

CONCLUSION & RECOMMENDATIONS

- † Results indicate that the surveyed dams have a Carrying capacity of about 72,894 mt of fish. Masinga dam has the highest Carrying capacity followed by Kamburu, Kindaruma, and Gitaru with 51,217, 15,135, 2,409, and 2,351 mt, respectively.
- † All the four dams are in Embu County were within the River Tana system. Other dams with substantial carrying capacity are Kiserian (522.95 mt) and Chinga (396.90 mt) in Kajiado and Nyeri Counties respectively.
- † In the Western Kenya region, Yao Kosiga Dam in Homa Bay County exhibited the highest potential (47 mt). This was followed by Olasi (41.98 mt) and Karamu (39.46) both located in Migori County.
- † The central region had a potential of 72,447 mt while that of western region was only 447 mt. The comparatively high potential in the central region is attributable to the huge hydro-electric dams.
- † Given the shallow depths of all the dams in the western region, restocking mainly with endemic species with limited or no supplementary feeding is recommended. The same is recommended for dams with low carrying capacities.
- † Cage culture is recommended for SWBs with strong community associations to provide security and farm inputs from nearby hatcheries.
- † Most of the surveyed dams had multiple purposes, a recipe for conflict among resource users.
- † To avoid conflict and improve performance, a SWBs strategy needs to be developed which involves: investment under the blue economy precipice; optimize operation by re-defining the dam objectives; economic analysis, rehabilitation, rebranding and upgrade; dam safety; sedimentation; and research.

KMFRI-ABDP-SWBs Fact Sheet, 2020. The socio-ecological study of selected SWBs in order to establish their carrying capacity for fisheries and aquaculture production.

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Central Region						
County	SWB/Dam	Size (ha)	SI	TSI	Carrying capacity (mt)	Remarks
Embu	Itathatha	3.3	0.47	0.54	4,020.19	Low
Embu	Gitaru	290	0.55	0.54	2351.35	High
Embu	Kindaruma	1000	0.51	0.45	2409.75	High
Embu	Kamburu	1125	0.54	0.55	15135.9	High
Embu	Masinga	12000	0.52	0.48	51217.9	High
Kajiado	Olmiirui	0.1	0.45	0.58	0.2349	Low
Kajiado	Iyamat	3	0.4	0.66	8.316	Low
Kajiado	Enkarani	5	0.44	0.63	12.474	Medium
Kajiado	Olokei	10	0.47	0.66	23.265	Medium
Kajiado	Kiserian	41.8	0.48	0.48	522.948	High
Kiambu	Kimuyu	0.27	0.51	0.52	0.64444	Low
Kiambu	Twiga	3	0.48	0.47	12.5885	Medium
Kiambu	Rungiri	3	0.51	0.49	14.6192	Medium
Kiambu	Tigoni	10.19	0.4	0.64	19.5648	Medium
Kirinyaga	Kangai	0.53	0.55	0.52	1.09138	Low
Kirinyaga	Thiba	0.75	0.61	0.65	1.33819	Low
Kirinyaga	Ahiti Ndamba	2	0.48	0.43	5.44896	Low
Kirinyaga	Njuki-ini	2	0.52	0.51	6.84216	Low
Kirinyaga	Karura	10	0.52	0.52	13.7904	Medium
Machakos	Katangi	5	0.47	0.55	15.8978	Medium
Machakos	Murhetheni	10	0.51	0.57	27.9072	Medium
Machakos	Muoni	13	0.48	0.53	29.7648	Medium
Machakos	Kwale	10	0.47	0.65	32.0775	Medium
Meru	Kaguru	1.5	0.46	0.46	1.4283	Low
Meru	Nguthuru Lainga	6.5	0.53	0.54	8.37135	Low
Meru	Ontulili	68	0.53	0.42	68.1156	Medium
Meru	Nkunga	68	0.55	0.41	69.003	Medium
Nyeri	Kibaya	0.85	0.42	0.33	0.70686	Low
Nyeri	Kiunyu	0.85	0.51	0.55	0.71528	Low
Nyeri	Gai kuyu	0.59	0.54	0.43	0.90419	Low
Nyeri	Ichamara	2	0.57	0.31	2.1204	Low
Nyeri	Guana	2	0.54	0.58	3.7584	Low
Nyeri	Hohwe	3	0.47	0.4	6.0912	Low
Nyeri	Njengu	9	0.57	0.42	20.0378	Medium
Nyeri	Chinga	175	0.54	0.5	396.9	High
Tharaka Nithi	Gatoto	0.75	0.47	0.14	0.2961	Low
Tharaka Nithi	Ndetha	0.75	0.47	0.59	1.24785	Low

AQUACULTURE BUSINESS DEVELOPMENT PROGRAMME (ABDP)



FACT SHEET



The socio-ecological studies of selected Small Water Bodies (SWBs, dams and reservoirs) in order to establish their carrying capacity for fisheries and aquaculture production

November 2020



BACKGROUND INFORMATION

Small water bodies (SWBs) remain among the least investigated part of the water environment and are largely excluded from fisheries management planning. Understanding SWBs carrying capacity will open an investment paradigm towards increased food and energy production.

Carrying capacity (metric tonnes, mt) refers to the ability of the environment to accommodate a particular activity or rate of activity without unacceptable impact.

Central region is adorned with several natural springs, rivers, expansive hydro-electric dams and a dense human population which provide huge potential for fish culture and market.

Warm temperatures in the western region coupled with an established fish market within the Lake Victoria Basin front this region as most suitable for sustainable dam fisheries production.



METHODOLOGY OF STUDY

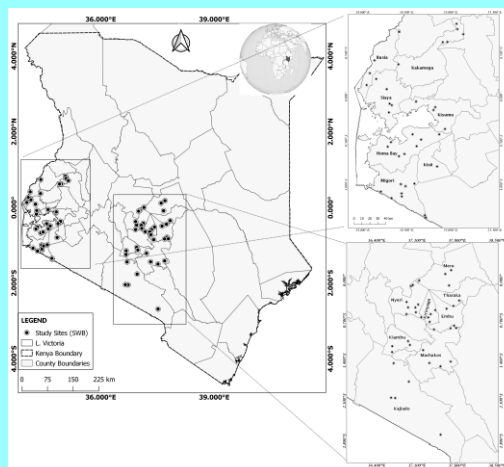
The dam morphology, ecological integrity, food availability and quality and socio-economics indicators of the communities are studied in order to establish suitability and fisheries carrying capacity of the dams. The dam morphology, ecological integrity, food availability and quality and socio-economics indicators of the communities were studied in order to establish suitability and fisheries carrying capacity of the dams.

Carrying capacity of SWBs was calculated using socioeconomic index (SI), and trophic status index (TSI).

A composite Socioeconomics Index (SI) is calculated as a measure of the general socio-economics carrying capacity acceptable for any fisheries development interventions in the SWBs. This percentage score is derived from weighted averages of the specific ordinal scores subject to the Likert scale ratings of various socio-economics perception indicators.



STUDY SITES



The study was conducted in 8 counties in Central (Nyeri, Kirinyaga, Meru, Tharaka Nithi, Embu, Kiambu, Kajiado, and Machakos) and 7 counties in Western (Migori, Kisii, Homabay, Kisumu, Siaya, Busia, and Kakamega) Kenya Regions.

SPECIES CAPTURED

Haplochromines, Crayfish, Tilapia, Cat fish, Red-finned barb, Mosquito fish, Labeo, Carps and Mudfish

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CONTRIBUTIONS

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FINDINGS

Western Region						
County	SWB/Dam	Size (ha)	SI	TSI	Carrying capacity (mt)	Remarks
Busia	Changara	0.84	0.51	0.65	3.34152	Low
Busia	Namonye	5	0.41	0.54	6.642	Low
Busia	Buhuyi	5	0.47	0.576	8.1216	Low
Busia	Namalenga	8.5	0.56	0.6	21.42	Medium
Busia	Munana	10	0.51	0.54	24.786	Medium
Homabay	Pap Orage	1	0.52	0.66	1.5444	Low
Homabay	Kobodo	2.5	0.41	0.54	3.321	Low
Homabay	Ramula	3	0.56	0.6	4.536	Low
Homabay	Kauma	1.8	0.38	0.5	5.13	Low
Homabay	Yengo	8	0.5	0.58	10.44	Medium
Homabay	Konyango	7	0.55	0.64	11.088	Medium
Homabay	Osono	20	0.54	0.58	37.584	Medium
Homabay	Yao Kasiga	8	0.48	0.68	47.0016	Medium
Kakamega	Mumanyonzo	1.5	0.5	0.67	1.5075	Low
Kakamega	X-Rasa	2	0.49	0.6	2.646	Low
Kakamega	Lugulu	1.4	0.45	0.62	3.5154	Low
Kakamega	Lumino	7	0.48	0.62	6.2496	Low
Kakamega	Musembe	6	0.53	0.59	16.8858	Medium
Kisii	Ibena	2	0.47	0.73	2.0586	Low
Kisumu	Kere	0.26	0.48	0.61	0.34258	Low
Kisumu	Huma	1	0.48	0.53	0.7632	Low
Kisumu	Buoye	0.8	0.44	0.59	0.93456	Low
Kisumu	Hejope	0.5	0.6	0.66	1.188	Low
Migori	Kanyona	0.25	0.43	0.66	0.4257	Low
Migori	Gwitembe	1	0.49	0.57	1.25685	Low
Migori	Mahena	1	0.47	0.65	1.833	Low
Migori	Siabai	3	0.49	0.62	2.7342	Low
Migori	Silanga	6	0.49	0.51	8.9964	Low
Migori	Silanga Mubachi	11	0.49	0.61	19.7274	Medium
Migori	Nyamome	8	0.51	0.6	25.704	Medium
Migori	Karamu	18	0.63	0.58	39.4632	Medium
Migori	Olasi	20	0.53	0.66	41.976	Medium
Siaya	Nyadong	2	0.45	0.56	1.512	Low
Siaya	Nyagoko	8.6	0.46	0.68	12.1054	Medium
Siaya	Ochat	11	0.48	0.48	19.008	Medium
Siaya	Mauna	15	0.54	0.51	24.786	Medium
Siaya	Urunga	11	0.51	0.52	26.2548	Medium

LESSONS LEARNT

Fisheries: The performance of tilapia and catfish species were much better in warmer areas such as the Western region and drier parts of Central region than the cooler areas mostly found in the Central region.

Ecology: Productivity indicators in the newly formed dams were relatively low, although the water quality looked very promising for fish culture.

Aquaculture: While many dams were found suitable for various scales of aquaculture production, the cages need to be set with adequate scientific guidance and adherence to set regulations in order to preserve the integrity of the dam's ecology.

Socio-economics: There is need to adapt fisheries development to the socio-economic dynamics of the dam's location such as local culture, market niche and technological edge.