Table S1. Characteristics of dams in Greece.

Name	Year	City	Length (m)	Height (m)
Thisauros	1996	Drama	480	172
Kremasta	1965	Evritania	460	165
Mesoxwra	2020	Trikala	340	151
Morna	1979	Fokida	815	139
Ilarion	2012	Kozani	540	130
Evinos	2001	Aitoloakarnania	640	127
Polifito	1974	Kozani	296	112
Smokovos	2002	Karditsa	456	104
Pournari	1981	Arta	580	102
Kastraki	1969	Aitoloakarnania	547	96
Platanovrusi	1998	Drama	270	95
Tauropos	1959	Karditsa	220	83
Sfikia	1985	Imathia	220	82
Piges Aoou	1989	Ioannina	300	78
Faneromeni	2004	Iraklio	484	75
Gadoura	2007	Rodos	585	67
Papadias	2008	Florina	540	67
Aposalemi	2012	Iraklio	660	61
Pramoritsa	2007	Kozani	195	57
Ladona	1955	Arkadia	102	56
Feneos	1996	Korinthos	225	56
Potamos	2008	Rethymno	265	55
Marathona	1929	Attiki	285	54
Gratini	2002	Rodopi	396	53

Asomata	1985	Imathia	205	52
Faneromeni Naxou	2004	Naxos	270	52
Pineios Ilias	1966	Ilia	220	50
Vraxos	2010	Kastoria	240	48
Livadi Larisas	2005	Larisa	245	45
Dipotamos	2005	Evros	200	44
Mpramianos	1987	Lasithi	600	44
Eresos	2002	Lesvos	350	41
Leukogeia	1994	Drama	360	41
Aoos	1990	Ioannina	235	40
Kalamoti	2008	Hios	340	40
Apolakia	1987	Rodos	365	39
Kalivas	2008	Evros	350	39
Rapentossa	2004	Attiki	145	39
Inio	2008	Iraklio	300	38
Panagiotiko	2003	Magnisia	150	38
Metallio	1999	Kilkis	159	38
Sarapiou	2011	Hios	170	35
Sissanio	2006	Kozani	122	35
Katafito	2001	Drama	300	34
Lithaios	2020	Trikala		32
Livadi Astipalaias	1997	Astipalaia	235	32
Mesovouni	2009	Kozani	325	32
Ano Merias	1997	Mikonos	170	31
Livadi Patmos	2005	Patmos	224	30
Marathos	1992	Mikonos	265	30
Pente alonia 1	1990	Ioannina	286	30

Perdika	1962	Kozani	352	30
Steno	2003	Serifos	168	30
Kolhiko	2009	Florina	196	29
Raxes	1995	Ikaria	235	29
Askiton	2000	Rodopi		28
Dafnozonaras	2010	Evritania	150	28
Deskati 2	2006	Grevena	470	28
Kastania	2011	Magnisia (Αλόνησος)	250	28
Krania Livadia	2000	Larisa		28
Germas	2006	Kastoria	225	27
Partheni	2002	Leroa	185	26
Strato	1988	Aitoloakarnania	1900	26
Akri Loutrou	2003	larisa		25
Vasilika	1996	Thessaloniki		25
Kontia	1976	Limnos	254	25
Livadi Kasteli	2001	Larisa		25
Lofos	1993	Larisa	150	25
Mesimeri	2008	Pella	120	25
Politson 3	1990	Ioannina	180	25
Folias	1995	Kavala	137	25
Logga	2000	Trikala	250	24
Palaiopriono	2008	Imathia	124	24
Zifias	1994	Xios	215	23
Kalivia	1992	Larisa		23
Loutro	2001	Larisa		23
Morna	2007	Pieria		23

Milopota	1995	Ios	120	23
Asproklisia	2009	Trikala	81	22
Vaketas	2008	Tinos	116	22
Louros	1954	Preveza	97	22
Krania Karia	1993	Larisa		21
Muranaioi	1992	Grevena	95	21
Skepari	2010	Trikala	107	21
Agia Varvara	2007	Imathia	2400	20
Eksarha	2001	Grevena	140	20
Kamares	2008	Sifnos	67	20
Karpero	2008	Grevena	170	20
Kokkinopilos	1985	Larisa		20
Ahelinadika	2001	Trikala		20
Logmis	1992	Grevena		20
Likos	2007	Pella	94	20
Liras	2003	Evros	90	20
Miloxori	2009	Kozani	319	20
Pentaplatanos	2008	Pella	104	20
Platani	2007	Pella	78	20
Pournari Ornia	2001	Larisa		20
Taxiarhi	2006	Grevena	160	20
Deskati	1997	Grevena	100	19
Agios Antonios	2001	Thessaloniki	210	19
Agios Georgios	1996	Grevena	110	19
Itea	2006	Grevena	100	19
kentro	1995	Grevena	130	19
Katakali	1995	Grevena	100	19

Roukouna	2009	Anafi	104	19
Felli	1995	Grevena	120	19
Megalo Eleutheroxwri	1996	Larisa	125	18
Politson 1	1990	Ioannina	130	18
Prodromos Deskatis	1999	Grevena	140	18
Anoiksi	1995	Grevena	120	17
Aimilianos	1995	Grevena	150	17
Ardani	2004	Evros	250	17
Vasileiades	2008	Kastoria	490	17
Karatza	2010	Attiki	420	17
Mpara	1995	Grevena	120	17
Pente alonia 2	1990	Ioannina	180	17
Girtoni	2010	larisa	115	16
Dasoxori Deskatis	1997	Grevena	210	16
Theodorakeio	2007	Pella	73	16
Lithotopos	1982	Σερρών	15000	16
Provatona	2005	Evros	92	16
Vathis	1992	Kilkis	190	15
Eggara	1994	Naxos	220	15
Eptalofos	1989	Kilkis		15
Thermis	1993	Thessaloniki		15
Kaki Lagada	1998	Paxoi	260	15
Livadas	2003	Tinos	780	15
Moni Agios Grigorios	1994	Agio Oros		15
Palaioxorio	1998	Grevena		15

Politson 2	1990	Ioannina	130	15
Pournari 2	1998	Arta	2000	15
Tourlou	2001	Paros	76	15
Taka	2009	Arkadia	4000	13
Artzan	2009	Kilkis	5250	10
Karla	2010	Magnisia	21800	8

Table S2 Overview of algorithm application for dam operation.

	Authors	Parameters Optimization	Type	Method-Tools	Dam Scope	Dam Name	Country
1	Cai et al. [52]	hydropower production, ecological flow	Single Objective	Genetic Algorithms	function for flood control, navigation, power generation	Three Gorges, Gezhouba	China
2	Tospornsampan et al. [53]	hydropower production,saliniy control,downstream requirements	Single Objective	simulated annealing	irrigation, hydropower production	Vajiralongkorn, Srinagarind and Tha Thung (Mae Klong River Basin)	Thailand
3	Tospornsampan et al. [54]	minimizing the total irrigation deficits during a critical drought year	Single Objective	genetic algorithm and discrete differential dynamic programming	irrigation, hydropower generation, domestic and industrial water supply, recreation and salinity control	Mae Klong system	Thailand
4	Ahmadianfar et al. [55]	volume of released water and stored water in reservoir,two objective functions	simulation-multioptimization	fuzzy set theory-genetic algorithm (NSGA-II)	irrigation,water supply	Zohre	Iran

		involving water supply of minimum flow and agriculturedemands in a long-term simulation period					
5	Chang and Chang [56]	minimize the shortage indices produced by joint reservoir operation	multi-objective Pareto	non-dominated sorting genetic algorithm (NSGA-II)	supplying the domestic and industrial water	Feitsui and Shihmen	Taiwan
6	Chen et al. [57]	minimization of the deficits of both the domestic water supply and the ecological water supply	multi-objective Pareto	particle swarm optimization (PSO)-adaptive random inertia weight (ARIW) strategy	flood control, water supply, hydroelectric power, and river ecological water supply	Panjiakou,Daheiting ,Taolinkou	China
7	Lei et al. [58]	hydropower generation	Single Objective	Stochastic dynamic programming based on copula functions	hydropower generation, flood control	Ertan	China
8	Bashiri-Atrabi et al. [59]	minimize the water supply deficit and flood damages downstream of a reservoir	Single Objective	Harmony search Algorith	Flood management	Narmab	Iran
9	Yaseen. et al. [60]	minimize power shortage in Karun-4 power plant	Single Objective-multi criteria decision	Artificial Fish Swarm Algorithm,Particle Swarm Optimization Algorithm,Hy	hydropower production	Karun-4 Dam	Iran

				brid Algorithm (HA)			
10	Ehteram et al. [61]	decreasing irrigation deficiencies	Single Objective	Spider Monkey Algorithm-Genetic Algorithm-Particle Swarm Algorithm	irrigation	Golestan and Voshmgi	Iran
11	Goodarzi et al. [62]	maximize the total reservoir release by considering domestic, industrial, and environmental demands	simulation-optimization (single)	simulation (HEC-RAS)-optimization liner LINGO	irrigation, water supply	Chadegan	Iran
12	Malekmohammad et al. [63]	estimates the optimal hourly reservoirs' releases to minimize the flood damages in the downstream river	Single Objective-Real Time	Genetic Algorithm (GA), Geographical Information System (GIS),K-Nearest Neighbor (K-NN) algorithm-Hec-GeoRAS	irrigation,hydropower production	Dez	Iran
13	Saadat and Asghari [64]	reservoir operating policies(reservoir volume and inflow to reservoir)	Single Objective	Stochastic Dynamic Programming	water supply,hydropower production	Zayandehrud	Iran

14	Afshar [65]	water supply,hydropower production	multi-objective	Particle Swarm Optimization (PSO) - (PCPSO) - (FCPSO)	irrigation,hydropower production	Dez	Iran
15	Afshar et al. [66]	Water quality, hydrodynamic model (CE-QUAL-W2)	multi-objective,simulation-multioptimization	multiobjective particle swarm optimization (MOPSO)	drinking water,agricultural water	Karkheh	Iran
16	Saber et al. [67]	difference between monthly downstream demands and release	Single Objective	PSO algorithm	irrigation,hydropower production	Mahabad	Iran
17	Kerachian, and Karamouz [68]	Salinity, Thermal Stratification and Water Quality Simulation Model	simulation-optimization (single)	genetic algorithms (VLGA)	irrigation,water supply,	15-Khordad	Iran
18	Ganji et al. [69]	storage, inflow and forecasted inflow of the current month	Single Objective	Game Theore, Nash Game - (PSDNG)	water supply,hydropower production	Zayandehrud	Iran
19	Malekmohammad et al. [70]	estimates the optimal hourly reservoirs' releases to minimize the flood damages in the downstream river	Single Objective-Real Time	Genetic Algorithm (GA), Geographical Information System (GIS),K-Nearest Neighbor (K-NN) algorithm-Hec-GeoRAS	irrigation,hydropower production	Dez	Iran
20	Li and Lian [71]	sediment deposition, power generation	multi-objective Pareto	particle swarm optimization	irrigation, hydropower production	Wanjiazhai	China

				and an improved multi-objective particle swarm optimization			
21	Li et al. [72]	maximizing total energy production ,flood control, navigation, and river maintenance downstream raise the constraints	Single Objective-daily optimization model	Dynamic Programming (IDP) and Genetic algorithm (GA)	function of flood control, navigation, power generation	Three Gorges, Gezhouba	China
22	Bilal et al [73]	initial reservoir storage , the resulting reservoir storage , the inflow to reservoir and the evaporation losses from reservoir.	Single Objective	hybridization of Dynamic Programming (DP) and Particle Swarm Optimization (PSO)	irrigation,water supply	Mula	India
23	Reddy & Kumar [74]	maximize total relative yield,actual evapotranspiration and potential evapotranspiration	Single Objective	modified version of Particle Swarm Optimization (PSO) named elitist-mutation (EMPSO)	irrigation	Malaprabha	India
24	Rani and Srivastava [75]	The objective function is minimization of squared deviation of releases from target demands	Single Objective	dynamic programming and genetic algorithm	irrigation, water supply	Mula	India

25	Kumar et al. [76]	optimizing reservoir operation for the optimal allocation of water for crops,maximize total relative yield over a yea	Single Objective	genetic algorithm (GA) ,Particle swarm optimization (PSO)	irrigation,water supply	Malaprabha	India
26	Jothiprakash and Shanthi [77]	minimize the annual sum of squared deviation form desired irrigation release and desired storage volume	Single Objective	Genetic Algorithm (GA)	irrigation	Pechiparai	India
27	Al-Aqeeli et al. [78]	maximize the annual hydropower generation- optimal monthly releases	Single Objective	genetic algorithm optimization model (GAOM)	irrigation,hydropower production	Mosul	Iraq
28	Dat et al. [79]	Optimal use of water for MAR,Slippage effect	Single Objective	non-linear optimization	Irrigation, Groundwater level and maximum MAR injection rates	Eastern Arkansas	USA
29	Hınçal et al. [80]	maximizing the energy production in the system	Single Objective-Real Time	Genetic Algorithm	hydropower production	Blue Mesa, the Morrow Point and the Crystal Reservoirs (Colorado River Storage)	USA