

MKURANGA DISTRICT COUNCIL



Decentralized Minor Permitting Procedure for Pond Mariculture



Approved September 30, 2009

ACKNOWLEDGEMENTS

This document was adopted by the District Council of Mkuranga on September 30, 2009. Technical and editorial support for this publication is provided by the Tanzania Coastal Management Partnership (TCMP) with the support from the Vice President's Office, The National Environment Management Council, the Fisheries Division of the Ministry of Livestock Development and Fisheries, the Coastal Resources Center of the University of Rhode Island and the United States Agency for International Development.

The Tanzania Coastal Management Partnership acknowledges the generous effort and extensive deliberations of the District, Ward and Village leaders, staff and stakeholders including fish pond operators. Technical contributors to this effort include J.M. Daffa, Baraka Kalangahe, Appa Mandari, Salim Ngomuo, and Sandey A.T. Nundwe of the Tanzania Coastal Management Partnership, Dar es Salaam; Dr. Aviti J Mmochi and Dr. Christopher A. Muhandu, Institute of Marine Science Zanzibar; S.P Mganga, ICM Facilitator, Mkuranga District Council; Zacharia Kitale, Mangrove Management Plan, Mkuranga Zone; Dr. C.G. Mahika, Fisheries Aquaculture; Vedast Makota and Danford Mwaipopo, National Environment Management Council; Z.D. Mbwambo, Forest Division HQ, Dar es Salaam; Frida P. Mhini, Engineer, Mkuranga District Council; Said Minangu, ICM member, Mkuranga; Stephen Nkondokaya Vice President's Office/ Environment; Fatma Sobo, Fisheries Division, Dar es Salaam; Dr. Rashid Tamatama and Dr. Philip K. Mwanukuzi University of Dar es Salaam; Dr. James Tobey and Don Robadue, Coastal Resources Center, University of Rhode Island; and J.D. Zongo, Land Office, Mkuranga District Council.



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PREAMBLE

The coast is the place where the land meets the Ocean. It is an area that is endowed with abundant and unique resources that need to be protected and conserved in a sustainable manner. The National Integrated Coastal Management strategy provides a framework under the National Environment Policy that links sectors at the District level and leads those sectors in a cooperative way in order to bring sustainable development. Coastal resources are under huge pressure that is caused by people being highly dependent on them for food and other basic needs, thus increasing the likely failure of these resources to support our future generations. Recently, different large economic activities are being located in coastal areas and more will follow. The establishment of a zoning and management plan for small-scale pond mariculture in Mkuranga district addresses one of the economic activities that is providing development in our coastal communities.

Mariculture activities started in Mkuranga district before 2000 when farming was done in salt pans and reservoirs used to keep water for salt crystallization. In 2004 demonstration ponds for fish farming were constructed at Mpafu village. This generated interest by a quite large number of people for engaging in mariculture activities. It is for this reason that Mkuranga district has decided to use an Integrated Coastal Management (ICM) strategy to introduce a zoning system that will establish permitting procedures for estuary and mangrove areas for pond mariculture. This system addresses the expanding number of requests for milkfish pond developments and will ensure that there is no significant environmental impacts from individual farms as well as potential cumulative impacts due to increase in number of ponds to particular area. Mkuranga is creating a model ordinance relevant to other areas of the nation and is a way to scale up responsible milkfish farming in the vicinity of existing pond sites.

The District authorities will now regulate eligible projects for minor permits, set limits on the location, size of small scale mariculture operations and determine suitable species for cultivation. Establishment of new ponds and normalizing existing pond aims to encourage well running pond operations that produce the intended products which are highly resistant to damage and disease. The ponds in Mkuranga will not cause problems to others. The new procedures remove any uncertainties in decision making, which benefits the district as well as the permit holders in the three wards where fish pond development will be permitted. The process of planning and design of this policy was done with all stakeholders including village government leaders, fishers, village leaders, mariculture farmers, and different technicians from Mkuranga district with cooperation of technicians from the TCMP. Before preparing this document, technical work included identifying all the salt pans areas with potential for mariculture activities in three wards, Magawa, Kisiju and Shungubweni to make sure there is sufficient area and researching the criteria and best practices needed in mariculture farming, .

Finally, I would like to state that the zoning of areas capable of supporting mariculture in Mkuranga is an important part of a master plan for the coast that will reduce conflicts in potential mariculture areas for the benefit of all coastal communities. In conclusion, I would like to offer my gratitude to the United States Agency for International Development (USAID), the Coastal Resources Center of the University of Rhode Island (CRC/URI), the Tanzania Coastal Management Partnership (TCMP), and Government officials of Mkuranga District Council. I also would like to thank all the Mkuranga stakeholders who participated and contributed to the development of this document and who generously supported the process.



Ms Sipora Liana
District Executive Director, Mkuranga District

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I. INTRODUCTION

Mariculture in Tanzania is in an early stage, but is steady growing. The number of fish ponds (milk fish, mullet, tilapia, and prawn) in coastal districts approaches 100. With some 50,000 hectares of salt flats in the country, the potential for fish and prawn farming expansion is high and growth is likely to continue, contributing to food security, income generation and employment in coastal communities.

The development of pond mariculture in Tanzania should be promoted; but it needs to be done in a controlled and thoughtful manner. An inter-agency Mariculture Working Group met and deliberated on this for several years in the late 1990's. This group identified pond siting and approvals as a priority area of concern and subsequently developed mariculture permitting guidelines that were agreed to and adopted by the relevant government institutions. To date, the permitting guidelines have not been proactively applied and there are in fact few cases in which permits for mariculture have been approved and issued.

Therefore, the goal of the Mkuranga District Small-Scale Mariculture Zoning and minor Permitting Procedure is to carry out a functional, practical, coordinated and decentralized permitting system in Mkuranga District for small-scale coastal mariculture projects (particularly for milkfish, mullet, tilapia and prawn farming) that can be replicated in other coastal districts. This is an example of good integrated coastal management (ICM) practice that utilizes spatial information for decision making.

Most small-scale mariculture activities can be broadly divided into three types:

1. Earthen pond culture
2. Open water culture systems operated in the intertidal and sub intertidal waters (mollusk culture in shallow salt water areas, seaweed farming in coastal seas, pen and cage culture in sea water bodies, and culture of giant clams, sponges and corals in or near coral reefs)

3. Hatcheries for finfish and shellfish including prawns and crabs

The Mkuranga District mariculture zoning and permitting policy is aimed at earthen pond culture in the intertidal area (e.g. milkfish or prawn farming).

In principle, mariculture ponds can be constructed in agricultural land, salt flats and unarable land, and Mangrove Zone IV land.¹ These habitats are typically not fully the responsibility of any institution, or where such jurisdiction exists, are often given low priority for oversight and regulation. Thus, there is no comprehensive institutional oversight, nor a set of regulations that comprehensively regulates the use of these habitats for mariculture.

The outcome of this presents dual risks. In some cases, a mariculture operator could potentially use a particular habitat site in ways that are not prohibited legally, but which could still cause negative impacts. On the other hand, in the absence of guiding regulations, government personnel may decide to take an overly conservative approach to permitting, and thus prohibit projects that would be appropriate and beneficial to coastal communities.

Zoning as a management tool used in conjunction with a simplified and decentralized permitting system can help avoid this dilemma and regulate use in areas appropriate for mariculture.

These procedures aim to develop a zoning and management plan for pond mariculture in Mkuranga district that can be used for sustainable development of mariculture as a pilot for other districts in Tanzania. It also aims to provide a practical permitting

¹ The mangrove forests of mainland Tanzania have been classified by the Mangrove Management Plan in four management zones: Zone I, forests which will receive total protection; Zone II, forests that are ready to be brought into production; Zone III, degraded areas that will be closed to allow recovery; and, Zone IV, areas that will be set-aside for different developments. Mangrove forests in Zone IV allow for controlled development such as creation of aquaculture ponds or solar salt pans.

procedure for interested small scale mariculture investors in Mkuranga district. This will provide sustainable mariculture development and management with low environmental impacts.

II. DEFINITIONS

The following terms have a specific meaning within the context of this Guidelines:

Application fee – a fee that is required to be paid during the application for a mariculture site in a district

As-built or existing pond – an earthen pond already constructed to create an enclosure for culturing of fin fish or any marine organism

Cultivation Method – The method applied to culture any aquatic organism.

Extensive Cultivation – Cultivation of aquatic organism whereby the organisms totally depend on natural habitat for food, i.e. no manure, no fertilizer, no external feeding etc.

Intensive Cultivation – Cultivation of aquatic organism where they totally depend on man made feed and husbandry

Semi-Intensive Cultivation – Cultivation of aquatic organism where the feeding process partially depends on natural habitat and the other part might be introduced or man made feeds or nutrients.

Council Technical Team (CTT) – refers to council heads of sections in the district representing their expertise, e.g. natural resource, fisheries, forestry, etc. during the evaluation of applications for aquaculture ponds.

Council Management Team (CMT) - refers to Councils' Head of Departments of the Mkuranga District Council.

Enforcement action – Any action aimed to curb illegal practice, e.g. construction of a pond in mangrove areas

Estuary – the aquatic region where marine and fresh water meet (river mouth meets with ocean) mostly the area is rich in prawn fishing

Existing pond – A pond that are already built and stocked with fingerlings

Exotic Species – Non native species that are imported or introduced from outside the area.

Global Positioning System (GPS) A technique involving a hand-held electronic device that records the geographic position of the user which should be used to locate, record and map mariculture ponds and related infrastructure for the spatial data base.

Mangrove Zone IV – The zone that is permitted for development of various activities according to the Mangrove Management Plan, e.g. construction of fish ponds or salt pans, etc.

Mariculture operation – keeping or culture of aquatic organism, e.g. in ponds or cages.

Minor Permit – The permit involves small scale (less than 10 ha) mariculture operation which does not need to go NEMC for EIA.

Major Permit – Permit that involves large scale (greater than 10 ha) mariculture operations and has to go to NEMC for EIA.

Native species - Species that are indigenous to the area in question.

NEMC: National Environmental Management Council

One Stop Review – Is the review of a mariculture project whereby everything is done in one multisectoral office: application, review and permitting.

Operation fee – a fee that is charged on a periodic basis during the operational lifetime of a licensed pond.

Permit Application – Request for permission to undertake a mariculture operation in a potential site through completing a written form with pertinent information about the proposed project that is sufficiently complete to allow authorities to review and evaluate it.

Permit Approval – The written decision containing approval or permission for the requested application

Permit Monitoring Data Base – the data file that contains all data collected about aquaculture project including application for permission, decisions, enforcement and environmental monitoring for each application.

Permit Rejection – Termination of permit/ permit refusal.

Permit Renewal – This is the application for a permit at the end of the previous permit.

Pond – Small body of standing water used for the culture of aquatic organism.

Salt Flats – A base area inundated by seawater often used for salt pans.

Significant environmental impact – a substantial, or potentially substantial, adverse change in any of the conditions within the area affected by the project, including but not limited to land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance.

Site – Location/place chosen for pond construction.

Site inspection – A physical inspection of the proposed or built pond site by one or more members of the District Technical Team to verify the accuracy of information in the permit application and to check for suitability of the area where culture of marine organism is expected to take place.

Spatial Data Base – Data base that contains information about the location, extent and nature of culture.

Stocking species – species that are stocked in a pond to grow.

Use or Access Rights – specific permission given to the applicant for a license to utilize the land area for the duration of the

aquaculture project, in the form of a lease, title, grant, permit, concession or other legally binding document that protects the holder from loss of access for a prescribed period of time.

Village Development Committee – A Village committee comprising members from that particular village responsible for addressing development issues of the the village

Zoning Scheme – separation of certain zones to reduce user conflicts depicted by a written or visual representation of boundaries, allowable uses and restrictions.

III. OBJECTIVES

The objectives of the Mkuranga District Small-Scale Mariculture Zoning and Minor Permitting Procedure are to locate potential sites for mariculture activities to ease the provision of permits for sustainable small scale mariculture activities for improving livelihoods of the coastal communities:

Characterize and map potential mariculture areas in Mkuranga District so as to provide orderly development

Establish a low cost, efficient, decentralized permitting procedure for small-scale pond mariculture, reducing the potential for cumulative impacts and providing a model for other coastal Districts

Promote responsible, controlled growth of small-scale earthen pond culture in a way that is environmentally sustainable and does not exceed the carrying capacity of the estuaries or degrade mangrove ecosystems

Document and monitor mariculture operations to enable enforcement of compliance with policies and to provide information to allow for adjusting policies in the future

Advance environmentally and economically sound land use planning in relation to resource allocation and population in coastal communities

Specific Objective

To establish an efficient, low cost and decentralized permitting procedure for sustainable small scale pond mariculture, and reducing the potential for cumulative impacts resulting from exceeded carrying capacity of fish ponds in the estuaries or degrade the mangrove ecosystems through the enforcement of compliance with polices and to provide information to allow for adjusting polices in the future.

IV. MKURANGA DISTRICT SMALL-SCALE MARICULTURE POLICIES

1. Incentives for the development of small scale mariculture projects

To minimize conflicts and ecosystem impacts, it is the policy of Mkuranga District that earthen pond mariculture that meets the standards and criteria described below be encouraged for the economic well being of its communities. The procedures for obtaining Minor Permits issued by the District shall not require the applicants not to bear an undo burden in meeting standards of proof or in the lengthy and costly proceedings. The District will have 30 business days from the time of accepting an application to issuing the permit (e.g. compared to 102 days).

2. Eligible projects for Minor Permits issued by the District

The following existing ponds and newly constructed ponds are generally eligible for a Minor Permit if they meet the following requirements:

- Involve a total of less than 10 hectares
- Do not utilize exotic species
- Do not involve intensive forms of cultivation technology
- Have clear title or tenancy over the site
- Are acceptable to the village and ward where it is located
- Will not cause significant environmental impacts
- Are located in designated suitable areas

3. Limits on the location of small scale operations

It is the policy of Mkuranga District to limit the areas where small scale mariculture can occur to those locations which are behind mangrove forest, corresponding to areas designated as suitable in technical studies and encompassing portions of agricultural land, salt flats, unarable land, and areas designated as Mangrove Zone IV.

Mkuranga District has an estimated area of 1300 ha of salt flats areas where aquaculture might be permissible. About 367 ha have received an initial indication based on field analysis as potentially suitable salt flats distributed in the three coastal wards, namely Magawa, Kisiju and Shungubweni, as shown in Annex I and Figure 1.

4. *Limit on the size of mariculture operations*

It is the policy of Mkuranga District to limit the size of a small scale mariculture individual operation to no more than 10 hectares. Proposals larger than this will be rejected outright and the applicant directed to apply for a Major Permit from the National Environmental Management Board or Tanzania Investment Bank (TIB) and Aquaculture Division.

5. *Species suitable for cultivation*

The District will only issue permits for the cultivation of native species of fish and shellfish. Proposals for the cultivation of exotic, non-native species will be rejected outright and applicants directed to the attention of the National Environmental Management Council and Aquaculture Division.

6. *Allowable methods of cultivation*

The District will only issue permits for extensive and semi-intensive forms of cultivation. Proposals for intensive culture of species will be rejected outright and applicants directed to the attention of the National Environmental Management Council, Aquaculture Division or TIB.

7. *Projects that cause significant environmental impacts cannot receive a Minor Permit*

Permits will not be issued for a proposal with a high likelihood of causing significant environmental impact to the estuary and land where it is located.

Pond operations should not cause harm to endangered species and protected areas.

Pond operations should not interfere with adjacent uses in any way that cannot be mitigated or compensated.

8. *Existing operations will be regularized*

Existing ponds will be required to submit information documenting the nature of their operation so that permits can be regularized to remove any uncertainties for the benefit of the district as well as the permit holder. The District will work with each pond operator to identify and rectify any issues of inconformity with this ordinance.

9. *Best business and pond management practices*

The District of Mkuranga seeks to encourage the establishment of well run pond operations that produce the intended products, are resistant to damage and disease and does not cause such problems to others, and are managed in ways that generate the revenue necessary to cover costs and allow for maintenance of the operations. Applicants are encouraged to seek technical assistance on the design and operation of their facilities as well as adopt best business management practices.

10. *Maximum extent of pond operations in an estuary*

Mkuranga has seven (7) estuaries in the three wards where fish pond development will be permitted (an estuary consists of the coastal area where fresh water from the land mixes with sea water, usually semi-enclosed by a barrier beach or spit). To protect environmental quality in these areas, it is the policy of Mkuranga District to issue its minor permits for aquaculture related pond construction to an area that is no more than 20 per cent of the combined area of salt flats and mangroves associated with the estuary. The intent is to avoid the accumulation of impacts that could damage the environment of these areas as well as interference with other activities in the area.

In addition, to reduce the cumulative impact of mariculture and protect coastal habitat, no more



Figure 1 Mariculture base map for Mkuranga District

than 80 percent of any area deemed suitable such as unarable land and agricultural land will be given minor permits for pond development. This does not apply to sites located on salt flats and mangroves where the more stringent 20 percent rule applies as described in the previous paragraph.

NOTES: The Minor Permitting Procedure (MPP) once proven successful could potentially be applicable to the entire coastal of Tanzania. However, policies could vary between one District and another, (e.g. percentage of land to be given to investors).

V. SMALL-SCALE MARICULTURE PERMITTING PROCEDURE FOR APPLICANTS

The permitting procedure for small-scale mariculture activities shall follow the procedures described below using the forms and instructions provided in the Annexes as indicated. *The procedures are based upon those described in the Mariculture Investor's Guide.* However the Mkuranga procedure shall be simple, easy to use and especially suitable for use at the community level. *The procedure is designed to be applicable to all coastal Districts choosing to adopt it.* The District does not take on the responsibility for directly helping individuals or groups acquire sites, initiate or manage mariculture businesses. Important considerations that persons interested in initiating small-scale pond culture should take into account regarding site selection and fish pond operations are listed in Annex 6.

A potential mariculture pond in an existing salt works or other pond structure will be provided with the quickest review, and will not be considered as a new operator in terms of the limits on cumulative development of mariculture in the estuary where the farm is located mentioned in Policy 10. Therefore, the investor only needs to be registered and be listed in the village mariculture roster. However, the investor should fill in an application standard form provided.

All other applicants are encouraged to consider carefully the size of the operation they ultimately wish to manage. This regulatory procedure is not intended to handle projects that do not conform to the basic requirements of eligibility described in VI-2 below. Applicants are discouraged from occupying the time of district authorities with requests that patently exceed this threshold. The District will exercise its right to reject such applications outright without detailed technical review or site visit.

VI. PROCEDURE FOR DISTRICT REVIEW

The permit procedure is illustrated in Figure 2 below.

Any one having an idea to start a mariculture operation shall initially send his application for obtaining permit through the following steps:

A duly filled in application form (Annex 2) shall be submitted to the village government with application fee of 10,000/= including all the necessary attachments of land use permit, and 3 passport size photos.

If approved at the village level, the village government will send the application forms together with all the necessary attachments to the Council Technical Team (CTT) for preliminary review.

The CTT will examine the following aspects of the proposal:

Verify that the application is complete, including land permit (ownership or concession for the site from the Village, Ward or District)

Determine if the project meets the thresholds for Minor Permit. If not, then reject, recommend revision or recommend submission to the NEMC Major Permit process.

The thresholds for classifying an application as a Major Permit include the following:

The project is greater than 10 hectares in size

The project would result in more than 20 percent of the associated estuary containing aquaculture operations

The applicant is not the party with title, ownership or concession for the site from the Village, Ward or District

The project will generate significant environmental impacts through

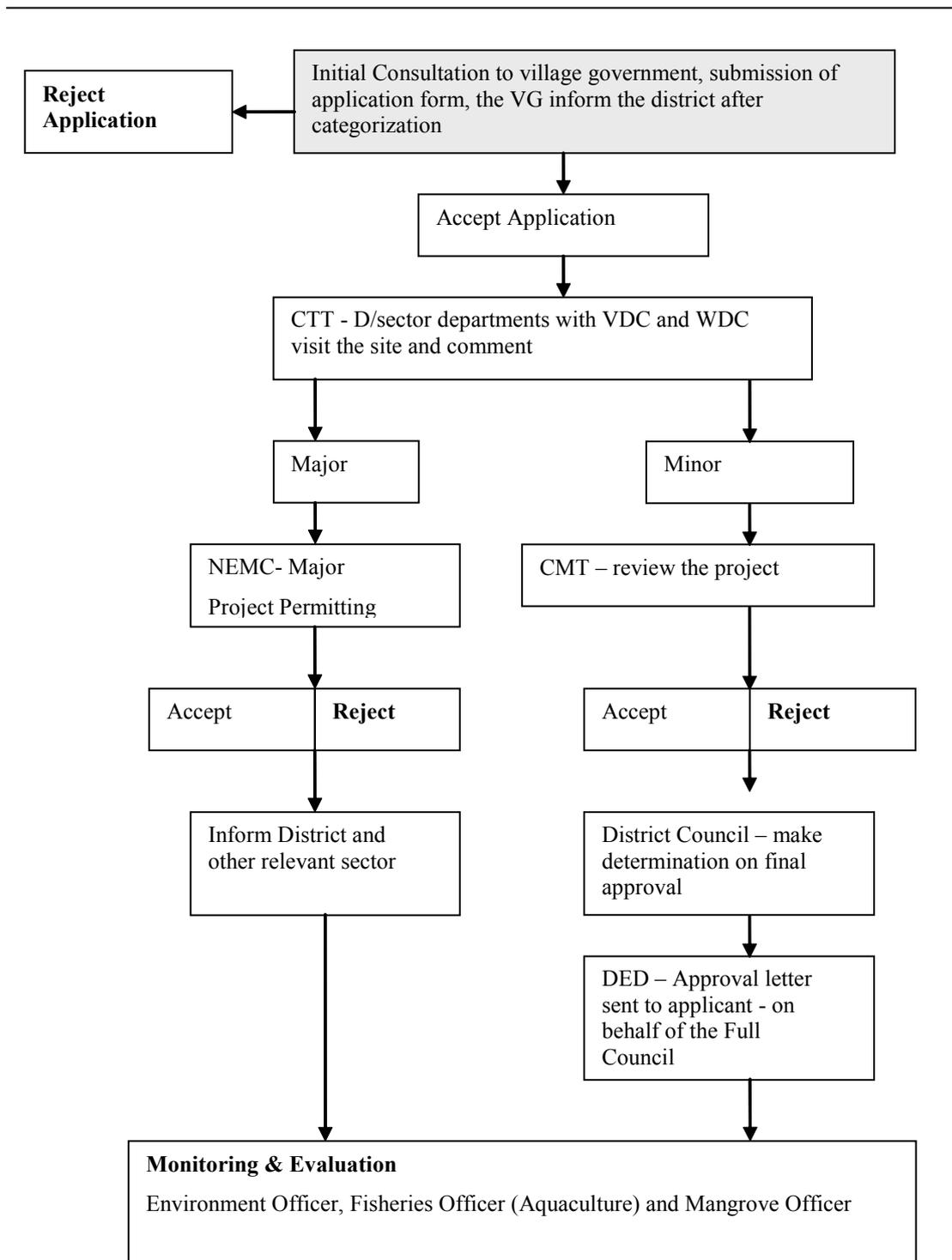


Figure 2: District Small scale Mariculture Permitting procedure¹

NOTE: For the case of minor process, the applicant does not need to pay any costs involved during field visit unless the applicant wants to speed up the process. According to MMP, every user of Zone IV has to pay an Annual Management fee.

construction or operation, or is partly or wholly within a geographic area where aquaculture uses are prohibited

The project involves intensive culture technology

The project involves the cultivation of exotic species

If it is a minor operation, i.e. does not have significant impacts; then:

The CTT will conduct a field inspection of the proposed site. This should be done utilizing staff with appropriate technical expertise in collaboration with village government (VG) and a copy of the document submitted to Ward Development Committee (WDC)

The CTT will review the proposed project design to insure that the activities can in fact be accommodated at the site, that the applicant has the necessary legal and physical access to construct all of the required installations, and that no required technical aspect of the project has been left out of the application.

The CTT will confirm that the project falls within the areas predetermined as potentially suitable for aquaculture, is compatible with adjacent uses and is consistent with local development plans

The CTT will verify that the applicant has indicated where they will get the knowledge, financial resources and management ability necessary to carry out the project as proposed or revised.

The CTT will issue one of the following recommendation statements within 30 business days of receiving a properly completed application:

recommendation for rejection
recommendation for submission to NEMC as a major permit

acceptance conditioned on specified modifications to the application or conformity with additional conditions
outright acceptance

The CTT will forward the application with its recommendation to the Council Management Team (CMT) with a copy to the Ward Development Committee, who will submit to the District Council for approval. The District Executive Director (DED) shall write to the applicant and inform about the decision with a copy to Village government and provide information to the Aquaculture Division and NEMC for public record.

The District letter of approval will serve as evidence of a permit to operate the mariculture farm.

If the application is approved, the applicant must pay appropriate fees of 10,000/= (Ten thousand only).

VII. MONITORING AND EVALUATION

Monitoring and evaluation of permitted operations is the responsibility of the District Office in particular ICM, environment, fisheries and forestry (mangrove) officers. Monitoring should determine if the terms on the project as permitted have been followed in order to avoid environmental impacts. In particular, it is important to monitor water which is discharged from the pond(s) in terms of quality and quantity. Water quality features of discharged waters for assessment include pH, salinity, specific density, and temperature. The capacity of the receiving water to dilute the discharge to acceptable levels should be considered.

Spatial Database

The District office shall maintain a database on mariculture activities with the following information taken from the application form, DTT review and field inspections. Data fields may include the following:

- Name of owner and manager
- Precise location determined using GPS coordinates
- Source of water (name of river, stream, estuary, or open sea)
- Number of employees
- Design of pond(s)
- Date of construction
- Number of ponds and total pond area (hectares)
- Source of fingerlings for stocking (e.g. hatchery; capture from the sea/estuary.)
- Species stocked and stocking density
- Date of harvests and amount harvested
- Critical difficulties (e.g. permit approval; stocking; growth rate; pond construction; water supply; harvest; transport of harvested fish; sale of fish)

ANNEXES

1. Area covered with salt flats by ward and by village
2. Application form
3. Government approval/ rejection letters
4. Checklist for Village government committee
5. Checklist for Council Technical Team
6. Considerations in site selection and operation

Annex 1 Area covered with salt flats used for, and suitable for mariculture by ward and by village

Locations with a + represent existing areas of mariculture operations

Ward	Village	Location Name	Estuary	Hectares
Magawa	Kifumangao	Mivinjeni	Magawa	19.7
		Mchambike	Magawa	8.6
		Kikutani	Magawa	4.3
Kisiju	Kerekese Mpafu	Kikutani 2	Magawa	11.0
		+ Mhagatani 2	Makutika-Palacha	3.4
		Kivukoni	Kivukoni	1.0
		Kivukoni2	Kivukoni	4.1
		+ Kalantini	Kivukoni	9.5
		Maunganya	Kivukoni	2.6
		+ Bubu 2	Makutika-Palacha	0.6
		+ Bubu	Makutika-Palacha	0.8
		Kibewa 6	Makutika-Palacha	4.3
		+ Kibewa 5	Makutika-Palacha	3.9
		Kibewa 4	Makutika-Palacha	5.6
		Kibewa 3	Makutika-Palacha	3.4
		Kibewa2	Makutika-Palacha	2.5
		+ Kibewa 1	Makutika-Palacha	41.5
		+ Kondo Kirago	Kivukoni	23.0
		Kondo	Kivukoni	1.3
		Palacha	Makutika-Palacha	14.9
		+ Lule kivinjani	Makutika-Palacha	32.3
		Mhagatani 1	Makutika-Palacha	7.7
Kisiju Pwani	Kisiju Pwani	+ Mohamed's farm		
		KKMM	Ununio River	3.7
		Bandari 3	Ununio River	0.4
		Bandari 2	Ununio River	2.6
		Bandari 1	Ununio River	1.3
		+ Ziweziwe	Makutika-Palacha	4.5
		+ Ziweziwe 2	Makutika-Palacha	2.0
		Dindini	Makutika-Palacha	10.8
		+ Makutika	Makutika-Palacha	1.4
		Shungubweni	Shungubweni	+ Kiperani
+ Matebe	Boko Mdogo River			36.0
+ Matebe "B"	Mbezi River			13.9
+ Miswakini kuruti	Mbezi River			12.5
+ Kigunda	Mbezi River			11.7
TOTAL				380.4

Mkuranga area showing three wards with existing milkfish ponds

Ward	Village	Salt flats and ponds in Hectares	Existing ponds (number)
Magawa	Kifumangao	44	0
Kisiju	Kisiju Pwani, Kerekese & Mpafu	189	13
Shungubweni	Shungubweni/Kuruti/Boza	148	4
TOTAL		380	17

MKURANGA ESTUARIES (listed North to South)	Mangroves all types (ha)	Salt Flats, Fish Ponds and Salt Works (ha)	Combined Mangroves + Salt Areas (ha)	Maximum Allowable Ponds in Estuary based on policy (20%)	Existing Fish Ponds (ha)	Designated new areas for ponds	Fraction of maximum allowable proposed for new areas
Mbezi River estuary*	1161	66.7	1228	246	62	0	0.25
Boko Mkubwa River estuary*	443	42.8	486	97	0	0	0.00
Boko Mdogo River estuary*	727	99.8	828	166	86	0	0.52
Makutika-Palacha estuary*	1243	55.1	1298	260	90	49	0.54
Kivukoni River estuary*	670	94.3	765	153	32	9	0.27
Ununio River estuary*	571	100.4	672	134	4	4	0.06
Magawa Area**	131	88.3	220	44	0	44	0.99
TOTAL hectares	4949	547	5496	1099	274	106	0.35

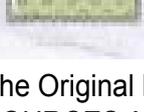
Figure 3 Estimated mangrove area, salt flats including fish ponds and potential areas for fish pond development, by estuary

NOTES: Data is for Mkuranga District, taken primarily from GIS analysis of 1990 Forest Division maps as well as field surveys of existing and potential pond sites in 2008 and 2009 conducted by the Tanzania Coastal Management Partnership. Only the Magawa area designated area will reach the built out limit. The Makutika-Palacha estuary will only reach 54 percent of the limit if all potential pond sites are utilized. This policy limits fish pond development to a total of 380 ha including existing ponds and sites that have been designated as potentially suitable. The maximum possible fish pond development in Mkuranga is limited to 20 percent of total mangrove and salt flat areas combined within each estuary, which is 1,099 ha overall for the district. Few or no sites are designated in some estuaries, for example Boko Mkubwa and Ununio River.

* Estimate of areas based upon GIS analysis of Mangrove Forest Maps published in 1990 by the Ministry of Lands, Natural Resources and Tourism, Forest and Beekeeping Division, and field surveys of existing and potential pond sites in 2008 and 2009.. GIS maps prepared by Dr. Philip Mwanukuzi, University of Dar es Salaam, and analysis conducted by D. Robadue, University of Rhode Island, USA.

**Estimate of areas based upon GIS maps prepared by Dr. Y.Q. Wang, University of Rhode Island, based on Landsat imagery from 2000.

LEGEND
FOREST CLASSIFICATION

-  Rhizophora dominant with occurrences of Avicennia, Ceriops, Sonneratia, Bruguiera, Heritiera and/or Xylocarpus
-  Sonneratia - almost pure stands
-  Sonneratia dominant with Avicennia, Bruguiera and/or Rhizophora
-  Heritiera - almost pure stands
-  Heritiera dominant with Avicennia, Bruguiera and/or Rhizophora
-  Avicennia dominant with Rhizophora, Bruguiera, Heritiera, Ceriops and/or Xylocarpus
-  Avicennia - almost pure stands
-  Mixture of Avicennia and Ceriops
-  Ceriops dominant with occurrences of Rhizophora, Avicennia and/or Bruguiera

The Original Base Map Prepared and Published by: MINISTRY OF LANDS, NATURAL RESOURCES AND TOURISM, FOREST AND BEEKEEPING DIVISION. The Catchment Restoration Project, Dar-es-Salaam, 1990. Photo Interpretation by: Survey and Inventory Section, Forest and Beekeeping Division Dar-es-Salaam, 1989. Aerial Photography by: Photomap International Inc. 1988/89

The information on fish ponds is approximate. Prepared by Tanzania Coastal Management Partnership in cooperation with the District of Mkuranga, 2009.

 Existing Pond  Potentially allowable sites for pond construction	SP = Salt Pans S = Saline, bare areas CC = Clear cut area OF = Non-mangrove forest
---	---

Legend

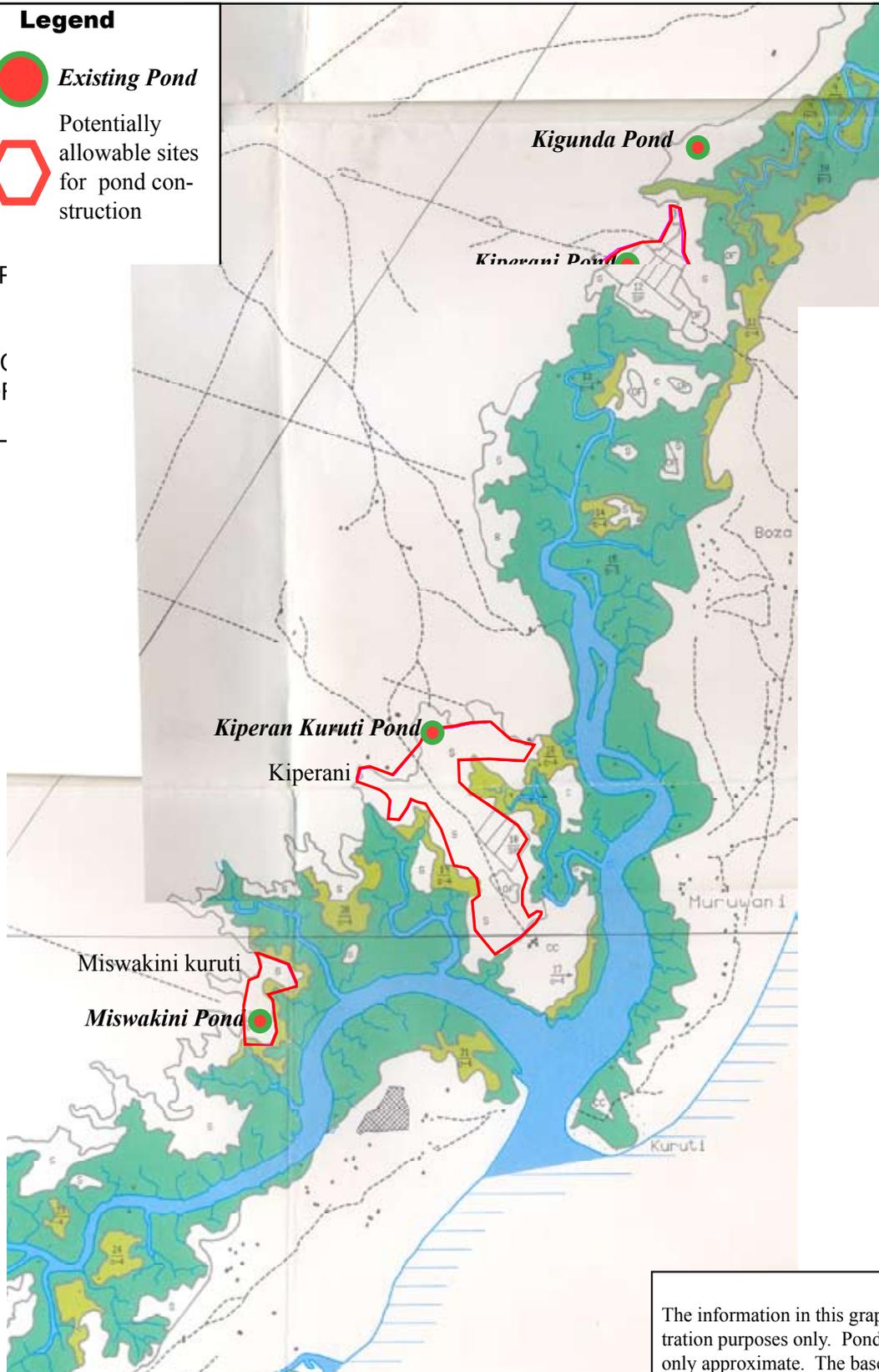


Existing Pond

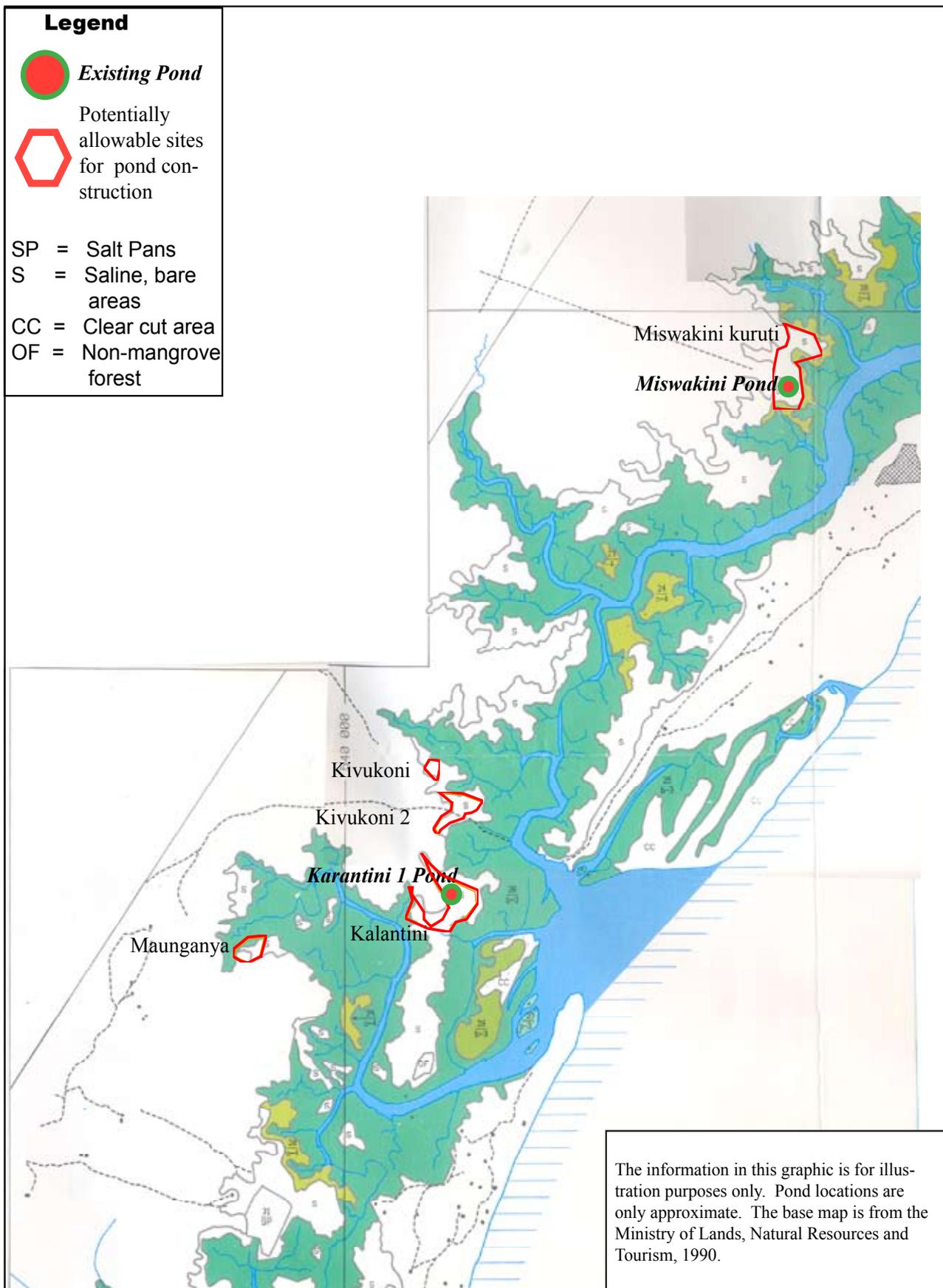


Potentially allowable sites for pond construction

SF
S
CC
OF



The information in this graphic is for illustration purposes only. Pond locations are only approximate. The base map is from the Ministry of Lands, Natural Resources and Tourism, 1990.

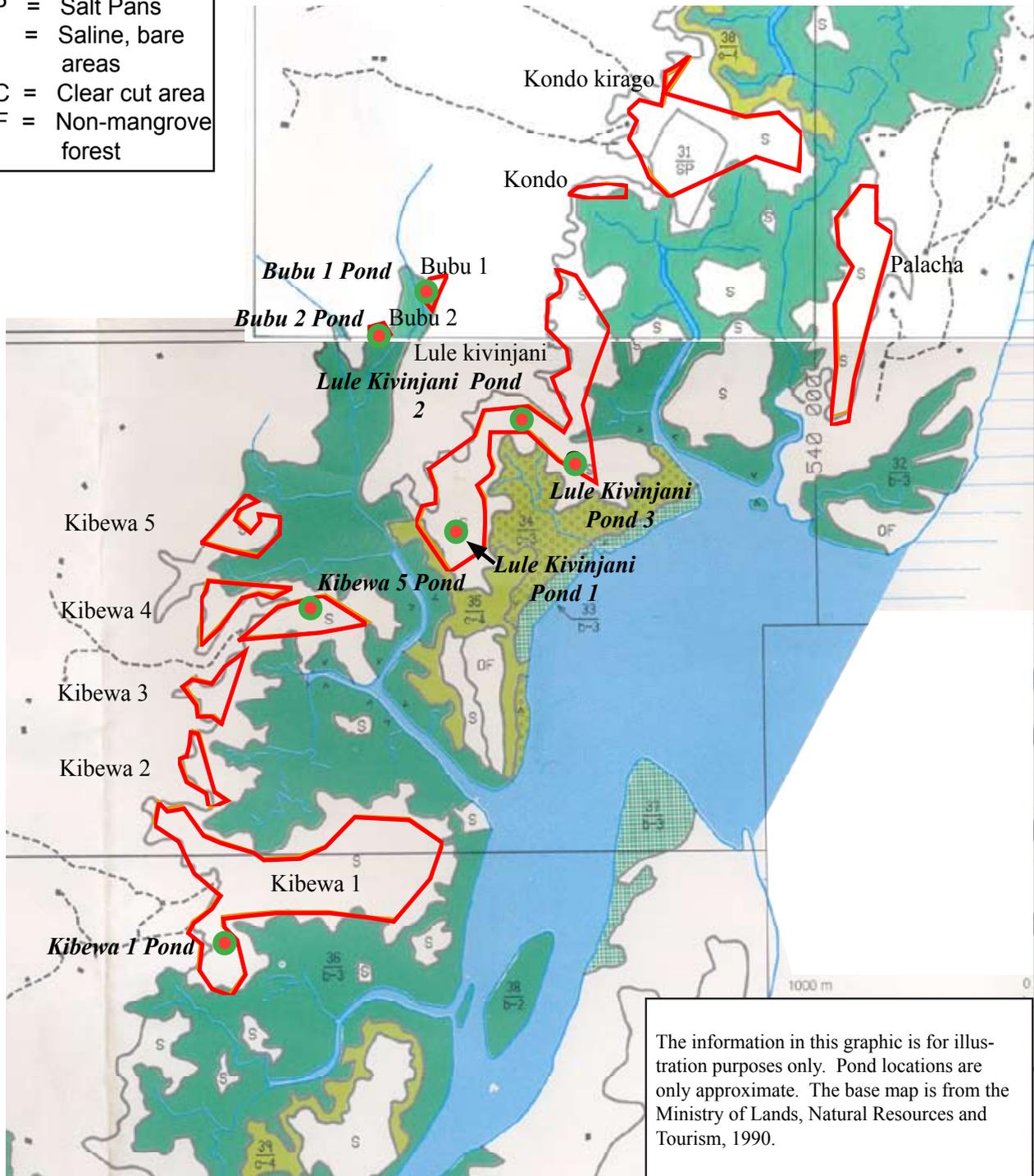


Legend

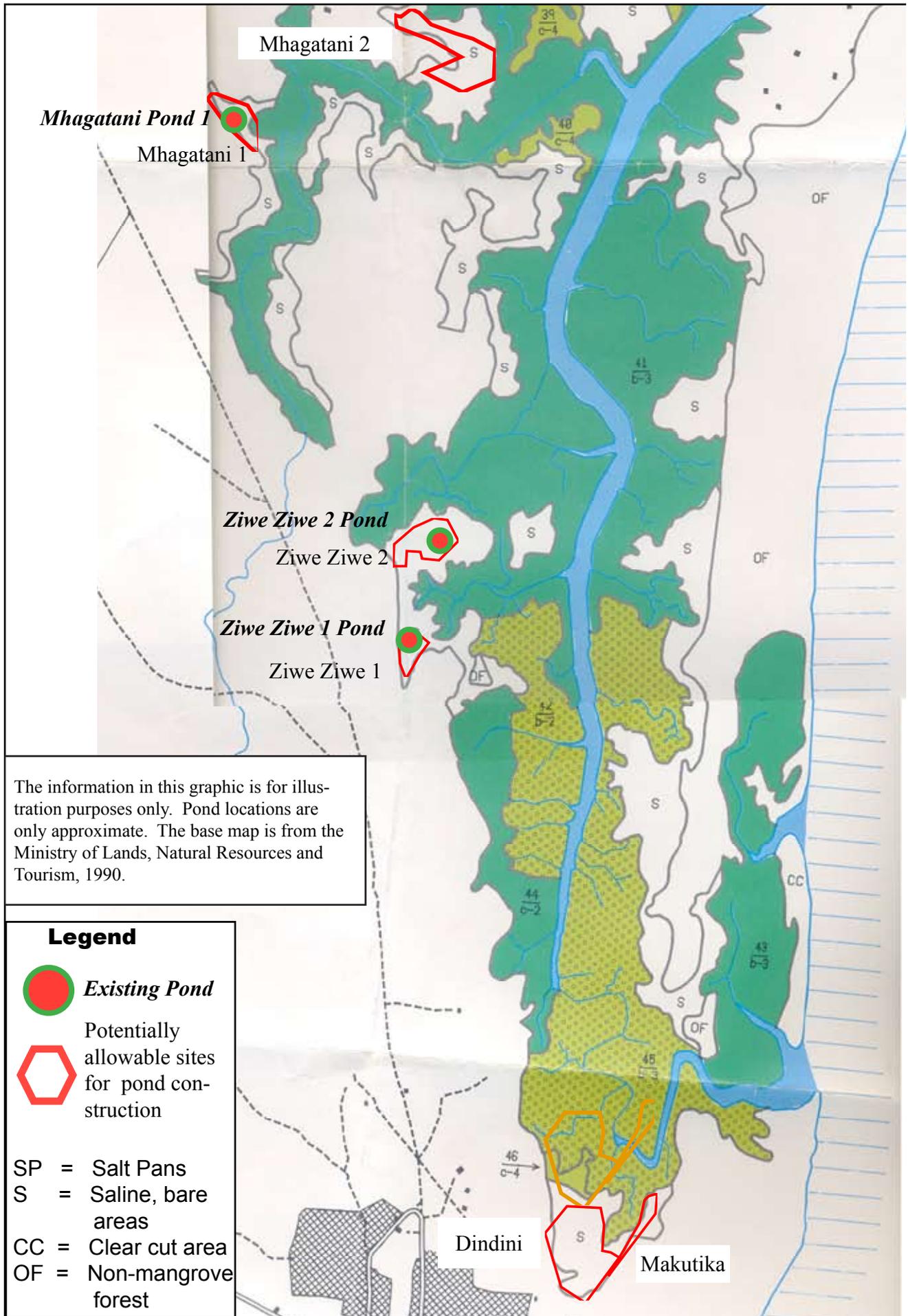
 Existing Pond

 Potentially allowable sites for pond construction

SP = Salt Pans
S = Saline, bare areas
CC = Clear cut area
OF = Non-mangrove forest

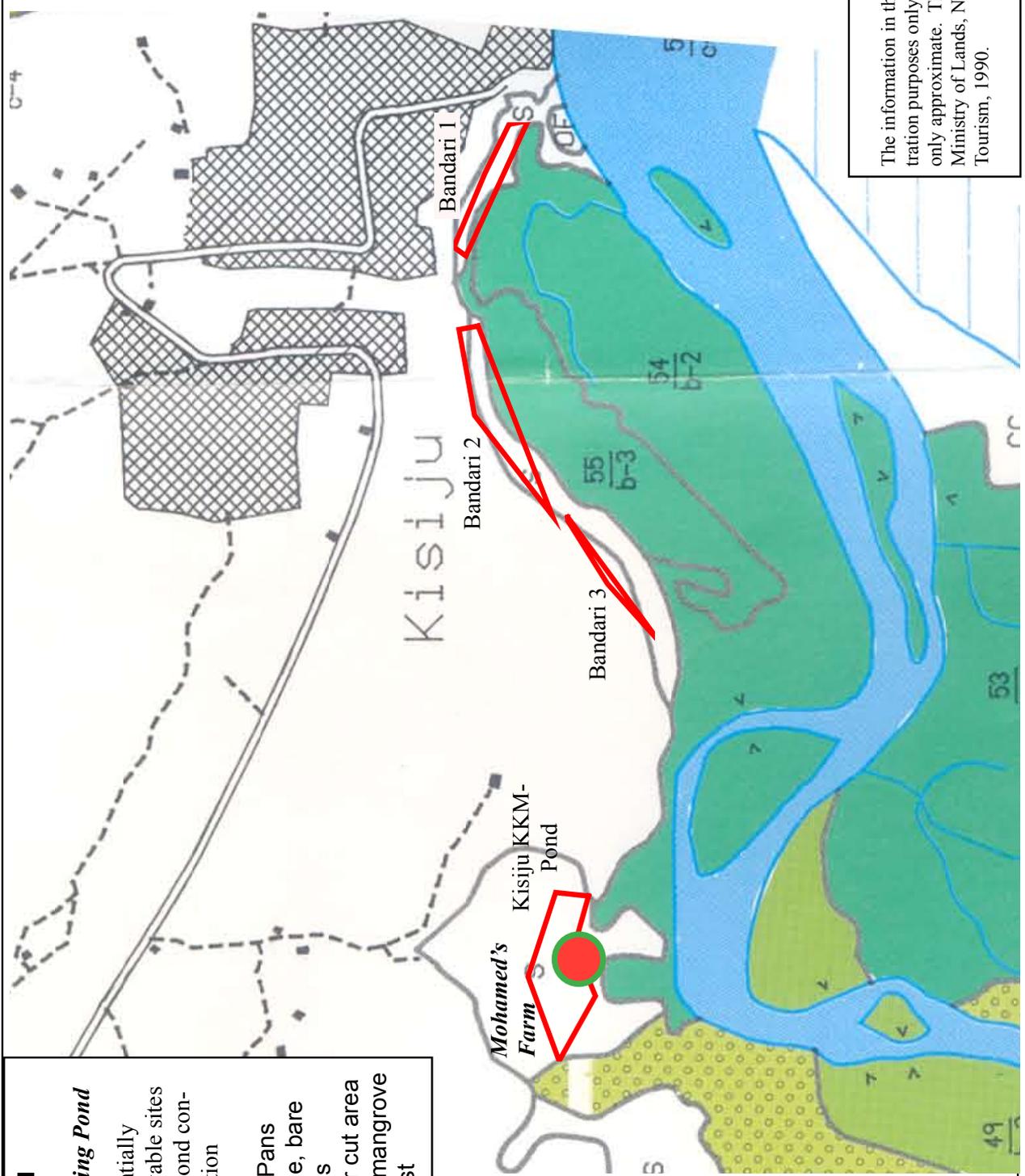


The information in this graphic is for illustration purposes only. Pond locations are only approximate. The base map is from the Ministry of Lands, Natural Resources and Tourism, 1990.

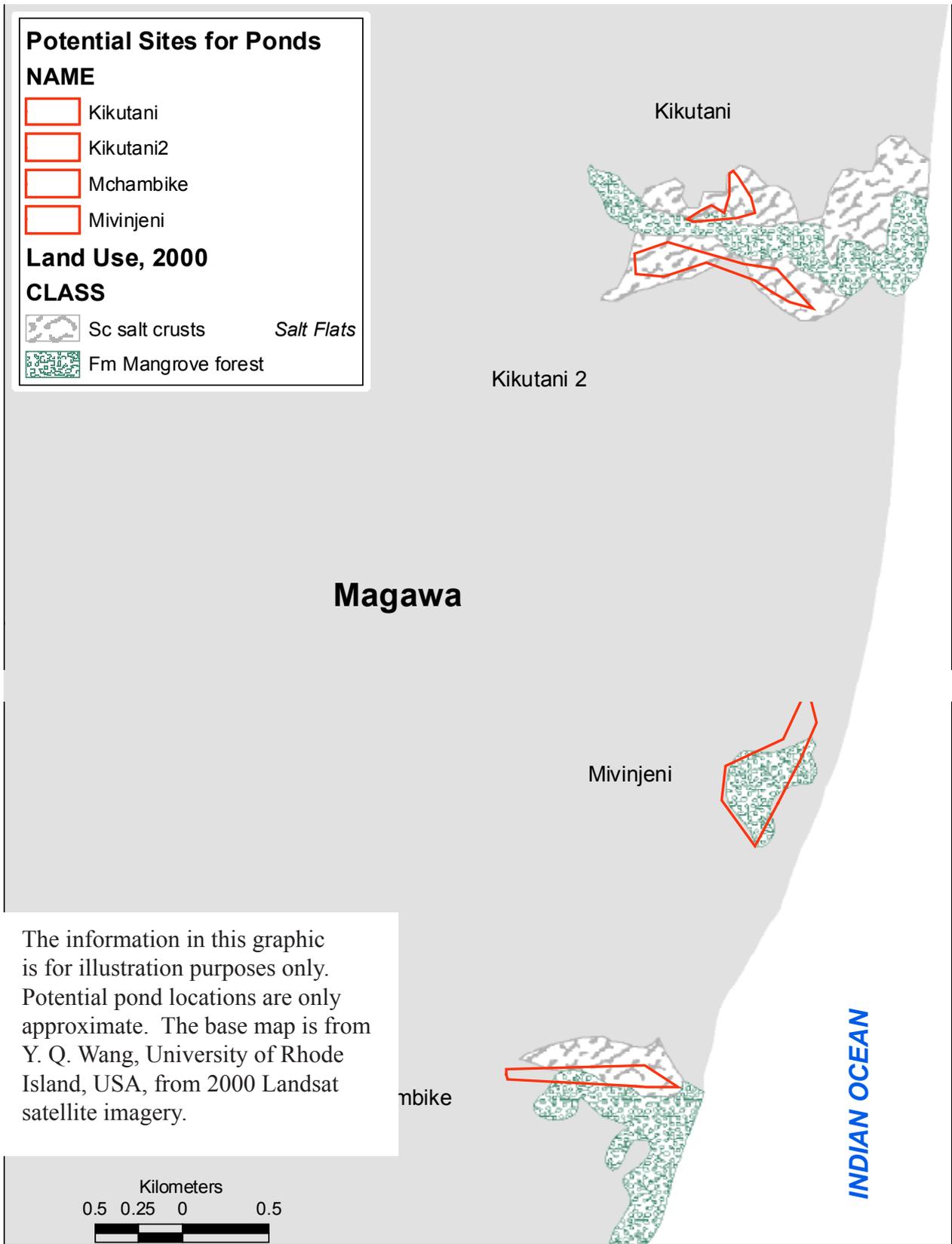


Legend

-  Existing Pond
-  Potentially allowable sites for pond construction
- SP = Salt Pans
- S = Saline, bare areas
- CC = Clear cut area
- OF = Non-mangrove forest



The information in this graphic is for illustration purposes only. Pond locations are only approximate. The base map is from the Ministry of Lands, Natural Resources and Tourism, 1990.



Annex 2: Application Form

APPLICATION FORM FOR MKURANGA SMALL SCALE MARICULTURE ACTIVITIES

PART 1

(To be filled by an Applicant)

I /We* hereby apply for permission to construct, develop and manage fish pond(s) for fin fish /prawn farming
Physical address Village of applicant stal Address
Applicant's Tel. No. Email..... Applicant's Status: Resident/Non resident.....
Method of farming Extensive ___ Semi intensive ___ Intensive ___... Species to be farmed..... Number of ponds to be constructed Size of the ponds to be constructed.....
NOTE: ¹ Projects with a total area of over 10 ha, must be submitted to NEMC for major permitting ² Attach a sketch diagram for the pond(s) layout and illustrations
Source of fingerlings/fish seeds.....
Expected cycles of harvest per calendar year.....
Source/intake of water to the pond(s) will be through..... Discharged /drainage of pond water will be to the following waterbody.....
* Delete which ever is inapplicable.

Will any type of fertilizer be used?	Yes _____ No _____
If YES, specify and give details	
.....	
Will any kind of antibiotics for treatments be used in the pond(s)?	Yes _____ No _____
If YES, specify and give details	
.....	
Describe how you plan to operate the ponds during each harvest cycle, including collection fingerlings, feeding, pond maintenance, harvesting procedures, processing, and marketing.	

I certify that all the above information is true and correct to the best of my knowledge
Signature.....
Date.....

NOTE: The applicant shall attach the following documents when submitting this application:

1. A Sketch Map showing the area of the project, pond layout and pond walls, water intake and discharge, and other buildings or equipment to be installed or constructed.

N.B. Please consult the book of maps of mangroves, salt flats, saline areas and potentially suitable sites at the District office.
2. Land permit or other indication of tenure or access to the proposed project site
3. Three (3) passport size photographs of the applicant
4. Application fee of 10,000/=

Annex 3: Government Approval Letters

Part 1. Rejection letter from Village Executive Officer to applicant.

Office of the Village Government,
..... Village
Mkuranga
Ref. No:
Date:
To:

Dear Sir/Madam:

Re: APPLICATION FOR A PIECE OF LAND IN RESPECT TO PRACTISING MARICULTURE ACTIVITIES.

On behalf of the District Government, I hereby take this opportunity to inform you that your application dated for a piece of land(area) located at to be used for mariculture activities has been rejected due to the following reasons;

.....
.....
.....
.....
.....
.....

Yours sincerely,

Signed
Village Executive Secretary

Official Stamp
Village Government

Part 2. Approval letter from Village Executive Officer to District Executive Director.

Attached to the letter are the signed recommendations of the Village Executive Secretary, District Fisheries Officer (Aquaculture), and District Zonal/Mangrove Officer, and copy to Ward Executive Officer

Village Government Office,
..... Village,
Mkuranga

To: District Executive Director
Mkuranga District Council
P.O. Box 10
Mkuranga

Ref. No:
Date:

Dear Sir/Madam.

Re: SUBMISSION OF APPLICATION FORM FOR MARICULTURE ACTIVITY IN
.....VILLAGE FOR MR/MS/MRS.....

Reference is made to the heading above concerning the development of a small scale milk fish/
prawn farming/..... activity invillage. (tick or fill in as applicable if other
than two)

On behalf ofvillage, the village government is taking this opportunity
to forward the application to you for consideration according to the mariculture zoning and
permitting procedure in our district.

The village government has received the application and reviewed it according to the District
Minor Permitting Guidelines and Review Check Lists.

The village government agrees that all the necessary requirements for pond construction have
been met. The village also realized that once the ponds have been successfully managed, they will
contribute to village development on the economic and conservation aspects, improved protein
consumption and nutritional status of village communities.

Therefore, we are forwarding the application forms to you for your review and approval.

Yours sincerely,

Signature

Village Executive Secretary

Official Stamp
Village Government

Recommendations

.....
.....
.....
.....
.....

Full name.....

Signature.....

Date.....

Official Stamp (Village Executive Secretary)

Recommendations

.....
.....
.....
.....
.....

Full name.....

Signature.....

Date.....

Official Stamp District Fisheries Officer (Aquaculture)

Recommendations

.....
.....
.....
.....

Full name.....

Signature.....

Date.....

Official Stamp District Fisheries Officer (District/Zonal Mangrove Officer)

Part 3. Letter from the District Executive Director (DED) to the Council Management Team with the recommendations of the Council Technical Team.

Mkuranga District Council,
P.O. Box 10,
Mkuranga

District Management Team
Mkuranga District Council
Ref. No:
Date:

Re: APPLICATION FOR A PIECE OF LAND IN RESPECT TO PRACTISING MARICULTURE ACTIVITIES.

On behalf of the District Technical Team, I take this opportunity to inform the District Management Team and District Council of the review findings and recommendations of the attached application for mariculture activity in Mkuranga.

Recommendations

.....
.....
.....
.....
.....

Yours sincerely,

District Executive Director

Official Stamp
District Government

Part 4. Based on the decision of the District Management Team and District Council, the District Executive Director (DED) shall write to inform the applicant of the District's final decision.

The DED will copy the letter to the Village government, as well as to Aquaculture Division and NEMC for public record. The District letter of approval will serve as evidence of a permit to operate the mariculture farm.

Mkuranga District Council,
P.O. Box 10
Mkuranga

To.....
.....
.....

Ref. No:
Date:
To:

Dear Sir/Madam:

Re: APPLICATION FOR A PIECE OF LAND IN RESPECT TO PRACTISING MARICULTURE ACTIVITIES.

On behalf of the District Government, I hereby take this opportunity to inform you that your application dated for a piece of land located atwith an area of.....m² to be used for mariculture activities has been approved/rejected due to reasons outlined below:

.....
.....
.....
.....
.....

Yours sincerely,

District Executive Director

Official Stamp
District Government

Annex 4: Checklist for the Village Government Committee

Every person seeking a permit to build and operate ponds for growing finfish or shellfish need to demonstrate to the Village, Ward and District government that they have the permit to utilize, that their project will not negatively interfere with any other activities in the village where it is to be located, will not negatively interfere with projects or land use rights held by others, and that it is consistent with the development plans in the village. National law protects mangroves and the District will review the application to be sure that the project does not infringe upon mangrove areas, as well as to verify all of the facts presented in the application. If the village is satisfied with the proposal, it will submit the proposal and its recommendations to the districts for review by CTT. The village has the responsibility to give comments to the District to consider during the application review period. The village will be consulted again during the application review process before a final decision is made.

The Village is required to submit a letter of its provisional consent, together with comments to the District Fisheries Officer (Aquaculture), to accompany the applicants' submission.

Checklist for Village and Ward	Yes	No	Comments
Was the specific purpose of the project as described by the applicant reviewed?			
Was a written presentation of the project proposal submitted? Was it reviewed?			
Was a sketch map of the project area submitted? Was it verified in the field? Was it approved?			
Location of the project site. Was it indicated? Was it visited? Is it within an approved zone? Was it approved?			
Other activities in the area Are there other activities in the proposed project site? Are the activities related to aquaculture ponds?			
Possible conflicts between the project and other activities in the area. Are there possible conflicts? List of conflicts/concerns			
Development goals of the village and ward. Is the project consistent? How will it interfere with goals, plans and life in the village?			

Checklist for Village and Ward	Yes	No	Comments
Ability of the applicant to implement the project. Is the applicant able? ¹ Are there any concerns about the applicant? List of concerns:			

¹ At least financially and technically

² Ward is mentioned here as a power centre

Annex 5: Checklist for the District Technical Team

The role of the District Technical Team is to ensure that the applicant for a permit to build an aquaculture project has properly completed the application form, has consulted with the village and ward where the project is to be located, and possesses access to the location. The DTT is then responsible for verifying the information in the application and evaluating the proposal in respect to the policies and rules set out by this ordinance.

The following worksheet is an aid to this review process.

Checklist for District Technical Team	Yes	No	Comments
1) Review the application form for completeness, preferably at the time the applicant submits it to the District office. This should include any other attachments as requested in the application form. Is it complete?			
2) Threshold Review: If any of the following are true, inform the applicant to either revise the proposal or submit the application for review by NEMC			
a. The project is greater than 10 hectares in size			
b. The project would result in more than 20 percent of the combined mangrove and salt flats in the estuary containing aquaculture operations. Check with the Mkuranga coastal aquaculture maps and related tables to calculate this.			
c. The percent of the salt flat area that will be occupied by aquaculture ponds is more than 80%.			
d. The applicant is not the party with permit/, ownership or concession for the site from the Village, Ward or District			
e. The project appears to generate significant environmental impacts through construction or operation, or is partly or wholly within a geographic area where aquaculture uses are prohibited.			
f. The project involves intensive culture technology. The DTT does not have the legal and technical capability of reviewing this type of project.			

Checklist for District Technical Team	Yes	No	Comments
g. The project involves the cultivation of exotic species. The DTT does not have the legal and technical capability of reviewing this type of species.			
h. In the area concerned, the DTT have to check on the carrying capacity of ponds in the area			
i. Cumulative impacts			
3) The receipts for relevant fees are submitted to the relevant authorities. Has the application fee been paid?			
4) A copy of letter from VG that the site chosen can be/ not developed as consent. Village letter received?			
5) Attach District coastal aquaculture maps, and confirm: Location of the farm in relation to adjoining water way. Existing vegetation type and cover e.g. Mangrove areas.			
6). Review the proposed project design to insure that the works and activities can in fact be accommodated at the site. Was the proposal reviewed?			
7) Confirm that the applicant has indicated to have the necessary legal and physical access to construct all of the required installations, and that no required technical aspect of the project has been left out of the application. Is the applicant a legal owner of the area? Has the applicant indicated to have the necessary requirements for the project? Are all the aspects of the project covered?			
8) Verify that the applicant has indicated where to get the knowledge, financial resources and management ability necessary to carry out the project as proposed or revised. Does the applicant have or has indicated how to get adequate knowledge?			

Checklist for District Technical Team	Yes	No	Comments
<p>8) continued: Does the applicant have or has indicated how to get financial resources for the project? Does the applicant have or has indicated how to get proper management plans for the project?</p>			
<p>9) Confirm that the project is physically compatible with adjacent uses and falls within the areas predetermined as potentially suitable for aquaculture, for example that soils characteristics are suitable for dykes construction etc.</p> <p>Is the project compatible with other activities taking place in the area?</p> <p>Are the environmental conditions suitable for the activity e.g. soil type, water quantity and quality?</p>			
<p>10) Confirm that the Type of species cultured are native species</p> <p>Are the intended species native?</p>			
<p>11) Confirm that the cultivation methods are extensive or semi-intensive only</p>			
<p>12) Review any concerns raised by the Village or Ward, on potential impacts of the operation and mitigation measures if any to keep its status as a Minor Permit.</p> <p>List issues</p> <p>Are the concerns major? Are the concerns minor?</p> <p>Are there reasonable mitigation measures?</p> <p>List mitigating measures</p>			
<p>13) Are the fingerlings of the intended species locally available?</p>			

Annex 6: Considerations in Site Selection and Operations

Not all salt flats are suitable for pond culture. In selecting ideal locations for an earthen pond for culture system, soil quality, water quality and quantity, socioeconomic and environmental factors should be taken into account. The location chosen should interfere minimally with sensitive habitats and other economic activities. The selected sites for earthen pond culture should have the following factors into consideration:-

1. Location

The ideal position for a pond is the one which can receive water supply by gravity or tidal flow, and discharge the used water under gravity. Ponds should be ideally located in areas where construction will cause the least disturbance to sensitive habitats or other economic activities. It is preferable that ponds not be located adjacent to built up areas or high density settlements. Protected areas, parks, and areas of cultural or spiritual importance should be avoided for pond construction.

2. Water quantity and quality

The availability of water being in quantity and quality is important all systems of mariculture. There must be a continuous and sufficient clean volume of water to satisfy the needs of the operation in all seasons, without affecting the needs of other users. Natural water flows should not be diverted in such a manner that the downstream use or habitats are impacted.

For fish to attain optimal growth, water quality should be at a level that is most favorable. It is therefore necessary pond managers monitor water quality parameters regularly. The optimum water quality conditions for milkfish farming are shown in Table A6-1.

Table A6-1. Standard water parameters suitable for mariculture

Parameter	Optimum
Dissolved Oxygen	3-5 ppm
Temperature	22-35°C
pH	6.8-8.7
Salinity	18-32 ppt
Turbidity	0.5 m

3. Soil quality

Impermeable soil (e.g. loamy-clay) is the best with which to construct a pond. Acid sulphate soils should be avoided. Table A6-2 below shows the suitability of the different soil classes in pond constructions.

CLASS	RELATIVE CHARACTERISTIC		COMPACTION CHARACTERISTIC	SUITABILITY FOR DIKE MATERIAL
	PERMEABILITY	COMPRESSIBILITY		
Clay	impervious	medium	fair to good	excellent
Sandy clay	impervious	low	good	good
Loamy	semi-pervious to impervious	high	fair to very	fair
		high	poor	
Silty	semi-pervious to impervious	medium to high	good to very	poor
			poor	
Sandy	pervious	negligible	good	poor
Peaty	-	-	-	very poor

Table A6-2 Relationship of soil classes and suitability for dike material

Source: BFAR & FAO/UNDP Training Manual, 1980

4. Tidal characteristics and ground elevation

The suitability of a tide-fed site for a milkfish pond depends on the relationship between the tide characteristic of the area and its ground elevation. Areas with ground level that are too high or too low in reference to 0-datum are not economically suitable to be developed as a fishpond for it will require extensive excavation or filling. Areas reached only by the high spring tides should be ruled out as it is costly to excavate. Low areas on the other hand will require filling-up or else full draining will not be accomplished. The best elevation for a pond bottom would at least be 0.2 meter from the datum plane or at the elevation where 0.8 meter depth of water can be maintained inside the pond during ordinary tides. This index should satisfy the requirements of both fish and natural fish food. Photosynthesis should still be able to take place at the bottom of the pond to produce the benthic algal mat ("*lab lab*"), a natural food for milkfish and a lot of finfish and shellfish.

5. Flood hazard

Flooding is considered to be one of the most destructive natural disasters in the fishpond industry. Floods cannot be controlled completely, but it is important to know how a fishpond can be free to some extent from flood hazard. It is necessary to know the weather conditions in the area and determine the highest flood that occurred. High tide plus the highest flood level on record should be considered so proper diking and drainage can be planned. In Eastern Africa, the main rainy season is March to May when the fingerlings are more abundant. In addition to dike construction considerations, farmers may want to consider harvesting before the rainy season and restock the ponds just after the rainy season. This is considered important since some unpredictable flooding usually occur in connection with the equinox and related phenomenon (e.g. March 2007 episode)

6. Climatic conditions

Seasonal climatic changes are important in scheduling and managing fishpond operations. The climatic elements that concern most operators are rainfall, temperature and prevailing wind direction because they greatly affect fish production directly or indirectly. Data on rainfall and wind direction are necessary in planning the layout and design of pond system. Knowing the past rainfall record can help the investor decide on dike heights or whether to include drainage

canals. Winds can also be very destructive since they generate wave action that can destroy the sides of the dikes. By knowing the prevailing wind direction, dike positioning can be planned, by exposing the least area possible to damaging waves. Heavy rain can suddenly change the salinity and temperature of pond water, which can be detrimental to fish. It is also important to know the period of the rainy season as this will affect pond preparation and stocking cycles. Drying of pond bottoms cannot be accomplished during rainy days but is a necessary step prior to stocking to reduce likelihood of disease outbreaks.

7. Type and density of vegetation

It is highly recommended that pond sites be selected primarily in salt flat areas behind mangrove stands. Large scale clearing is not recommended as it increases construction costs and is environmentally destructive.

8. Fingerling availability

The availability of fish fingerlings should be determined before the area for pond culture is located. The distance from the catch to the pond should be less than 3 hours of travel.

9. Supportive entrepreneurial Environment

- Skilled and unskilled labour
- Infrastructure and telecommunication for supporting transportation of kilns, ice and other storage facilities and construction material.
- Production inputs- seeds, feeds, fertilizers
- Financial sources/credit facilities
- Security and Bio-safety of products

10 Marketing

- Reliable markets