Aquatics Unlimited

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FINAL PERFORMANCE REPORT
For The
PERIOD ENDING December 31, 1997

U.S.A.I.D. GRANT NO: 623-0124-G-00-6009-00

Submitted to

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USAID/REDSO/ESA/PROC
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Final Report USAID Grant #623-0124-G-00-6009-00
Period Ending· December 31, 1997
Page One

In compliance with the Grant Award terms and conditions, this final report outlines a comparison of actual accomplishments with the goals and objectives established for the period, and the finding of the Grant Evaluation Team (investigator) The reasons why established goals were not met, where appropriate, are outlined Other pertinent information, including an analysis and explanation of cost overruns or high unit costs is outlined

The project's objective as well as the Measurable Outputs & Deliverables as outlined in the Grant Award are provided below A summary of events is provided and derived from previously submitted quarterly reports

In addition a copy of the "Evaluation of the Aquatics Unlimited (AU) Grant to Support Emergency Water Hyacinth Program in Uganda" prepared in September 1997 is enclosed

1: Technical Assistance and Coordination **January 1996-December 31, 1998**

Technical Assistance and Coordination Objectives Breakdown

a: Assist in donor funding

By December 1997, donor funding for the Emergency Action Plan had grown from approximately US $678,000 00 to approximately US $5,000,000 00 in equipment, technical assistance and cash funding through AU's support to the GoU's effort Project donors included USAID, UNDP, UN-FAO, Government's of France, Netherlands and Japan, and The World Food Program (WFP)

By December 31, 1997 hand tools had been supplied to various boat landings around Lake Victoria, Kyoga, Albert and the Albert Nile and were in use Mechanized harvesting equipment was in operation at Owen Falls Dam and Kagera River Japanese equipment has arrived in country and was being assembled for training and operation Exposure to weed control techniques and management through participation in conferences, workshops, field trips, had taken place through the various donor funding packages Unfortunately a Work for Food program was not implemented by the WFP and FAO funding for weevil releases were delayed

b: Environmental assessment

The compilation of information for the Draft Environmental Assessment (DEA) was initiated in February 1996 and delivered for review in mid March 1996 In May 1996 an EA Scoping Process was initiated in cooperation between AU, USAID, and Uganda's National Environmental Management Authority (NEMA), and Ministry of Agriculture, Animal Industries, and Fisheries (MAAIF) A Scoping Workshop was held on July 10, 1996 to review the Scoping Document at which time approximately 50 interest groups voiced their concerns over what further significant issues should be addressed in the preparation of an Environmental Impact Assessment

On 12 September 1996 a Preliminary Draft Environmental Impact Assessment - 1st Draft was completed and distributed for review and comment amongst the preparer's (Aquatics Unlimited, USAID, the Environmental Assessment Liaison (Water Hyacinth Unit, Ministry of Agriculture, Animal Industries and Fisheries (MAAIF), to the University of Florida - Center for Aquatic Plants (UF-CAP) and the National Environmental Management Authority (NEMA) In addition, courtesy copies of this draft were supplied to the Vice President/Minister of MAAIF and to the Minister of State - General, MAAIF Comments were received and additional information was collected for inclusion into Draft 2 Draft 2 was completed in early October 1996 and submitted to NEMA for distribution to the Core Scoping Committee Following a review of Preliminary Draft 2 of the EIA, a Core Scoping Committee meeting was called to receive further comment in preparation for the Final Environmental Impact Assessment (FEIA)

On 11 November 1996 a Core Scoping Committee meeting was held to discuss the Preliminary Draft 2 of the Environmental Impact Assessment (EIA) In attendance were members from MAAIF, NEMA, the National Agricultural Research Organization/Fisheries Research Institute (NARO/FIRI), Directorate of Water Development (DWD), and USAID Comments on improving the draft were noted and the various members also submitted comments in writing Improvements to the EIA were made to satisfy comments made by members It was stressed during this meeting that In-Lake Herbicide trials data was necessary to successfully complete the EIA

On 30 July, 1997 the DEIS Public Hearing took place and was attended by over 500 persons Presentations were made by MAAIF/Water Hyacinth Unit and by scientists involved during herbicide trials The public's comment were noted by the Chairman of the Pubic Hearing, the Vice Chancellor of Makerere University In addition NEMA solicited comment from the public by mail Prior to 11 September 1997, the Vice Chancellor

submitted his report of the Public Hearing to NEMA At this stage and as outlined per the NEMA Draft EIS Guidelines and Regulations, MAAIF/AU should have been provided the opportunity to address the comments of the public That was not the case and NEMA took a unilateral decision based on the comments of an uniformed, biased public and on 11 September 1997 deferred the herbicide option while approving mechanical and biological controls This deferment, in effect, was a rejection of the herbicide control option and was a decision not supported by scientific fact nor by MAAIF

After conducting additional scientific reviews Aquatics Unlimited on 31 October 1997 submitted to MAAIF/WHU a reply to the public comments Upon MAAIF/WHU review of AU reply to comments, MAAIF/WHU added relevant information and submitted an official MAAIF stance on 5 November, 1997 titled, " MAAIF Response to NEMA", a response which addresses the comments of the public and the NEMA's letter of deferment/rejection

Between November and December 1997, meetings had been held by the Policy Committee on the Environment (A Cabinet level committee chaired by the Prime Minister), The Vice President, Ministers of State in Agriculture and Environment, National Coordinator of the Water Hyacinth Unit, and the Executive Director of NEMA, as well as in several other committees or other bodies concerned with the issue These meeting have all been held in an attempt to agree on a way forward to ensure that the EIS follows an accepted procedure Discussions on the issue are continuing and it is expected that the Final Environmental Impact Statement will be released by March 1998

c. Remote monitoring methods

Equipment procurement for the Geographic Information System (GIS) and the Global Positioning System (GPS) systems was initiated and scheduled for implementation in May/June 1996 The US Department of Defense had been requested by US-AID to initiate the process of declassification for the satellite imagery covering the Lake Victoria area

AU assisted US-AID in the preparation of a Memorandum to the Department of State, Bureau of Intelligence and Research, RE Spatial Data Request (satellite data images) to document historical (1 & 3 years in the past), as well as monthly updates for one year to properly track, document, and alter control efforts as required Baseline data information had been purchased and the system was planned to be installed in Uganda in September 1997

Unfortunately by December 1997 satellite data images did not become available Some hardware and software to be used in the monitoring effort was acquired and was used to demonstrate the capability of the technology with oblique aerial photographs taken by Aquatics Unlimited These photographs, although fairly accurate for demonstration purposes, were not reliable for large scale monitoring of the lake Commercial black and white aerial photography firms were approached but due to costs and timing proved to be beyond budget

d. Prepare Kagera River Objectives

A Boom was installed on the Kagera River on October 2, 1996 and became fully operational by October 10, 1996 Two 10 man teams and two tractor wagon combinations were used in removing approximately 1500 to 2000 square meters of material per day or approximately 240 cubic meters per day This represented a removal rate of approximately 15 to 20% of incoming volumes for a 24 hour period, but a 40 to 50% removal rate during working hours It was estimated that about 1 hectare/day floats down the river This rate, however, fluctuated with occurrence of rainy or dry seasons

Due to budget constraints, the Kagera river operations were discontinued on 21 June 1997 and alternate sources of funding were being identified in order to restart operations Long delays occurred in acquiring equipment sent from USA through Dispatch Agency of the United States/USAID warehouse and freight forwarders Equipment finally became available in July/August 1997 In October 1997 a conveyor was setup at Kagera river and put into operations with MAAIF funds 10 men and 1 dump truck were also assigned to the effort In November unusually heavy rains caused the system to be shut down until a change in conditions Heavy rains continued through the end of the year, thus preventing a restart of operations

In early October 1997 members of the Parliamentary Sessional Committee on Natural Resources visited the site and were briefed by the Water Hyacinth Unit National Coordinator and Fisheries Commissioner on the progress made to date on this effort

e: Conduct In-Lake Herbicide Trials

Herbicide trials were delayed through January 1997 until all Government of Uganda approvals were received The trials were completed satisfactorily in cooperation with scientists from Makerere University, National Water and Sewerage, and MAAIF Research

Institutes, a final report was compiled, and the report approved during a National Technical Committee for the Control of Water Hyacinth (NTCWH) meeting on May 30, 1997 The main conclusion of the report was that there were no observable negative effects seen when the herbicides 2,4D, and Glyphosate were used in accordance with manufacturer's Directions for Use and applied by certified applicators

The approved In-Lake Herbicide Trials Verification Report was then annexed in to the Final Draft Environmental Impact Study (DEIS) which was then formally submitted on 12 June 1997 to MAAIF's Water Hyacinth Unit, who after reviewing the DEIS submitted it to NEMA. A total of approximately 50 DEIS copies were submitted with an additional 70 copies of an Executive Summary DEIS distributed A Public hearing meeting was held on July 30, 1997

f. Methods for Controlled Use of Herbicides

Methods for the controlled use of herbicides were expected to follow laws and regulations as specified by the USEPA and the GoU and as outlined by the FEIS These methods will be finalized upon receiving a positive Record of Decision for the FEIS from MAAIF and NEMA.

g Methods for removing plants from Owen Falls Dam

Harvesting equipment from Holland arrived in Uganda in early September 1996 and was commissioned and tested at Port Bell by the manufacturer Upon successful testing of the equipment at Port Bell the two harvesting systems were then relocated to Owen Falls Dam in October 1996 Mechanical harvesting at Owen Falls Dam was slow to start due to GoU operational funding delays and late arrival and clearance of four units, 4 x 4 Dump trucks GoU operational expenses did, however, become available and alternative dump trucks were made available Rains and additional wind blown hyacinth slowed removal progress in late 1996, but by end of the quarter (December 1996) when rains had ended and winds were no longer adding substantial amounts of hyacinth, operations were steadily improved as both machine operators and site managers became familiarized with operations By the end of the quarter approximately 3600 square meters of material were being removed daily or about 2 hectares/week

On March 19, 1997 the Owen Falls Dam was entirely cleared of water hyacinth It is estimated that the total amount of water hyacinth removed from the period mid August 1996, when the government initiated a short term (30 day) combination manual/mechanical removal operation and augmented by a previously installed Uganda Electricity Board conveyor system (operated throughout the removal period) and through the use of the Conver (Dutch) equipment (October 1996 to March 1997), approximately 70 hectares of water hyacinth and related debris were removed

During the period March to June 1997, water hyacinth did not accumulate at the Owen Falls Dam in sufficient quantities to justify mechanical removal until approximately mid June In June 1997 water hyacinth began to migrate towards the dam in sufficient quantities that mechanical harvesting recommenced Good progress was made during that time to prevent serious buildup from reoccurring

In mid August 1997 two large mats blew towards the dam re-infesting the area with approximately 10 to 20 hectares At the above mentioned rates of removal it was predicted that if no more water hyacinth was blown to the dam and the water hyacinth that re-infested the site did not multiply that the removal would take between 60 and 90 days Due to unusual weather patterns water hyacinth periodically continued to invade the site In December 1997 removal progress slowed as weeds could no longer be dumped in nearby sites forcing operations to dump weeds 7 kilometers from the point of harvest Turn around times increased substantially with corresponding decreases in the amount removed per day and increased operational costs Depending on wind patterns it was predicted that the dam would be cleared sometime late in the first quarter of 1998

Reinfestation, however, is guaranteed to reoccur as large mats in various bays have not been brought under control The preferred method of control in the bay areas is via the use of US-EPA Registered aquatic herbicides

h. Methods for Port Bell Plant Reduction

Due to limited quantities of weed present at the Dam in April 1997, one weed harvesting system was relocated to Port Bell where a weed mat of approximately 600 hectares was stationed as a result of predominant southerly winds Operations continued on a daily basis though it was not reasonable to expect that mechanical harvesting would have had the same dramatic effects as those at the Dam since the quantities were substantially greater In August 1997 this system was moved back to Owen Falls dam as a large reinfestation had again occurred

In mid December 1997 Japanese equipment purchased through funding provided by the Government of Japan arrived at Port Bell and was being assembled Training was expected to occur in late January or early February 1998 with permanent operation at Port Bell to begin shortly thereafter Previous years infestation have indicated that approximately 600 ha can infest this area It is not expected that the equipment will be able to cope with this magnitude of weed, nor that dumping areas will be near or large enough to be effective

i. Methods for Water Works Plant Reduction

The NWSC declined an offer to place a boom at the Entebbe Water Works as it had contracted for a Gabion to be constructed at its intake The Entebbe water works is the most water hyacinth impacted of the municipal waterworks Due to financial difficulties the contractor failed to complete the contract and NWSC was in discussions over how to proceed with protection of their intake

j· Methods for Fishing & Landing Site Access

Hand tools, supported through funds from the United Nations Development Program (UNDP) and the Government of Japan, were purchased and delivered to many sites on Lake Victoria Heavy rains in the last quarter of 1997 prevented delivery of tools to all the identified sites Minor and temporary reductions around landing sites are expected through the use of this method

k: Public Sensitization

A public sensitization campaign for the In-Lake Herbicide Trials was carried out on November 25 and 29, 1996 to educate the public in and around the selected trial bay area of the planned activities for the chemical verification studies as well as to further document their views on the use of aquatic herbicides for the water hyacinth control program The program involved meeting local leaders at the Resident District Commissioner, Chief Administrative Officer, Local Council (LC) 5, and LC 3 level to foster support for the intended program and to seek their assistance and approval in calling meetings at two local villages (Mubanda and Butere) for the purposes of educating the local LC's and residents on GoU efforts, water hyacinth control strategies, and the need to carry out herbicide trials Cooperation for the trials was stressed and precautionary measures during the trial period were discussed in order that no outside influences would effect the results of the

trials Safety precautions were also discussed and handouts provided in both Luganda and English version Visits to the district center were made to seek the support at the district level on November 25, 1996 and were followed by meetings on November 29, 1996 at schools in both the villages of Mubanda and Butere where school children as well as parents, LC 1, LC 2 were brought together to be made aware of GoU efforts in controlling water hyacinth, and the proposed In-Lake Herbicide trials A video of control efforts in the United States was shown to the participants (Dubbed Luganda Version of a University of Florida - Center of Aquatic Plants video tape) Questions related to control efforts and herbicide use were raised by the participants and public support for the exercise was given Prior to the trials, fliers detailing precautions were taken to the villages for distribution These precautions were more of requests to keep out of the treatment areas to prevent outside influences from effecting the results of the trials

During the In-Lake Herbicide Trials period, the parliamentary Sessional Committee on Agriculture (12 members of parliament) were taken by the Water Hyacinth Unit, members of the Herbicide Trial Team, and Aquatics Unlimited by boat to view the herbicide trial site and efficacy of the herbicides applied Also present were journalists from several local newspapers The group was briefed on the herbicide trial and good question and answer session followed The event was shown on Uganda Television and appeared in several of the local papers

Through the MAAIF's Agriculture Education Unit (AEU) a video was in preparation describing efforts to date in the control of water hyacinth The (AEU) film unit accompanied Aquatics Unlimited and a member from the Water Hyacinth Unit to the herbicide trials site in order to film the efficacy of the herbicides and to speak with local villagers about the herbicide trials The film unit also accompanied Aquatics Unlimited to the Kagera River to record the removal operations and spoke to many villagers on the subject of water hyacinth and on the control program at large The film unit also took footage of the removal operations at the Owen Falls Dam

Segments of these outings were broadcast over Radio Uganda in the local language and a video is presently in preparation for broadcast on television The Ministry of Agriculture, Animal Industries, and Fisheries has continued to replay, on occasion over Radio Uganda, segments of the interviews conducted during trips to the herbicide trial site, Kagera river, and Jinja - Owen Falls Dam

A summary of the Executive Summary-Draft Environmental Impact Study was drafted and submitted to NEMA for review as requested Following a review MAAIF/NEMA provided 30,000 copies of this summary as an insert to the New Vision Newspaper for distribution prior to the July 30, 1997 DEIS Public Hearing A number of reporters, groups, and individuals, both local and international, continue to seek and are provided information regarding the DEIS, Herbicide Trials, and Herbicides

I: Other Water Bodies

In May 1996 a trip was taken through the Kagera River Valley through Uganda, Tanzania and Rwanda Time did not permit travel to other water bodies, and were scheduled for a later period

During the first quarter of 1997 several trips were taken to the village of Pakwach on the banks of the Albert Nile River A bridge over the river acted as a barrier to the floating mats of aquatic weed vegetation (water hyacinth, hipppograss, Papyrus,) and approximately 10 hectares of mat piled up on the upstream side of the bridge This mat covered the entire water surface from bank to bank allowing for people and animals to, in effect, walk across the river Methods to dislodge this mat jam were reviewed In addition, site visits to review the hyacinth problem and associated biological control activities were conducted up the Nile River from Pakwach to Lake Albert

Hand tools were taken to Pakwach Bridge in April 1997 where meetings took place at both the district level and village level in order to organize and commence dislodging the water hyacinth and other aquatic weeds that had been accumulating over a period of 6 months MAAIF provided funds equivalent to $1,000 00 to the Nebbi District's Chief Administrative Officer who became responsible for disbursing funds to the District Fisheries Officer who was held accountable and responsible for ensuring that work progressed satisfactorily 50 men were recruited from the village of Pakwach, hand tools distributed, and work commenced on chopping or prying chunks of mat loose to allow them to float down river Additional funds were being sought as the task was a large one that was expected to take some time with the quality and number of tools provided

During the later half of 1997 the infestation at the bridge had been 80% removed Recommendations for prevention of future buildups were provided to the MAAIF/WHU

2 Regional Collaboration AU, the UF-CAP, and the GoU, through the Water Hyacinth Unit, jointly pooled information resources to determine the most appropriate regional collaborators The regional workshop and the formation of the hyacinth working group were to be jointly developed by AU, UF-CAP & GoU along with regional collaborators in Kenya and Tanzania The steps required are outlined below

2: Regional Collaboration

a· Develop list of potential regional collaborators

In February 1996, The Nile 2002 Conference was held at the Nile International Conference Center This conference was an asset to our regional collaboration efforts During the conference we were able to make contact with representatives from all countries in the region

A Lake Victoria Water Hyacinth Control Program Update was held on October 22, 1996 at the Washington Circle Hotel in Washington D C The meeting was informal and provided an update to the regional Ambassadors on the current problem, support being provided by Aquatics Unlimited, University of Florida - Center for Aquatic Plants via grant funding from USAID A slide show presentation gave the Ambassadors present (Tanzania and Uganda) a good overview of the current problem and steps being developed for an integrated control program On 23 October 1996 a presentation was made to the Kenyan Ambassador who was unable to attend the pervious day's meeting

b: Regional site visit and problem review

Regional problems were identified and some regional contacts were established This was expected to help identify beneficial control strategies for the region

It was determined by AU and the GoU/Water Hyacinth Unit that the In-Lake Herbicide Trials and the Environmental Impact Assessment process should be completed prior to the Regional Workshop, and thus prior to the Regional Site Visits These were to be scheduled when a consensus on the workshop was reached with the GoU

c: Regional Workshop

It was felt that prior to holding a regional workshop that it was imperative that In Lake Herbicide trials be completed and incorporated into the Final Environmental Impact Assessment

Attempts were made during April 1997 to involve concerned scientists from Uganda, Tanzania, and Kenya to participate in the University of Florida - Center for Aquatic Plants (UF-CAP) sponsored Aquatic Plant Management Short Course workshop held in Orlando, Florida in mid May 1997 Due to the then ongoing identification and selection of persons for the creation of water hyacinth control units in Kenya and Tanzania under the Lake Victoria Environmental Management Program, it was not possible at that time for those countries to participate in this workshop However, a Ugandan team did participate in the 3 day workshop which exposed the group to various management control techniques, manufacturers of control equipment, researchers at the University, State and Federal levels, oversight agency personnel, as well as aquatic plant management contractors This was followed with travel to the field to witness actual control techniques being practiced and to hold a dialogue with those involved in the operations of those programs A trip was also made to the UF-CAP and a United States Department of Agriculture Experiment Station - Agriculture Research Station to familiarize the group with available resources and personnel at these aquatic plant research facilities

d· Formation of Regional Water Hyacinth Working Group

Plans were under way to form the Nile Basin Aquatic Plant Management Society after the July 30, 1997 Public Hearing of the DEIS It was expected that this society, to be made up by members from Uganda, Tanzania, Kenya, Rwanda, Sudan and Egypt, would provide a forum for aquatic plant management professionals to provide direction to future aquatic plant control efforts and information dissemination for the region This Society has been slow to form, but it is hoped that in 1998 a first meeting can be held

Other Pertinent Information

In January 1997 AU was given approval for a No - Cost Extension as several key outputs/deliverables had not been achieved, but were in full execution and on line for completion In addition, grant funds remained to allow the efforts to be carried out Some reasons for delay, to name a few, occurred as a result of building capacity and

strengthening lead agency authority in the overall program, coordination and establishment of a focused direction of and between the many different Ministries, parastatals, agencies, donors involved, acceptance and the building of credibility and confidence in Aquatics Unlimited's expertise, mid 1996 Presidential and Parliamentary elections and the resulting reshuffle throughout government, as well as the need to follow never or rarely tested and newly created environmental statutes, regulations and/or guidelines By August 1997 funds had become exhausted by higher than expected costs related to achieving some activities and USAID approved a Cost Extension through December 12, 1997 to complete various activities

3: Measurable Outputs & Deliverables per the Grant Award

Information related to the measurable outputs and deliverables (see below) is outlined in the above sections

1 Completion of Environmental Assessment
2 Complete Implementation Plan
3 Public Sensitization
4 Review of Implemented Monitoring Program
5 Results from In-Lake Trials
6 Kagera River Control Program Report
7 Report on Regional Collaboration

Information enclosed with this report is as follows

1 Evaluation of the Aquatics Unlimited Grant to Support Emergency Water Hyacinth Program in Uganda

Please contact Thomas J McNabb at Aquatics Unlimited in the United States or Thomas Moorhouse of Aquatics Unlimited in Uganda with any questions or further information desired

Evaluation of the Aquatics Unlimited Grant to Support Emergency Water Hyacinth Program in Uganda

by

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Wendy Andrew - Environmentalist/Consultant, Team Member

Accompanied by Additional Team Members:-

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15th September, 1997

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Abbreviations and Acronyms

APC	-	Agricultural Policy Committee
AU	-	Aquatics Unlimited
EAP	-	Emergency Action Plan
EIA	-	Environmental Impact Assessment
EIS	-	Environmental Impact Statement
FIRI	-	Fisheries Research Institute
GIS	-	Geographic Information System
GMU	-	Grant Management Unit of USAID
GoU	-	Government of Uganda
GPS	-	Global Positioning System
LVEMP	-	Lake Victoria Environmental Management Program
MAAIF	-	Ministry of Agriculture, Animal Industry and Fisheries
MNR	-	Ministry of National Resources
NEMA	-	National Environmental Management Authority
NGO	-	Non Governmental Organization
NWSC	-	National Water Sewerage Corporation
UEB	-	Uganda Electricity Board
UF-CAP	-	University of Florida - Center for Aquatic Plants
UNDP	-	United Nations Development Program
UN-FAO	-	United Nations, Food and Agricultural Organization
UR	-	Uganda Railways
USA	-	United States of America
USAID	-	United States Agency for International Development
US-DOD	-	United States - Department of Defense
WHU	-	Water Hyacinth Unit - this is a unit within the fisheries department of the Ministry of Agriculture, Animal Industry and Fisheries

Table of Contents

DRAFT EVALUATION REPORT

1 0 Executive Summary

The evaluation was carried out by a Team of Consultants who reviewed documents, interviewed key stakeholders and visited project sites at Owen Falls dam, Port Bell Ferry Landing Site, Kagera River at the mouth of Lake Victoria The team has on the basis of this work made this report which includes their findings and recommendations for the remaining part of the project and any future support by USAID

The USAID grant supported Emergency Action Plan for the control of water hyacinth has progressed fairly well and on course The project has three major thrusts, namely

- Technical Assistance and Coordination
- Regional Collaboration
- Operational Support

The Team reviewed each aspect of the project to determine their level of implementation The evaluation report therefore, contains the findings and recommendations of the team in respect of the these three major objectives of the project

1 1 Technical Assistance and Coordination

This aspect of the project aimed at reviewing and developing appropriate, cost effective control systems and procedures to facilitate the funding of the Emergency Action Plan for the control of water hyacinth There are measures now in place for which funding by various donor agencies and GoU are being released This includes funds for the clearing of the Owen Falls Dam, the clearing of the ferry landing site at Port Bell, the building of a boom at the mouth of the Kagera river as it enters into Lake Victoria and provision of hand tools for manual removal of water hyacinth to major fish landing sites on Lake Victoria **See Annex A**

The major challenges encountered centered around government beauracracy resulting in unnecessary delays in implementing the project Another challenge is with regard to networking with other stakeholders It appears sometimes stakeholders were not working in concert with each other An example has to do with clearing the clogging

at water-in-take points at Entebbe and Ggaba The National Water and Sewerage Corporation seems to have its own program of action which made it problematic for the project to handle the infestation at those points The team recommends that the roles of each stakeholder be clarified and a forum for resolving discrepancy in roles be instituted assist in the smooth Co-ordination of the program

1 2 Regional Collaboration

This aspect of the project sought to involve the governments of Uganda, Kenya, Rwanda and Tanzania in formulating policy, and involvement in research for the control of water hyacinth This was to be done through workshops, regional site visits, the formation of a regional working group, and other methods of information exchanges Some progress has been made towards forging regional collaboration However, regional collaboration has been a bit slow because some stakeholders felt the EIA needed to be completed first before serious steps towards regional collaboration could be taken So far, a regional working group has been formed bringing together the region's ambassadors to the USA. They have already had one meeting in Washington, USA. An aquatic plant management shortcourse and followed by field trips was held in Florida USA (sponsored by UF-CAP and attended by participants from across the US and Egypt), but was attended only by Ugandan representatives On the whole, regional collaboration has been problematic because the other countries in the region have not yet put in place operational structures for the control of water hyacinth However, one success in this regard is the formation and registration of the Nile Basin Aquatic Management Society Although this is not part of the project mandate, it is a positive offshoot of the creation of a regional consciousness The society is yet to become operational Another aspect of regional collaboration is the creation of the LVEMP which similarly is not part of the project mandate but is an avenue that is being exploited to forge regional collaboration

The team recommends a more aggressive participation by the Ugandan government in spearheading regional approach to water hyacinth control The existing regional organizations should be optimally utilised in this exercise

1 3 Operational Support

There are two aspects of operational support The first one is the establishment of monitoring methods utilizing currently available technologies to develop baseline maps of the initial project area in Lake Victoria within a Geographical Information System Using this system appropriately would allow the production of maps showing distribution of water hyacinth over period of time, treatment areas, progress and results of Emergency Action Plan Implementation Program The second one is conducting of limited in-lake herbicide trials and the obtaining of regional support for controlled herbicide use in recommended treatment areas The first aspect has not yet been carried out due to delays in obtaining the necessary facilities from the US-DOD However, the second aspect has been implemented by conducting an in-lake herbicide trials in Wazimenya bay of Lake Victoria A major challenge to in-lake trial was the level of negative publicity against any herbicide use Right from the start there was a lot of negative media publicity much of which was not well informed about the process This put a big hurdle in the way of in-lake trials and any presentation of findings arising from it This was clearly reflected in the media report of the EIS public hearing on the result, in particular, of the in-lake trial

The team's recommendation is that more efforts be made in pursuing the remote sensing methods and GoU prevails upon US government to make available necessary facilities from US-DOD as this is probably the most effective option On media, the team recommends a more aggressive public relations program with the media to provide the correct information but also to step up the level of public sensitization

1 4 General

The project has moved forward by supporting the WHU through the development of the EIS, the In-Lake Herbicide Trials, providing technical training in the field of aquatic plant management, and the operational activities at Kagera River, Jinja and Port Bell Aquatics Unlimited has provided technical expertise as well as facilitation of the approval process for the EIS which is an element of the development and implementation of the Emergency Action Plan for the Control of Water Hyacinth The team is of the view that the process of EIS review and initiation of the EAP would

appear to require additional time, perhaps three to six months to complete This time frame will be dependent on the approval processes through MAAIF and NEMA.

2 0 Evaluation Methodology

This evaluation was conducted to measure the progress and assess the degree of success accomplished by Aquatics Unlimited toward the goals of the Action Plan for the Environment/Emergency Water Hyacinth Control Program - Uganda The stated purpose of the project was to support the Government of Uganda, through MAAIF/WHU in reviewing and developing appropriate water hyacinth control procedures for Lake Victoria and other Uganda water bodies to reduce the environmental and socio-economic impacts of the water hyacinth problem

A three member evaluation team made site inspections, interviewed key personnel and affected persons and reviewed project documentation to develop the evaluation conclusions The sites visited included the Nile River at Owen Falls Hydroelectric Dam, the Nile River at Pakwach Bridge, Port Bell Ferry Terminal, Lake Victoria at Ggaba Landing, Wazimenya Bay, the Kagera River near its entrance into Lake Victoria and the Water Works at Ggaba I and II and Entebbe **See Annex A** Interviews of affected persons at each site were conducted along with interviews of WHU personnel regarding the impacts of water hyacinth and the potential control methods Among those interviewed were the WHU Technician at Owen Falls Dam, Project Engineer of WHU, UR Engineer in charge of Port Bell Ferry Landing Site, Staff in charge of Kagera Boom, Staff of AU, the Project Manager of WHU and other Staff at WHU Head Office in Entebbe The team also attended the public hearing presented by the National Environmental Management Authority inviting comments on the EIS Project operational and financial documents were also reviewed Details of the documents reviewed are set out in the appendix The evaluation team included Charles Owor (Team Leader - Lawyer and Consultant), Wendy Andrew (Environmentalist), Melanie Mason (USAID Staff) They were accompanied by Patrick Agaba (AU Staff) and Sam Bikangaga (Staff of MAAIF) On completion of the field visits the Team Leader submitted a draft report to GMU for comments on areas not yet adequately covered The Team Leader took GMU s comments into account and produced this final report

3.0 Purpose

The stated purpose of the project was to support the Government of Uganda, through MAAIF/WHU in reviewing and developing appropriate water hyacinth control procedures for Lake Victoria and other Uganda water bodies to reduce the environmental and socio-economic impacts of the water hyacinth problem Water hyacinth impacts such diverse areas as aquatic ecology, fisheries and fishermen, hydroelectric power production and human health

4.0 Goal/Subgoal

The goal of the Action Plan for the Environment/Emergency Water Hyacinth Control Program - Uganda was to review and develop, cost effective control systems and procedures in order to allow implementation of the Emergency Action Plan as funding becomes available The projected outcome was to accomplish three subgoals

- Supply Technical Assistance
- Support Regional Collaboration
- Implement Operational Objectives

Each subgoal had various tasks associated with it and there are shown here below

4 1 Technical Assistance

The supplying of technical assistance included the following activities

- Assistance in budget preparation and identification of donor funding
- Environmental Assessment
- Remote Monitoring Methods
- Preparation of Kagera River Objectives
- Review of Methods for the Controlled Use of Herbicides
- Review of Plant Removal Methods for the Owen Falls Dam and Port Bell Sites
- Methods for Plant Reduction at the Water Works Facilities
- Methods for Reduction of Plant Interference at Fishing and Landing Sites
- Public Sensitization Regarding an Integrated Control Program
- Review of water hyacinth problems on Other Water Bodies

Of these identified tasks some were clearly accomplished- the preparation of an appropriate budget and the identification of funding sources which increased from US $678,000 00 to US $5,165,438 00 for instance was successfully implemented

Current project donors include

- USAID
- UNDP
- UN-FAO
- The World Food Program
- The Government of Netherlands
- The Government of Japan

Additionally the task of clearing the water hyacinth mat from the Owens Falls Dam has clearly been met The dam was cleared on March 19, 1997 and has been kept clear of obstruction since that date Work however, continues on the Port Bell site and the water works locations

4 1 1 The following tasks are still continuing to be addressed

- Public Sensitization or Education Regarding Integrated Control Programs for Water Hyacinth
- Review of Other Water Bodies and the Remote Monitoring Methods to determine the Extent of the Problem
- Monitoring the Control Efforts

These tasks are open ended and will continue either through AU or MAAIF/WHU for some time

4 2 Regional Collaboration

The support for regional collaboration which has moved forward slowly with some difficulty aimed at determining responsible agencies and individuals in member countries who could then be used to foster regional endeavours in controlling water hyacinth Along this line, the establishment of relationships with the LVEMP which is a regional initiative has been a positive outcome LVEMP is a joint venture involving

Tanzania, Uganda and Kenya Another positive step has been the establishment of the Nile Basin Aquatic Plant Management Society, a regional chapter of the Aquatic Plant Management Society, an international organization of scientists, educators, administrators, and concerned individuals interested in the management and control of aquatic plants Although this was not a specific task of the project, it is actually a direct consequence of the awareness for regional collaboration created through the project Additionally an informal update was provided on October 22, 1996 at the Washington Circle Hotel in Washington, D C USA to the region's Ambassadors based in USA The up-date centred on the current problems with water hyacinth on Lake Victoria and the support being provided by Aquatics Unlimited under the USAID Grant

4 3 Operational Support

The operational support program had 3 main objectives

- The implementation of a remote monitoring program
- Putting in place the Kagera River objectives in respect of the interception of water hyacinth before they enter Lake Victoria
- Conducting the in-lake herbicide trials

Clearly the in-lake herbicide trials have been accomplished and the data gathered has been included in the Environmental Impact Statement Final Draft The process of the in-lake trial was to establish the viability of using herbicides as a method of control Two types of herbicides were applied in the in-lake trial i e glyphosate and 2, 4-D The in-lake trial was part of the EIA The EIA eventually resulted into EIS document which was later subjected to a public hearing where the public made comments and asked questions about the different control options However, the in-lake trial was preceded by a process of public sensitization program Along with the conduct of these trials, excellent public sensitization efforts were developed and utilized at the local level, including meetings with local school children and their parents and the use of informational video tapes in both English and Luganda

5 0 Findings

5 1 Inputs

The team found out that generally the inputs to the project have been very good The technical support is strong and coordination between the Water Hyacinth Unit, MAAIF, and Aquatics Unlimited is excellent Good relations have been forged with the necessary agencies and individuals The technical support of the Ugandan office of Aquatics Unlimited by their main office has been rapid and consistent The only apparent delays are due to time differences, however, the time difference actually allows the operation to continue on a 24 hour basis

However, it was found out that there have been some challenges in implementing the program These challenges are mainly related to training of personnel and maintenance of equipment for operational activities

A more difficult challenge has been found to be the bureaucratic delays which are inherent in the government system While this is a dynamic process that requires analysis and discussion, in many instances progress toward production of a functional program of water hyacinth control has been slowed down by lack of partnering or coordination between the stakeholders Unfortunately the agencies are at times not working in concert or efforts are delayed for little reason Personnel in the Water Hyacinth Unit were particularly frustrated with the lack of cooperation that they had received from other stakeholders At the same time they were very complimentary regarding the cooperation and assistance they have received from Aquatics Unlimited

The team found out that the one significant input which has been problematic is the satellite imagery which has not been available from the US-DOD This has prevented any progress on the remote sensing or monitoring element of the project While other alternative methods of remote sensing are available, the large size of Lake Victoria and the water hyacinth problem makes these methods both problematic and expensive beyond the scope of the initial project grant The most effective and efficient method therefore remains the satellite imagery

5 2 Outputs

The team established that there were already some outputs achieved in the course of implementing the project These include -

1 Conducting of the in-lake herbicide trial at Wazimenya bay, Lake Victoria This was done jointly by AU staff, WHU staff and some Ugandan Scientists from the relevant fields **See Annex WZ**

2 Production of the Draft Environmental Impact Statement, Water Hyacinth Control Program This process is a consequence of the EIA process which has also been completed

3 Information retrieval and dissemination to involved agencies like MAAIF/WHU, NEMA and USAID These agencies have been part and parcel of the implementation of the project in one way or the other

4 Establishment of the Kagera River water hyacinth interception methods This involved the erection of a boom at a point near the entrance of the Kagera river into Lake Victoria A boom has been installed and there will be a harvester and conveyor soon to remove the water hyacinth trapped by the boom **See Annex B**

5 Technical assistance to the Water Hyacinth Unit in regard to mechanical and physical removal systems in place This aspect was in regard to clearing the Owen Falls Dam site, clearing the Port Bell ferry landing site and clearing certain fish landing sites by manual removal **See Annex C**

6 Establishment of a pool of technical expertise in Uganda through participation in the 1997 UF/CAP Aquatic Plant Management Short Course and review of aquatic plant management techniques throughout the United States The participants from Uganda who attended the short course included the following -

- Dick Nyeko - National Coordinator, WHU
- Edward Rukunya - Biological Control Division, WHU
- Engineer Kaketo - Mechanical Control Division, WHU
- Patrick Etyang - Chemical Control Division WHU
- Patrick Agaba - AU Local Coordinator
- Helen Bugaari - AU Environmental Coordinator

- Tom Moorhouse - Project Coordinator

This also allowed the WHU and AU participants to observe the training and certification procedures established in an on going water hyacinth control program **See Annex UF**

7 Production of public information and public sensitization materials in preparation for the In-Lake Herbicide Trials at Wazimenya Bay **See Annex PS I, PS II and PS III**

8 Establishment and support of Regional collaboration program - the establishment of the Nile Basin Aquatic Plant Management Society and the support of the activities of the Lake Victoria Environmental Management Program are both outcomes of the drive to forge a regional approach to water hyacinth control

9 Conducting of a public hearing on the EIS at the International Conference Centre, Kampala This public hearing was very successful in terms of public response and in terms of the creation of transparency in handling public matters

The only outputs originally expected that were not produced were the remote sensing/measurement of the extent of the water hyacinth problem on Lake Victoria and the inclusion of regional collaborators in the UF/CAP Short Course The former due to lack of US-DOD satellite imagery and the later due to the inability to identify the appropriate Kenyan or Tanzanian personnel early enough to attend the Short Course

5 3 External Factors

The team found out that there were major changes in the time-table for implementation of the project These changes were mainly caused by the slow beauracratic system which made approval of certain activities and documents to drag on This had major impacts on the finances of the project in that some activities could not be implemented as the time frame could not allow it

It was also found out that there was an attempt by the government to spray Lake Victoria before the EIA was done This caused a lot of public outcry including an

attempted suit by a member of the public against the GoU and AU hence galvanizing negative public opinion against any chemical control method

The team established that the fish export market was also a critical factor that impacted public opinion against chemical control Fish exporters for fear of losing their market especially in Europe where customers are sensitive about the possible effects of herbicide on fish tissue gave the whole issue an economic and political dimension This means economic and political factors have to be constantly taken into account as the project goes on It therefore slows down the decision making process as the constituency to be consulted has become very wide

As a result therefore, it was clear to the team that, Government policy on chemical use has become all the more cautious hence affecting the speed of decision making

The team further found out that conflict in the region, especially the Rwanda/Republic of Congo (Zaire then) also negatively impacted the implementation of the regional collaboration program e g AU staff who travelled to Rwanda to review the source of the water hyacinth in Rwanda could not access areas where there was intransigence between Zaire (as it then was) and Rwanda Later on the Minister of Agriculture and the Commissioner for Fisheries were able to travel further upstream the Kagera River within Rwanda Uganda and Rwanda have as a result of the Minister's visit entered into a Memorandum of Understanding for collaboration in Agriculture Control of water hyacinth was incorporated into the Memorandum of Understanding However, Rwanda has had urgent priorities which relegated control of water hyacinth much further down the list Rwanda is a significant country because a sizeable portion of water hyacinth flows into Lake Victoria from Rwanda through the Kagera River

Another external factor established by the team was the inability of neighboring states of Kenya and Tanzania to nominate their staff dealing with Aquatic Weed Control Units for a trip to University of Florida This means the level of knowledge on control of water hyacinth is not the same among the countries of the region This certainly affects regional collaboration as disparities in understanding the problem and the various control options will slow down the process of regional collaboration

5 4 Unplanned Effects

It was discovered by the team that there are a few unplanned effects of the project so far The primary effect is the impact of alternate employment to the individuals involved in the Kagera River water hyacinth removal efforts The area has relatively little employment opportunities outside of fishing The opportunity for additional income through employment of labourers in manual removal of water hyacinth in this project has been a benefit to local residents

Another unexpected effect is the use of water hyacinth compost as a planting site for small crops at the Owen Falls mechanical removal site Local residents have planted maize and cassava in the compost created by the dumping of the water hyacinth removed from Owen Falls Dam area Whether crop productivity will benefit is uncertain and may have occurred because of lake of other suitable space

5 5 Beneficiaries

The team found that the main beneficiary if the project is successfully implemented is the Ugandan populace whose livelihood in one way or the other is intertwined with Uganda's main water bodies which are all currently being affected by the water hyacinth infestation In this regard, successful control of the water hyacinth will reduce the level of infestation to a manageable level which will not be detrimental to the ecology and ecosystem of the whole country This means all Ugandans are therefore beneficiaries

It is a well known fact that water hyacinth affects the hydrological regime and biodiversity, it jeopardizes utilization by man of natural resources especially fish If controlled, the productivity of Uganda's water bodies (biodiversity) and fish catches will be greatly enhanced The team established that the fishing industry is probably the most directly affected and conversely if water hyacinth infestation is controlled, the industry will be one of the greatest beneficiaries

The other beneficiaries established by the team are the riparian communities Currently the floating water hyacinth mats disrupt or stop activities like water transportation and communication which are actually imperative for any community but more especially the riparian communities Once the infestation is successfully

controlled, water transport and communication by riparian communities will be facilitated and their livelihood will not be adversely affected This to a larger extent also refers to the riparian states of Uganda, Kenya and Tanzania The Ugandan Government and indirectly the Ugandan tax payer will be saved further financial burden if the infestation is effectively controlled now before it becomes more expensive to control in future The integrated approach if utilized as advised will reduce the infestation fairly quickly hence saving the country unnecessary expenses in the future

The team also established that with regard to the infestation at the Owen Falls Dam, control of the infestation will mean undisrupted hydro-electric power generation This has consequential effects on the whole Ugandan populace that depends on hydro-electric power for their fuel and more especially Ugandan Investors who have invested a lot of capital which must be recovered, through profits On the other hand, the whole Ugandan economy stands to gain if the Owen Falls infestation is successfully contained

5 6 Project Staff

The team found that implementation of the activities of the project has generally progressed well apart from the activities related to regional collaboration which have progressed a bit slowly Although there have been major constraints to implementation which could be attributed to bureaucratic delays in the government system, negative press publicity creating unwarranted caution in the decision making process of the government, the project staff have responded quite positively to all these constraints in that none of them interviewed seemed despondent or discouraged in their desire to see the project completed successfully

On the whole, the staff have adapted themselves well to the varying conditions in the field where for example certain procedures are found to be unworkable, staff have devised innovative methods of getting the work done

5 7 Project Management

With regard to project performance in terms of defining strategy, activity, planning, reporting, personnel management and financial management, the team found out the following

5 7 1 Data Collection

Each unit of the project whether at Owen Falls, Port Bell or Kagera, knew clearly what they were to achieve and the strategy to be applied There was regular data collection and documentation especially at the Kagera river operational site for which AU is directly responsible However, the team did not find such consistent detailed data collection and documentation at Owen Falls Dam and Port Bell sites even though there was some recording of the figures in respect of the mechanical removal process It is apparent that WHU is facing a challenge in regard to regular, detailed and systematic data collection and documentation at operational sites where they are directly responsible

5 7 2 Co-ordination with other Stakeholders

There appears to be a clear reporting system within the different units of the WHU and between the WHU and AU What was sometimes a bit hazy was the co-ordination between the WHU and the other stakeholders e g NEMA, the National Water Sewerage and Corporation (NW&SC), Fisheries Research Institute (FIRI), Uganda Electricity Board (UEB) An example of this was seen during the EIS public hearing, where it appears some aspects of the guidelines of the process of public hearing was not clear to WHU and AU NEMA has put in place Draft Regulations, part of which make provisions for public hearings of EIS However, these Regulations have not yet been gazetted as a statutory instrument Unfortunately NEMA had earlier sent out another draft guidelines on the EIA process which also had some provisions on the public hearing process There seems to be some discrepancy between these two documents Both documents do not have the force of law until the regulations are gazetted WHU and AU seem a bit confused about the operating guidelines for the public hearing and procedures thereafter

5 7 3 Personal Management

Personnel management did not seem to pose a major problem in the project as both WHU and AU seem to have good working relations among the staff The staff of the mechanical control unit of WHU however, pointed out that decision making and project implementation are sometimes hindered due to lack of quick communication from staff at Owen Falls Dam, Port Bell Ferry Landing Site and Kagera Boom Site with the Engineer in charge of the mechanical unit Although the setting up of a communication network is not part of AU's mandate, this has serious implications on the progress of the integrated control measures

5 7 4 Wazimenya Public Sensitization

The team also visited Wazimenya bay and interviewed the villagers in the vicinity including Local council officials, fishermen, housewives and school children All these people clearly recalled the sensitization program like the video film on water hyacinth control, the leaflets and signposts warning them not to use water for a period of time during the in-lake trials The interviews were actually not pre-arranged but the interviewees were randomly selected

5 7 5 Kagera River Objectives

The team found that the Kagera River objectives were implemented as planned and later improved through operational experience and the resulting removal of water hyacinths was quantified Unfortunately lack of funding required these activities to be temporarily suspended The team however, established that additional mechanization of this process will be established with the receipt of a conveyor dedicated to the Kagera River project This will mean the removal of water hyacinth trapped by the boom will be faster and require less man power

5 7 6 Remote Sensing Strategy

The team found that in relation to the remote sensing strategy, despite the setbacks of not receiving the US-DOD satellite imagery as scheduled remote monitoring objective is still expected to be addressed through the purchase of aerial photography/satellite

imagery and the use of a newly received boat to map existing hyacinth mats with computer linked GPS equipment

5 7 7 Quarterly Reporting

The team assessed that the idea of quarterly reporting by the AU to USAID is a good method of monitoring the progress of the project on a regular basis However, the absence of a mid-term report was found to be a draw back in respect of discovering major flaws in the project and addressing them in time The team is of the view that problems related to regional collaboration and the confusion as to roles (e g who is the Lead Agency or what exactly is AU's position) could have been identified early and rectified in time

5 7 8 Biological Agents Strategy

The team found that the biological control by use of the biological agents has not yet produced any significant reduction in the water hyacinth infestation It was found that for the biological agents to be successful they need to establish themselves in the area for at least three years This means the biological method still needs further observations before its viability can be established

5 7 9 Integrated Control Strategy

On the whole exercise the team found out that there is every hope that the project when implemented as proposed would greatly contain the water hyacinth infestation The project has already resulted into the successful clearing of a large portion of the Owen Falls Dam The same technique would be able to clear the dam in case of any future infestation at the dam should a change in the wind drift more weeds there This is because there is already some experience and track record to go by It is also expected that the harvester from Japan, when put into use, will further reduce the infestation, especially at the Port Bell ferry landing site The chemical control method when applied under safe and clear directions and integrated with the other control methods would complete the emergency control program

6 0 Recommendations

On the basis of the people interviewed, documents reviewed, sites visited and the findings established by the team wishes to make the observations and recommendations that could help if the project were to continue and have the desired impact

6 1 Communication Equipment

When the team visited the Owen Falls Dam site, the engineer in charge and staff at Owen Falls Dam and Port Bell ferry landing site pointed out that linking the engineer with each project site by radio call or reliable telephone connection would go a long way in reducing delays caused by break down of machinery and other operational problems The team therefore, recommends that radio call equipment be provided to link the operational sites with WHU head office This radio equipment could also later be used to track the movement of the water hyacinth mats so that before they arrive at sensitive areas like Owen Falls Dam and Port Bell Ferry Landing Site, the staff are prepared for mechanical removal or any other method of interception that would be available in future

6 2 Data Collection

The team recommends that the operational sites at Owen Falls Dam and Port Bell ferry landing sites be more consistent and detailed in collection of data in respect of quantity of water hyacinth removed per day, the level of man-power, quantity of fuel used etc There is need to devise basic forms to be used in a daily manner This will help in analysing and assessing the control method more accurately AU could design concrete data collection systems and recommend to WHU for implementation This is important for the purposes of monitoring the real impact of the integrated control program

6 3 Financial Reporting

Although the financial management of the project seems to run as budgeted, the team however found out that the WHU felt that even if AU has no legal obligation to submit reports of its spending to WHU, it would help a lot if copies of such reports sent to USAID are also sent to WHU to enable WHU to explain any issue that may be

raised to it about funding The team recommends therefore, that AU reporting documents send to USAID should be copied to WHU This will also encourage the spirit of transparency and reduce unnecessary misunderstandings

6 4 Delays in Implementation

Whereas the project strategy if followed properly should be able to address adequately the emergency control of the water hyacinth in its three pronged approach, there is always the problem of delays in implementation The team found out that in this project, the initial time frame did not take into account the possible delays in forging regional collaboration Because of the impact of regional collaboration, this needs to be reassessed Equally bureaucratic hurdles need to be considered in assessing the time frame for the other aspects of the project The team therefore recommends that future project budgeting should provide for at least six months additional time to accommodate any delays

6 5 Need for Continuous Support

The team found out that once a large portion of the water hyacinth infestation can be knocked off, it will be possible for the Uganda government on a sustainable basis to control the infestation at Owen Falls Dam and Port Bell ferry landing The team however, recommends that to supplement government's effort, the fishermen could also be regularly provided with hand tools for manual removal However, the use of mechanical control still needs to be further studied if more cost effective and efficient methods are to be found The team recommends that where chemical control is proved to be viable and safe, the method should be further investigated, researched, and adapted to Uganda's condition This requires continuous research by government agencies instead of a once-off approach The WHU unit should therefore, be mandated and facilitated to continuously engage in improving the various control methods

6 6 Media Publicity

With regard to media publicity, the team recommends that there is a need to be a bit more aggressive on media publicity and improving public relations with the press as

opposed to being passive or merely reactionary A possible approach recommended by the team is to arrange dialogue sessions with editors of major newspapers and heads of other media institutions e g radio stations The idea of having regular inserts in major newspapers with articles giving the corrects facts is also recommended There is also need to involve policy makers on a more routine basis if support for the different measures is to be realized Reporting to the relevant Parliamentary Committees should be more regular and WHU must not only wait to be invited to report Regular updates to members of Parliament and other opinion leaders is highly recommended

6 6 1 Public Sensitization

The team has established that the Wazimenya bay public sensitization is actually a model that could be followed at a more national level However, the team recommends that there should not just be sporadic media appearances There must be on-going sensitization about what is happening Even the elite community which is a critical section of the public must constantly be informed and educated The Ministry of Information appears at times to be an unwilling partner At the political level the team recommends that the Ministry of Information must be brought in to constantly give the correct media report about the progress of the project One concrete way of doing this is to hold a seminar for the key staff of Ministry of Information and also invite editors of major newspaper

6.6 2 Public Involvement in Sensitization

During the evaluation, the team found out that accurate public information is critical to the success of the project In this instance although public education on the problem and potential solutions has been going on the team recommends that more intensive efforts would be helpful In a sensitive area such as the use of herbicides the need for public knowledge about the problem and the potential solutions as well as the cost-benefit analysis of each solution is essential Clearly the operational decisions will be made by the appropriate agencies within the GoU, however, the team thinks that additional public information efforts in advance of the public hearing could have been helpful Input from residents in the area in which the herbicide trials were conducted might also have been helpful if included in the public hearing process

6 7 Regional Collaboration

Similarly, the team recommends that regional collaboration programs must be spear-headed by GoU which has more experience than its neighbors Uganda's mission abroad should be used to initiate consultations within the region Institutions like LVEMP must also be more actively and regularly engaged in forging regional collaboration In short, Uganda must not wait for co-operation from its neighbors but must incorporate its neighbors in its leading role in the control of water hyacinth A good rallying point is the Nile Basin Aquatic Plant Management Society which is a voluntary society that will include all the key players in the region who are engaged in and concerned about the control of Aquatic Plants Uganda should actively support and promote such a society in order for the knowledge it already possesses on water hyacinth to be spread to its neighbours

6 8 WHU Capacity Building

It has been established by the team that the WHU has progressed considerably in building its institutional capacity However, the team recommends that it needs to be better equipped with efficient communication network and its operations need to be decentralised to the districts affected by the water hyacinth to enable prompt action At the same time WHU needs more legal authority to make decisions and take action In this regard, legislative reform is very necessary for stipulating the powers and functions of the WHU This will also solve the problem of uncertainty of procedures and roles

6 8 1 Future USAID Intervention

The team recommends that in future USAID intervention in water hyacinth control should include the following areas of assistance

- Assistance to WHU in further capacity building and improving its communication network
- Assist in the decentralization of the control of water hyacinth using the local government authorities This will provide a more effective community participation approach to solving the program

- Assist GoU incorporating her neighbours in the regional program addressing the water hyacinth problem This could be done by assisting AU to become regional in its operations
- Continue with financial support of the program until there is clear evidence of a substantial in the level of water hyacinth infestation or until the operational control programs have taken off and can be run by GoU on a sustainable basis
- Continue to support the Kagera River operational objectives, especially the improvement of the boom to an optimum level
- Assist in setting up the remote sensing method of monitoring the magnitude and pattern of water hyacinth infestation It should especially assist in the obtaining of US-DOD remote sensing imagery
- Continue to assist in information up-dating capacity of both AU and WHU
- Assist in evaluation of alternative uses of water hyacinth
- Provide greater assistance in, operational mechanical control program which requires expansion and therefore increased funding

6 8 2 Additional Training for WHU Staff

The team recommends that additional training of personnel involved in the mechanical removal of water hyacinths would be beneficial This training could include small engine and hydraulic system maintenance as well as worker safety training such as water safety (basic swimming skills) water diving and lifesaving These are activities that should be addressed if the scope of the project is increased or if future grants are considered

6 9 Co-ordination with LVEMP

The team recommends that the technical assistance and public education efforts must continue in order to assist the GoU in resolving the water hyacinth problem in Lake Victoria and other Ugandan waters The team further recommends that focus needs to shift to regional coordination as operational programs are established for Lake Victoria Presently the appropriate vehicles exist for this coordination through the LVEMP which is an opportunity that must be maximally utilised Deliberate public

relations efforts must be built with LVEMP whereby AU and WHU freely exchange information on water hyacinth control

6 10 Clarification of Roles and Responsibilities

The team recommends that MAAIF should identify activities which can strengthen the coordination between the agencies or ministries involved in reviewing and establishing an operational program of this type Further clarification of each agency's stake in the problem and their role in the resolution might be necessary The APC should be used as a forum for clarifying the roles and responsibility of stakeholders This should be done so conclusively that no person is in doubt Alternatively whenever there is doubt the APC should be the organ referred to for clarification One area which the team recommends for clarification is the roles of WHU, AU, MAAIF, MNR It must be clarified who the lead agency is and who the developer is in accordance with the National Environmental Statute, 1996

6 11 Further Research on Herbicide Use

The team found out that the impact of herbicide use especially its effects on fish export still needs to be determined and recommends further research which is comprehensive and can clearly establish truth from falsehood This might mean involving all the stakeholders and agreeing in advance on the methodology of the research Herbicide use is a critical component of the Emergency Action Plan for the control of water hyacinth It is instrumental in determining whether or not AU proposed solution to the water hyacinth is viable or not In the event that herbicide use is entirely discouraged, the whole project needs to be reassessed as to how the other options of biological control, manual and mechanical control can be optimally applied In the event that this is the case, the team recommends that AU could be retained to advise GoU on the optimum use and improvement of the other control methods

7 Conclusion

In conclusion the team is of the view that AU through the USAID grant has successfully made the Emergency Program for the control of water hyacinth in Uganda to get off the ground This is evidenced by fact that Uganda is way ahead of its

neighbours in both understanding the problem of water hyacinth infestation and the extent of implementing actual control measures It has therefore set GoU on a path for finding viable sustainable control program The team has assessed that considering the constraints experienced, AU's performance is quite commendable AU should be supported to continue the work already started until the infestation is brought within manageable levels The team however, feels that any continuation of the program by AU must be based on a new agreement in which the roles of AU and other stakeholders like WHU, NEMA, MNR, MAAIF is clearly delineated

Annex A

Water Hyacinth Emergency Action Program Operational Sites

Annex A
Water Hyacinth Emergency Action Program
Operational Sites

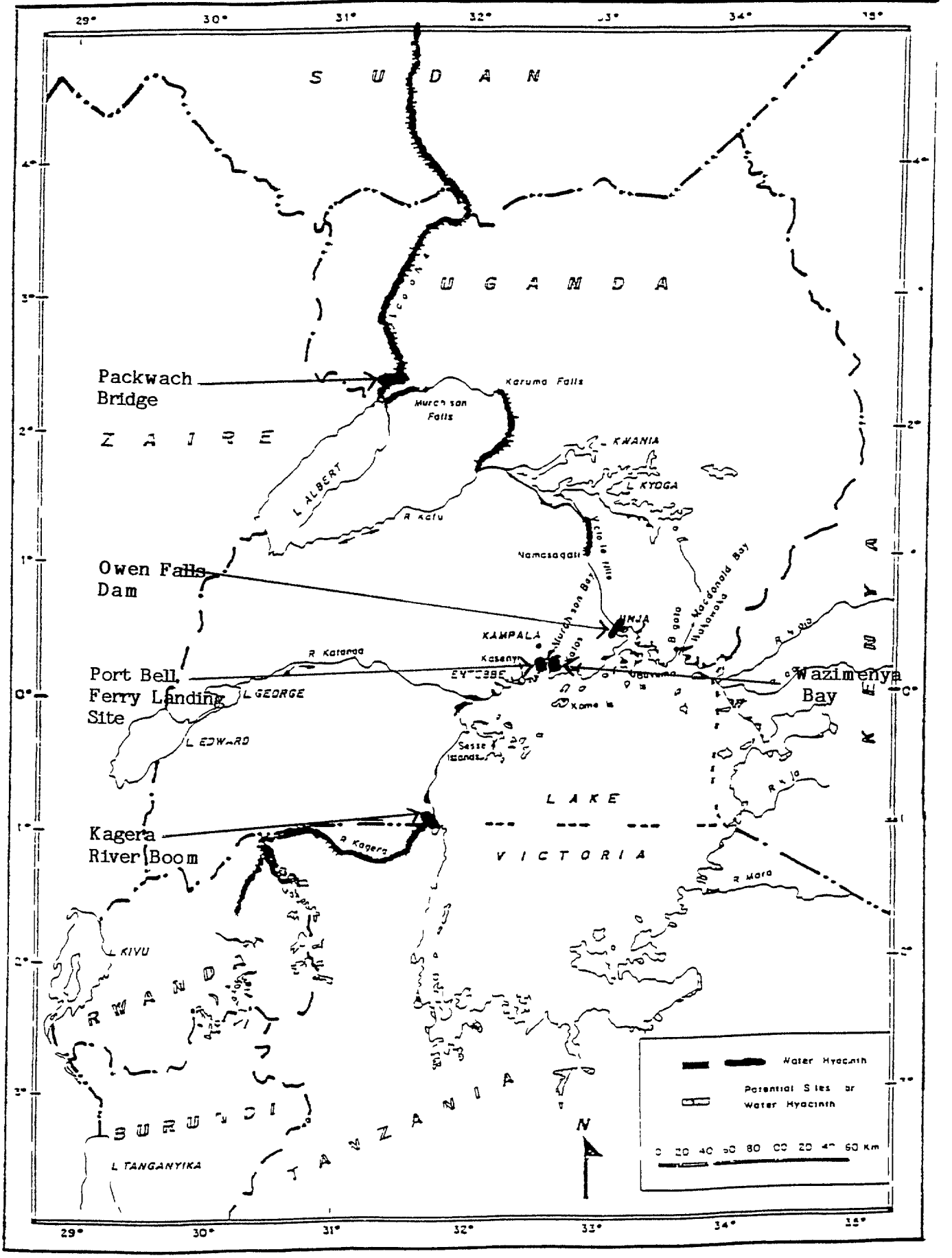


Fig. 1 General distribution of water hyacinth in Uganda

Annex B

Kagera River Operations

Kagera River Operations

Aquatic Unlimited under a grant from USAID to provide technical assistance to the Ministry of Agriculture, Animal Industries and Fisheries/Water Hyacinth Unit, installed and operated a floating barrier to trap and remove incoming water hyacinth via the Kagera River from September 1996 through June 1997 Removal of water hyacinth was carried out through the use of manual methods and tractor/wagon combinations Water hyacinth volumes were estimated to range between 4000 to 12 500 square meters/day traveling down the Kagera River 1 kilometer from the outlet to Lake Victoria at Goma village near the fish landing of Kasensero (See table 1) Volumes removed averaged between 1500 to 2000 square meters/day six days per week This translates to a removal rate of between a high of 37% to a low of 16% on a daily basis However, based on the work hour bases of 9 hours per day, work hour removal rates ranged between approximately a 100% hourly removal rate to a 42 % hourly removal rate

Table 1 Water Hyacinth removal rates from Kagera River at Goma Uganda from September 1996 through June 1997 through manual/mechanical efforts Aquatics Unlimited

Input and Removal Rates	Low Volumes in Square Meters	High Volumes in Square Meters
Water hyacinth input/day	4000/day	12 500/day
Water hyacinth removal/day	1500/day	2000/day
Water hyacinth removal per 24 hour day as percentage	37%	16%
Water hyacinth input/hour	166/hour	520/hour
Water hyacinth removal/hour	166/hour	222/hour
Water hyacinth removal per 9 hour work day as percentage	100%	42%

Incoming water hyacinth quantities varied primarily due to changes in river levels associated with rain falls within the catchment basin Changes in water level in the river caused shoreline water hyacinth infestations to breakaway and be flushed out of the river towards the lake Water hyacinth mats typically contained other semi - aquatic invasive weeds which at times added to the difficulty of removal

During non-working hours, the boom was opened to allow weeds to bypass the boom in order to prevent buildups Had buildups been allowed, two situations would have occurred These are 1) The entire water surface would have been blocked and prevented local canoes from traveling up and down the river causing a potential conflict or dispute and/or 2) The weight of the water hyacinth buildup behind the boom would cause enormous pressure to build up and risk damaging the equipment This buildup situation did occur at the start of the operation in September 1996 but fortunately was corrected quickly and prevented any problems from arising A previous GoU installed barrier was not capable of being retracted and caused the hyacinth to back up hundreds of meters upriver causing hardship to local villagers It

is unsure whether pressure build up behind the barrier or disgruntled villagers or both caused the barrier to be either damaged or removed

Manufacture, transport and installation of anchors, anchoring system, pontoons, and the temporary boom system was Ugs 21 528 000 A Conveyor System was sent from the US with an associated cost of $38,672 00 including a backup generator and two years spare parts, and the Fast Water Boom system cost was $9,720 00 The associated freight charges for these items was approximately $11,500 00 FOB Kampala

During the boom operations period the associated operational costs were as follows (See Table)

Table 2. Monthly Operating Costs - Kagera River Water Hyacinth Removal

Description	Units	Unit Cost (UgS)	Monthly Operating Cost (UgS)
Labor salary	20	100 000	2 000 000
Supervisor salary	1	144 000	144 000
Tractor hire	2	1 920 000	3,840 000
Tractor fuel in liters	1052	1 075	1 130 900
Fuel Transport	1	60 000	60 000
Canoe rental	2	48 000	96 000
Land use fee	1	10 000	10 000
		Total	7,280,900

In late May the permanent boom and conveyor system finally arrived in Uganda and cleared customs after a 7 month period of transport from the USA through Mombasa to Kampala Further delays occurred while transport companies and freight forwarders disputed payments received for services In about mid July these disputes were finally cleared and the equipment available for receipt By this time, however, funding of Kagera River boom operations had ceased (June 15,1997) as grant funds were nearly exhausted

The Boom operations at the Kagera could be restarted with relative ease as the major components of the boom are still in place The former crew are eager to begin this work and the tractor/wagon contractor can mobilize his equipment given short notice

It is envisioned that if the conveyor and boom were taken to the river, the manpower required would decrease to perhaps half, or 10 men, and that volumes removed per hour would increase significantly Manual loading of tractors was carried out quickly, but loading times are expect to increase through the use of the convevor system Fuel costs will increase as the convevor is powered bv a small generator The convevor is not that sophisticated and with training could be operated by personnel at the river Maintenance of the generator will have to be stressed and a daily log kept in order to keep up with regular service intervals Spare parts for the conveyor and generator are available to ensure smooth operation

The following is an estimated draft budget to operate the Kagera River water hyacinth removal operations using the permanent convevor and boom system (See Table 3)

Table 3 Draft Budget Monthly Operating Costs - Future Kagera River Water Hyacinth Removal

Description	Units	Unit Cost (UgS)	Monthly Operating Cost (UgS)
Labor salary	10	100 000	1 000 000
Supervisor salary	1	144 000	144 000
Tractor hire	2	1 920 000	3,840 000
Tractor fuel in liters	1052	1 075	1 130 900
Conveyor fuel	400	1 075	430,000
Fuel Transport	1	60 000	60 000
Canoe rental	2	48 000	96 000
Land use fee	1	10 000	10,000
		Total	6,710 900

Initial transport and setup costs to deliver the boom and conveyor system to the Kagera River will need to be determined The container in which the equipment is presently stored has been purchased with grant funds and will need to be transported to a secure site for future use

As the current boom system at the Kagera River is operational and providing for the type of water hyacinth diversion that is required, it is recommended that we continue to utilize this present boom system until problems develop The new boom can then be used in trials at other locations (i e , Owen s Falls Dam Bay, Water Works Sites, etc) to determine boom requirements, or kept in storage until needed

Annex C

Extract from AU Quarterly Report on Mechanical Removal

Annex C

Extract from AU Quarterly Report on Mechanical Removal

Methods for removing plants from Owens Falls DamMarch-May 1996 1

An integrated plan that will utilize all processes including mechanical chemical spraying and biological control practices will be established. The procedures manual outlining the control methods for this area will be completed by June 1996 as scheduled.

Initial methods to remove plants from in front of Owens Fall Dam have been determined and operations are expected to begin in September 1996 following delivery of equipment the GoU purchased from PEJA Africa (Conver harvesters from Netherlands Grant) for the project Performance data on the Conver harvesting systems is not available for water hyacinth removal and it is hoped that the equipment will meet project operational objectives AU plans to inspect the equipment in Holland prior to shipment in early July Donor support for the construction of a boom system in this area to prevent future accumulations infestations is underway

The Initial Preparations Report for the Mechanical Control Program that includes equipment operational requirements. procedures, site preparations and personnel requirements has been completed so that proper planning for the equipment being delivered in September can begin immediate operation

The final preparations for the mechanical control program in this area will be finalized following the equipment inspection scheduled for early July in Holland The final procedures manual integrating the mechanical, chemical and biological control methods will be completed following the completion of the In-Lake Trials and EA approvals

The harvesting equipment from Holland arrived in Uganda in early September and was commissioned by the manufacturer and tested at Port Bell. The equipment was not delivered per the original contract with the GoU as changes were made following order The system delivered lacks mobility of the aquatic weed harvester as it is a stationary system with push boats The equipment was initially tested at Port Bell and the two harvesting systems were relocated to Owens Fall Dam.

The harvesting system has now been at the Owens Fall Dam for two weeks, but due to budget releases and coordination of fuel delivery, operations have been slow to start. It is expected that this will improve over time as a routine of operation is developed and operational funds become available.

Mechanical harvesting at Owens fall dam was slow to start due to GoU operational expense problems and late arrival and clearance of four units 4 x 4 Dump trucks GoU operational expenses did, however, become available and alternative dump trucks were made available Rains and additional wind blown

hyacinth also slowed progress but by end of the quarter when rains had ended and winds were no longer adding substantial amounts of hyacinth, operations were steadily improving as both machine operators and site managers became familiarized with operations By the end of the quarter approximately 3600 square meters of material were being removed daily or about 2 hectares/week Preventive maintenance is being stressed and should operational funds continue to be released in a timely manner, good progress should be evident in first quarter of 1997

On March 19, 1997 the Owen's Fall Dam was entirely cleared of water hyacinth It is estimated that the total amount of water hyacinth removed from the period mid August when the government initiated a short term (30 day) combination manual/mechanical removal operation and augmented by a Uganda Electricity Board conveyor (throughout the removal period) and through the use of the Conver equipment (October to March), approximately 70 hectares of water hyacinth and related debris were removed

Maintenance of equipment throughout the period continued to be stressed, as was record keeping and report writing It is expected that as winds shift additional weeds will continue to arrive at the Dam and this situation will be monitored and weeds removed when necessary

The draft Summary of Proposed Operations Water Hyacinth Control Program includes operational requirements for mechanical operations and is awaiting final approvals as outlined above

During quarter 6, water hyacinth did not accumulate at the Owens Fall Dam in sufficient quantities to justify mechanical removal until approximately mid June At that time water hyacinth began to migrate towards the dam in sufficient quantities and mechanical harvesting recommenced Good maintenance control progress was being made to prevent serious buildup from reoccurring

Methods for Port Bell Plant Reduction Mav-June 1996
1

An integrated plan that will utilize all processes including mechanical harvesting chemical spraying and biological control practices will be established for this area The control procedures manual will be completed by June 1996 as scheduled

Mechanical control equipment for this area was purchased from the Netherlands and scheduled to arrive in Uganda in mid September 1996 Aquatics Unlimited delivered the Initial Preparations for the Mechanical

Control Program report to MAAIF, the WHU and NARO, and plans to inspect the equipment prior to shipment in early July The final preparations for the mechanical control program in this area will be finalized following the equipment inspection scheduled for early July in Holland The final procedures manual integrating the mechanical, chemical and biological control methods will be completed following the completion of the In-Lake Trials and EA approvals.

The harvesting equipment from the Netherlands arrived in Uganda in early September and was commissioned by the manufacturer and tested at Port Bell. Due to wind conditions this time of year, the water hyacinth mats have wind blown to open water areas of the lake and mechanical operations will concentrate on these areas once operational funding and other logistical problems are worked out within the GoU

The harvesting equipment purchased from the Netherlands for use at Port Bell was relocated to the Owens Falls Dam site during this period to help the sister unit remove the accumulation of water hyacinths in front of the dam As wind conditions reduced the water hyacinth problem at the port during the period the equipment will return following completion of the dam site removal process

As a result of successful removal of water hyacinth from the Owen s Fall Dam preparations were underway to transfer one harvesting system to Port Bell to commence removal operations as wind patterns were expected to move weeds into the northern part of the bay, the location of Port Bell, allowing for easy access to the plant biomass

The draft Summary of Proposed Operations Water Hyacinth Control Program includes operational requirements for operations at this site and is awaiting final approvals as outlined above

Due to limited quantities of weed present at the dam, one weed harvesting system was relocated to Port Bell where a weed mat of approximately 600 hectares is now stationed due southerly winds Operations continue on a daily basis though it is not reasonable to expect that mechanical harvesting will have the same dramatic effects as those at the dam since the quantities are substantially greater

Annex PS I

Public Sensitization in English

MESSAGE FROM MAAIF - GOVERNMENT OF UGANDA ON WATER HYACINTH CONTROL PROGRAM IN-LAKE HERBICIDE TRIALS

5 February 1997

AS YOU ARE AWARE THE PROLIFERATION OF WATER HYACINTH HAS REACHED LARGE PROPORTIONS THROUGHOUT MUCH OF THE UPPER NILE SYSTEM INCLUDING LAKE VICTORIA. CAUSING PROBLEMS FOR THE LIFE ECONOMY AND ENVIRONMENT OF UGANDA AND ITS NEIGHBORING COUNTRIES AS IN MANY OTHER LOCATIONS IN THE WORLD WATER HYACINTH PROBLEMS IN UGANDA INCLUDE OBSTRUCTION OF BOAT TRAFFIC INTERFERENCE WITH WATER SYSTEMS IMPACTS TO HYDROELECTRIC POWER PRODUCTION AND INTERFERENCE WITH FISHING AND FISHING ACCESS THE WEED AFFECTS FISH AND WILDLIFE RESOURCES REDUCES WATER QUALITY AND INCREASES SEDIMENT ON THE LAKE BOTTOM

IN ORDER TO REDUCE WATER HYACINTH PROBLEMS IN THE LAKE SOME MEASURES ARE BEING UNDERTAKEN BY THE GOVERNMENT TO CONTROL THE MULTIPLICATION OF THE WEED THESE MEASURES INCLUDE AN INTEGRATED APPROACH TO CONTROLLING THE HYACINTH THROUGH USE OF HERBICIDES BIOLOGICAL AND MANUAL/MECHANICAL METHODS OF CONTROL

THE HERBICIDES FOR USE DURING THE IN-LAKE TRIALS ARE GLYPHOSATE AND 2 4-D THESE HERBICIDES ARE USED PRESENTLY IN NORMAL DAY TO DAY OPERATIONS ON OUR FARMS TO CONTROL AGRICULTURAL WEEDS AND WIDELY USED AROUND THE WORLD THEY CAN ALSO BE SAFELY USED ON THE WATER HYACINTH

THESE HERBICIDES ARE NOT NEW THEY HAVE BEEN USED IN OTHER COUNTRIES LIKE AMERICA. IN AFRICAN COUNTRIES SUCH AS NIGERIA. SOUTH AFRICA AND SUDAN AND IN SOUTHEAST ASIA WHERE THEY HAVE PROVED EFFECTIVE IN CONTROLLING WATER HYACINTH

THE HERBICIDE TRIALS WILL BE CARRIED OUT ON A SMALL SCALE AT WAZIMENYA BAY ADJACENT TO MUBANDA PARISH. NTENJERU SUB COUNTY MUKONO DISTRICT SPRAYING DURING TRIALS WILL OCCUR ONCE ON 11 FEBRUARY 1997

1 STAY **100 METERS** AWAY FROM THE SPRAYED WATER HYACINTH FOR 30 DAYS
2 **DO NOT** COLLECT WATER. BATH OR WASH CLOTHES WITHIN 100 METERS FOR 30 DAYS
3 **DO NOT** PLACE FISHING NETS OR CATCH FISH WITHIN 100 METERS FOR 30 DAYS
4 **DO NOT** ALLOW LIVESTOCK TO DRINK THE WATER WITHIN 100 METERS FOR 30 DAYS

YOUR COOPERATION WILL BE HIGHLY APPRECIATED AND WILL ALSO ENABLE US TO COLLECT VITAL DATA INPUT FOR A SOUND ENVIRONMENTAL IMPACT ASSESSMENT

Annex PS II

Public Sensitization in Luganda

OBUBAKA OKUVA MU MAAIF - GAVUMENTI YA UGANDA OKULWANYISA EKIDDO KUNYANJA

5 Februarv 1997

NGABWEMUMANYI OKWAALA KWEKIDO KWALIILA DALA EBITUNDU BINENE NYO MUMAMBUKA GOMUGA KIYIRA. NGAMWOTADE NENYANJA NALUBAALE NEKIRETELA DALA OBUZIBU BUNGI ERI OBULAMU EBYENFUNA. N OBUTONDE BWA UGANDA WAMU NAMAWANGA AMALALA. NGABWEKIRI AWALALA WONA MUNSI OBUZIBU BWEKIDO MU UGANDA BUTWALIRAMU OKUKYANKALANYA ENTAMBULA YAMATO OKUSUMBUWA EMIDUMU GYAMAZI AKABENJE MU KUKOLA KWAMASANYALAZE N OKUKYANKALANYA OBUVUBI NABAVUBI EKIDO KYAKABAATE ERI EBYENYANJA NE BISOLO EBYOMUNSIKO KIKENDEEZA OMUTINDO GWAMAZI ATE KYONGERA N OMUWENDO GWE TTOSI WANSI MUNYANJA

OKUSOBOLA OKUKENDEEZA KUBUZIBU BWEKIDO MUNYANJA. ENKOLA EZIMU ZITESEZEBWAKO GAVUMENTI OKUSOBOLA OKUFUGA OBUFUKUNYA BWEKIDO ENKOLA ZINO ZIJAKUTWALILAMU ENKOLA EYOBWESIMBU OKUSOBOLA OKUFUGA EKIDO OKUYITA MU NKOZESA YAMALAGALA. ENZAALA EMIKONO N EBYUMA ENWANYISA EY EBYUMA NENFUGAYOKUZALA KWEKIDO YO YATANDIKA DDA OKUKOLA

KYETAGISA OKUSAAKO OMWOYO NTI AMALAGALA AGATESEBWAKO OKUKOZESEBWA MUKUGEZESA KU NYANJA GEGA GLYPHOSATE NE 2 4-D AMALAGALA GANO GAKOZESEBWA MUBULAMU NAKATI MUMASAMBA GAFFE OKUFUGA EMIDO EGYOMUNIMIRO ATE NGA GAKOZESEBWA NE MUNSI NYINGI MUBWEGENDEREZA GASOBOLA OKUKOZESEBWA KUKIDO

AMALAGALA GANO SIMAPYA GABADDE GAKOZESEBWA MUMAWANGA AMALALA NGA AMERICA. MUMAWANGA G AFRICA GAKOZESEBWAKO MU-NSI NGA NIGERIA. SOUTH AFRICA NE SUDAN NEMUMASERENGETA GOBUVANJUBA BWA ASIA. GYE GAZULIDWA OKUBA AGOMUGASO MUKUFUGA EKIDO OKUFUYIRA KUBERAWO OMULUNDI GUMU NGA 11/02/1997

<u>OKUGEZESA KWAMALAGALA</u> KUJAKOLEBWA KUMUTINDO OGWAWANSI KUKYEBEEYA KYE WAZIMENYA OKULIRANA KU MUBANDA PARISH. NTENJERU MUKONO DISTRICT

OKUMALA EBANGA LYANAKU AMAKUMI ASATU (30) OLUVANYUMA LWOKUFUYIRA EDODO TUBASABA

1 MUBEERE EBIFUBA KIKUMI (100) OKUVA AWAFUYIDWA EKIDO
2 TEMUKIMA MAZI KUNAABA. OBA KWOZA ENGOYE MUBIFUBA EBYO EKIKUMI OKUVA MU BIFO EBIFUYIDDWA
3 TEMUTEGA BUTIMBA BUVUBA OBA OKUVUBA MUBIFUBA EBYO EKIKUMI (100) OKUVA MU BIFO EBIFUYIDDWA
4 TEMUKIRIZA BISOLO KUNYWA MAZI MU BEFUBA EBYO EKIKUMI (100) OKUBA MU BIFO EBIFUYIDDWA

BAMBI MANYA NTI OKUSALAWO OKUKUSABA OBEERE WALA OKUVA MUKIFO EKYO KWEKUTUSOBOZESA OKWEKAANYA EKIGENDERERWA AWATALI KUTATANYIZIBWA ERA KINO KIJAKUTUYAMBA OKWEYONGERA OKUKAKASA ENKOLA EYO ERA KINO KIJA KUTUYAMBA OKWEYONGERA OKUKAKASA ENKOLA EYO **ENKOLAGANA YO NAFFE EJAKUSIIMIBWA MUKIKA KYAWAGULU KINO KIJJA KUTUYAMBA OKUMALILIZA EKITABO EKIKWATA KUBUTONDE BWENSI**

55

Annex PS III

Program for the Public Sensitization

Sb

TENTATIVE PROGRAMME FOR THE PUBLIC SENSITIZATION FUNCTION
MUKONO DISTRICT - 29th November , 1996

Venue - Mubanda Primary School

11 30 a m - School children assist to organise venue
11 45 a m - Parent arrive and are seated
11 50 a m - District Officials seated
11 55 a m - L C 5 Chairman arrives

12 00 - RDC arrives - National Anthem Buganda/Uganda

12 05 p m - Headmaster welcomes guests
12 10 p m - L C I welcomes guests
12 15 p m - L C III brief speech

12 20 p m - L C V brief speech

12 30 p m - MAAIF Official - Water Hyacinth Control in Uganda

1 00 p m - Aquatics Unlimited - In-lake trials film and brief
1 30 p m - Public Discussion

2 00 p m - RDC closing remarks

Venue - Butere Primary School

2 30 p m - School children assist to organise venue
2 45 p m - Parent arrive and are seated
2 50 p m - District Officials seated
2 55 p m - L C 5 Chairman arrives

3 00 - RDC arrives - National Anthem Buganda/Uganda

3 05 p m - Headmaster welcomes guests
3 10 p m - L C I welcomes guests
3 15 p m - L C III brief speech

3 20 p m - L C V brief speech

3 30 p m - MAAIF Official - Water Hyacinth Control in Uganda

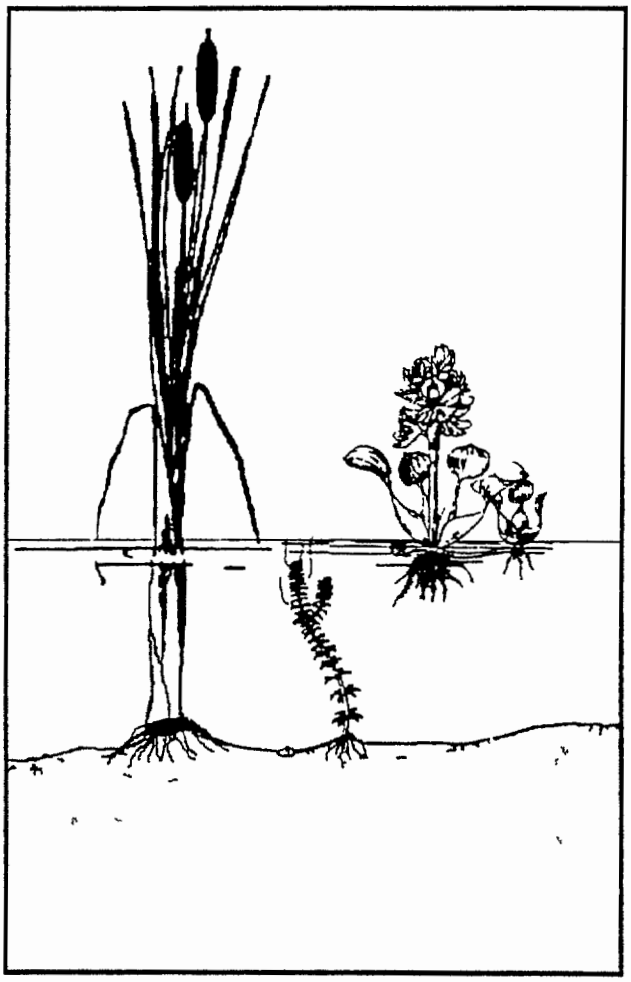
4 00 p m - Aquatics Unlimited - In-lake trials film and brief
4 30 p m - Public Discussion

5 00 p m - RDC closing remarks

Annex UF

Aquatic Weed Control, Aquatic Plant Culture and Revegetation Short Course

Aquatic Weed Control, Aquatic Plant Culture and Revegetation Short Course



Monday, 12 May 1997- Thursday, 15 May 1997

Meetings held at

Rolling Hills Hotel and Conference Center
3501 W Rolling Hills Circle Fort Lauderdale Florida 33328

- and -

Fort Lauderdale Research and Education Center
3205 College Avenue Fort Lauderdale Florida 33314-7799

ıvid W Buchanan *Dr David L Sutton*
rnon V Vandiver Jr *IFAS Office of Conferences and Institutes*

rse Objective

ıjective of the short course is to provide participants with initial training and a dvanced research update in the following areas
juatic weed and aquatic plant identification and biology
juatic weed control techniques including biological control, herbicide aracteristics, herbicide application technology, and regulatory information
juatic plant culture and revegetation techniques, and regulatory information

ference Structure

onday, Tuesday and Wednesday programs will be conducted at the Rolling lotel in Fort Lauderdale, Florida Thursday's program will begin at the hotel orning refreshments and a Plant Identification Workshop The mid-morning ıops, which begin at 10 15am on Thursday, will take place at the Fort dale Research and Education Center (FLREC) Please note, if you are ng the Thursday morning media training workshop, you will need to report to REC at 8 00am The Tuesday evening cookout will be held at the FLREC and dnesday evening social is scheduled poolside at the Rolling Hills Hotel

ia Training Workshop

ake Director of Public Affairs with the Monsanto Company conducts an ve training session to enhance the skills of industry representatives in dealing e media Each participant is videotaped and receives one-on one instruction ase their credibility with both the media and their clients Advance registra- equired to participate and ENROLLMENT IS LIMITED to the first 10 ınts for each session As the morning and afternoon media training ops are identical, you will only need to register for one

ification Training Workshops

l be conducting two concurrent workshops that will provide specific ıon on CORE and calibration to prepare you for certification exams or to s a refresher Both workshops will be held Monday evening, 12 May from ɔm at the Rolling Hills Hotel We ask that you stop by the Conference ation Office prior to the workshop to pick up course materials

)RE program will include such topics as pesticide label interpretation, ıl protection equipment pesticide safety, pesticide handling and container l techniques The calibration training workshop will review calculation ıs area measurements and equipment calibration techniques You may want ; a calculator

Commercial Pesticide Applicator Certification testing will be offered at 1 00pm on Thursday afternoon at the FLREC There is no charge for taking an examination

How long will the test take?
Each examination takes approximately one hour to complete depending on the individual If time allows you are permitted to take more than one test Calculators may be used for all examinations

What other examinations will be offered?
In addition to the CORE examination examinations are offered in several other primary and secondary categories

Examination Categories

Primary Categories Agricultural Plant-Row Crop Agricultural Plant Tree Crop Agricultural Animal Aquatic Chlorine Gas Infusion Forestry Organotin Antifouling Paint Ornamental & Turf Regulatory Right of Way Seed Treatment Sewer Root Control, Wood Treatment

Secondary Categories Aerial, Demonstration & Research

NOTE Certification for most categories requires a passing score on both the CORE and applicable category examinations

Preparation for Exams

To prepare for the exams it is recommended that you review the appropriate Pesticide Application Training Manual for the categories in which you will be testing If you do not have a manual you may purchase one prior to the short course IFAS Publications offers a wide selection of training manuals from which to choose (See purchasing information below)

IFAS Publication Sales

Aquatic weed weed science and aquatic plant extension publications from the University of Florida's Institute of Food and Agricultural Sciences (IFAS) will be available for sale at the conference You will be able to choose from plant identification books pesticide training manuals educational videos weed control guides, and related publications For advance purchases please contact IFAS Publications at (352) 392 1764 For Visa or MasterCard purchases call 1 800 226-1764

Registration Information

The $125 registration fee includes the educational program course materials a portfolio a conference t-shirt morning mid day and afternoon refreshments a deli lunch a cookout at the Fort Lauderdale Research and Education Center (FLREC) on Tuesday evening 13 May and a poolside social on Wednesday evening 14 May

the Rolling Hills Hotel To register for the short course, please complete and return the registration form Photocopy the blank registration form for additional registrants FAX registration is available for Master Card/Visa payments You will receive written confirmation when your registration is received

NOTE We can no longer accept journal transfer payments

Refund Policy Requests for registration refunds will be honored if notice of cancellation is received by the Office of Conferences on or before May 1, 1997 A $25 00 processing fee will be deducted from all refunds Sorry, no refunds will be honored for cancellations after May 1, 1997

Meeting Site and Hotel Accommodations

The Rolling Hills Hotel, located at 3501 W Rolling Hills Circle, Fort Lauderdale, FL is the official conference site A special rate of $45 per night with one to four people in a room is available for participants of the Aquatic Weed Short Course *(Rate is subject to 9% sales tax)* Reservations must be made by April 1, 1997 in order to assure availability at the group rate To make reservations, call the hotel directly at 1 800-327 7735 or (954) 475-0400 ***Be sure to mention you are attending this course.***

Continuing Education Units

Continuing Education Units (CEUs) may be earned by attending this course ***If you desire to have CEUs applied toward your license, you must present your commercial pesticide license and social security number at the registration desk***

A representative from the Florida Department of Agriculture and Consumer Services will be available in the Conference Registration Office throughout the conference to answer questions regarding CEUs and licensing

Questions?

Additional Meeting Registration Information

Registration Department, Office of Conferences and Institutes
Florida Leadership and Education Foundation, Inc
Institute of Food and Agricultural Sciences, University of Florida
P O Box 110750, Gainesville, FL 32611-0750
PHONE (352) 392-5930 / FAX (352) 392-9734
EMAIL bamt@gnv ifas ufl edu

Additional Short Course Program Information

Dr Vernon V Vandiver Jr
Fort Lauderdale Research and Education Center (FLREC)
Institute of Food and Agricultural Sciences, University of Florida
3205 College Avenue, Fort Lauderdale, FL 33314-7799
PHONE (954) 475-8990 / FAX (954) 475-4125
EMAIL vvv@icon ftld ufl edu

AGENDA

Monday, 12 May 1997

Rolling Hills Hotel, 3501 West Rolling Hills Circle

(See map on pg 13)

6 00pm -8 00pm **Registration** (Davie A & Davie B) and **Sale of Publications** (Hotel Lobby)

Commercial Pesticide Certification Training Workshops

7 00pm -9 00pm **Two Concurrent Workshops**

I General Standards (CORE) Training - *Dr Mary L Lamberts* (Florida Room A)

II Application Equipment Calibration - *Mr Richard P Cromwell* (Florida Room C)

Tuesday, 13 May 1997

Rolling Hills Hotel, 3501 West Rolling Hills Circle

7 00am -5 00pm **Registration** (Davie A & Davie B) and **Sale of Publications** (Hotel Lobby)

7 00am **Morning Refreshments** (Hotel Lobby)

Opening Session

MODERATOR *Dr Larry R Arrington*

8 00am **University of Florida-IFAS Welcome and Opening Remarks** - *Dr Christine Taylor Stephens*

8 10am **University of Florida-IFAS Fort Lauderdale Research and Education Center Programs** - *Dr David W Buchanan*

8 20am **Your Aquatic Weed Information Needs and How We Satisfy Them** - *Dr Randall K Stocker*

Defining the Weed Problem

8 30am **International Aquatic Weed Problems** - *Dr William T Haller*

8 55am **International Movement of Weeds, U S Regulatory Efforts** - *Dr Randy G Westbrooks*

9 20am **Be on the look-out for Wetland Nightshade—an invader of wetlands** - *Dr Alison M Fox*

9 35am **Tropical Soda Apple** - *Dr J Jeffrey Mullahey*

9 50am **Hydrilla in Florida** - *Dr William T Haller*

10 05am **Weed Eradication Strategies** - *Dr Robert E Eplee*

10 20am **Refreshment Break**

Herbicide, Adjuvant, and Application Technology

10 35am **Tebuthiuron, PGR's** - *Mr Ronald G Cornish*

10 50am **Surfactant and Polymer Use in Herbicide and PGR Applications** - *Dr Alva P Burkhalter*

11 15am **Pump and Application Equipment Characteristics** - *Mr Richard P Cromwell*

11 35am **Herbicide Application Equipment Calibration** - *Mr Richard P Cromwell*

12 00pm **Lunch** (on your own)

Mechanical Control Technology

MODERATOR *Dr Randall K Stocker*

1 00pm **Surface Water Management Through Aquatic Plant Harvesting** - *Ms Gina M Dauffenbach*

Biological Control of Weeds

1 20pm **The Concept of Biological Control** - *Mr F Allen Dray*

1 35pm **Aquatic Weed Biological Control** - *Mr Wiley D Durden*

1 50pm **Overview of Biological Control with Plant Pathogens, Dieback Disease of Melaleuca** - *Dr Raghavan Charudattan*

2 10pm **Feeding Habits of Grass Carp** - *Mr Rue S Hestand*

2 25pm **Grass Carp Use in South Florida Canals** - *Mr P E Schooley*

Regulatory Concerns for Aquatic Weed Control Managers and Aquatic Plant Nursery and Revegetation Managers

2 40pm **Permitting Grass Carp for Aquatic Weed Control** - *Mr John D Wiekert*

3 00pm **Refreshment Break**

3 15pm **Florida Department of Agriculture and Consumer Services Aquatic Plant Nursery Regulations** - *Ms Debra S Chalot*

3 30pm **Florida Department of Agriculture and Consumer Services Restricted Use Pesticide Applicator Licenses** - *Ms Pamela D Houmere*

3 45pm **[illegible] Protection Concerns [illegible]** - *Dr O Norman Nesheim*

4 00pm **Relating Pesticide Safety to Label Information** - *Dr O Norman Nesheim*

4 30pm **Florida Department of Environmental Protection Aquatic Plant Permitting Programs** - *Ms Jacqueline C Smith*

4 45pm **Regulatory Compliance with Wetland Mitigation, Monitoring and Maintenance Requirements** - *Mr Donald C Burgess*

Professional Society Presentations

5 00pm **Florida Aquatic Plant Management Society** - *Mr Ernest W Feller* and *Mr Donald W Doggett*

5 10pm **South Florida Aquatic Plant Management Society** - *Mr Steven Weinsier*

5 20pm **Adjourn**

7 00pm **Steak and Corn Cookout** (Fort Lauderdale REC)

Wednesday, 14 May 1997

Rolling Hills Hotel, 3501 West Rolling Hills Circle

7 00am **Registration** (Davie A & Davie B) and
-5 00pm **Sale of Publications** (Hotel Lobby)

7 00am **Morning Refreshments** (Hotel Lobby)

Aquatic Plant Culture Technology

Moderator *Dr David W Buchanan*

8 00am **Enhancement of Aquatic Habitats in Urban Areas** - *Mr Phillip R Jimrusti*

8 15am **Differences in Early Growth and Corm Development in Micropagated *Sagittaria latifolia* Genotypes** - *Dr Michael E Kane*

8 35am **The Chemistry of Submersed Soils** - *Dr George H Snyder*

9 05am **Fertilization of Container-Grown Aquatic Plants** - *Dr David L Sutton*

Aquatic Plant Identification

9 20am **Common Aquatic Grass Identification Made Easy?** - *Dr David W Hall*

10 20am **Refreshment Break**

Aquatic Weed Management - Part I

10 35am **Environmental Considerations in Planning Aquatic Herbicide Applications** *Dr Alison M Fox*

10 50am **Environmental Considerations for Aquatic Weed Control** - *Dr Charles E Cichra*

11 15am **Relationship of Aquatic Macrophytes and Fish Populations** - *Dr Charles E Cichra*

11 50am **Short Course Sponsor Recognition** - *Dr Vernon V Vandiver Jr*

12 00pm **Lunch** (on your own)

Herbicide and PGR Formulations and Management Practices

Moderator *Dr Jerry M Bennett*

1 00pm **2,4-D** - *Mr Jerry D Miller*

1 15pm **Copper** - *Mr Harry D Knight*

1 30pm **Diquat** - *Mr Michael M Owen*

1 45pm **Endothall** - *Mr William H Moore*

2 00pm **Fluridone** *Mr David P Tarver*

2 15pm **Glyphosate** - *Mr H Ross Hakes*

2 30pm **Imazapyr** - *Mr Joseph P Visaggio*

2 45pm **Bromacil, Diuron, Hexazinone** - *Dr Vernon V Vandiver Jr* and *Mr Edward E Puletz*

3 00pm **Refreshment Break**

Technical and Professional Communications Opportunities

3 15pm **University of Florida-IFAS Web Page, Aquatic Weed Management Guides** - *Mr Marion Douglas*

3 30pm **Communication Opportunities with Aquatic Plant Issues** - *Ms Lisa M K Drake* – MONSANTO

4 00pm **University of Florida-IFAS CD-ROM Multimedia Database** - *Mr Francis Ferguson Jr*

4 15pm **University of Florida-IFAS Center For Aquatic Plants Aquatic Plant Information Retrieval System** - *Ms Karen P Brown*

Aquatic Weed Management - Part II

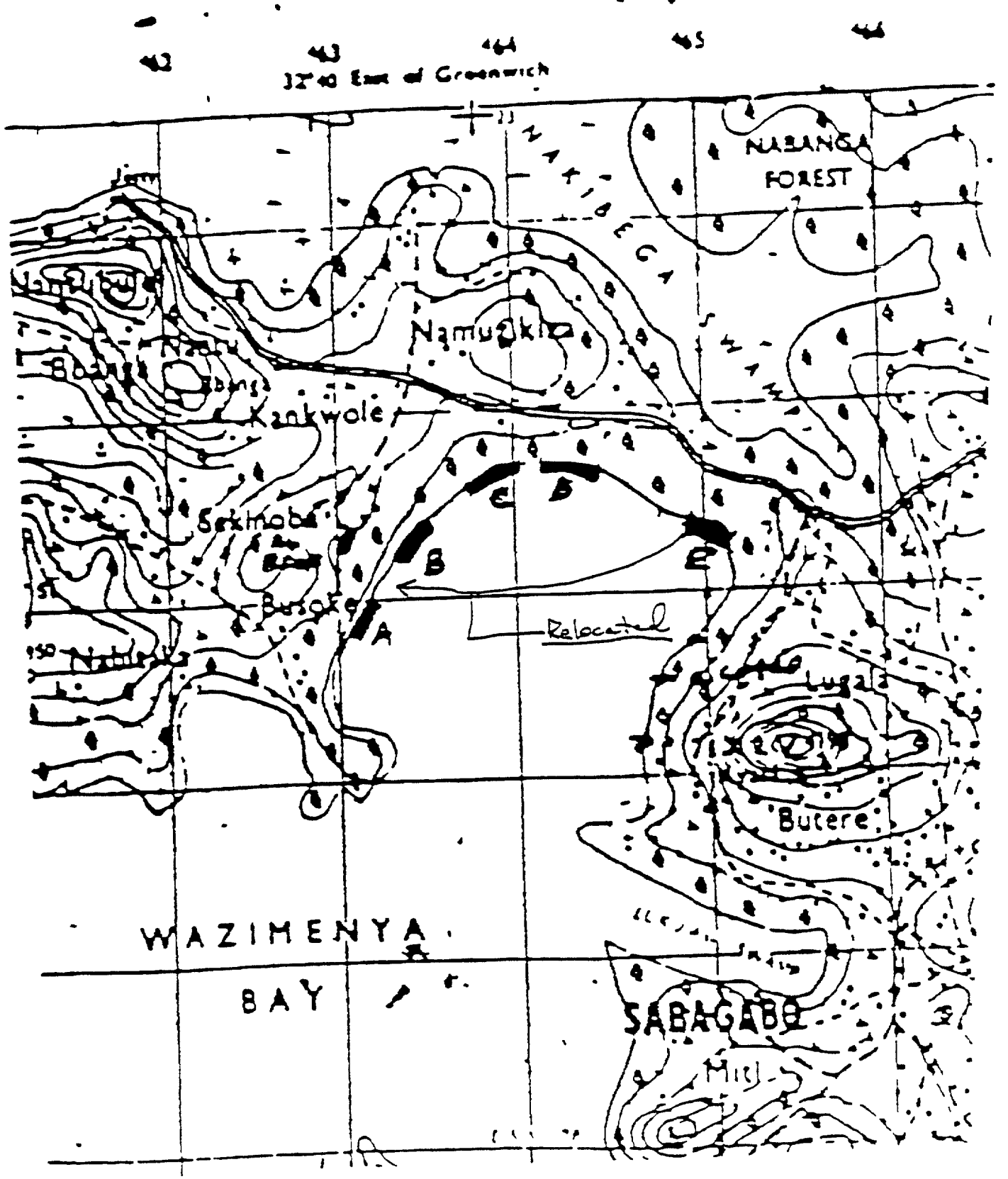
4 30pm **Wildlife Value of Aquatic Plants** - *Mr Carl L Terwilliger*

4 45pm **Fertilizer "Runoff" and Aquatic Weed Growth** - *Dr John L Cisar*

5 00pm **Adjourn**

6 00pm **Poolside Social** (Rolling Hills Hotel)

Site Map



In Lake Herbicide Trials (02-97)

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2 Memorandum of Understanding between AU and GoU

3 USAID Action Plan for the Environment/Emergency Water Hyacinth Control Program in Uganda - Grant Evaluation Scope of Work

4 Draft Environmental Impact Statement, Water Hyacinth Control Program, Preliminary Final Draft, prepared by AU and USAID - June 1997 Kampala Uganda

5 Strategies for Water Hyacinth Control - Report of a Panel of Experts Meeting 11 - 14 September, 1995 - Fort Lauderdale, Florida, USA - By FAO in collaboration with - University of Florida, Institute for Food and Agricultural Sciences, Rome, 1996

6 Proceedings of the International Water Hyacinth Consortium - World Bank, Washington DC, 18 - 19 March 1997 - Edited by E S Delfosse and N R Spencer

7 The Nile Basin, Aquatic Plant Management Society Constitution July, 1997