appendix D 7

Number of families per unit sampler - Log n transformed data

*** ANALYSIS OF VARIANCE ***

by LOGLN
SEASON
SITE
SUBSTRAT

UNIQUE sums of squares
All effects entered simultaneously

Source of Variation	Sum of Squares	DF	Mean Square	F	Sig of F
Main Effects	52.446	7	7.492	14.312	.000
SEASON	21.318	2	10.659	20.362	.000
SITE	14.465	3	4.822	9.211	.000
SUBSTRAT	19.315	2	9.658	18.449	.000
Explained	52.446	7	7.492	14.312	.000
Residual	29.838	57	.523		
Total	82.284	64	1.286		

72 cases were processed.
7 cases (9.7 pct) were missing.

Appendix E

Some chemical and physical parameters of study site recorded during May 1997 to December 1997
MAY

Parameter	ST 1	ST 2	ST 3	ST 4	R 1	R 2	IC 1	IC 2	SC 1	SC 2
Temperature (°C)	23.6	23.7	24.1	27.2	29.6	28	33.1	30.4	32.1	28.2
Conductivity (µS)	294	75.4	307	108.3	212	208	277	199	317	523
Velocity (m/s)	0.67	0.21	0.28	NA	0.39	0.37	0	NA	0.17	0.75
pH	7.8	7.6	8.7	7.5	7.8	7.8	8.4	8.1	7.9	7.4
Acidity (mg/l as CaCO ₃)	0	0	0	0	0	0	0	0	0	0
Alkalinity (mg/l)	145	45	155	45	100	85	100	85	100	170
Hardness (mg/l)	180	60	160	80	180	120	140	140	100	120
Dissolve Oxygen (mg/l)	7.3	6.7	7.3	5.5	6.1	5.8	8.7	6.1	5.9	0
BOD ₅ (mg/l)	0.2	1	0.1	0.6	0.7	0.7	1.3	0.6	0.9	15
NO ₃ -N (mg/l)	1.19	0.59	1	0.99	0.75	0.91	0.6	0.65	0.89	0.97
NH ₃ -N	0.012	0.5	0.026	0.04	0.012	0.312	0.025	0.217	2.202	3.338
PO ₄ -P	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fe	0.28	1.36	0.4	0.48	1.8	0.6	0.12	0.48	1.84	0.88
Cu	0.003	0.006	0.002	0.003	0.005	0.003	0.002	0.003	0.004	0.003
Zn	0.196	0.107	0.214	0.089	0.178	0.107	0.196	0.125	0.143	0.107
Mn	0.15	0.35	0.15	0.05	0.15	0.1	0.05	0.05	0.5	0.65

Source (Nagapattinam, Unpublished data)
Note : BOD₅, Biochemical Oxygen Demand

June

Parameter	ST 1	ST 2	ST 3	ST 4	R 1	R 2	IC 1	IC 2	SC 1	SC 2
Temperature (°C)	18.7	20.4	21.6	24.3	25.6	28.4	29	30	27.7	27.8
Conductivity (µS)	253	90.7	199	71.6	188.6	199	307	186.4	292	539
Velocity (m/s)	0.31	0.12	0.37	0.17	0.46	0.38	0.01	0.14	0.24	0.9
pH	7.9	8	8.5	7.8	7.9	7.8	7.4	8.2	7.4	7.3
Acidity (mg/l as CaCO ₃)	0	0	0	0	0	0	0	0	0	0
Alkalinity (mg/l)	117	39	90	29	72	80	102	72	97	155
Hardness (mg/l)	123.6	30.9	92.7	26.8	76.2	82.4	107.1	80.3	84.5	131.8
Dissolve Oxygen (mg/l)	7.1	6.6	7.6	6.5	6.1	5.8	10.5	6.5	1.5	0.5
BOD ₅ (mg/l)	1.2	0.6	0.5	0.5	0.1	0.1	1.5	0.6	8	8
NO ₃ -N (mg/l)	2	1.2	1.7	0.95	1.1	1.3	1.5	0.86	1.9	1.7
NH ₃ -N	0.02	0.02	0.02	0.1	0.08	0.1	0.05	0.19	0.72	1.72
PO ₄ -P	0.075	1.07	0.075	0.79	0.92	0.49	0.58	0.16	0.42	1.53
Fe	0.48	0.52	0.24	0.84	1.52	1.48	0.32	0.24	2.56	1
Cu	0.002	0.002	0.002	0.002	0.004	0.002	0.002	0.002	0.003	0.002
Zn	0.018	0.018	0.018	0.018	0.89	0.054	0.018	0.018	0.018	0.036
Mn	0.05	0.05	0.05	0.05	0.25	0.15	0.2	0.05	0.6	0.9

Appendix E

July

Parameter	ST 1	ST 2	ST 3	ST 4	R 1	R 2	IC 1	IC 2	SC 1	SC 2
Temperature (°C)	24.1	23.4	23.8	25.4	28.6	29.7	28.7	28.2	29.6	29
Conductivity (µS)	341	120.4	208	64.9	201	193	155	153.9	205	495
Velocity (m/s)	0.34	0.3	0.36	0.31	0.23	0.12	0.58	0.63	0.36	0.56
pH	8	8.1	8.5	7.8	7.9	8.1	8.3	8.3	7.7	7.7
Acidity (mg/l as CaCO ₃)	0	0	0	0	0	0	0	0	0	0
Alkalinity (mg/l)	140	40	80	40	100	80	100	60	90	160
Hardness (mg/l)	164.8	32.9	82.4	24.7	84.5	82.4	72.1	72.1	76.2	111.2
Dissolve Oxygen (mg/l)	6.9	7.1	7.2	7	5.8	5.9	6.3	6.4	2.6	0
BOD ₅ (mg/l)	0.2	1	NA	0.2	0.8	0.7	1	0.7	3.6	10.8
NO ₃ -N (mg/l)	1.9	1.3	1.2	1.2	1.9	2.1	1.8	1.9	1.9	2.5
NH ₃ -N	0.01	0.08	0.01	0.02	0.01	0.21	0.08	0.14	0.75	2.64
PO ₄ -P	0.24	0.2	0.05	0.54	1.34	0.34	0.18	0.26	0.73	2.68
Fe	0.4	0.7	0.25	0.25	1.55	0.95	0.75	0.69	1.55	0.7
Cu	0.004	0.003	0.002	0.003	0.003	0.003	0.006	0.005	0.005	0.04
Zn	0.099	0.06	0.11	0.1	0.11	0.17	0.19	0.18	0.15	0.24
Mn	0.19	0.12	0.19	0.05	0.15	0.1	0.15	0.1	0.22	0.66

Source (Nepalrajung, Unpublished data)

Note : BOD₅ Biochemical Oxygen Demand

August

Parameter	ST 1	ST 2	ST 3	ST 4	R 1	R 2	IC 1	IC 2	SC 1	SC 2
Temperature (°C)	24.3	23.6	24	24.4	26.5	26.7	24.6	24.8	27.8	28.6
Conductivity (µS)	219	89.1	142	50	148	167	127	115	247	347
Velocity (m/s)	0.79	0.3	0.79	0.54	0.59	0.86	0.55	0.58	0.42	0.57
pH	7.6	7.7	8	7.6	7.4	7.4	7.6	7.6	6.99	6.97
Acidity (mg/l as CaCO ₃)	0	0	0	0	0	0	0	0	18	23
Alkalinity (mg/l)	93	42	66	19	61	66	55	45	0	0
Hardness (mg/l)	87.2	28.8	57.7	14.4	63.9	107.1	8.2	47.4	84.5	107.1
Dissolve Oxygen (mg/l)	6.8	7.1	7	6.8	5.8	5.2	6.8	7.4	1.5	0.6
BOD ₅ (mg/l)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NO ₃ -N (mg/l)	2.1	1.1	1.8	1.2	1	1.2	2	1.1	2.1	2.2
NH ₃ -N	0.01	0.01	0.01	0.01	0.02	0.01	0.05	0.01	0.4	1.05
PO ₄ -P	0.12	0.09	0.12	0.26	0.32	0.34	0.09	0.13	0.06	0.93
Fe	0.6	3.467	0.867	0.667	2.067	3.8	2.067	1.533	1.133	104
Cu	0.002	0.002	0.002	0.002	0.006	0.002	0.002	0.002	0.004	0.003
Zn	0.35	0.2	0.038	0.038	0.062	0.037	0.012	0.051	0.051	0.025
Mn	0.125	0.325	0.35	0.01	0.35	0.375	0.275	0.275	0.1	0.425

September

Parameter	ST 1	ST 2	ST 3	ST 4	R 1	R 2	IC 1	IC 2	SC 1	SC 2
Temperature (°C)	24	22.5	24	22.5	28	27	25.5	25.5	27	27.5
Conductivity (µS)	214	99.7	184.7	47.3	196	211	154.7	145.9	240	211
Velocity (m/s)	0.87	0.15	0.35	0.5	0.61	0.46	0.36	0.31	0.35	0.46
pH	7.2	7.1	7.8	7.1	7.2	7.2	7.4	7.4	6.8	7.2
Acidity (mg/l as CaCO ₃)	0	0	0	0	0	0	0	0	10	0
Alkalinity (mg/l)	96	18	80	19	86	83	62	61	0	83
Hardness (mg/l)	92.7	65.9	74.2	8.2	84.5	82.4	55.6	55.6	68	82.4
Dissolve Oxygen (mg/l)	6.1	6.7	6.7	7.1	5.6	5.5	6.1	6.4	1.6	5.5
BOD ₅ (mg/l)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NO ₃ -N (mg/l)	2.52	0.4	1.25	0.17	0.6	0.32	0.19	0.31	0.51	0.32
NH ₃ -N	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PO ₄ -P	0.08	0.11	0.19	0.08	0.28	0.17	0.17	0.15	0.46	1.34
Fe	1.89	0.6	0.4	0.1	1.18	1.64	0.96	0.91	1.3	1.06
Cu	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zn	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mn	0.32	0.07	0.26	0.05	0.28	0.28	0.17	0.17	0.34	0.71

October

Parameter	ST 1	ST 2	ST 3	ST 4	R 1	R 2	IC 1	IC 2	SC 1	SC 2
Temperature (°C)	22.8	22.1	23	24.7	28.4	28.3	28.1	27.2	28.1	28.2
Conductivity (µS)	225	102.4	187.8	48.8	221	231	169.6	174.7	192.7	446
Velocity (m/s)	0.57	0.2	0.65	0.17	0.42	0.72	0.61	0.58	0.39	0.52
pH	7.6	7.7	8.2	7.4	7.9	7.6	8	8	7	7.1
Acidity (mg/l as CaCO ₃)	0	0	0	0	0	0	0	0	0	0
Alkalinity (mg/l)	94	42	57	21	97.5	97.5	53	55	59	135
Hardness (mg/l)	102.5	32	46.5	12.5	89	96	66.5	64.5	55	80.5
Dissolve Oxygen (mg/l)	7.4	7.5	8	7.3	6.7	6.5	7.2	7.1	2.6	1.5
BOD ₅ (mg/l)	0.1	0.1	0.1	0.1	1.4	0.75	0.35	0.9	4.2	5.88
NO ₃ -N (mg/l)	2.83	0.42	1.29	0.28	0.5	0.35	0.25	0.22	0.44	0.14
NH ₃ -N	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PO ₄ -P	0.18	0.15	0.14	0.22	0.19	0.21	0.16	0.16	0.35	1.5
Fe	1	1.52	0.6	0.21	1.52	0.73	1.26	0.88	1.3	1
Cu	0.004	0.005	0.002	0.003	0.003	0.002	0.003	0.002	0.003	0.004
Zn	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mn	0.18	0.14	0.12	0.08	0.23	0.19	0.14	0.22	0.26	0.52

Source (Nepanathlung, Unpublished data)

Note : BOD₅ Biochemical Oxygen Demand

Appendix E

Appendix E

November

Parameter	ST 1	ST 2	ST 3	ST 4	R 1	R 2	IC 1	IC 2	SC 1	SC 2
Temperature (°C)	21	21	21	20	24	24	24.5	23.5	24.5	24
Conductivity (µS)	235	97.7	173	43.7	228	242	176	180.2	252	441
Velocity (m/s)	0.5	0.15	0.44	0.15	0.6	0.55	0.39	0.11	0.26	0.6
pH	7.8	7.7	8.1	7.6	7.8	7.8	7.9	7.9	7.3	7.25
Acidity (mg/l as CaCO ₃)	0	0	0	0	0	0	0	0	0	0
Alkalinity (mg/l)	108	35	77.5	17.5	96.5	100	80	82	83.5	135
Hardness (mg/l)	127	30.5	98	7.18	121	115.5	81	90	75	90
Dissolve Oxygen (mg/l)	7.5	7.2	7.9	8.6	7.2	7	7.2	7	1.8	0.8
BOD ₅ (mg/l)	0.3	0.35	0.3	0.4	6.6	1.4	1.45	0.8	3.9	10.05
NO ₃ -N (mg/l)	2.91	0.23	1.64	0.07	0.34	0.24	0.1	0.05	0.79	0.05
NH ₃ -N	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PO ₄ -P	0.2	0.04	0.07	0.06	0.11	0.17	0.07	0.05	0.39	1.42
Fe	0.94	1.16	1.66	0.22	3.11	1.66	0.33	0.27	1.88	1.05
Cu	0.005	0.004	0.002	0.002	0.003	0.002	0.002	0.002	0.002	0.003
Zn	0.286	0.189	0.2	0.151	0.216	0.178	0.216	0.167	0.216	0.189
Mn	0.116	0.06	0.33	0.033	0.41	0.183	0.066	0.033	0.41	0.66

December

Parameter	ST 1	ST 2	ST 3	ST 4	R 1	R 2	IC 1	IC 2	SC 1	SC 2
Temperature (°C)	19	17.5	18	16	2	20	17.9	18	21.5	21
Conductivity (µS)	231	884.5	169.4	270	231	263	158.2	154.2	184.2	463
Velocity (m/s)	0.33	0.19	0.44	0.41	0.18	0.39	0.49	0.37	0.16	0.28
pH	7.99	7.82	8.17	7.44	7.82	7.85	7.99	7.96	7.25	7.06
Acidity (mg/l as CaCO ₃)	0	0	0	0	0	0	0	0	0	0
Alkalinity (mg/l)	117	41	84.5	25	104	114.5	75	75.5	71	161
Hardness (mg/l)	122.2	27.2	86.8	13.1	107.1	110.1	75.7	76.7	64.6	108.1
Dissolve Oxygen (mg/l)	7.6	8.4	8.4	9.4	7.7	7.3	8.5	8.8	4.2	0.7
BOD ₅ (mg/l)	0.73	1.35	0.1	1.4	4.85	2.05	0.9	2.1	3.6	9.9
NO ₃ -N (mg/l)	3.76	1.075	3.02	0.44	1.43	0.72	0.39	0.38	1.56	0.28
NH ₃ -N	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PO ₄ -P	0.13	0.02	0.05	0.07	0.07	0.13	0.01	0.06	0.02	1.68
Fe	1.33	1.77	1.16	0.11	2.33	1.11	1.05	1.05	1.44	1
Cu	0.002	0.003	0.002	0.002	0.002	0.002	0.02	0.002	0.002	0.003
Zn	0.265	0.259	0.135	0.005	0.065	0.2	0.038	0.173	0.054	0.059
Mn	0.183	0.133	0.116	0.033	0.312	0.22	0.133	0.083	0.25	0.7

Source (Napathaling, Unpublished data)

Note : BOD₅, Biochemical Oxygen Demand

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