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

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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

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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 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 bureaucracy 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 lack 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 sent 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 correct 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

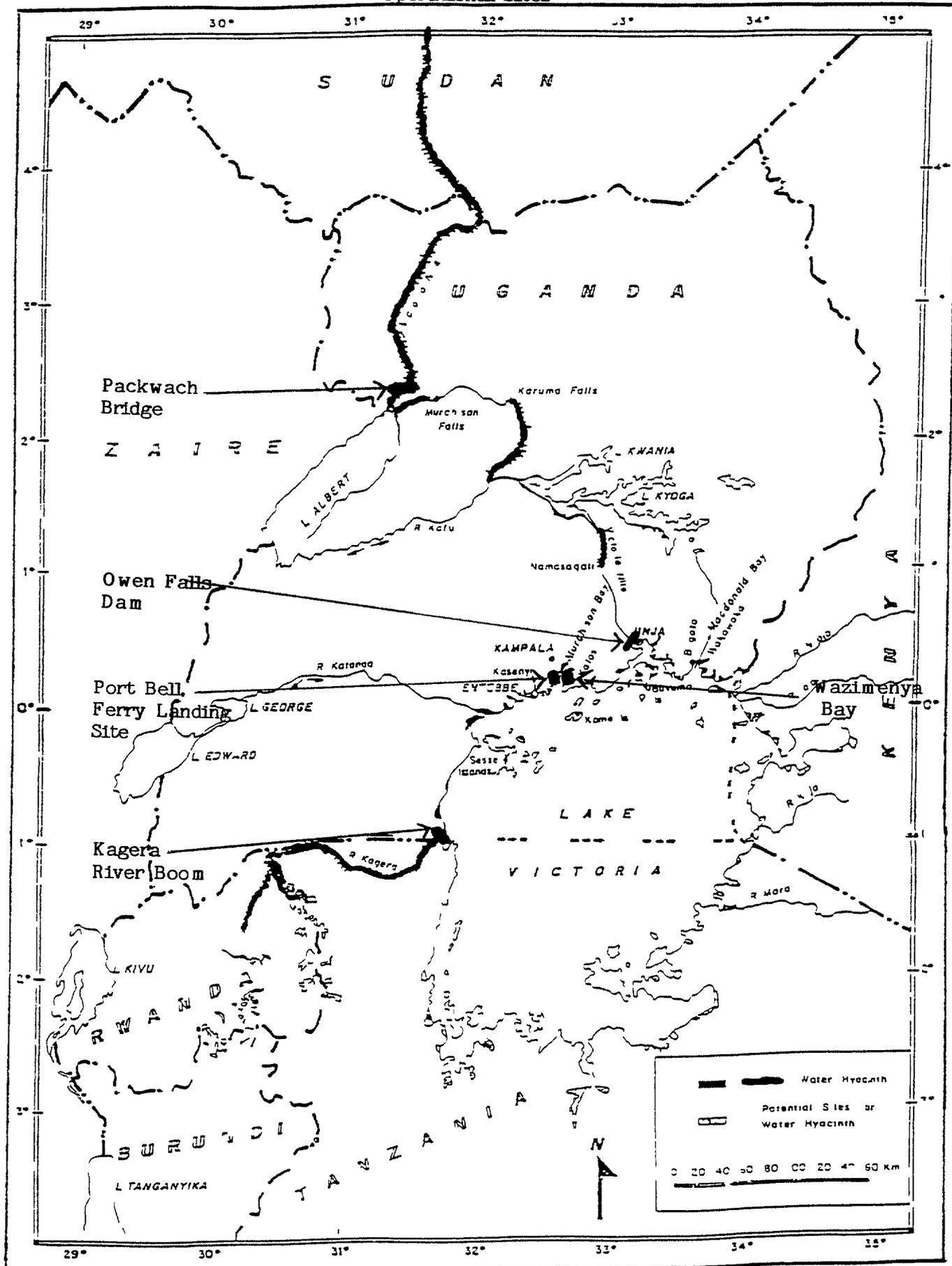


FIG. 1 General distribution of water hyacinth in Uganda

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 Aquatic 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	<u>7,280,900</u>

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 expected to increase through the use of the conveyor system. Fuel costs will increase as the conveyor is powered by a small generator. The conveyor 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 conveyor 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

Extract from AU Quarterly Report on Mechanical Removal
Methods for removing plants from Owens Falls Dam March-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

May-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 February 1997

NGABWEMUMANYI OKWAALA KWEKIDO KWALILA 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 ZITSESEBWAOKO GAVUMENTI OKUSOBOLA OKUFUGA OBUKUNYA 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 OKUSAAGO OMWOYO NTI AMALAGALA AGATESEBWAOKO OKUKOZESEBWA MUKUGEZESA KU NYANJA GEGA GLYPHOSATE NE 2 +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 GAKOZESEBWAOKO 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

OKUGEZESA KWAMALAGALA 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 TEMUTEKA 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 EJAKUSIMBWA MUKIKA KYAWAGULU KINO KIJA KUTUYAMBA OKUMALILIZA EKITABO EKIKWATA KUBUTONDE BWENSI

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Annex PS III
Program for the Public Sensitization

Annex PS III

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

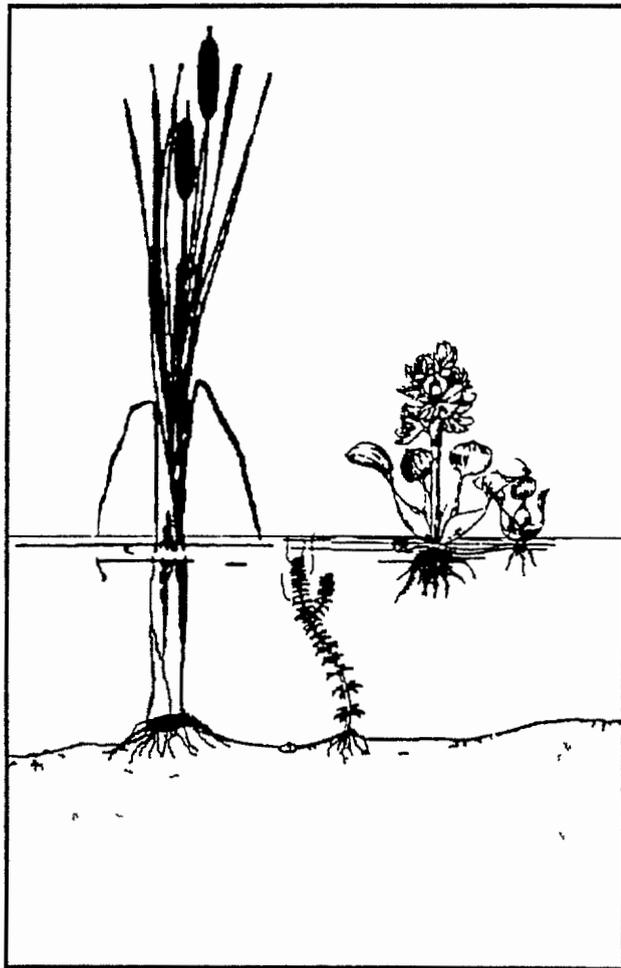
- 3 30 p m - MAAIF Official - Water Hyacinth Control in Uganda

- 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

Course Objective

The objective of the short course is to provide participants with initial training and an advanced research update in the following areas:

- aquatic weed and aquatic plant identification and biology
- aquatic weed control techniques including biological control, herbicide characteristics, herbicide application technology, and regulatory information
- aquatic plant culture and revegetation techniques, and regulatory information

Conference Structure

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

Media Training Workshop

The Director of Public Affairs with the Monsanto Company conducts an advance training session to enhance the skills of industry representatives in dealing with the media. Each participant is videotaped and receives one-on-one instruction to increase their credibility with both the media and their clients. Advance registration is required to participate and ENROLLMENT IS LIMITED to the first 10 participants for each session. As the morning and afternoon media training workshops are identical, you will only need to register for one.

Plant Identification Training Workshops

We will be conducting two concurrent workshops that will provide specific instruction on CORE and calibration to prepare you for certification exams or to serve as a refresher. Both workshops will be held Monday evening, 12 May from 6:00pm to 8:00pm at the Rolling Hills Hotel. We ask that you stop by the Conference Registration Office prior to the workshop to pick up course materials.

The CORE program will include such topics as pesticide label interpretation, personal protection equipment, pesticide safety, pesticide handling and container management techniques. The calibration training workshop will review calculation techniques, area measurements and equipment calibration techniques. You may want to bring 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 **Registration** (Davie A & Davie B) and
-8 00pm **Sale of Publications** (Hotel Lobby)

Commercial Pesticide Certification Training Workshops

- 7 00pm **Two Concurrent Workshops**
-9 00pm **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 **Registration** (Davie A & Davie B) and
-5 00pm **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 Houmire

- 3 45pm Regulatory Concerns for Aquatic Plant Nursery Managers - 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 Weinstier
- 5 20pm Adjourn
- 7 00pm Steak and Corn Cookout (Fort Lauderdale REC)

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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

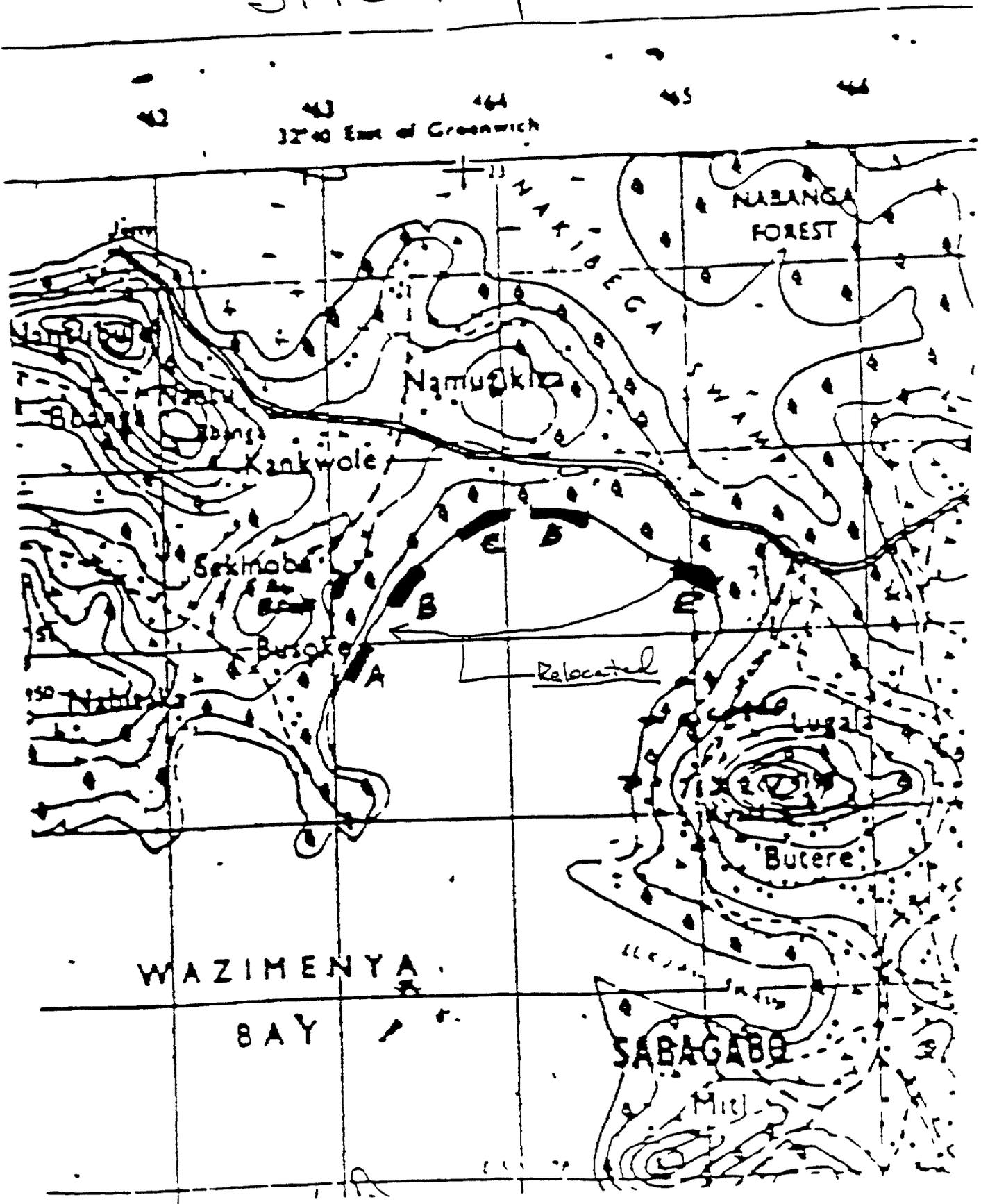
Technical and Professional Communications Opportunities

- 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 - MANSON*
- 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)

Bibliography

- 1 AU quarterly report to USAID for the period ending June 30, 1997 - July 24, 1997
- 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