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The Suitable for Aquaculture Water Source Research and Water Quality Parameters in the Some Cities in the Gap Regions

[1]Mesut Ural, [2]Erdem Memisoglu and [2]G. Nedim Ornekci
[1]Faculty of Fisheries, Tunceli University, 62100 Tunceli, Turkey
[2]Aqriculture Ministery, Aquaculture Research Institute, 23100 Elazig, Turkey

Abstract: In the culturel production aquaculture, first physical and chemical have suitable for flow owner a water source and ecological factor minimal level effection an appropriate to occupy a place. In this research Adiyaman, Diyarbakir, Gaziantep, Kilis and Sanliurfa cities were 25 L/sn and have more flow stream, river and source water for aquaculture production water source and in order to production appropriate to occupt a place.

Key words: GAP region, water sources, water quality parameters, aquaculture, appropriate place, appropriate to occupt

INTRODUCTION

Humanbeings look for new sources of food because world population is ever increasing. Fish and other aquatic products are among these food sources because of the proteins they contain. In order to make use of natural resources in the best possible way today, new detailed were needed and basic information to be obtained from researches about these resources (Yuksel and Celayir, 2010).

The idea of consuming aquatic products of course, brings with it the idea of breeding them. Water and soil qualities and other environmental characteristics play an important role especially at the stage of planning in culture fish breeding. Because a well-planned and well-run fish breeding farm encourages the establishment of other farms. For this reason, it is essential that the water source qualities and the characteristics of the place the fish breeding facility is intended to be built are investigated thoroughly (Atay, 1990; Celikkkale, 1994; Ekingen, 1983; Kurum *et al*., 1998).

The waters used in aquaculture are the most suitable ones of springs, lakes and underground waters. Spring waters usually are poor in oxygen and contain harmful gases as well. They don't carry parasites and pathogens and aren't contaminated by rain water and floods. Although, the oxygen content of streams are high, they may contain residues of agricultural pesticides if they carry flood waters. If streams are to be used in breeding, the water course from the spring upto the breeding facility must be examined closely. It must be known if contaminant water from residences or factories are mixed with it. Besides, the flowrates of the stream at its highest and lowest throughout the year and how long it flows turbid must be known. The structural characteristics of the landscape the stream is flowing through, the conditions of the secondary streams merging into it, the physical and chemical features of the water and the food content of the water are also very important (Akyurt, 1979; Alpbaz and Hossucu, 1996; Claude, 1982; Celikkale, 1994; Ozdemir and Sunlu, 1996; Svobodova *et al*., 1993; Tuncay, 1994; Yaramaz, 1992).

The place of the breeding facility must be chosen very carefully. If a fish breeding facility is to be built, it either must have enough water resources to meet the demands or it must be built close to a water source. It must include natural or man made dikes or drainage channels against floods. The grounds must be large enough and mustn't be exposed to the winds. There must be no big rocks, stones and tree stubs. There must be a natural slope on the grounds which facilitates water's flow towards the facilities. The facilities must be in a place which makes its transportation to markets easy and cheap (Atay, 1990; Celikkkale, 1994; Ekingen, 1983; Kurum *et al*., 1998).

MATERIALS AND METHODS

The research was conducted in the form of determining the water sources (brooks, streams, rivers and spring waters) with 25 L/sn and higher flowrates in Adiyaman, Diyarbakir, Gaziantep, Kilis and Sanliurfa and their villages and counties. Detailed information were obtained from the government institutions which had done researches about water resources in these places, this information was written down and field studies were planned. In the field studies and technical surveys, the physical and chemical features (turbidity, colour, water

Corresponding Author: Mesut Ural, Faculty of Fisheries, Tunceli University, 62100 Tunceli, Turkey

Table 1: The suitable for aquaculture water sources and measured some water quality value in the Adiyaman city

City Adiyaman	Name of water source	Flow (L/sn) Mak-Min	Water heat (°C)	pH	Conductivite (mV)	Hardness $CaCO_3$ (mg L^{-1})	Iron (mg L^{-1})	Nitrite (mg L^{-1})	Nitrate (mg L^{-1})	Free Oxygen (mg L^{-1})	Chlorin (mg L^{-1})	Carbon dioxide CO_2 (mg L^{-1})	Ammonia NH_3 (mg L^{-1})
Celikhan center	Zebran fount	300-500	10.3	7.8	206	8	0	0	2	11.5	0.01	0.5	0.0
Celikhan center	Hapseri source	500-1000	10.3	7.8	206	8	0	0	2	11.5	0.01	0.5	0.0
Gerger Su Tape village	Hizori fount	100-150	11.4	7.4	226	10	0	0.1	2	9.3	0.01	0.5	0.0
Gerger Gurdalli village	Horrik fount	30-50	10.4	7.9	195	9	0	0.1	5	8.5	0.01	0.7	0.0
Gerger Gurdulli village	Kirkgoze source	200+250	12	7.9	210	8	0	0	9.3	11.4	0.01	0.5	0.0
Gerger Kutuklu village	Omeraga fount	70-100	12	7.9	220	11	0	0.1	8	8.5	0.02	0.6	0.0
Kahta Kocahisar	Degirmenbasi source	250-350	12.1	8.1	196	6	0	0.1	1.0	10.8	0.02	0.5	0.0
Kahta Eski Kahta	Kahta stream	1500-3000	10.9	8.2	229	80	0.1	0.1	6	10.8	0.02	0.7	0.0
Kahta center	Kalburcu stream	1000-1500	13.5	8.4	345	81	0	0.1	8	11.5	0.19	0.2	0.1
Besni Asagi Sogutlu	Tavas source	500-700	15	7.1	411	19	0	0	8	12	0.02	0.7	0.0
Besni Eski village	Sugozu source	4000-5000	15.5	7.2	390	66	0	0.2	20	11.6	0.03	0.9	0.0
Besni Kargali village	Kargali fount	150-200	17.2	7.3	257	8	0	0.1	5	7.8	0.02	0.5	0.0
Adyaman center	Gurlevik source	200-250	8.3	7.6	173	112	0	0	18	11.5	0.02	0.4	0.0
Adiyaman center	Ziyaret stream	750-1000	12.7	8.3	330	9	0	0.1	15	10.8	0.16	0.9	0.2

Table 2: The suitable for aquaculture water sources and measured some water quality value in the Gaziantep city

City Gaziantep	Name of water source	Flow (L/sn) Mak-Min	Water heat (°C)	pH	Conductivite (mV)	Hardness $CaCO_3$ (mg L^{-1})	Iron (mg L^{-1})	Nitrite (mg L^{-1})	Nitrate (mg L^{-1})	Free Oxygen (mg L^{-1})	Chlorin (mg L^{-1})	Carbon dioxide CO_2 (mg L^{-1})	Ammonia NH_3 (mg L^{-1})
Yavuzeli Saribugday Village	Halilbas fount	30-50	18.1	7.3	470	67	0.03	0.2	13	5.9	0.01	0.5	0.01
Yavuzeli Kuzuyatagi	Kirkgoz source	100-150	20.6	7.1	517	33	0.01	0	7	6.8	0.02	0.5	0.01
Yavuzeli Kuzuyatagi	Merzimen stream	300-500	20.7	7.3	504	21	1.04	0.1	15	6.8	0.01	0.5	0.02
Yavuzeli Cimenli	Karapinar source	300-450	19.1	7.4	451	20	0.09	0	10	5.1	0.02	0.6	0.01
Araban Gecehoyuk	Karasu stream	400-500	23.8	6.7	440	37	0.05	0.1	11	7.1	0.0	0.7	0.01
Araban Gumuspinar	Sitma fount	75-100	20.2	6.5	482	32	0.06	0.1	8.8	6.4	0.10	0.7	0.01
Araban Center	Ardil stream	400-500	24	8.4	448	36	0.05	0.09	9	6.8	0.01	0.2	0.01
Oguzeli Asmacik	Hoyuk fount	40-50	17.4	7.4	585	16	0.23	0.06	12	7.4	0.16	0.5	0.2
Oguzeli Karpuzatan	Karpuzatan source	350-450	17.0	7.2	616	17	0.01	0.1	12	7.3	0.02	0.5	0.1
Oguzeli	Kirkgoz	90-150	17.6	7.3	440	10	0.01	0.1	11	7.1	0.01	0.4	0.1

Table 2: Continued

City Gaziantep	Name of water source	Flow (L/sn) Mak-Min	Water heat (°C)	pH	Conductivite (mV)	Hardness $CaCO_3$ (mg L^{-1})	Iron (mg L^{-1})	Nitrite (mg L^{-1})	Nitrate (mg L^{-1})	Free Oxygen (mg L^{-1})	Chlorin (mg L^{-1})	Carbon dioxide CO_2 (mg L^{-1})	Ammonia NH_3 (mg L^{-1})
Sazgin	source												
Oguzeli Sutlice	Aynafar sources	400-500	17.1	7.3	450	18	0.02	0.1	9	6.2	0.01	0.7	0.1
Oguzeli Tuzel	Tüzel stream	200-250	17.4	7.8	448	20	0.23	0.2	10	7.1	0.01	0.7	0.2
Nizip Adakli	Keret sources	50-70	17.2	7.3	545	16	0.20	0.09	12	5.5	0.11	0.7	0.1
Islahiye Center	Gozbasi source	100-150	14.5	7.3	425	20	0.04	0.08	10	7.2	0.13	0.7	0.1
Islahiye Kayabasi	Kayabasi source	100-150	13.5	7.1	194	14	0.08	0.1	0	7.3	0.10	0.2	0.1
Islahiye Kayabasi	Bordelik source	40-70	12.8	7.5	192	30	0.05	0.1	2	8.0	0.2	0.1	0.1
Nurdagi Hisar	Kakurt gozu source	25-30	15.8	7.1	486	20	0.1	0.1	10	7.5	0.1	0.6	0.1

Table 3: The suitable for aquaculture water sources and measured some water quality value in the Kilis city

City kilis	Name of water source	Flow (L/sn) Mak-Min	Water heat (°C)	pH	Conductivite (mV)	Hardness $CaCO_3$ (mg L^{-1})	Iron (mg L^{-1})	Nitrite (mg L^{-1})	Nitrate (mg L^{-1})	Free Oxygen (mg L^{-1})	Clorur (mg L^{-1})	Carbon dioxide CO_2 (mg L^{-1})	Ammonia NH_3 (mg L^{-1})
Musabeyli Asagi kalecik	Afrin Cayi	350-500	16.7	8.3	540	35	0.1	0.1	3.5	4.0	0.15	0.1	0.1
Musabeyli Gunesli	Sabun suyu deresi	70-100	19	8.6	720	75	0.09	0.1	25	3.8	0.06	0.7	0.1
Merkez Kazikli	Balik suyu	30-45	20.3	8.1	591	74	0.2	0.1	23	5.5	0.2	0.1	0.1
Merkez Kucukkonak	Sunnep suyu	30-40	20.7	8.1	620	80	0.2	0.1	26	5.5	0.2	0.1	0.2

Table 4: The suitable for aquacultur water sources and measured somr water quality value in the City

City Sanliurfa	Name of water source	Flow (L/sn) Mak-Min	Water heat (°C)	pH	Conductivite (mV)	Hardness $CaCO_3$ (mg L^{-1})	Iron (mg L^{-1})	Nitrite (mg L^{-1})	Nitrate (mg L^{-1})	Free Oxygen (mg L^{-1})	Clorur (mg L^{-1})	Carbon dioxide CO_2 (mg L^{-1})	Ammonia NH_3 (mg L^{-1})
Hilvan Golebakan	Golebakan sources	100-170	18,1	7.7	370	37	0.04	0.1	10.5	6.9	0.08	0.4	0.1
Siverek Gulluce	Gulluce sources	30-55	16.3	7.3	250	5	0.0	0.0	0.0	7.8	0.01	0.3	0.0
Siverek Center	Sampinar sources	15-25	18.3	7.8	375	60	0.04	0.2	15	6.9	0.01	0.5	0.01
Siverek Yalankoz	Yalankoz source	15-25	18.1	7.8	147	22	0.02	0.2	15	6.9	0.01	0.3	0.01
Bozova center	Kucukgol sources	35-50	26	8.2	190	10	0.02	0.02	15	6.4	0.01	0.6	0.01
Bozova center	Büyükgöl sources	45-70	25	7.9	220	25	0.04	0.2	25	6.1	0.02	0.7	0.01
Halfeti center	Degirmendere sources	15-25	24	8.3	381	7	0.04	0.2	17.2	5.9	0.01	0.2	0.01
Halfeti Fistikozu	Fistikozu source	15-25	25	7.6	400	25	0.02	0.2	18	6.9	0.01	0.5	0.01
Harran Tahilalan	Tahilalan source	15-25	24	8.5	385	20	0.04	0.08	25	5.8	0.01	0.6	0.02

Table 5: The suitable for aquacuture water sources and measured some water quality value in the Diyarbakir city

City Diyarbakir	Name of water source	Flow (L/sn) Mak-Min	Water heat (°C)	pH	Conductivite (mV)	Hardness $CaCO_3$ (mg L^{-1})	Iron (mg L^{-1})	Nitrite (mg L^{-1})	Nitrate (mg L^{-1})	Free Oxygen (mg L^{-1})	Clorur (mg L^{-1})	Carbon dioxide CO_2 (mg L^{-1})	Ammonia NH_3 (mg L^{-1})
Çinar Yarimkas	Yarimkas sources	30-50	17.1	7.6	150	53	0.04	0.1	9.7	6.8	0.01	0.2	0.01
Çinar Yarimkas	Bas Madrap sources	40-60	17.1	7.6	170	27	0.04	0.0	13.5	6.9	0.08	0.3	0.01

Table 5: L Continued

City Diyarbakir	Name of water source	Flow (L/sn) Mak-Min	Water heat (°C)	pH	Conductivite (mV)	Hardness $CaCO_3$ (mg L^{-1})	Iron (mg L^{-1})	Nitrite (mg L^{-1})	Nitrate (mg L^{-1})	Free Oxygen (mg L^{-1})	Clorur (mg L^{-1})	Carbon dioxide CO_2 (mg L^{-1})	Ammonia NH_3 (mg L^{-1})
Çinar	Bellitas	50-70	10.1	7.3	130	67	0.0	0.0	7.6	7.8	0.02	0.2	0.01
Bellitas	sources												
Center	Pamukçay	150-200	22	8.0	250	87	0.05	0.1	30	6.5	0.01	0.6	0.02
Center	Ambarçayi	50-70	24	8.0	375	80	0.04	0.2	25.7	5.7	0.02	0.8	0.02
Hazro	Cesmebasi												
Yazkoyu	source	100-150	17	7.1	147	22	0.02	0.0	15	6.8	0.01	0.3	0.01
Silvan	Basdegirmen	30-50	18.1	7.3	170	27	0.02	0.0	15	6.4	0.01	0.6	0.01
Basdegirmen	source												
Silvan	Belbaki	15-25	20	7.8	189	55	0.11	0.11	35	6.1	0.02	0.7	0.01
Çatak köprü	source												
Çermik	Seyhan	100-150	19	8.2	381	83	0.04	0.1	25	5.9	0.02	0.7	0.02
Center	stream												
Çermik	Sinek	50-70	24	8.1	170	15	0.03	0.2	10	5.2	0.02	0.5	0.01
Center	stream												
Çermik	Gözebasi	30-50	17	7.3	155	20	0.04	0.1	15	7.2	0.03	0.4	0.01
Center	source												
Dicle	Büyükçesme	250-300	10	7.3	110	20	0.02	0.0	0.0	8.2	0.0	0.2	0.01
Degirmen	sources												
Hani	Aynkebir	50-75	15	7.3	110	81	0.02	0.0	0.0	7.7	0.02	0.2	0.01
Aynkebir	sources												
Hani	Seren	35-50	17	7.2	110	120	0.01	0.0	7.0	7.4	0.0	0.2	0.01
Seren	sources												
Hani	Koki	55-70	16	7.3	150	15	0.02	0.0	0.0	7.7	0.01	0.2	0.1
Kirimli	sources												
Hani	Balçakli	50-75	20	8.1	210	44	0.02	0.1	15	6.1	0.0	0.4	0.1
Yukari	stream												
Turali													
Ergani	Bogaz	35-50	18.1	7.9	215	100	0.02	0.1	25	6.5	0.02	0.5	0.1
Yolköprü	stream												

heat, pH, conductivity, hardness, nitrite, nitrate, ammonia, iron, oxygen, carbondioxide and free chlorine concentration values) were examined. Turbidity, colour and smell were sensory evaluated; water heat was measured with a digital thermometre; pH, conductivity and oxygen was measured with a Hanna digital indicator and chemical measurements (hardness, nitrite, nitrate, ammonia, iron, free chlorine, carbondioxide) were done with a Hanna-C 200 field photometer and a DR-2010 field spectrophotometer by using water analysis criteria (APHA, 1985).

The physical and chemical values and water analyses data sheets of the water resources in the cities where this study was conducted are shown in Table 1-5.

RESULTS AND DISCUSSION

It was determined that 13 out of 19 water sources in Adiyaman city were suitable for culture fish breeding according to the results of field surveys and technical examinations (Table 1). It was determined that 17 out of 19 water sources in Gaziantep city might be suitable for culture fish breeding and 3 of them might be risky because of the contamination by waste water from nearby residences and agricultural fields and the results are shown in Table 2.

It was determined that 2 out of 4 water sources in Kilis city might be suitable for culture fish breeding and the remaining 2 might be risky because of the contamination by waste water from both nearby residences and agricultural fields and because their flowrates in summer months drop drastically leading even to total drying-up (Table 3).

It was determined that 6 out of 11 water sources in Sanliurfa city might be suitable for culture fish breeding and the remaining 5 were not suitable since their flowrates were considerably low (Table 4).

It was determined that 13 out of 17 water sources in Diyarbakir city might be suitable for culture fish breeding and the remaining 4 might be risky because of the contamination by waste water from both nearby residences and agricultural fields and because their flowrates in summer months drop drastically leading even to total drying-up (Table 5).

CONCLUSION

Direct results which were obtained as a result of the research we did at the water resources in the cities where the research was conducted and literature scan were provided since no studies had been done on these water resources.

REFERENCES

APHA, 1985. Standard Methods for the Examination of Water and Waste Water. 16th Edn., VCH Publishers Inc., New York.

Akyurt, I., 1979. Water Quality on the Fisheries Growth. Division of Fisheries of Agriculture Faculty University of the Atatürk, Erzurum.

Alpbaz, A. and H. Hossucu, 1996. Field Fisheries and Practical Carp Growth. Fisheries High School, University of the Agean, Printery of the Agean University, Bornova, Izmir, pp: 1-13.

Atay, D., 1990. Fish Productions. Aqriculture Ministery, Fisheries Research Enstitute of the Egirdir Press, Egirdir, Isparta, pp: 304.

Celikkale, M., 1994. Freshwater Fishs and Growth. Marine Science Faculty of Sürmene. 2nd Edn., Tecnical University of Blacksea Printery, Trabzon, pp: 420.

Claude, E.B., 1982. Water Quality Management for Fish Pond: Fish Culture. Elsevier Scientific Publishing Company, Amsterdam, Oxford, New York, pp: 318.

Ekingen, G., 1983. Aquaculture and Fisheries. University of Firat Press of the Medicine Faculty, University of Firat Press of the Medicine Faculty, Elazig.

Kurum, V., Y. Emre and M. Bayrak, 1998. Trout Growth. Aqriculture Ministery, Aqricultural Research General Directorate, Ankara.

Ozdemir, E. and V. Sunlu, 1996. Water Quality. Fisheries Faculty University of Agean, University of the Agean Printery, Bornova, Izmir, pp: 147.

Svobodová, Z., R. Lioyd, J. Máchová, B. Vykusová and FAO., 1993. Water Quality and Fish Health. EIFAC Technical Paper No. 54. Food and Agriculture Organization, Rome, ISBN: 0532-940X, pp: 59.

Tuncay, H., 1994. Water Quality: Aqriculture Faculty. University of Agean Press, Izmir, pp: 243.

Yaramaz, Ö., 1992. Water Quality: Aquaculture Academy University of Agean. Printery of the Agean University, Izmir, pp: 91.

Yuksel, F. and Y. Celayir, 2010. A research on the fish production and catching efficiency in the Keban Dam Lake. J. Anim. Vet. Adv., 9: 741-747.