BRAZIL INLAND FISHERIES

Sustainable Livelihoods and Conservation

CIDA project A-020911

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FOR THE PERIOD January 31 - September 30, 2003

Canadian International Development Agency
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Executive Summary

The current semi-annual report covers the first 9 months of activities of the CIDA project "Brazil Inland Fisheries: Sustainable Livelihoods and Conservation", including the first six months of the 2003-4 fiscal year. During this period, numerous activities were carried out, to a great extent addressing those planned for the first year in the initial proposal. These included a conference session on fish passage, participatory community meetings in Três Marias, a roundtable session at World Aquaculture 2003, a multi-stakeholder fisheries review meeting, organization and participation in Brazilian and international conferences, workshops and technical meetings, community and policing assessment missions by Canadian experts and Brazilian partners, a technical visit by a Canadian expert on invasive mussels, as well as project management and implementation missions (see report for full list).

These activities have generally served the double purpose of addressing the initially proposed function in the project as well as contributing to the revision of project strategies to adapt to current conditions.

A complementary proposal to support the transfer of co-management experience from the Brazilian Amazon to the project's focal area on the São Francisco River was successfully pursued with the IDRC, to start activities in January 2004.

A Canadian management and reporting protocol has been developed, and the Brazilian management and partnership organization is being established.

Progress towards expected outputs in the subprojects and crosscutting themes is approximately 11%, whereas progress towards long-term outcomes is approximately 8%.

Summary of Activities

See Appendix A for a summary of expected results and indicators for activities completed during the reporting period.

Sub-project 1 – Preparing communities for co-management

Activities Completed

- *Activity 1.3.1 – Community policing strategies.* May 26-27, 2003, Joachim Carolsfeld (WFT) and Raimundo Marques (Federation of Artesanal Fishers MG) visited the "Anjos do São Francisco" community policing initiative in Pirapora, guided by Captain Arley Ferreira of the Minas Gerais Military Police. They also met local NGOs and university staff of Pirapora interested in integrated policing and environmental stewardship. Subsequently, they held a complementary meeting with Barbara Johnsen of SEMEIA (Três Marias) and local police of Três Marias and worked on a strategy for the policing aspect of the project. Captain Arley Ferreira prepared a trip report of the mission (see Appendix C).

Participatory policing was also discussed at length at the project's fishermen's meeting to review the Fishing Decree, held in Três Marias at the start of August (see *Activity A.1*). This event, held at Centro de Apoio ao Pescador (CAP), also helped to set the institutional and collaborative stage for a broader and improved implementation of effective community policing.

- *Activity 1.2.1 – Transfer of Amazonian co-management experience.* A proposal to the International Development Research Centre (IDRC) was prepared, together with the Instituto Amazônico de Manejo Sustentável dos Recurso Ambientais (IARA) and the UFSCar entitled "Rumo á Co-Gestão da Pesca no Vale do São Francisco". This proposal compliments the CIDA project in paying Brazilian costs for the transfer of the Amazonian co-management experience to the São Francisco valley, funding a local coordinator for the CIDA project, and supporting research to monitor the effectiveness of this activity - including impacts on race and gender. The proposal was submitted in March 2003, and approved in September. Merle Faminow (the regional IDRC officer) visited Brazil in late August to meet with partners in the project, establish the relationships with the CIDA project, and confirm IDRC approval. The visit included UFSCar, SEMEIA and fishing organizations in Três Marias, and IARA and fishing organizations in Santarem (see Joachim Carolsfeld trip report in Appendix C). Merle was well received by partners in all locations, who provided cars, drivers, and tours. Raimundo Marques (President, Federation of Artesanal Fishers MG) accompanied Merle on the trip to the Amazon, which also provided an opportunity for initial networking between the São Francisco and Amazonian fishing communities and exchange of experiences with regard to co-management. Joachim Carolsfeld (WFT) accompanied Merle throughout his visit.

- *Activity 1.1 – Assessment and revision of co-management strategies.* Brian Harvey and Carmen Ross (WFT) attended a meeting of the West Coast Vancouver Island Aquatic Management Board September 10 – 11, 2003. The meeting provided a good opportunity to re-establish connections with the board, to improve networking with various groups working in the area and to create opportunities to involve the board in the project. The board is a leading Canadian example of a participatory, multi-stakeholder community-driven initiative dedicated to the use, protection and management of aquatic resources and may prove useful as an example for similar initiatives in Brazil. Carmen Ross (WFT) prepared a trip report of the meeting (see Appendix C).

- *Activity 1.1.1 – Technical review visit by Canadian co-management team*. Dr. Jutta Gutberlet (University of Victoria, Department of Geography) conducted a 3-week participatory evaluation of fishing community perceptions, status and needs in selected communities in the mid-upper and the lower São Francisco River from June 25 – July 14, 2003. During the mission she visited 11 different fishing communities and interviewed more than 30 community representatives. The survey was carried out based on participatory appreciative inquiry principles, and was designed to provide both training opportunities and venues for exchange of experiences in different methodologies. Cristiane Seixas (a recent Brazilian doctoral

candidate from the University of Manitoba with a thesis on Brazilian fisheries co-management), Ana Thé (UFSCar), Regina Cedeira (IARA) and Barbara Johnsen (CAP) thus participated in portions of the trip, and in the mid-upper river and Sineide Montenegro and Fátima de Sá (UFAL) participated in the visit of the lower river valley. Integration with policing and technical components of the project in Minas Gerias was achieved through a meeting at the beginning of the visit with fisheries managers (IEF, IBAMA, and Military Police) and Alexandre Godinho (UFMG). Throughout her trip in Minas Gerias, Dr. Gutberlet was supported by a car, driver and infrastructure of SEMEIA in Três Marias, and was also accompanied by Raimundo Marques (Federation of Artesanal Fishers, MG). The trip resulted in an updated socio-economic status report of the artesanal fishery in the target areas, including recommendations for priority interventions based on needs expressed by the communities (see Appendix C). In addition, networking between project partners and the fishing communities was enhanced, and the meeting with fisheries managers set the stage for a participatory review of fisheries regulations (see *Activity A.1*).

Outputs

- Capacity and willingness of fishing and other community members to participate in management discussions in a productive manner has been improved through the workshops conducted;
- The previously adversarial relationship between state regulators (IEF) and the professional fishermen has been improved;
- Networking between participatory policing initiatives in Pirapora and Três Marias was improved and relationships between policing and regulatory authorities and community members were strengthened. This will also allow for a less adversarial atmosphere and more productive interactions between the fishing community and those policing their activities;
- An institutional structure, IDRC funding, and collaborative network has been set up for making use of co-management experience of the Amazon in assisting the situation of the fishing communities of the São Francisco;
- Networking between facilitators and researchers of the co-management process has been increased, including a better definition of appropriate strategies for the project;

The percentage of project outputs achieved to date for Sub-project 1 is estimated to be 10%.

Outcomes

Activities have set the stage for desired outcomes of the project, but while the participatory evaluation of fisheries regulations was a substantial milestone towards communities prepared for co-management, it is too early to say that outcomes have been achieved. An estimate of how close we are to achieving the project outcomes in Sub-project 1 is 5%.

Sub-project 2 - Building sustainable livelihoods

Activities Completed

- *Activity 2.1.1 – Participatory assessment of community attributes, needs and development strategies*. Erika de Castro, of the University of British Columbia (Centre for Human Settlements), accompanied by Inês Mancuso (UFSCar), Barbara Johnsen (Secretária do Meio Ambiente de Três Marias/CAP) and Raimundo Marques (Federation of Artesanal Fishers MG), reviewed potential for developing alternative activities for family livelihoods (particularly for women) in Três Marias and Pirapora on September 18 – 19, 2003. Erika prepared a trip report of her visit (Appendix D).

- *Activity 2.3 – Building alternative livelihood options*. During a two-week project implementation mission to Brazil, May 22 – June 5, 2003, Brian Harvey conducted technical tours of hydroelectric facilities and tilapia net cage farms in Três Marias, Pirapora and Varzea de Marituba, assessed fishing community attitudes toward and interests in aquaculture and promoted linkages to on-going project activities on aquaculture as an alternative livelihood. Raimundo Marques (Federation of Artesanal Fishers MG) and Barbara Johnsen (Secretária do Meio Ambiente de Três Marias/CAP) accompanied Dr. Harvey during his visits to Três Marias and Pirapora, with car, driver and infrastructure support from the municipality of Três Marias. Drs. Sineide Montenegro and Fátima de Sá (UFAL) hosted his visit in the lower São Francisco.

- *Activity 2.3.1 – Aquaculture risks and development.* A roundtable session "Freshwater Aquaculture and the Environment: What's Next?" was organized and held at the World Aquaculture Conference 2003 in Salvador, Brazil on May 20th. Approximately 100 individuals, from many different countries, representing government, industry, fishing communities, NGOs and researchers attended the session. The session improved understanding of existing and potential environmental impacts of aquaculture in Brazil (with reference to experiences in Canada and the US), current aquaculture issues and policies in Brazil and possible management options. Session presentations and discussion will provide the basis for the development of recommendations for environmental protocols for low risk aquaculture development. The event included talks by artesanal fishing leaders from both the mid and lower São Francisco sections (Raimundo Marques, Noberto dos Santos and Antonio Toinho), which marked the first time that artesanal fishermen were present and spoke in these meetings. A conference report was written that includes a session agenda, an awareness pamphlet and roundtable session notes (see Appendix D).

Outputs

- Our picture of community attributes, needs and the appropriate development strategies has been filled out in relation to the kinds of sustainable livelihoods that are appropriate.

- The interest of fishing communities in the potential benefits from, and environmental risks associated with, freshwater aquaculture has been given prominence and the beginnings of a forum for resolution of social and biological problems has been created.

The percentage of achieved project outputs to date for Sub-project 2 is estimated to be 5%.

Outcomes

Activities have set the stage for desired outcomes of this sub-project, but it is too early to say that outcomes have been achieved. An estimate of how close we are to achieving the project outcomes in Sub-project 2 is 5%.

Sub-project 3 – Securing the fisheries resource

Activities Completed

- *Activity 3.7.3 – Workshop on fish passages*. A special session, "Fish Passage in Brazil", was convened at the annual meeting of the Brazilian Ichthyologists' Society (SBI) held in São Paulo, Brazil January 27 – 31, 2003. Approximately 300 Brazilians (including students, researchers and industry representatives), about 50% of which were women, participated in the session. The session improved understanding of fish passage issues in Brazil for participants and attendees, created a multilateral discussion of issues with productive and stimulating discussion of the current legal situation and improved networking with key stakeholders. Proceedings of the session were produced on CD. The CD includes a summary of the session and discussion, summaries, audio files and PowerPoint presentations of 8 presentations given at the session, as well as one paper prepared for the session (see Appendix E).

  Networking contacts re-established during the 2003 SBI annual meeting allowed for the production of a CD of a session “Effects of Dams on the Environment and Fish in Brazil” held by WFT during a previous meeting in São Leopoldo, Rio Grande do Sul, Brazil, January 7 – 12, 2001. This CD includes a summary of the session, a summary and audio recording of the session discussion, summaries and audio files of the 6 presentations given at the session, as well as PowerPoint presentations for 4 of those presentations. Both Portuguese and English versions of the CD were produced (see Appendix E).

- *Activity 3.4 - Reducing industry impact.* Joachim Carolsfeld (WFT), Gerd Marmulla (FAO) and Uwe Schultz (UNISINOS) participated in a 4-day technical visit to the new Itaipu fish passage (currently the largest in the world) and local environmental groups February 1 – 5, 2003. Together with Domingo Fernandez (Itaipu Binacional), 5 Itaipu engineers, 2 environmentalists and one recycling expert, the group evaluated and discussed current status of research on fish migration in fish passages, invasive mussel species, community collaboration and garbage recycling. All are issues pertinent to the São Francisco River situation, and are potential topics for community exchanges. The trip included a lecture by Uwe

Schultz (UNISINOS) given to 15 Itaipu employees, which included 10 women. The visit improved networking with partners in Southern Brazil (UNISINOS) and initiation of the development of a mitigative plan with Núcleo de Pesquisas em Limnologia, Ictiologia e Aqüicultura (Nupelia), the incorporation of plans for *Limnoperna* mussel control and the development of opportunities for community garbage management.

- *Activities 3.7.4 & 3.3.2 – Technical assistance in the design of fish passages and the implementation of stock assessment options*. Joachim Carolsfeld (WFT) participated in a 3-day technical visit to Nupelia February 6 – 8, 2003. The Nupelia group is a recognized leader in fisheries management in Brazil. Nupelia researchers and staff (including Angelo Agostinho, Luiz Gomez and Lisiane Hahn) guided the visit, with discussions on developing a monitoring program for the Itaipu fish passage and creating stronger collaborative ties for the improvement of fisheries management and assessment in the São Francisco River.

- *Activity 3.4.3 – Canadian assistance to implement solutions*. Marcia Divina Oliveira (EMBRAPA) and Eva Klassen (WFT) attended the "12th International Conference on Aquatic Invasive Species" June 7 – 15, 2003 in Windsor, Ontario. In addition to Marcia's presentation titled "Invasion of Golden Mussels, *Limnoperna fortunei*, in Pantanal Wetland, Brazil", attendance at the conference helped to improve and diversify understanding within the project of the impacts of aquatic invasive species and control options, as well as improving networking. The paper and results of Marcia's visit were also presented in a conference on Ballast Water control in Brazil, and at the industry workshop on *Limnoperna* in Belo Horizonte in September 2003 (see below). As a result of these activities, a collaboration has developed between Marcia and the CEMIG representative for mussel control (Monica Campos of CETEC in Belo Horizonte) which has recently received $R100,000 of research funding from the MMA. Both Marcia and Eva prepared trip reports of the conference (see Appendix E).

- *Activity 3.4.3– Canadian assistance to implement solutions*. Renata Claudi (RNT Consulting, Picton, Ont.) conducted a 10-day technical visit in Brazil September 14 – 23, 2003 to provide technical assistance in the assessment and management of invasive mussel fouling and the control of the spread of invasive aquatic species. During the visit she attended and presented a talk on these issues at the "Brazilian Association of Hydroelectric Companies (ABRAGE) 3rd Technical Meeting on the Golden Mussel," held in Belo Horizonte September 17 – 18, 2003 (see below). She also toured the Volta Grande and Itaipu power plants, and made suggestions for the prevention and management of mussel infestations, provided guidance for research efforts and helped CEMIG personnel plan the upcoming "ABRAGE 4th Technical Meeting on the Golden Mussel." Since this trip, a revised monitoring program based on Renata's suggestions has been implemented at the Volta Grande and São Simão hydrodams, and the MMA has been successfully lobbied to take a more active role in controlling mussel spread through the establishment of a multi-stakeholder working group, A German-Canadian company specializing in control of

zebra mussels participated in the 4th Technical meeting upon Renata's recommendation. Renata Claudi prepared a trip report of her visit (see Appendix E).

- *Activity 3.4.3 – Canadian assistance to implement solutions*. Maria Edith Rolla (CEMIG), Joachim Carolsfeld (WFT) and Renata Claudi (RNT Consulting) helped organize and participated in the "Brazilian Association of Hydroelectric Companies (ABARGE) 3rd Technical Meeting on the Golden Mussel" held in Belo Horizonte September 17 – 18, 2003. 47 Brazilians from a variety of stakeholder groups, including industry, government, universities and NGOs, participated in the meeting, which integrated the results of 2nd meeting with the South American meeting on golden mussel control and discussed topics such as preventative and corrective actions for industry, environmental impacts to natural ecosystems and strategies for controlling the spread of the species. The project's assistance to this meeting addressed one of CEMIG's key problems, and strengthened CEMIG's desire to participate in the CIDA project in other activities: new terms of agreement for a participatory partnership with UFSCar were drawn up, CEMIG provided assistance and a strong positive presence at the Aguas do Lago 2003 conference (see below), and negotiations were initiated to adjust the security zone at the Três Marias dam to better suit fishing and community interests. Maria Edith prepared a report of the meeting (see Appendix E).

- *Activity 3.6 – Improving water management practices*. Together with the Três Marias city hall and the Consórcio dos Municipios do Lago de Três Marias (COMLAGO) the "1st Conference of the Cities of the Três Marias Reservoir Region" was organized for August 7 – 8, 2003, with guest speaker and facilitation funded by the project (see Appendix E for conference programs and announcements). Community and government representative from 8 municipalities in the region participated in the conference with a total of about 200 participants. The conference was part of a series of assessment workshops sponsored by the Brazilian government - our project contributed a strong environmental component to the discussion and a facilitator to improve participatory outcomes. A range of topics was discussed and a list of resolutions was created, relating to the urban and cultural development, natural resource management, tourism and environmental improvement of the region. The conference improved community awareness of these issues at a regional level and provided an alternate participatory experience to participants to enhance multi-stakeholder involvement in the creation of community development initiatives (see also cross-cutting theme A). Results, together with those of "Aguas do Lago 2003" (see below), will contribute to the strategy for implementation of the CIDA project in this area.

- *Activity 3.6 – Improving water management practices*. Barbara Johnsen (Secretária do Meio Ambiente de Três Marias) organized the "Waters of the Lake 2003: Directions for Participatory Multi-user Management of the Três Marias Reservoir" (Seminário Águas do Lago 2003: Rumos para Gestão Participativa dos Usos Múltiplos do reservatório de Três Marias - MG) held in Três Marias September 11 – 12, 2003, with organization and funding assistance from the project. Participants in the events included community members, mayors and council members, user

groups, (CODEMA, COMLAGO, UNIMONTES, SEMAD, UFMG, and CEMIG) and federal and state regulators (OSN, ANEEL, MMA/SRH, ANA, CODEVASF, IGAM, COPASA). Presentations covered reservoir operation, energy generation, pollution, viability of tourism, irrigation and navigation and served to inform participants of each other's roles in water management. Participants were subsequently divided into facilitated thematic breakout groups to discuss these topics and identify strengths, conflicts, and needs and to develop strategies and a work plan for resolving these issues. These results will contribute significantly to updating the project's strategy on water management issues. Barbara Johnsen prepared a report on the workshop, which includes a seminar program, an outline of results, and two newspaper reports of the event (see Appendix E).

- *Activity 3.6 – Improving water management practices*. With project assistance, Silvia Freedman (President of the Pró-Comitê da Bacia Hidrográfica – SF04) and Ceiça Maria Correia (Communications Director, Três Marias) participated in the "5th National Meeting of Hydrographic Basin Committees" (V Encontro Nacional de Comitês de Bacias Hidrográficas) held in Aracaju, SE August 18 – 21, 2003. The conference provided the opportunity for participants to improve networking, to assess the implementation process for basin-specific decentralized water management plans (i.e. the basin committees) and review implementation tools, experiences, and problems of established basin committees. Participants were also informed of the government's decision to revitalize plans to divert a portion of the São Francisco into the Northeast. The expressed government policy is that Basin Committees of the São Francisco will not have a say in these diversion plans, but will be responsible for revitalizing the river itself so it can withstand the impacts of the project. Both Silvia and Ceiça prepared trip reports of the meeting (see Appendix E).

Outputs

- Improved understanding and networking amongst Brazilian researchers and user groups on the topic of fish passes – both in terms of structural and biological options and in legal requirements;

- Improved networking and working relationships with both Itaipu and Nupelia – important resource institutions for future work in the São Francisco region;

- Improved understanding and networking amongst hydroelectric companies, the government, and a Canadian consultant on the issue of invasive mussel control mechanisms and strategies – both for control of excess growth (fouling) on structures and for control of further geographical expansion.

- Improved industry support of the CIDA project by CEMIG and other hydroelectric companies;

- Improved community understanding of how water management currently works in Três Marias, including a better understanding of how to work within these criteria and how to modify them if need be;

- Improved understanding on the part of the regulators of the communities' concerns;

- Improved community contacts with water regulators and between the water regulation organizations;

- Community members in Três Marias with improved capacity to conduct participatory meetings with concrete outcomes (15 with preliminary training in workshop facilitation – including 13 women).

The percentage of project outputs achieved to date for Sub-project 3 is estimated to be 15%.

Outcomes

Activities have set the stage for desired outcomes of this sub-project, but have not resulted yet in their measurable achievement. However, the improved engagement by CEMIG in the project activities is a significant achievement that should contribute to the outcomes of a variety of project components. The participatory baseline for water management established by the events sponsored by the project will likely contribute significantly to more effective and relevant local management (as well as contributing to the relevancy of the project's activities). The project also appears to have significantly influenced policies that may help stop the spread of the invasive mussel *Limnoperna*, thus possibly contributing to averting a new irreversible stress to the São Francisco River system that otherwise is bound to show up within a year or two. We estimate that we are 12% towards achieving the project outcomes proposed for Sub-project 3.

Cross-cutting Theme A – Assist the development of policies for sustainable fisheries with community participation

Activities Completed

- *Activity A.1 - Multi-stakeholder fisheries meeting*. The project organized a government-sanctioned meeting of artesanal fishing leaders to review a proposed new decree for the state fisheries law. The meeting was held at CAP in Três Marias, August 2 – 4, 2003. Approximately 70 fishing federation, colony, and association leaders (including women), and representatives of NGOs, UFSCar, IEF, local government, the military police, and WFT attended the meeting. During the meeting the entire draft decree was reviewed, discussed, revised and signed with the help of a professional facilitator (Margarita Ramos) contracted by the CIDA project. Decree revisions that came out of the meeting include removal of all of the key gear restrictions on artisanal fisheries and provisions for the participation of fishermen in the formulation of local laws ("portarias"), policing, stock assessment and fisheries research. In addition to the revised decree, which is currently waiting for approval, immediate benefits of the meeting include vastly improved relationship between IEF and artisanal fishermen, removal of a controversial "portaria" prohibiting a type

of drift gill-net that is essential to the fishery in some sections of the river, and a draft agreement between CEMIG, the fishing federation and the city of Três Marias to reduce the controversial security zone below the dam to a mutually agreed upon distance. A report of the meeting was prepared, which includes an awareness flyer, a list of participants, the revision of the draft fisheries decree signed by all stakeholders, and a "portaria" promised in the meeting that lifts the prohibition of "caceia" nets (see Appendix F). CAP, SEMEIA (Três Marias), and the Artesanal Fishermens' Federation of MG provided logistic support for the meeting.

- *Activity A.2 - Training workshops*. Margarita Ramos gave a training workshop on participatory facilitation at SEMEIA in Três Marias September 13 – 16, 2003 to members of local NGOs, health workers, teachers, public administrators and youth (from a fishing family) – most of which were women. See Appendix F for a report on the workshop and the workshop certificate. Course participants subsequently facilitated, during the reporting period, breakout groups at the *Aguas do Lago 2003* conference and the *1st Municipal Youth Conference on the Environment* held in Três Marias schools and presented environmental education to 1,000 students for a municipal CAP-CEMIG/ANEEL project.

- *Activity A.3 – Participation in international conferences*. Carmen Ross (WFT) attended the "American Fisheries Society 133rd Annual General Meeting" August 10 – 14, 2003 held in Quebec City. Support of the participation by Alexandre Godinho (UFMG) was also planned, but at the last minute he was not able to go. Attendance at the conference helped to improve understanding within the project of current research on invasive species, aquatic protected areas, aquaculture and stocking, globalization, stock assessment, habitat restoration and fisheries conservation and management. Carmen prepared a trip report of the meeting (see Appendix F).

- *Activity A.3 - Participation in conferences.* Dr. Maria Inês Mancuso (UFSCar project coordinator) participated in a conference in São Paulo, "Papel e Inserção do Terceiro Setor no Processo de Construção e Desenvolvimento da Ciência, Tecnologia e Inovação [Role and Point of Entry for the Third Sector in the Process of Construction and Developemnt of Science, Technology, and Innovation]", July 30 - Aug.1, 2003. This conference served to provide linkages to several relevant Brazilian non-profit organizations.

Outputs

- A mechanism for participatory development of fishing legislation was created by the Fishing Decree review meeting, including increased experience on the part of the fishermen in negotiating their positions and an improved relationship between regulators and these fishermen;

- 15 community members in Três Marias have improved their capacity for participatory facilitation through a specific course. This capacity was demonstrated by some of these participants in 3 subsequent events;

The percentage of project outputs achieved to date for Cross-cutting Theme A is estimated to be 15%.

Outcomes

No sustainable outcomes are yet evident in this sub-theme, though sub-projects 2 and 3 have contributed considerably to the progress towards community-based participatory processes. Advances can be estimated as 10% of the final desired outcomes.

Cross-cutting Theme B – Public awareness and education

Activities Completed

- *Activity B.1 & B.3 – Activities for riverine community and broader Brazilian targets.* During a two-week project implementation mission to Brazil, May 22 – June 5, 2003, Brian Harvey conducted community consultations on awareness needs with CAP, fisheries federation representatives and fishing families in Três Marias, Pirapora, Barra de Guaicui and Penedo and gathered logistical information, possible film-shooting locations and interest in a public awareness film on fisheries in the São Francisco River.

- *Activity B.1.4 – Facilitate development of an interpretive radio or television programme on fisheries issues.* Ceiça Maria Corriea (representative of Federation of Professional Artisanal Fisherman of MG) and Zanco Melo (Pirapora Fishing Colony) participated in a radio programming training session at the 4th Community Reporters Workshop in Santarém July 31 – August 11, 2003. Attendees were able to develop a range of skills and knowledge in the production of community radio programs and in radio journalism, including communications theory, journalism ethics, recording and editing radio programs and the use of radio equipment. Participation was supported by the Pro-Varzea project, and will be followed up by further training with IARA during their activities in the project in early 2004. Conversations have already been held with Community radio stations in Três Marias, Pirapora, and Buritís to host eventual fisheries-related programming.

- *Activity B.1 – Activities for a riverine community target.* The project was profiled by various project partners in a variety of media, including newsletters and local newspapers (see Appendix F for a few examples).

- *Activity B.1 – Activities for a riverine community target.* The project was presented by Joachim Carolsfeld (WFT) and Barbara Johnsen (CAP and SEMEIA) at a meeting of the COMLAGO consortium of municipalities around the Três Marias reservoir, February 18 – 20, 2003. The meeting received local press coverage (see Appendix F).

- *Activity A.3 – Participation in international conferences*. The project supported the participation of Inês Mancuso (UFSCar) at the First World Environmental Education conference held in Espinho, Portugal from May 20 – 24, 2003 (see Appendix F).

Outputs

- Improved vision of an appropriate awareness strategy amongst project partners, including refinement of targets;
- Improved capacity of selected community members to participate in radio programming;
- Improved vision in project management of environmental education strategies
- Improved public awareness of project at local, regional and national levels.

The percentage of project outputs achieved to date for Cross-cutting Theme B is estimated to be 10%.

Outcomes

No sustainable outcomes are yet evident in this sub-theme, though advances can be estimated as 5% of the final desired outcomes.

Cross-cutting Theme C - Creating opportunities for women, youth and family

Activities Completed

- *Activity C.1 – Workshop component on women's needs.* Erika de Castro's technical visit in September (see Activity 2.1) with Inês Mancuso (UFSCar) provided initial recommendations on appropriate activities to be carried out to address requirements for women in Três Marias and Pirapora (see Appendix D for Erika's trip). In addition, a strategy was built into the co-management transfer activity for UFSCar to research and address gender and race issues in fishing families, reviewed during the visit by Merle Faminow (see Activity 1.2.1).
- *Activity C.3 – Youth workshop to identify needs and strategies*. Dulcineia Mônica de Jesus (Três Marias Prefeitura), Adriana Aragão (Três Marias Prefeitura) and Milton Odair da Cruz (Três Marias fisherman/guide) participated in the "Municipal Conference of the Youth of Santo André" September 26 – 28, 2003. The conference allowed the participants, through a series of thematic mini-conferences on work, health and environment, social and political organization and participation, socio-cultural expressions and diversity, cultures of peace and social stigmata imposed on youth, information and digital inclusion and education, to be directly involved in the construction of proposals for public policies to address the needs of the youth of Sto. Andre. A report was prepared for the conference, which includes a summary of the conference and trip reports prepared by Dulcineia Mônica de Jesus, Adriana Aragão and Milton Odair da Cruz (see Appendix F).

Outputs

- Improved vision amongst project partners of appropriate strategies to address gender, race, and youth issues.

The percentage of project outputs achieved to date for Cross-cutting Theme C is estimated to be 10%.

Outcomes

The percentage of progress towards project outcomes to date for Cross-cutting Theme C is estimated to be 10%.

Management

Activities Completed

- Joachim Carolsfeld (WFT) conducted a one-month technical/project development mission to Brazil January 26 – February 25, 2003. During this visit he conducted numerous project and activity planning and networking meetings with various project partners, contributed to the setting up of a Brazilian management structure for the project, pursued Brazilian counterpart funding, assisted the development of a parallel project proposal for funding through IDRC, evaluated the status of project themes and the roles of project partners and helped to develop strategies to accomplish those themes.

- Maria Inês Mancuso (UFSCar) established the continuing interest of UFSCar to coordinate the CIDA project, and developed a strategy to do so. This involved numerous meetings at UFSCar from Nov. 2002 through the entire reporting period, as well as intense discussions and negotiations with WFT, the Federation of Artesanal Fishermen, IDRC, CIDA, ABC, MMA, and other project partners. She also hosted all WFT management trips to Brazil.

- Brian Harvey (WFT) conducted a two-week project implementation mission to Brazil May 22 – June 5, 2003. During the visit he met with numerous project partners concerning project implementation and management.

- Carmen Ross (WFT) participated in three-weeks of intensive language training in Maceío, Brazil May 10 – June 01, 2003.

- Joachim Carolsfeld (WFT) conducted a three-week project management and technical mission to Brazil May 10 – June 01, 2003. During this visit he conducted a number of project management meetings with various project partners, generated discussion and decisions relating to project management structure in Brazil, and conducted assessment, planning and technical visits for upcoming project activities, including policing, fisheries reviews and fry-tagging.

- A Project Implementation Phase Report for the period February to May 2003 and a 2003/2004 Annual Work Plan were prepared by WFT and UFSCar, with input from other principal Brazilian project partners, and submitted to CIDA. The reports were also submitted in Portuguese to ABC by UFSCar.

- Joachim Carolsfeld (WFT) conducted a three-week project management and implementation mission to Brazil July 30 – September 23, 2003. During this visit he conducted a number of project management meetings with various project partners, participated in the organization and implementation of 5 workshops and conferences and conducted two technical review visits with Canadian experts (see Appendix G).

- A revised proposal for counterpart funding was prepared by Maria Inês Mancuso (UFSCar), Joachim Carolsfeld (WFT) and Raimundo Marques (Federação dos Pescadores Artesenais MG) and submitted to Dr. Maurício Cortines Laxe (Ministério do Meio Ambiente - MMA) for approval September 14, 2003 (see Appendix G). This was followed up by a visit to MMA's Executive Assistant (Dr. Basileu) together with the UFSCar rector, at which time the funding was again approved in principal. However, due to a variety of circumstances, this has not yet materialized.

- Dr. Maria Inês Mancuso (UFSCar), Joachim Carolsfeld (WFT), and Antonio Marcus (UFRJ) met with the a representative for the Petrobras vice-president in charge of that company's program "Fome Zero" (upon an invitation arranged by Antonio Marcus). The CIDA project was presented and potential partnerships and funding were discussed, with a very positive reception.

- A pamphlet describing the project and its objectives was produced by WFT for use by project partners to promote the project locally and inform stakeholder of the goals and focus of the project (see Appendix G).

World Fisheries Trust developed a Canadian management structure during the reporting period (see report for the Project Implementation Period), including narrative and financial reporting structures and contingency plans to reduce reliance on single staff members.

However, the project took quite a long time to be approved, which has led to several implementation delays on the Brazilian side. The focal Brazilian partner (UFSCar) unfortunately lost a key person for the project, which led to a considerable delay for re-organization and identification of a new management team, which, in turn, led to a long delay in getting an agreement signed between the ABC and the UFSCar. While the process has considerably strengthened some key partnerships (e.g. the Federation of Artesanal Fishermen, MG and the Policia Militar, MG), many other proposed partnerships are no longer well defined, including some of the earlier commitments for counterpart funding. These issues are being pursued and gradually becoming resolved.

Outputs:

- Considerable learning and improved understanding of management issues of the project by WFT, UFSCar, and the Federation of Artesanal Fishermen MG;

- Strengthened management teams and structures that are less reliant on single people;

- Strengthened partnerships within the project;

- Increased expression of good ownership and continuing support of the project by local Brazilian partners (see CAP manifesto, Appendix G).

Outcomes:

While not well identified in the project's proposal, an appropriate and very important outcome of management activities is appropriate institution building amongst all partners so that everyone can carry out effective, participatory, multi-lateral, and multi-disciplinary projects of this kind with ease. In many ways, this is the area of the project that has, so far, received the most intense attention and effort. An estimate of how far we have moved towards this goal is 25%.

Project Spin-Offs

WFT has been approached by the United Nations Environment Program (UNEP) to assist in development of a medium-sized GEF project on increasing developing country awareness of ecosystem-based fisheries management. There is excellent potential to link our participation in this project to planned activities in the CIDA project, particularly in the area of participatory fisheries management. Essentially we would be able to add value to the CIDA activities by using additional UNEP funding to increase attendance at workshops and increase the spread of results. Negotiations with UNEP and GEF are ongoing.

Through World Bank contacts we have learned of significant GEF investment in riparian restoration in São Paulo State. There is potential to link Brazilian partner high interest in restoration with this project.

Collaboration with the GEF project in the São Francisco basin was promoted in a meeting in Belo Horizonte, and was favourably received, but has not yet come to fruition.

A strong relationship with the new Secretaria Especial de Pesca e Aquicultura is evolving through several visits both in Brasilia and Belo Horizonte.

Variance of Activities Planned vs. Carried Out

Establishing a Brazilian management structure for the project and the confirmation of Brazilian counterpart funding have both been considerably delayed. Nevertheless, the proposed activity schedule has been largely adhered to, generally using the events opportunistically as venues to better define project implementation strategies. A few planned activities were not carried out (e.g. Brazilian participation in the AFS conference, participation in a conference on the use of fish hatcheries, value-added technical review trip). Some unexpected opportunities were capitalized on to address areas of the project in manners different than originally proposed (e.g. Water Management and the fisherman's workshop to review the fishing law).

Whereas overall counterpart funding that was initially promised has been slow in materializing, most partners active in these early portions have been very good about in-kind counterpart contributions. SEMEIA and CAP, of the Três Marias municipality, have been particularly good with the provision of infrastructure and logistic support for all activities in the mid-upper portion

of the São Francisco, as well as providing very important personalized lobbying support in both state and federal governments.

Variance of Expenditure Forecasted vs. Actual

No significant variance (see Quarterly Financial Report for period October-December 2003). The project is slightly under-spent at this point.

Problems and Difficulties

Linkage with the IDRC-supported research project on development of participatory fisheries accords (now funded and administered by UFSCar and IARA) was more time-consuming than anticipated, but will now also provide us with an executive secretary in Brazil. Establishing a Brazilian management structure and getting the CIDA project signed by ABC and UFSCar have also been quite delayed for various reasons, and counterpart funding promised from the MMA, while re-confirmed, has not yet arrived. However, all of these issues are slowly being resolved.

Report on Gender Equality Strategy

The projects remains committed, on both the Canadian and Brazilian sides, to the improved realization of equality for women in our project and the target groups. Most activities to date have had 50% or more female participants, and women are well represented in the Brazilian management team. However, as numbers of participating women are only one preliminary level of involvement, the project is also committed to developing a more wide-ranging strategy. In developing this strategy, we are concerned about creating sustainable improvements of gender equality in a fashion that is appropriate to the realities of the fishing families, and we feel should be guided largely by our female Brazilian partners on this issue. Our initial baseline evaluation and Erika's field review during the current reporting period have not yet resulted in an adequate strategy (other than the promotion of participation of women in all activities and promoting gender equality whenever possible). We will thus seek out further input on the gender question during our upcoming technical visit in Canada and have included it within UFSCar's survey work for the IDRC project. A more specific gender strategy will be developed out of these results.

Youth Initiatives

We are also concerned about having sustainable and appropriate positive impacts on youth with our project. As this will require both good background work and a commitment of counterpart funding to carry on any intiatives we may trigger, a youth conference was only proposed for the second year of the project. Initial background work has been started during the current reporting period, with the opportunistic participation of some youths and youth representatives at the Youth Conference in Sto. Andre (not planned in project originally). This experience, together with results of UFSCar's highly relevant research work with the IDRC project, will allow us to better develop the project's strategy to improve the life of youth in the target communities.

Indicators

Progress on establishing baselines for indicators is slow, particularly for the social indicators that will require participatory definition and monitoring of a variety of people in the community. The project is supporting the publication of existing baseline data, which will help, and interaction with the Outcome Mapping approach that will be used with the related IDRC project is likely to create a very informative indicator matrix.

Key Lessons Learned During Reporting Period

Cost-effectiveness: The project is slightly under-spent in the first year, though we feel that activities and generation of outputs is more-or-less on track, despite operating with limited in-kind cash. We have achieved excellent cost-effectiveness by taking advantage of opportunities to link events, and by "piggy-backing" on events organized by others. Networking for conflict resolution and a greater participatory nature of resource and project management has been achieved economically through ensuring a diverse composition of participants in technical visits and activities. We will also start making use of resources of other partners, for example the very broad global Internet awareness network of the Vancouver Aquarium.

Relevance of results: The political timing for the project has been relatively good, as the new Brazilian government is just setting policies that are very compatible with project goals. International initiatives with holistic and participatory fisheries and watershed management are also progressing rapidly in parallel, and are providing opportunity for powerful synergies (such as the opportunity to assist UNEP in promoting ecosystem-based management). The São Francisco basin is presently both a national and international focus: nationally because of the controversial water diversion plans, and internationally as a "benchmark river basin" for the CBD- sponsored River Basin Initiative.

Sustainability of results: It's still too early to speak of lessons learned in sustainability, although the partners believe that the approach taken toward technology transfer (a mentored, facilitated approach rather than just transfer) is already contributing to the creation of very effective in-country "teams" whose members represent all stakeholders rather than one or two. Institution-building is a big part of this process, and is likely to be very important for our project.

Partnership: The main lesson learned is the need to not only establish partnerships, but also to utilize those partnerships to their fullest potential (for example, the full potential of the partnership with IBAMA is not being realised, whereas the partnership with CAP/SEMEIA has produced many unexpected benefits). Institutional and personal conflicts can limit such partnerships. Our strategy has been to create teams that include all partners (ideally conflicting ones) and build personal relationships between them that can contribute to institutional accord and carry forward beyond the period of the project. We believe this is the only way to ensure sustainability.

Appropriateness of design: The multi-disciplinary and cross-institutional design of the project is generally holding up well. The synergies and new partnerships fostered by this approach are showing great promise in terms of new, significant impacts. Many partners are not yet used to this multi-disciplinary approach and conciliatory partnerships, but progress is being made. A

clear strategy for dealing with the full extent of proposed partnerships is also not yet in place, but the multi-disciplinary design of the project has helped considerably in getting the project approved and is developing. Establishing a management structure has taken most of Year 1, and is still hampered by lack of a promised financial contribution from MMA. Nevertheless, all partners are making significant in-kind contributions (including Canadian partners).

Conflict management: As we had expected, conflicts are wide-spread, in and around both our project and in "target" groups. We had initially proposed to build an institutionalized conflict resolution mechanism for the project, together with input from UVic's Conflict Resolution Center. However, so far we have not yet been able to pull the partners together enough for such a development and we have realised that the conflicts are not readily resolved in a sustainable fashion with point-source interventions. Thus, we have adopted more of a continuous conflict management strategy, lead primarily by WFT (with pointers from the Conflict Resolution Center), but also with substantial input from a variety of Brazilian individuals. For example, the participatory fisheries and water management meetings were designed on principles of the Harvard Negotiation Project, with substantial input from the facilitator, Margarita Ramos, and also served to give participants experience in conflict management. Conflict management and resolution were also topics addressed in Ms. Ramos' training course in Três Marias. We plan to continue to build experience and capacity in conflict management throughout the activities of the project.

Informed and timely action: Long-term visits of WFT staff to Brazil have resulted in highly effective use of opportunities to increase project reach (for example, the fishermen's accord and resulting Decreto).

Areas Requiring CIDA Action or Approval in Near Future

Selection of a project intern may necessitate CIDA approvals, depending on the funding source used by the project, as may assistance with securing the MMA funding.

Upcoming Missions To and From Brazil

Joachim Carolsfeld and Brian Harvey (WFT): Transfer of radiotagging technology, project management meetings, participation in social survey and awareness. January - February 2004.

Karl English and Bill Koski (LGL Environmental Systems Ltd.): Transfer of radiotagging technology. January 2004

Michael Shawyer (Memorial University of Newfoundland). Technical visit to Três Marias regarding adding value to fishing activities. Approx. March 2004.

Lessons Learned Symposium

Community Policing review trip to Canada, integrated with other community aspects

APPENDIX A – EXPECTED RESULTS AND INDICATORS FOR ACTIVITIES CONDUCTED DURING THE REPORTING PERIOD

Subproject/theme *Component* Activity	**Result**	**Indicators** (disagregg. by gender & societal function)
1. Preparing communities for co-management		
1.1 Assessment and revision of co-management strategies		
1.1.1 Technical review visit by Canadian co-management team	Status report and strategy; enhanced networking	Variety of Brazilian representatives involved in review; new policy components (project & government)
1.2 Adaptation and transfer of the Amazonian fisheries co-management experience to the Sao Francisco River		
1.2.1 Transfer of Amazon experience to Sao Francisco River (IARA)	Implementation of co-management capacity in pilot community; transfer package developed	Understanding & implementation of co-management elements in fishing community; co-management support elements
1.3 Assessment and implementation of community policing strategies		
1.3.1 Technical visit to review Brazilian situation	Strategy plan for project; policy suggestions for Brazil; networking initiated	Number suggested actions; number policy developments; number new contacts
2. Building sustainable livelihoods		
2.1 Participatory assessment of community attributes, needs and development strategies		
2.1.1 Assessment and strategy workshops (UBC - Erika)	Strategy plan for project; community awareness; increased networking of resource groups	Number suggested actions; number new opportunities created
2.3 Building alternative livelihood options		
2.3.1 Conference session on aquaculture risks and development	Improved policies and understanding of low-risk aquaculture development	Number new policies; number new development programs to reduce aquaculture risks
3. Securing the fisheries resource		
3.3 Improving stock assessment capabilities		
3.3.2 Canadian assistance for implementing stock assessment options	as above	as above
3.4 Reducing industry impact		
3.4.3 Canadian assistance to implement solutions	as above	as above
3.6 Improving water management practices		
3.6.2 Workshop to review water management models	Diversification of water management protocols in Brazil; community awareness; networking	Number participants; number new policies; level of community awareness
3.7 Improving habitat		
3.7.3 Workshop on fish passages	Improved understanding of fish passages in tropical waters; strategies developed; networking	Number participants; number reports, new policies & studies on fish passage effectiveness
3.7.4 Technical assistance in the design of fish passages	as above	Improved understanding of fish passages in tropical waters; number of strategies developed; number of new network connections
Cross-cutting A. Assisting the development of policies for sustainable fisheries with community participation		
A.1 Multi-stakeholder fisheries meeting	Improved cross-societal communication & multilateral fisheries agreements; networking	Number new policies; diversity of participants
A.2 ANA training workshops for water basins	Improved capacity in community to participate in multi-stakeholder meetings; networking	Number participants in workshops; number new policies developed
A.3 Participation in international conferences	Improved & diversified Brazilian capacity to pursue fisheries co-management and allied issues; networking	Number participants; number new policy & strategy developments

Subproject/theme *Component* Activity	**Result**	**Indicators** (disagregg. by gender & societal function)
Cross-cutting B. Public awareness and education		
B.1 Activities for a riverine community target		
B.1.4 Facilitate development of an interpretative radio or television program on fisheries issues (IARA)	Improved public awareness of Brazilian fisheries issues in Brazil	Number of contributions; level of public awareness
B.2 Activities for a broader Brazilian target		
B.2.4 Contribute to locally produced television shows on fisheries issues	Improved public awareness of Brazilian fisheries issues in Brazil	Number of contributions; level of public awareness
B.3 Activities for a Canadian/international target		
B.3.1 Promote television and print coverage of the project in Canada	Improved public awareness of Brazilian fisheries issues in Canada	as above
Cross-cutting C. Creating opportunities for women, youth and family		
C.1 Workshop component on women's needs	Opportunities for women in all project activities	Number of women participating and getting returns from project
C.2 Brazilian gender specialist in Canada	Increased Brazilian capacity to build opportunities for women at all societal levels	Number of women participating and getting returns from project; number gender-specific initiatives developed
C.3 Youth workshop identifying needs & strategies	Develop strategies to increase opportunities for youth in fishing communities	Number participants; number initiatives identified & implemented; number new opportunities
C.4 Assessment of educational strategies (UBC & Esqimalt High)	Strategic plan for incorporating fisheries in school programs	Number of curricula with fishing content
D. Communication		
D.1 Project website	Communication and feedback between project participants	Number of "hits" on website; number feedback comments
D.2 Project newsletter	as above	Number of newsletters distributed; number feedback comments
D.3 Creation of other publicity material for the project	as above	Number of feedback comments
E. Management		
E.1 Project organization meetings	Effective project administration, including conflict resolution	Annual and individual event reports; feedback surveys of participants
E.2 Consultative council meetings	Multi-stakeholder feedback to ensure pertinence and maximum effectiveness of project activities	Adaptive modifications in project strategies

APPENDIX B – SCHEDULE OF ACTIVITIES FOR NEXT REPORTING PERIOD

Subproject/theme *Component* Activity	Location		**2003** Quarter 3			**2004** Quarter 4		
	Brazil	Can	Oct	Nov	Dec	Jan	Feb	March
1. Preparing communities for co-management								
1.1 Assessment and revision of co-management strategies								
1.1.4 Identify and resolve user group conflicts	X		X	X				
1.2 Adaptation and transfer of the Amazonian fisheries co-management experience to the Sao Francisco River								
1.2.1 Transfer of Amazon experience to Sao Francisco River (IARA)	X		X	X	X	X		
1.2.2 Canadian fisheries biologist (set up office in Três Marias)	X		X					
1.2.3 UFScar monitoring program	X		X	X	X			
1.3 Assessment and implementation of community policing strategies								
1.3.1 Technical visit to review Brazilian situation	X					X		
1.3.3 Technical visit to review Canadian options		X	X					
2. Building sustainable livelihoods								
2.1 Participatory assessment of community attributes, needs and development strategies								
2.1.2 Technical training to evaluate and improve situation	X				X	X		
2.1.3 Identify or set-up community groups to start considering the situation in the SF	X		X	X	X	X	X	
2.2 Building community capacity								
2.2.1 Canadian sociologist	X					X	X	
2.2.2 Community visit to Canada for livelihood alternatives		X	X					
2.2.3 Community interchange within Brazil	X					X	X	
2.2.4 Network building and strengthening of NGOs and municipalities	X		X			X	X	X
2.3 Building alternative livelihood options								
2.3.3 Canadian mission (value added mission - MUN)		X				X	X	
2.3.5 Participatory review of alternate activities	X				X	X		
2.3.6 Alternate activity intro week	X				X	X		
3. Securing the fisheries resource								
3.1 Improving fisheries management through DNA training								
3.1.2 Brazilian in Canada to train on use of DNA		X	X	X				
3.2 Improving ability to study and understand Brazilian migratory fish behaviour								
3.2.2 Canadian radiotelemetry assistance in Brazil	X		X	X				

Subproject/theme *Component* Activity	Location		**2003** Quarter 3			**2004** Quarter 4		
	Brazil	Can	Oct	Nov	Dec	Jan	Feb	March
3.4 Reducing industry impact								
3.4.1 Brazilian review mission to Canada on mitigation of dam impacts		X						X
3.4.5 Brazilian intern training in the non-monetary evaluation of social and environmental impacts		X		X				
3.5 Improving the effectiveness of stocking								
3.5.2 Training workshops for monitoring effectiveness of stocking	X			X				
3.7 Improving habitat								
3.7.5 Community based environmental improvements as part of community workshops	X							X
3.7.7 Develop pollution assays	X							X
3.7.8 Develop pollution & garbage management	X							X
Cross-cutting A. Assisting the development of policies for sustainable fisheries with community participation								
A.1 Multi-stakeholder fisheries meeting	X		X					
Cross-cutting B. Public awareness and education								
B.1 Activities for a riverine community target								
B.1.4 Facilitate development of an interpretative radio or television program on fisheries issues (IARA)	X			X	X			
B.3 Activities for a Canadian/international target								
B.3.1 Promote television and print coverage of the project in Canada		X	X	X	X	X	X	X
B.3.2 Contribution to Canadian aquarium display		X	X			X		
Cross-cutting C. Creating opportunities for women, youth and family								
C.1 Workshop component on women's needs	X			X				
D. Communication								
D.1 Project website	X	X	X	X	X			
D.2 Project newsletter	X	X			X			
D.3 Creation of other publicity material for the project	X	X	X	X	X			
E. Management								
E.1 Project organization meetings	X	X	X			X		
E.2 Consultative council meetings	X					X		

APPENDIX C – SUB-PROJECT 1 RESULTS

TRIP REPORT

Brazilian Environmental Review Policing Mission

Três Marias, Pirapora and Belo Horizonte, Brazil
May 25th – 27th, 2003

Captain Arley Ferreira
Polícia Militar de Minas Gerais

World Fisheries Trust Visit
Report

To Lieutenant Cel, Specialized Activities Assessor

As shown by the attached documents, a visit to Três Marias was carried out from May 25th-May 27th 2003 by participants of the project "Interior Fisheries in Brazil: Participative Conservation and Management": an initiative of a Canadian, non-governmental organization, World Fisheries Trust (WFT), with the Military Police as a partner.

Joachim Carolsfeld (Yogi) and Gerald Kurten (Texan fish culturist), accompanied by the author, drove from Belo Horizonte to Três Marias.

Upon arrival in Três Marias, Mr. Raimundo Marques, President of the Federation of Professional Fishermen accompanied us, and we continued on to Pirapora, where we arrived to spend the night of the 25th [of May].

On the morning of the 26th in Pirapora, we met with the staff of the 11th Company of the Military Police, where we were presented to two Volunteer Environmental Agents (AAVs) of the "Angels of the São Francisco", who had been trained by the Brazilian Institute of the Environment and Renewable Natural Resources (IBAMA).

The following people participated in the meeting in Pirapora: Major Renato Zenobio, Commander of the unit; Major Silvio, of the 3rd CAE RPM; Lieutenant Ferraz, of the 3rd CAE RPM; Lieutenant Mauro Alves, Conmander of the Pel Espz, Pirapora; Sub-Lt. Carlos, of the 3rd CAE RPM; Sgt. Abdon, of the Pel Espz Pirapora; Mr. Raimundo Marques, President of the Federation of Professional Fishermen; Prof. Ernando, specialist in geography and the environment from the University of Montes Claros (UNIMONTES); Yogi, of WFT; Gerald, Texan fish culturist; Isaac Sanches and Jose Henrique, volunteers from the AAV; and myself, the author.

The meeting had as its purpose to show, to the visitors, how the "Angels of the São Francisco" - AAV work, as well as the results that have been reached to date. It was an informal debate in which everyone participated freely and amply, expressing opinions, criticisms, and suggestions for the improvement of the activities being undertaken by the "Angels of the São Francisco".

In his talk, Yogi re-emphasised the importance of the participation of professional fishermen in the management of the fishery, and was supported by Prof. Ernando of UNIMONTES. He explained about the project "Peixes, Pessoas e Agua" that was discussed in a workshop that took place in Salvador, Bahia, on May 20th, 2003 (folder attached).

Speaking about the work that they developed in partnership with the Military Police of Minas Gerais (PMMG), the AAV ("Angels") explained that they fill out Notes of Occurrence ("autos de constatacao") that they send on to the Military Police, IBAMA and the Public Prosecutors; that they go out to do enforcement in groups of four or five, with the support of only one military person; that they have been well accepted in the community, which normally respects its recommendations; that they have managed to help the Military Police get alternative financing, especially for use in environmental enforcement; that they "filter" reportings, to ensure that the Military Police's efforts aren't applied irrationally; that they have presented educational lectures (environmental education) in primary schools; that the AAV of São Francisco are part of an NGO that is receiving money from the Terms of Adjustments of Conduct (TAC), carried out by the

local Public Prosecutors. Yogi handed out a document written by the fishermen of Três Marias (copy attached) with the help of Barbara Johnsen - Secretary of the Environment of that Municipality - which was presented at the workshop that took place in Salvador, Bahia, and shows evidence of the hopes of the Três Marias community of professional fishermen from that the military police that police the fishery be trained to deal with social issues that permeate this kind of work [the fishery].

Sub-Lt. Carlos, of the 3rd CAE RPM, suggested that the Development Company of the São Francisco Valley (CODEVASF) become involved in training new AAV volunteers in Três Marias, where there is a campus of UNIMONTES that could provide support in terms of installations and professors.

After the meeting we had a short excursion on the São Francisco River, near the rapids and to the Pirapora Industrial Park, situated along the shores of the river. It was possible, on the trip, to see that the new "Selva Mariner" brand outboard motors, recently acquired by the PMMG, are showing technical defects and creating difficulties in their application for environmental policing. Besides the technical problems, the lubricating oil that they use is difficult to find at local commercial outlets - it is only found in Belo Horizonte.

In the afternoon, we returned to Três Marias, arriving there at around 5:00 pm. We met with Prof. Alexandre Godinho, a researcher from the Federal University of Minas Gerais (UFMG), at which time there were discussions about technical issues in pisciculture.

On the morning 27th of May 2003, we met at the Municipal Secretariat of the Environment of Três Marias. Participants in the meeting were: Barbara Johnsen, Secretary of the Environment for Três Marias; Mr. Raimundo Marques, President of the Federation of Professional Fishermen; Sgt. Eduardo, Commander of the Environmental Group for the Military Police; Yogi; Gerald; the author; and members of the local media (interviews and filming). The objective of the meeting was to tease out general strategies for the implementation of the project's activities related to increasing the participation of fishermen in the management of the professional fishery. Yogi suggested that the representatives of the partner organisations travel to Canada to get to know some of the activities that are working out in that country, serving as "benchmarks" for implementing activities of interest in Três Marias. Barbara and Raimuindo complained about the lack of effectiveness in collection of water and fish [samples] when there are mortalities, alleging that they have not yet received any results of the sample collections of which they were aware.

In the afternoon we drove to the CODEVASF Fish Culture Station, where we made contact with Professor Sato, a scientist that has been working with restocking of endemic fish species of the São Francisco River since the company was first established in the Municipality. At this opportunity, Gerald marked specimens with tags recently developed by North American scientists. These fish were placed in individual cages separated from all the rest, to be verified for tags effectiveness after 90 days.

At approximately 6:00pm, we returned to Belo Horizonte, without registering any problems.

The PMMG is participating in a new novel synergy involving efforts of the national scientific community and a foreign NGO, with the intention of equalising and improving the citizenship of Brazil's professional fishermen.

It is important to note the good impressions the foreigners had of the support and effective participation of the Military police in the project, which does not occur in other states. This also

provides evidence that we have advanced significantly towards the proposed actions for the project in 2003, emphasising the need to implement a philosophy of “community policing of the environment”, something we will try out as a pilot study in the fishery of Três Marias this year.
Belo Horizonte, May 29th, 2003.

Arley Gomes de Lagos Ferreira Cap PM
Technical Assistant of the Environment - AAE

TRIP REPORT

West Coast Vancouver Island Aquatic Management Board Meeting

Port Alberni, September 10th – 11th, 2003

Carmen Ross
World Fisheries Trust

The West Coast Vancouver Island Aquatic Management Board (WCVI AMB) board meeting held in Port Alberni on September 10th and 11th afforded the opportunity to re-establish connections with the board (many were formerly active in the Regional Aquatic Management Society), to network with board members, staff and guests, to make known WFT's work, and to create opportunities to involve the WCVI AMB in the CIDA project. Attendees of the meeting are listed below. The WCVI AMB is a good example of a participatory community-driven initiative dedicated to the protection and management of aquatic resources in Canada. It could provide valuable and rare first-hand experience and perspectives that may help to guide similar initiatives in the Saõ Fransisco River.

Josie Osborne of the Nuu-chah-nulth Tribal Council (NTC) presented the West Coast Vancouver Island 2003-2005 Experimental Gooseneck Barnacle Fishery Plan. The plan is based on a study conducted by WCVI Aquatic Management Society (the working body of the WCVI AMB), the NTC and the West Coast Goose Barnacle Harvesters Association. The study used local and indigenous harvesters knowledge of the fisheries history, harvest methods, safety and harvesting logistics, harvest sites, species recovery, harvest rates and much more. The plan provides a great example of how local knowledge can be used in a scientifically defensible manner to develop new and emerging fisheries and how local communities can initiate and guide the development of livelihood alternatives that will benefit the community. Josie has agreed to act as an information source and is prepared to present the project to a group of Brazilian community representatives if requested.

A discussion on the second day focussed on the access and benefits framework being developed by the board to maintain and enhance coastal communities' ability to access and receive benefits from local aquatic resources. The strategic plan being developed by the board will address the issue by defining why access is important and who has a right to it, assessing the current status of community access in the WCVI area, examining the main trends and issues impacting access, determining what opportunities exist in the community and what mechanisms exist to promote them and, finally, to identify which coastal opportunities are appropriate for which community mechanisms. I mentioned David Greer and Brian Harvey's soon-to-be-published international revision of access and ownership of aquatic genetic resources (Wealth in the Water) and offered the authors as a resource, given their extensive research and knowledge of the issue. Brian has communicated further with Andrew on this matter and sent him some relevant sections of the text. I promised to send a copy of the book to the board as soon as it is published.

Mention was made of the 5th Clayoquot Science Symposium to be held by the Clayoquot Biosphere Trust on November 25th – 28th. Discussion at the meeting will include Coastal Zone Management, tourism, community development and access and benefits. It may be interesting to attend this meeting to further interact with people working in the region. The WCVI AMB is to coordinate their next board meeting to coincide with these discussions so that board members can attend and participate.

The minutes of this and other WCVI AMB meetings are available on their website at http://www.westcoastaquatic.ca/Resources.htm#a.

ATTENDEES

Executive Director: Andrew Day

Government Board Members:

Ron Kadawaki - Fisheries and Oceans Canada

Peter Leitz - Ministry of Agriculture, Food and Fisheries

Tom Pater - Comox Strathcona Regional District Rep

Non-government Board Members:

Errol Sam - commercial fisherman (Ahousaht First Nation)

Maureen Sager - Alberni Environmental Coalition

Marilyn Murphy - South Coast Sport Fishing Advisory Board Chairperson

Odd Grydeland - B.C. Salmon Farmer's Association

Garnet Jones - Pacific Salmon Commission

Staff & Guests:

Suvanna Simpson – WCVI AMB Administration

Caron Olive – Ecotrust (Information Specialist)

Evelyn Pinkerton & Anita Bedo – Simon Fraser University

Don Hall & Josie Osborne (Gooseneck Barnacle test fishery study) – NTC

Brian Harvey & Carmen Ross – World Fisheries Trust

Kelly Frances & Kevin Conley – Fisheries and Oceans Canada

Alana Heith – Provincial Ministry of Agriculture Food and Fish

Tanuja Barker & Alvin Barker – Australia

Liz Foster – University of Tasmania

FIELD EVALUATION

Socio-economic situation of fishing communities at the San Francisco River – Brazil

An independent and rapid assessment

September 2003

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1. INTRODUCTION

The current report is the outcome of fieldwork carried out in the states of Minas Gerais and Alagoas, Brazil, from June 25 to July 14, 2003. Throughout this period we received the support of many people and institutions, including heads of fisher organizations (Colônias de pescadores) and fisher associations, several government agencies and non-governmental organisations (NGOs), as well as a number of fisher families in all localities we visited. Several other researchers accompanied us in several parts of the trip, giving valuable contributions. We thank them all!

In general, many artisanal fisheries in traditional riverine and coastal communities from different Brazilian regions are now experiencing a crisis. The reasons behind this situation are diverse and vary from place to place. Among these are population growth, social exclusion of traditional fishers, conflicts between traditional fishers and other more powerful resource users, and overfishing.

Hence, there is an urgent need to develop management strategies to ensure a socially just and environmentally sustainable resource use among all fishing and water resource users. Otherwise, traditional fishing communities are at risk to become even more socially excluded and their livelihoods become threatened. For fisher families fishing means not only the everyday searching for food, but it constitutes a main cultural factor that builds the livelihoods of fishing communities.

Co-management is a way to better regulate fishing methods, catch, closing seasons and areas (Nogara 2000, p.136). This report presents some of the environmental and socio-economic baseline information needed for the *rapid assessment* on chances of success in implementing a co-management arrangement for the San Francisco (SF) river basin.

1.1 Main objectives

1.) Survey the main environmental and socio-economic problems regarding fisheries in the studied communities
2.) Get IARA agent familiar with conditions at the project's focal area for a possible adaptation of the *Acordos de Pesca* (fishing agreements) methodology (developed by IARA) for the San Francisco River
3.) Discuss with local leaders and government representatives the current fishery situation and possible solutions, and at the end, identify possible actions the project may take to improve such situation
4.) Assess existing capacities at local communities and municipalities and their potential for co-management
5.) Propose appropriate indicators for monitoring the project

1.2 Research methods

Much research has been carried out on San Francisco fisheries (Thé, Madi & Nordi s.d., Godinho & Godinho s.d., Valêncio et ali. s.d., among others). Hence, in this report on the assessment of the socio-economic situation of fishing communities at the higher, middle and lower San Francisco[1], our main focus is on the analysis of data obtained during fieldwork. In

[1] The San Francisco river basin is sub-divided into four sections: higher, middle, sub-middle, and lower. The higher part correspond from the source to Pirapora (630 km in length), the middle part runs from Pirapora to Remanso

particular, we focus our analysis on the focal areas identified by the project (see map at Figure 1)

Because the project aims to expand and build new capacities for sustainable development of fishing communities, we adapted a participatory research approach. However, because of the short time we spent in the field, it was not possible to establish strong interactions with local people as required by such approach. To compensate this problem, we seek to be in accordance with the main objectives of such approach to during interviews and meetings. According to Thiollent (2002), these are to identify priorities among the problems to be tackled while searching for solutions that create a better understanding of the current situation and to search for solutions, increasing the knowledge of the people and the groups involved. One of our main research task was to identify the priority order of problems to be addressed and the possible viable solutions to be implemented.

Our field research focused on identifying and valuing community resources and existing capabilities. It is quite important to know the capabilities and limitations of communities. In order to get such information we adapted the *asset based community development* approach (Foster & Mathie 2003) and the *capacity assessment* approach (Markey et ali. 2001). Such approaches are based on *appreciative inquire*, that means, on valuing communities' existing capabilities and on identifying their needs. These perspectives involve the identification and mobilisation of social capital for community development[2].

Fieldwork took place from June 25 to July 14, 2003. Many municipalities were visited along the SF River, in addition to the municipality of Buritis, which is located along one of SF tributary rivers - Rio Urucaia. In Minas Gerais, we visited Três Marias, Pirapora, Buritizeiros, São Francisco, Januária, Pedras de Maria da Cruz and Buritis. In Alagoas, we visited Piranhas, Entremontes, Penedo and Marituba do Peixe.

During the first two days (a boat trip from Três Marias to Pirapora, Minas Gerais State), Jutta Gutberlet was joined by Mr. Norberto (Colônia Z5), Ana Thé (Federal University at São Carlos) and Regina Cerdeira (IARA). The head of the Minas Gerais Fisher Federation, Mr. Raimundo, joined the rest of trip in that state. Cristiana Seixas participated on the trip from Pirapora to São Francisco. In the Alagoas State, Jutta Gutberlet was joined by Sineide Silva Montenegro and Fátima de Sá from Alagoas Federal University (UFAL).

(1,090 km), the sub-middle part runs from Remanso to the old Paulo Afonso falls (686 km), and the lower runs from that point to the river mouth (274 km).

[2] See also Kretzmann & McKnight 1993.

Figure 1: The study region

In all municipalities and communities we visited, meetings and interviews were held with leaders of civil society and representatives of some government agencies. We interviewed the head of fisher organisations (Colônia de Pescadores) or fisher associations and government agents responsible for the enforcement of regulations from the Brazilian Agency for the Environment and Natural Resources (IBAMA[3]), the State Institute of Forests (IEF[4]) of Minas Gerais, and the Environmental Police[5]. Representatives from City Hall and municipal secretaries such as the Municipal Secretary for Environment and Tourism) and local leaders such as university professors, environmentalists, and NGO members were also interviewed. We further carried out semi-structured interviews with randomly chosen fishers and their families, including fisherwomen. We intended to diversity the opinions about fisheries and water resource issues.

The interview structure was aimed to explore the socio-economic and environmental universe of local communities (see questionnaire in Appendix 1 - in Portuguese), and questions were mainly open-ended ones. Interviews were carried out individually or in-group. Time spent in each interview varied from 20 min to 2 hours, according to interviewee availability. Despite the short time we spent in each locality, we also interacted with other locals and made several observations to complement our understanding of the local cultural and ecological diversity.

In some localities meetings were held with large groups of fishers and government and NGO representatives. In these cases, data collection was based on focal discussion about the fisheries, the river and resource management issues at each locality. In each municipality, we tried to assess the available infrastructure for carrying out workshops and meetings.

To a certain point, our fieldwork has already made a contribution in preparing local communities for co-management – as specified at the project proposal. During the first part of the trip (from Belo Horizonte to Pirapora, MG), Regina Cerdeira from IARA helped us to get familiar with the IARA methodology on *acordos de pesca* (fishing agreements) (Castro 2000). She introduced the topic during meetings with fishers, government agencies and ONGs. The idea of fishing agreements was carried on farther to other communities and municipalities visited.

As mentioned before, the short time available to research each locality became a constraint to this research. Nevertheless, the initial idea was to carry out a *rapid assessment*. Hence, the current report is not a deep study with detailed information, but the result of an effort to get a general understanding of the local scenarios and to identify key actions that may be taken to solve the conflicts identified.

[3] Instituto do Meio Ambiente e dos Recursos Naturais Renováveis
[4] Instituto Estadual de Florestas
[5] Polícia Militar Ambiental

2. RESULTS AND DISCUSSION

In this section, we discuss our main research findings concerning (1) major stakeholder groups involved in fisheries and water management; (2) the local socio-economy; (3) social mobilisation and leadership; (4) environmental impacts; and (5) stakeholder conflicts.

2.1 Major stakeholder groups

Fishers (professionals, sport)
In all municipalities visited there is already a certain degree of organisation among fishers, through the Colônia de Pescadores or Fisher Associations. The way each of these organisations works varies according to their history and engagement with the fishers' concerns. The total number of fishers affiliated to each organisation varies from region to region. There is however a high number of full-time fishers who are unaffiliated – often this number is even higher than that of affiliated fishers. The unaffiliated fishers are known as "gancheiros" by the affiliated ones. They carry out their fishing activity and market their products as professionals, but do not pay tax nor do they have a fishing license. Unaffiliated fishers do not receive insurance benefits, such as "unemployment insurance" during the closed fishing seasons which means that they continue fishing during the closed seasons, risking being caught (and getting a fine or losing gear).

Farmers
Farming (both agriculture and cattle ranching) occurs in several parts of the SF Basin, sometime right on the river margins. Most farms are quite large. In the higher and middle SF River, cattle ranches predominate but there are also some fruit farms and other plantations (annual and perennial). Close to the river mouth in the lower SF River, however, sugar cane monocultures are continually expanding. These are usually large farms and their owner sometimes also own alcohol and sugar industries. These large farmers are usually very powerful and influential and may hold close ties with politicians from different administrative levels. The initial contact with those farmers may be done through their union representatives or government agents who assist them.

CHESF
The SF Hydroelectric Company (CHESF[6]) was created by a Law Decree in 1945. It is one of the biggest companies of the electric power sector in Brazil. The company owns 14 hydroelectric plants, nine of which located at the SF river. 97% of the energy generated by CHESF benefits 42 millions of people in eight states of the Northeast region of the country. This company holds a lot of decision-making power concerning development issues in the Northeast region.

CEMIG
The Energetic Company of Minas Gerais (CEMIG[7]) controls the generation of hydroelectric energy in the higher and middle SF basin, including the Três Marias plant. This company holds a lot of decision-making power, and decision-making concerning the SF river management has not been quite democratic.

CODEVASF
The Company for the Development of SF Valley (CODEVASF[8]) promotes several activities in the region, including capacity building and implementation of fish farming projects, particularly

[6] Companhia Hidroelétrica do São Francisco
[7] Companhia Energética de Minas Gerais
[8] Companhia de Desenvolvimento do Vale do São Francisco

with tilapia – an exotic species. In Xingó, CODEVASF operates a capacity building centre, a fish farming training station, and a fish processing plant. It has good resources and infrastructure. Nevertheless, the company's interests are not always in accordance with the use of sustainable technology for small-scale fisheries, neither are they adequate to local conditions. Local fishers have not yet received the deserved attention from this company.

ANA[9]
The National Water Agency develops projects on water management (see: http://www.ana.gov.br/).

Environmentalists
During fieldwork we identified several environmental NGOs (see contact list). In general, their performances are punctual and quite restricted by the small amount of financial resources they have. The few NGOs we contacted seemed to be aware of the important role fishers play in conserving the river, and hence these NGOs support the fisher category.

Public authorities at local, state, federal levels
In Minas Gerais many municipal public authorities are experiencing financial and political crisis. In Januária and São Francisco, for example, the municipal executive is paralysed due to an inquiry of corruption and nepotism. These cities' Majors have recently been impeached.

Not all municipalities are well structured to deal with environmental and natural resources management issues. However, in almost all municipalities we could identify people who work for the municipal government and who are interested to deal with such issues. This means that there is a potential to strengthen the local existing structures and hence to amplify local actions towards the environment.

In Minas Gerais, the State Institute of Forests (IEF) is responsible for enforcing fishery regulations jointly with the Environmental Police. Both agencies have bureaus in all municipalities we visited. Fishers consider IEF and Environmental Police actions as repressive. In many municipalities there is no dialogue between IEF/Police agents and fishers.

Despite the fact that IBAMA (a federal agency) has bureaus in several of the municipalities we visited, this agency often acts together with state agencies such as IEF and Environmental Police. IBAMA has not much direct action in enforcing fisheries and water resources uses in this area. However, there are human resources available in IBAMA, which could be better utilised to preserve the river.

In 2003, a new federal agency responsible for fisheries and aquaculture (SAP[10]) was created. However, it is still too early to assess their role in managing water and fishing resources at the SF river. This agency is expected to play an important role in solving social and environmental problems at the SF river basin.

Watershed management committee
The Watershed management committees are part of the federal government policy for water management. At the SF river basin, discussions about the Watershed Committee varies from place to place. In the state of Alagoas, e.g. some actions have been taken to mobilise people to form sub-basin committees. The current project could work jointly with the Watershed

[9] Agência Nacional de Águas
[10] Secretaria Especial de Aqüicultura e Pesca

Committee in order to cooperate in planning and implementation of the Committee's activities, such as:

- Implementation of workshops to discuss environmental impacts of waste mismanagement, selective waste collection, recycling and handcrafting,
- Survey of marginal lagoons distribution and their environmental status,
- Workshops to inform about environmental and fisheries legislations.

2.2 Socio-economic scenario

The following information was obtained through individual interviews in each municipality. It is important to note that due to time constraints, only a limited number of interviews were performed. Hence the data presented below should be seen as qualitative information with no statistical value.

The income of professional fishers varies from place to place. In Três Marias, there are two fisher groups: lake fishers and river fishers. The net income of lake fishers is about R$ 200 to R$ 300 per week, while net income of river fishers is about R$ 100 to R$ 200 per week. Fishing expenses are about R$ 80/week. In lake fisheries, those who own boats and gears make much more money than fishers who work for middlemen.

In São Francisco city, river fishers make between R$ 80 to R$ 300 per month according to the season. During the “clear water” season (no rain) fish is more rare and expensive. During the “dirty water” season, fish is abundant and a fisher can make up to R$ 120 on a good fishing day. Nevertheless, fish is becoming scarcer in recent years.

In Januária, a fisher can make up to R$ 300/month during a good fishing month.

In Buritis, fishing net income for “encircling fishing” (*pesca em rodada*) varies between R$ 150 to R$ 400. Fishing expenses are high due to transportation (average of R$ 20/ 5 km) and the cost of ice.

In the lower SF basin, fishers’ economic situation is even worse. In Entremontes, during the low fishing season, a fisher makes only R$ 20/week. For that reason those working at the Xingó fish processing plant are satisfied with a salary of R$ 200/month (working 8h/day).

The *pitu* (fresh-water shrimp) fishery has declined drastically during the last decade. In 1998, Entremontes’ and Piranhas’ fishers had an average net income of R$ 100/month (Montenegro 2001, p. 3). According to fishers, nowadays the situation is even worse. Some affirmed that sometimes they capture no *pitu* at all – which is an indicator that fisheries are drastically declining.

In Marituba do Peixe, the fishers' income before the construction of the hydroelectric dam (about six years ago) was about R$ 150 to R $200 per day. Nowadays, the monthly fishing income is about R$ 80. Income from temporary jobs on farms is much better; for example, working in sugar-cane cutting yields R$24/day (or a little over R$500/month). Day labour on farm jobs usually make R$ 10/day.

It is quite common to see fishers involved in subsistence agriculture along all the SF river basin. Several fishers have their gardens along the river floodplain and terraces. In general, these are also the places where fishers camp. Food production (corn, bean, rice, pumpkin, etc) is very important in helping secure the fishers’ livelihoods.

Many fishers (including retired ones) produce and repair their gear. We didn't notice women's involvement in such activities. Neither did we notice fishers who produced gear for selling in the communities visited.

2.2.1 Social exclusion

Field data reveals some differences in terms of infrastructure access among fisher families. In general, families living in cities have access to water and electricity. However, not all neighbourhoods benefit from waste collection. In all municipalities, sewage is drained into septic tanks or directly into the river with no previous treatment. This situation may start changing as some municipalities (e.g., Buritis) have already plans for building a sewage treatment station.

For riverine people, access to basic infrastructure often resumes in energy provision only. Drinking water often comes from wells or direct from the river with no treatment. Household waste is not collected, but burned, buried or deposited on vacant lots.

Children from riverine households often have to commute daily to school, by boat through the river or through roads. As rural schools were closed, these children have to travel longer distances. The Federal Government's *bolsa escola* program has encouraged the participation of rural children in formal schooling.

In general, we observed a low self-esteem among fisher families. Fishers and their families are marginalized and treated as inferior by the government and the civil society as a whole. Fishers often have little or no participation in policy decision-making at the municipal level or in committees and council boards. Representation of fisher interests is quite low. In addition, the low educational level that still prevails among fisher families contributes to the maintenance of prejudice against them and their social exclusion.

Nevertheless, we observed some cases where such stagnation and exclusion seems to be changing due to a recent mobilisation of fishers. For example, in the municipalities of Maria da Cruz, Buritis and Penedo, fishers are more actively engaging in social mobilisation, and participating in meetings, workshops, lectures, etc, to discuss their situation and search for solutions to their problems.

2.2.2 Women participation in fisheries

Despite the fact that fishing is typically a male activity, there are also some fisherwomen. Only in a few places, however, fisherwomen are organised. An exception are the fisherwomen from Penedo. They created a Fisherwomen Association,[11] which is mobilising women who develop fishing-related work to demand better working and livelihood conditions. This association has a very active agenda to work with women from the lower SF river region. It is also co-ordinating its actions with both the Colônia de Pescadores and the Watershed Committee working in that region.

According to Marques' (1992) report, in the early 1990's there were some active fisherwomen in Marituba do Peixe. During that time, local men considered one of these women really *a fisher*, because she used gear exclusively used by men such as *covo*, gillnet (*rede de travessa*) and cast-net. The rest of the women used hook-and-line (*anzol-de-vara*), *bóia, jereré-de-cabo,*

[11] Associação das Mulheres Pescadeiras

jereré-redondo and *linha de mão.* Some of the gear, such as *jereré*, are not used by fishermen. Marques' (1992, p. 50) results indicate that, in this area, women do not usually fish as men do. Women normally fish when men are sick or when needed. Often, child education is different between girls and boys; the former learn straw crafting and the latter learn to fish (Marques, 1992, p. 51).

In one of our interviews in the lower SF River, a riverine man mentioned that his former wife fishes as a professional. Similar cases, in which women became professional fishers because they want to, or because they need to, are no exceptions. Once women get affiliated to the Colonia, they enjoy the same benefits given to all fishers, which makes a big difference to their family income.

2.2.3 Middlemen and patronage systems

Middlemen in fish commercialisation were detected in almost all places visited. It was not possible, however, to carry a detailed investigation on the relationship between middlemen and fishers. We observed, however, that even when fishers get self-organised to acquire a place to market their product – as it occurred in Três Marias – those fishers who acquired such a place often become middlemen themselves; i.e., they buy fish from other fishers at a lower price and re-sell it in that place. It would be worth investigating to what extent middlemen explore, in a negative sense, such situation or if they play an important role between fishers and the market.

Most likely, there are still patronage systems in the SF river basin. During this rapid survey, we heard about a patronage system in Barra de Guaicui, in a SF river tributary. According to a fisher, the buyer (middlemen) supplies the boat, fuel and ice to the fisher, who in return sells all his catch to this middleman. The problem is that in many cases, fishers will only increase their debts, as they cannot make enough money to pay the middlemen back.

It was mentioned during an interview that a cold storage plan (Frigorífico) in Pirapora supplies ice, fuel, and even transportation for fishers to get to their fishing spots (sometimes a 100 km away). We also observed that the Colônia Z-3 in São Francisco city operates a fish warehouse. This Colônia provides ice and money in advance to pay bills (water, electricity, medicines) to those fishers who sell their catches to it. Nevertheless, we were not able to verify if the Colônia pays lower prices than the overall market. In both cases, the Frigorífico and the Colônia, there may be a patronage system guiding the relations between them and the fishers; on the other hand, the current system may simply reflect the local market rules.

2.3 Social mobilisation and leadership

Colônia/Federation

Through this survey, we noticed that some colônias were well structured and apparently well organised, such as the case of Z-3 in São Francisco and Z-12 in Penedo. In Buritis, we participated in a meeting called by the Colônia Z-11 and we were able to assess *in situ* this organisation's mobilising potential. During our visit to Januária, the local Colônia head also called a meeting; nevertheless, a few fishers attended it. In Penedo, another meeting occurred during our stay there, involving the board of directors of the Colônia and some fishers. At that same day, however, the National Secretary of Fisheries and Acquaculture (from Brasilia) was visiting the city and the head of Colônia was also celebrating his birthday. Hence not many fishers attended the meeting.

Colônia Z-11 in Buritis demonstrated to hold a good mobilising capacity. Both the heads of the Colônia Z-11 (Buritis) and the Colônia Z-3 (São Francisco) seem to have strong local leaderships; on the other hand, the heads of Z-1 (Pirapora) and Z-2 (Januária) seemed to not be responding to the fishers' needs.

Although there are many affiliated fishers in almost all Colônias, the large part of them do not pay the annual fee nor do they participate in meetings and discussions. There is a huge discredit of unaffiliated fishers concerning the Colônia administration. This is in part reflects the culture of corruption established in many of these Colônias, during current or past administrations, such as the cases of the Colônias in Januária, Minas Gerais, and in Pão de Açúcar, Alagoas. Moreover, most of the unaffiliated fishers lack information about the benefits of affiliation.

Some Colônias hold monthly meetings, but in many cases fishers are not willing to participate. It might be the result of fishers' lack of confidence in the mobilising capabilities of their class to change issues of concern. They might be tired of simply receiving information, and not seeing their opinions and knowledge being used by their representatives in order to improve their situation. Hence, it is important that this project aims to value the fisher's knowledge and time when calling meetings during the co-management process.
Community radios are available in almost all places visited, but it is not always used as a mobilisation tool by the Colônias. Radio seems to be a very important media for fishers; all fishers interviewed regularly listened to community radio.

Apparently, the fisher organisation at the state level (Fisher Federation[12]) in Minas Gerais has done a good job in diffusing information regarding fisher rights (such as unemployment insurance, maternity leave, retirement payment, etc) in all Colônias of that state. The Fisher Federation has also shown its mobilising potential when organising together with several Colônias the largest public hearing of the Legislative Assembly of Minas Gerais, to discuss fishing management in this state (more than 2,000 fishers attended it). The head of Fisher Federation is also involved in several committees and councils related to environmental issues at municipal (Três Marias) and state levels. This demonstrates the capability to articulate and mobilise people and agencies for the co-management process.

Some of the Colônias in Alagoas need to be reorganised, because, as in the case of Minas Gerais, there is a culture of corruption, clientelism and long-stand power maintenance; issues that need to be overcome.

Community associations

Community associations were found in several cities. Some represented different neighbourhoods (e.g., 150 associations in São Francisco city) and others represented groups of people working in the same subject, such as washerwomen and embroiders. Here we focus only on community associations related to fisheries.

In Pedras de Maria da Cruz, Minas Gerais, the local Fisher Association has shown to be able to mobilise local fishers as well as fishers from distant areas. It deals with fisheries issues and also takes other actions such as organising the community for collecting garbage from the river. This association is independent from Colônia Z-2 in Januária.

[12] *Federação de Pescadores*

In Entremontes, Alagoas, the local Fisher Association[13] jointed the Colônia de Pescadores Z-25 in Piranhas. The head of the Colônia, also a member of the Fisher Association, seems to be a local leader. However, the Colônia was reactivated only recently and hence it is difficult to assess its mobilising capacity. It is clear however that there is a group of fishers willing to change their current situation.

The Penedo Fisherwomen Group[14] is an association related to and part of the Colônia de Pescadores Z-12 in Penedo. This group gathers 24 women who fish *pitu* (fresh-water shrimp) using *puça* as a gear and fish with gillnets (*rede de travessia*). Many other women however are still unaffiliated. The group mobilises women from 13 municipalities under Z-12 jurisdiction and meet twice a month, besides participating in other regional and state meetings and workshops. It is a well-articulated group carrying co-operative projects with the Fisher Pastoral, SEBRAE, and a group from Netherlands to develop a fish processing plant. Further, this group has previous experience in organising workshops.

Environmental NGOs

Overall we did not identify many environmental NGOs in the municipalities we visited. We may cite only few.

The Angels of São Francisco[15] are volunteer environmental agents that monitor the river and are found in some of the places we visited. They were trained by the Minas Gerais Military Police and by the Ministry of the Environment in collaboration with environmental agencies, which are developing a revitalisation project in the SF river basin[16]. The Angels of São Francisco are a potential partner for the project.

In Pirapora, the São Francisco de Assis Ecological Movement[17] seems to be demobilised, according to an informant. Another NGO found in Pirapora is the Minas Gerais Nature Conservancy Centre[18], which develops the "*Óia o Chico*" Program ("Look after the SF river") through a recent environmental proposal that involves the state and federal governments.

In Buritis, the Integrated Environmental Association of Buritis [19] (ABIMA) aims to deal with issues related to waste management, agrotoxic boxes, environmental education, reforestation and river revitalisation. Many other actors in this municipality are concerned with and involved in environment issues, including local environmentalists, the Municipal Secretary for the Environment, the Municipal Secretary for Agriculture, and the Municipal Common Council.

2.4 Environment impacts

Interviews with fishers and their representatives show their local knowledge about the river. Fishers depend on the river and explore it almost every day. Hence, they can really identify on going changes in the river, although they may not know the reasons behind these changes. Fishers, both men and women, are potential collaborators for the project, as they may act as environmental monitoring agents. They have already identified several environment impacts at

[13] *Associação de Pescadores*
[14] *Grupo de Mulheres Pescadeiras de Penedo*
[15] *Anjos do São Francisco*
[16] *Projeto de Revitalização da Bacia do Rio São Francisco*
[17] *Movimento Ecológico São Francisco de Assis*
[18] *Centro de Conservação da Natureza (CCN) de Minas Gerais*
[19] *Associação Buritinense Integrada de Meio Ambiente (ABIMA)*

the SF River (see Table 1a and 1b in Appendix 2 - in Portuguese). In the following sub-sections we will address the main environmental impacts identified during our fieldtrip and interviews made, and some confirmed by the existing literature.

2.4.1 Water pollution

Sewage drainage into the river implicates in lowering river water quality and in threatening people's health, particular for those depending exclusively on the river as drinking water. All municipalities, villages and communities we visited drain sewage directly into the river. Moreover, the SF River receives industrial discharge and household sewage through its tributaries rivers, such as the Rio das Velhas which brings into the SF river all the discharges and sewage from the major metropolis Belo Horizonte.

Nowadays, water supply is contaminated by sewage and discharges in even small localities. In Marituba do Peixe, for example, a fish-farming project is located close to a sewage draining spot and a fisher port, a place also shared by washerwomen. It is not surprising that water quality analysis show high concentration of Faecal Coliforms (Prof. Fátima, UFAL, pers. comm.).

Lack of urban waste management is a severe problem in all localities visited, despite the locality size. Many municipalities collect urban waste, at least in the most accessible areas. However, the final destination of the waste is inappropriate in all places. Often, it is dumped into open areas in the cities' surroundings; this may cause water table contamination. It may also be dispersed by winds and it may pollute the river. In less urbanised neighbourhoods and in riverine communities urban waste is not collected at all; part of it is burnt (causing air pollution), buried (causing water table pollution) or dumped into open areas (*lixões*) (which may be dispersed by wind).

In addition to health and environmental problems, the lack of urban waste management may be detrimental for the tourism sector. Garbage on the roadside and everywhere else is not the best post card for promoting tourism in a city.

None of the municipalities visited has a waste management plan in action (e.g., recycling, separate collection of recyclables). Some Secretaries, however, already understand the importance of waste management. There is a potential to receive their support to work towards this front. As a matter of fact, many ideas were discussed with government agents and fisher representatives about educating people on waste management. There is also an urgent need to elaborate a solid waste management plan to minimise domestic waste generation and to promote recycling and selective waste collection using agents who already work in this field.

In several parts of the river, industrial pollution is already a problem. According to interviewees, one of the most serious examples is the Metal Mining Company[20] (CMM) in Três Marias. This company has been polluting river water for decades and is often responsible for fish slaughter downstream after industrial discharge. Lately this situation is improving after the construction of a decanting tank and the hiring of an environmental engineering to deal with environmental problems.

Not much has been done to reduce agro-business pollution, mainly by agrotoxic substances. Fishers often mention problems resulted from water contamination by agriculture. The

[20] *Companhia Mineira de Metais*

development of large-scale agriculture also contributes to the deforestation of Cerrado (savannah) and of the gallery forests (*mata ciliar*), provoking erosion. Small and large irrigation projects are found along the SF River. They remove water for both agriculture and cattle raising.

The large cattle-raising impact on river quality is related to deforestation of the gallery forests of the main river and its tributaries. With deforestation, many food chains involving species, including fish, that feed on fruits and leaves of the gallery forest trees are interrupted. Hillside erosion becomes also a problem due to the lack of tree roots to hold land. This on turn leads to river siltation. In addition, farmers do often build dams on marginal lagoons to provide cattle with water.

Hydroelectric plants are also seen as water polluters due to the change in water temperature and the discharge of contaminants. In Três Marias, fishers observed deposition of layer (probably algae) on vegetation leaves found on sand banks along the river, downstream the dam. Fishers believe there is a close relation between this algae growth and the substances used to clean the turbines. They also believe that these substances are the chemicals causing skin problems in cast-net fishers (Santos & Marques 2003).

2.4.2 River physical changes

Among the major causes of change in water flow at the SF River is the construction of large-scale dams for the generation of hydroelectric power and the small-scale dams built on marginal lakes and small tributaries for farming purposes. The influences of a dam on the water level may extend to hundreds of kilometres both upstream and downstream. Upstream, habitats change from lotic to lentic. Downstream, a dam disturbs the natural seasonal floods that normally allow fish into and out of the marginal lakes – a breeding ground for many species. In addition, a dam becomes an obstacle for migratory fish – the main commercial fish species at the SF river basin. Hence, dam construction affects fish species composition, both upstream (habitat change) and downstream (lack of floods). Socio-economic impacts of a dam vary from the replacement of riverine population upstream to the several environmental changes downstream causing many problems to fishing communities. We expand on some of these issues.

In tropical floodplains systems– such as the area of the middle SF river– some fish species reproduction depend on moon-phase variation, and floods seem to be the most important regulatory factor for spawning for some species. Marginal lakes on the floodplain area, in which water level changes according to river floods, are known as natural breeding spots for many migratory fish species (locally know as *piracema* fish). Hence fish stocks are directly related to floodplain extension. Changing water regimes affect floodplain areas and in turn fish populations (Melo, Souza Rosa, Silva & Pinto 2003). Local fishers are quite familiar with such factors due to their experiences; as well, scientists have known the ecology of many fish species in this area for decades (Thé, Madi & Nordi s.d., p. 392). Both local and scientific knowledge was systematically disregarded in decision-making concerning water resource uses at the SF River Basin.

Before the Três Marias dam was built, the SF river floodplains were full of marginal lakes (see research cited by Jiménez, Godinho e Petrere Jr. s.d., p. 379). Nowadays, fishers, from both the high-middle and the lower SF river, complain about the dams built on marginal lakes by farmers, who use the water for agriculture and cattle raising.

In addition to changing water flow, dams by hydroelectric plants also change the physical-chemical composition of the water. For example, they change the cycles of "clear water" and "dirty water" (floods) disturbing the fish spawning. In Três Marias, fishers observed a slower water flow inside the dam area and the formation of sand banks where plants grow downstream. River siltation is a serious problem; it modifies water flow and its course and negatively affects fishing and transportation. Sand mining activities in some parts of the river may help reverse siltation, but, on the other hand, it also modifies water flow and its course.

Fishers from Piranhas, Entremontes and even Penedo, talk about the disastrous consequences of hydroelectric plant constructions, including the Xingó plant, operated by CHESF since 1996. Change in water flow impacts on the reproduction of many fish species. In addition, introduction of exotic and aloctone species after dam construction (e.g., tucunaré –see below) has negatively affected the natural fishing stocks in general (Montenegro, Nordi & Marques 2001, p. 5). In Piranhas and Entremontes region, the *pitu* fishery – a very important commercial fishery – became not feasible as *pitu* needs to migrate downstream to the estuary for spawning.

Based on their previous experiences, fishers from Piranhas, Entremontes and surrounding areas are now quite worried about the rumour of the construction of a new dam at the SF river near Piranhas. During the fieldwork we were unable to get more information on this matter; but we would like to call attention for the importance of developing a transparent planning for such a plant, so that fishers, the most affected group concerning changes in the river, are aware of all the plans.

2.4.3 Change in vegetation

Deforestation in the SF river basin is a big problem. Mining development increased demands for charcoal. Large extensions of the natural Cerrado vegetation in Minas Gerais area have been cut down. This is an ongoing process, and many trucks filled with charcoal travel towards mining industries every day on the roads in Minas Gerais. Meanwhile, eucalyptus and pine monocultures are expanding in this state.

Deforestation of the river gallery forest is also a serious problem. Hillside erosion due to the missing tree root system is a visible process, which can produce big impacts. Lack of vegetation along the river margins rapidly increases the siltation process, which may even lead to difficulties in transportation along the river.

We observed gallery forest deforestation in areas in Minas Gerais and Alagoas/Sergipe. In Alagoas, the expansion of sugar-cane monoculture is the main factor of deforestation. There is quite a strong economic power behind such activities, what may explain the inertia of enforcement agencies responsible for environmental monitoring.

2.4.4 Change in fishing resources

Introduction of exotic[21] *and aloctone*[22] *species*

The problems caused by the introduction of exotic and aloctone species in aquatic environments are well known in the literature. In many cases, introduced species compete with native species

[21] Species from and naturally occurring in other countries' water, despite of previous introduction in Brazilian water.
[22] Species from and naturally occurring in other Brazilian water basin different the one studied.

for food and habitat, or the former are a predator of the latter, leading to local extinction of many native species. In other cases, introduced species carry diseases not previously faced by native species, hence generating a large slaughter of the former. In the SF River, one of the most known aloctone species is the *Tucunaré* (*Cichla ocellaris*) from the Amazon river basin, a very efficient piscivorous species able to colonise diverse habitats. Since 1984, when it started to appear in fishers' catches, the percentage of Tucunaré on the overall catch has been increasing considerably (Sato e Goldinho 1988). *Tambaqui* (*Colossoma macropomum*) is another species introduced from the Amazon River basin. Another aloctone species is *pescada-do-piau* (*Plagioscion squamosissimus*) from the Paranaíba River, the most captured non-migratory species in Sobradinho dam. *Tilápia* (*Oreochromis nornorum*) is the most captured exotic species at the Itaparica dam. There are some fish farming projects using Tilápia in some parts of the SF river (Sato e Goldinho s.d.). According to Portaria 145/98 from IBAMA, aloctone species found at the SF river basin are *Tucunaré* (*Cichla ocellaris*), *Apaiari* (*Astronotus ocellatus*), *Tambaqui* (*Colossoma macropomum*), *Pacu caranha (Piaractus mesopotâmicus*), *Pescada do Piauí* (*Plagioscion squamosissimus*), *Pirapitinga* (*Colossoma brachipomum*), and *Tambacu* (Hybrid: *TambaquiXpacu*). The exotic species found there are *Carpa comum* (*Cyprinus carpio*), *Carpa prateada* (*Hypophthamictys molitrix*), *Tilápia nilótica* (*Oreochromis niloticus*), *Tilápia* (*Oreochromis nornorum*), *Carpa cabeça grande* (*Aristichthys nobilis*), *Camarão gigante da Malásia* (*Macrobrachium rosenbergii*), and *Tilápia vermelha* (Hybrid).

Decreasing in autoctone[23] native species

Several factors have contributed to a quantitative and qualitative decrease in the native icthiofauna biodiversity. Among these, we point out changes in natural habitats and riverbed (addressed in item 4.4.2), introduction of exotic and aloctone species (addressed above), predatory fisheries (addressed below), and river water pollution (addressed in item 4.4.1). Changes in the habitat of native species and riverbeds result mainly from (1) damming up the river in several spots (for building hydroelectric plants), which in turn transforms lotic environments into lentic ones and impedes species spawning migration (*piracema*); and (2) damming up the river marginal lakes (for farm uses) which are used as a breeding grounds for many fish species. As a fisher puts it, "*Fisher life is quite difficult; one day you catch, the other you don't. Every day things become worse. Before the dam, I was able to catch 30 kg of fish; nowadays, if I catch 5 or 8 kg that is a lot*". According to some fishers, the species that are decreasing the most are the large migratory fishes such as *Surubim* (*Pseudoplatystoma coruscans*) and *Dourado* (*Salminus brasiliensis*).

Predatory fisheries

Predatory fishery may be defined as one that captures individuals before they reach their sexual maturation stage and had an opportunity to reproduce at least once. Predatory fishery may also be one that prevents part of a target population from escaping for reproduction. That is, setting gillnets from one river margin to the other prevents part of a fish population in spawning migration, from completing its migratory route and its reproductive cycle. Another predatory fishery is one that causes fish injuries (wounds) without catching the fish, such as the case of some harpoon fisheries.

Predatory fisheries in the SF River is mentioned by some researchers (Sato e Goldinho s.d., Thé 2003) and also by some interviewees. Examples include the use of net mesh sizes smaller than the ones allowed by legislation and the harpoon fishery.

[23] Species from and naturally occurring in the Brazilian water basin studied

2.5. Main stakeholders conflicts

In the following paragraphs, we present stakeholder conflicts that we observed during fieldwork. Nevertheless, we were not able to map all the stakeholder conflicts in the SF river basin due to time constraints (see Table 2a and 2b in Appendix 2 - in Portuguese).

2.5.1 Fisher groups conflicts

Between fishing communities

Conflicts among various fishing communities were only found in Alagoas. These conflicts result from the installation of Xingó hydroelectric plant, which caused damages to fisheries in the municipality of Pão de Açúcar. Fishers from this municipality started to move to other fishing areas in the Piranhas and Entremontes municipalities.

Professional fishers vs. *sport (amateur) fishers*

Conflict between professional fishers and sport fishers exists in almost all localities visited. This conflict regards access to resources and to fishing spots. In Minas Gerais, professional fishers using gillnets complain about sport fishers using harpoon and hook-and-line. In Piranhas, Alagoas, the conflict regards the Surubim harpoon fishery carried out by tourists and by some local fishers, and the professional fishers who practice other fisheries.

Colônia affiliated fishers vs. *unaffiliated fishers*

Conflict between affiliated and unaffiliated fishers is not explicit; but the first group does not hold appreciation for the second one. Unaffiliated fishers argue that the Colônia does not bring them benefits and that money collected by the Colônia is not invested in fishers and their needs, but is used in the interest of few. This problem was observed in all municipalities visited.

Between fisher-groups using different gear

We have not found any conflict between different groups of professional fishers concerning the use of different gear; only those already mentioned above between professional fishers and sport fishers.

2.5.2 Conflicts between fishers and other stakeholders

Fishers vs. *Farmers*

This conflict exists in all places visited. It results from (1) the construction of small dams in marginal lakes of the SF River and its tributaries (areas used as nursery for many fish species) and (2) the construction of dams on small tributaries that prevent fish migration and spawning of some species. Farmers impede fishers to access the riverine area and fish in the lakes and dammed areas. Moreover, farmers collect river water for irrigating private plantations, hence, decreasing river water flow. Illegal water collection may be contained by introducing a fee for water usage. Another problem is water contamination by agrotoxic substances and cattle manure. As well, deforestation of the gallery forest for cattle raising and agriculture also leads to erosion of river margins and consequent siltation, which in turn affects fisheries.

Fishers vs. *Environmental Police*

Conflicts between fishers and the Environmental Police exist in many of the municipalities visited. Many reported on the violence with which fishers are/were treated by policemen. Further, many reported on cases where gear and fish were illegally caught and apprehended and, since 1998, on cases where fines (minimum value of R$700) were applied to fishers.

Fishers vs. *IBAMA/IEF*

In almost all municipalities, conflicts exist between fishers and IBAMA and/or IEF agents. Most of these conflicts result from the fact that some fishing regulations seem to be inadequate for the local context, according to fishers' view. This is particularly true for the cases of closing fishery periods, gear restrictions and restrictions in species caught. Lately these conflicts have been minimised by educational programs developed by IEF.

Fishers vs. *Hydroelectric companies*

In both states visited, fishers mentioned serious conflicts between them and the hydroelectric companies (CEMIG, CHESF). Fishers identify these companies as the main responsible for changing water regime and flow in the SF River, causing several problems for fisheries. In Três Marias and Piranhas, fishers complained about health problems, which according to them results from contaminated water discharged into the river after the plant turbines are cleaned.

Fishers vs. *Mining company*

In Três Marias a conflict exists between the mining company CMM and fishers. According to some fishers, residues from zinc production (from silicate mineral) are still contaminating downstream water. So much so that a fisher said that all his metal fishing gear, particularly hooks, were oxidising when used near Pirapora. Although we have seen sand extraction from the river; no conflict between this activity and fishers seem to occur.

3. RECOMMENDATIONS FOR THE *BRAZIL CONTINENTAL FISHERIES* PROJECT

The idea of the *Towards Co-Management* (*Rumos à Co-Gestão*) project proposal is to adapt the methodology elaborated by Instituto IARA for a possible fisheries management in the SF river basin. One of our objectives was to assess the potential and hindrances for using such a methodology. In this section we present our assessment.

3.1 Strategies to increase resource and fishing community sustainability

We identified a series of factors that may contribute to a strategy aiming to increase the sustainability in natural resource use and to improve the quality of life of fishers and their families. The findings are presented as follows:

- Promote an assembly to involve all the main stakeholders (users, government, NGOs) in the discussion about co-management and strategies to increase resource and fishing community sustainability
    - touch people
    - mobilise people
    - inform about the project and discuss it
    - develop the project strategic planning

- Implement the project:
    - carry out a gender analysis
    - capacitate co-management facilitators (fieldworkers, project managers, trainees)
    - capacitate fishers
        - teach adults to write and read
        - workshops to redeem fisher self-esteem
        - workshops to discuss equity and gender issues
        - workshops to address fisher wives' needs
        - environmental education for local society (including fisher families)
    - capacitate Colônias in:
        - administration
        - environmental and fisheries legislation
        - co-operativism
        - microcredit
        - methods to aggregate value to fishing products
        - marketing and commercialisation
        - equity and gender issues
    - carry out social-environmental participatory appraisal and scientific research[24]
        - valuing local ecological knowledge
        - valuing locally-devised (informal) fishing rules (customary rights)
    - develop a database for both socio-economic and environmental information
    - develop a database for capacity-building materials
    - communicate results from participatory appraisal and scientific research through:
        - radio programs
        - seminars and workshops
        - posters and booklets
        - elementary school and high school
- Carry out a participatory planning for co-management
    - Establish a permanent discussion forum involving several stakeholders
    - Develop fishing agreements (*"acordos de pesca"*)
- Implement actions identified to increase resource and fishing community sustainability
    - Implement fishing agreements
    - Implement other actions needed for environmental conservation and income generation
- Monitor implemented actions
- Evaluate these actions' results
- Discuss the result evaluation within the forum and promote the necessary adaptation of the actions to increase resource and fishing community sustainability
- Monitor and assess the project performance throughout the co-management process

As acting strategy, we also suggest that:

- The project should hold a regional co-ordination in Minas Gerais and another one in Alagoas; each one formed by a main co-ordinator and a secretary. For a better project performance, it is fundamental to hold local co-ordinators (fieldworkers or trainees) in each municipality. As well, it is quite important that the local co-ordinator works together

[24] Participatory methods such as *Rapid Rural Appraisal*, *Community Statistical Census, Community studies of the local Environment.* Use data from previous research, studies and surveys about the SF river fisheries.

with a fisher (male/female) elected by his/her class, so that this fisher becomes a link between the project local co-ordination and fishers.

- Capacity building should not focus only on the Colônia boards, but fishers in general, including unaffiliated fishers and those affiliated ones but not active in Colônia. Hence, Colônias should discuss strategic actions to include those fishers into the co-management process.
- The project timeline be adequate to capacity-building and learning speed of

  stakeholders; that is, the project should allow enough time for each of the co-

  management issues and steps to be dealt with properly.

3.1.1 Partners for co-management in Minas Gerais

Regional technical co-ordination (Minas Gerais)
- Ana Thé

Contacts for extension (Minas Gerais)
- Bárbara Johnson (Três Marias' Secretary for the Environment)
- Raimundo Marques (Head of the Fisher Federation, Três Marias)

Partners at communities/municipalities
- Três Marias: Mr. Norberto dos Santos (contact with riverine fishers)
- Pirapora: Prof. Sandra and Prof. Andréa (UNIMONTES- Pirapora)
- São Francisco: João (Head of Colônia Z3 in São Francisco), Luiz Ferreira de Souza (São Francisco's Secretary for Community Actions)
- Pedras de Maria da Cruz: Lorivaldo Evangelista de Souza (Head of Associação dos Pescadores de Pedras de Maria da Cruz)
- Januária: Sônia (SESC manager)
- Buritis: Renato (Head of Colônia Z11 in Buritis), Clorimundo de Jesus Mariano (environmentalist), Jesus Lopes Siqueira (ABIMA Associação Buritinense Integrado de Meio Ambiente de Buritis)

3.1.2 Partners for co-management in Alagoas

Regional Technical Co-ordination (Alagoas)
- Prof. Sineide Silva Montenegro (UFAL)
- Prof. Fátima de Sá (UFAL)

Contacts for extension (Alagoas)
- Antonio Gomes dos Santos (Vice Head of Fishers Federation in Alagoas and Member of the Hydrographic Basin National Committee for the São Francisco River Basin)
- Sandra Maria Lopes de Moura (agent of Alagoas' Secretary for the Environment)

Parceiros nas comunidades/municípios:
- Entremontes: Mr. Gabriel Araujo Gonçalves (Head of Colônia Z 25)
- Piranhas: Mr. Flávio (Colônia Z-25 treasurer)

- Penedo: Mr. Alfredo Fernando (Piau) (Head of Colônia Z12); Mrs. Angelincia (Head of the Fisherwomen Group in Penedo); Sineide's student willing to work with *pitu* fisherwomen
- Marituba do Peixe: Mr. Genival Bezerra Ramos (Val); Fisher; Sr. Manuel dos Santos (Colônia's monitor man), and Mrs. Belinaura Fernades Thomáz (Restaurant owner)

See also other contacts in Appendix 3 (in Portuguese).

3.1.3 Proposals for stakeholder capacity building

- Teach fishers to write and read using Paulo Freire's education methods (Freire, 1998/1970 e 1996)
- Workshops to address the following issues:
  - consciousness raising for citizenship (rights and duties)
  - social inclusion and self-esteem redeem
  - co-operativism, people's bank
  - fisheries in the SF river: ecology, regulations, alternatives
  - preparation (mechanisms) for conflict resolution
  - water and the environment: sewage, solid residues, recycling

- Capacity building for leadership and communities
  - Meeting moderation
  - Organising and structuring associations/colônias
  - Capacity building for *community statistical census* (according to IARA methods) and *community studies of the local environment (community mapping)*
  - Promoting meetings/assemblies

- Technical courses to aggregate value to fishing products (smoking, cooking, processing, packaging)
- Courses for fish farming with native autoctone species

3.2 Choosing sites for pilot projects: potentials and risks

We analysed Minas Gerais and Alagoas separately for the implementation of pilot projects (see Tables 3a and 3b in Appendix 2 - in Portuguese). In Minas Gerais, municipalities showing a certain potential for co-management are, in a decreasing order, Três Marias, Buritis, São Francisco and Pedra de Maria da Cruz.

Três Marias stands out due to several reasons. It is the home office of the Fisher Federation in Minas Gerais. This organisation in addition to the Colônia Z-5 (which own a Fisher Training Centre) and the Municipal Government, in particular the Secretary for the Environment, support the project. Two other organisations UNIMONTES and CODEVASF are potential contributors to the project. There are previous experiences in local leadership participation and citizen mobilisation through the Consórcio COMLAGO and Comitê de Bacia do Rio São Francisco. We consider the project risks of failure as medium, due to: (1) a possible loss of support by municipal government after 2004 elections; (2) the large area under jurisdiction of Colônia Z-5 results in a number of complex and diverse socio-ecological problems, which may diffuse mobilisation efforts; and, (3) we are not certain about IEF and IBAMA's local office support to the project.

Buritis' potential for co-management relies on: the relatively small size of the municipality and large number of families depending on fisheries; the apparent group cohesion among fishers; the project support received by Colônia Z-11, Municipal Secretary for the Environment, Municipal Secretary for Agriculture; Municipal Common Council, ABIMA, and local environmentalists. In addition, there is a high demand for the project because local people are quite aware of local conflicts and social-environmental problems that need to be tackled. Although a risk of losing support from the municipal government after 2004 elections exists, the existing complementary civil society network (Colônia, ABIMA environmentalists) is likely to provide project continuity.

São Francisco stands out due to: the mobilising potential of the Secretary for Community Action; the good infrastructure and administration of Colônia Z-3; the support from the Secretary of Health and the Environment, the Environmental Police, and most likely from IEF and environmental NGOs. In addition, the good communication between the Colônia and the Municipal Government seemed quite relevant. Based on the contacts made during the fieldwork, we considered local demand for the project[25] as high. The project's risks of failure are medium due to the large jurisdiction of Colônia Z-3; the Colônia's level of political awareness; and the political instabilities at the Municipal Government – the Major was impeached.

Pedras de Maria da Cruz' potential relies on the Fisher Association, which has mobilising experience, high level of awareness concerning social-environmental problems, and willingness to work towards conflict resolution. That is, there is a high demand for project implementation there. Nevertheless, we were not able to assess local government and other NGOs support to the project. The SESC Januária (neighbour city) may provide infrastructure for capacity building. We do not recommend Pirapora, Butizeiros and Januária as pilot project sites due to the following reasons. In Pirapora, Colônia Z-1 does not seem able to mobilise fishers, and it seems that there is no communication between the Colônia and the Municipal Government. During our short visit, we were not able to investigate the potential support of other organisations (Municipal Government, IEF, IBAMA, Capitania dos Portos, NGOs) to the project. Nevertheless, there are previous successful experiences on community development carried out by the Comissão de Solidariedade aos Trabalhadores; and UNIMONTES seems to hold a large potential for research and capacity building.

We do not have enough information to assess Buritizeiro potential as a pilot project site. In Januária, corruption and lack of structure in Colônia Z-2 impede project development at this moment. Despite political instabilities in the Municipal Government – the Major was impeached - the Secretary of Tourism supports the project. It is worth noting infrastructure facilities provided by SESC Januária.

Despite the fact that the project does not anticipate pilot projects in Alagoas, we assess the potentials and risks of failures of the sites visited in that state. Overall, there is a high demand for developing the project in all municipalities in Alagoas. Piranhas and Penedo stand out as sites to start focal work.

Colônia Z-25 has its home office in Piranhas and was recently reactivated. It holds a certain degree of mobilisation including fishers from neighbouring municipalities such as Entremontes. Municipal Governments in Piranhas and in Entremontes support the Project, including Piranhas' Secretary for the Environment. Some NGOs such as Embroiders Association also do so, but we were not able to seek support from environmental NGOs in theses municipalities.

[25] Local awareness of social and environmental problems and willingness to tackle them.

Xingó Institute and the Federal University of Alagoas (UFAL - with research and extension experience in the area) can provide infrastructure and capacity building. Xingó Institute works in the area of fish farming, extension education, management, and water resource monitoring, among others; and it has quite a good infrastructure for capacity-building activities. The Colônia Z-25 pointed out the high demand for project implementation in the area. There are some initial local actions related to the project goals that could be implemented by UFAL researchers and students with a minimum financial support from the project.

Project risks of failure are medium because of the "youth" of Colônia Z-25, the possible loss of support from the municipal government after the 2004 elections, and the apparent lack of strong non-governmental leaderships to provide continuity to the project.

In Penedo, there is a traditional strong mobilisation of fishers. Colônia Z-12 board of directors is very active and demonstrates high interests in implementing some of the project's activities. The Fisherwomen Group is also able to mobilise several people. At the municipal level, the Secretary for Tourism and the Environment supports the project. This secretary seems to be well articulated with other government agencies and NGOs. The Fisher Pastoral in Alagoas has developed important works with fishers and can be considered a serious project partner. Other organisations also support the project, such as the Fisher Federation in Alagoas, the São Francisco River Basin Committee and UFAL. Some awareness regarding social-environmental problems that need to be tackled already exists in Penedo. There is a significant demand to initiate project's activities in this municipality.

Project risks of failure in Pendeo may be considered low due to the Colônia's mobilisation capacity. There seems to be a certain degree of self-recognition and self-appreciation among fishers (both men and women). The Colônia together with the support of the Fisher Federation is already carrying out some activities to improve fisheries. Some government agencies are also keen about working with fishers to improve social and environmental actions. Nevertheless, political discontinuity due to the 2004 election and political awareness of the Colônia may threaten the project's development.

3.3 Socio-economic indicators for the project medium-term monitoring

- *Project effectiveness*: remaining or increasing number of families or communities depending primarily on fishing; cost-benefit analysis
- *Improvement in fishers' wellbeing*: fisher's average income (engaged in the project); number of fisher families engaged in other fishing-related economic activities
- *Co-management implementation*: number of fishing agreements established; number of stakeholders participating in each agreement; stakeholder representation
- *Co-management process transparency*: level of information of all stakeholders engaged in the process
- *Fishing agreements efficiency*: number of conflicts solved; number of infractions detected by environmental police before and after the implementation of the agreement
- *Involvement of government agencies*: local government actions to mitigate or solve environmental problems (urban waste, sewage, water pollution, deforestation).
- *Involvement of NGOs:* local actions to mitigate or solve environmental problems (urban waste, sewage, water pollution, deforestation).
- *Continuity of project actions*: perseverance of people in participating in action promoted by the project (forum, assemblies, courses, workshops, seminars); number of young people involved in project activity, etc.

- *Improvement of fisher self-esteem*: fisher participation in producing radio programs specific for fishers and number of the program listeners; fisher's participation in local politics
- *Fishers' environmental awareness*: Participation of fishers and their families in other activities to mitigate social-environmental problems
- *Inter-institutional co-operation*: number of government agencies participating in project activities and in building fishing agreements
- *Decision-making power*: decision-making rules (e.g., consensus, voting), degree of stakeholder and government participation
- *Institutional strengthening*: number of people participating in capacity-building courses; effectiveness of task accomplishment
- *Equity*: number of women participating in project activities
- *Credibility*: continuity of proposed activities.

In order to monitor such indicators, it is necessary that, *after defining the pilot project sites, a detailed research is carried out in these places to identify the baselines (i.e., current data)* against which to compare data obtained through monitoring in the following years. Depending on the sites chosen, some data may be already available through reports or publications of previous research in the area such as data presented by Thé (2003), Thé, Madi & Nordi s.d., Godinho & Godinho s.d., Valêncio et ali. s.d., among others.

The co-management assessment should further consider indicators of institutional, economic and environmental aspects of sustainability, as those proposed by Hanna (1996):

- *Resilience*: innovation, rule flexibility, adaptation to new situation, and adaptation to changes in markets
- *Efficiency* (cost-benefit analysis): costs of information gathering and processing, co-ordination of decision makers and user groups, and enforcement cost
- *Equity*: parties representation, process clarity, (compatible) expectations, and distributive effects of actions,
- *Stewardship*: lengthened time horizon, monitoring of behaviour, and enforcement of rules

It is important to note that a trade-off exists among these indicators and that, in fact, they do not represent single variables but a set o variables that reinforce one another. It is also worth noting that evaluation and monitoring shall be an on-going process during co-management, and that new problems may emerge during evaluations, which should be addressed.

Fisheries sustainability indicators per se shall also be monitored. Research on fisheries biology may be carried out to point out the best quantitative indicators and their target goals for sustainable use of the SF river fisheries. This however demands a lot of timely and economic investments in research. On the other hand, one may assess fisheries sustainability based on the direction towards which some indicators are moving; for example, increase in catch-per-unit-effort (CPUE), increase in number of individuals larger (total length) than specie sexual maturation size; reduction on the proportion of immature individuals in the total catch; presence (re-appearance) of native autoctone species previously disappeared from fishing landing, etc. Definition of key indicators of ecosystem health shall consider yet fisher's local knowledge on the ecosystem[26]. They may provide more trustful indicators based on their experience in exploring the system.

[26] Effectiveness of resource users participation in defining key indicator of ecosystem health was documented for an South Africa community (Rhodes University, Unitra and Fort Cox 2001).

3.4 Hindrances for co-management

The main hindrances observed during fieldwork are the following (see also Table 4a and 4b in Appendix 2 - in Portuguese).

Colônia's lack of mobilisation and low representation

Not many fishers attend Colônia meetings despite meetings are called by community radios. Many fishers do not trust the Colônia administration and complain about the lack of content during the meetings. Capacitating Colônias' board of directors to better plan meetings may help to overcome this problem. Another problem is the large distance some fishers need to travel to participate in meeting. One way to deal with this is to choose two informants from each distant region to attend meetings, so that they become the link between local fishers and the Colônia.

Communication problems between political levels and Colônia affiliated fishers

Two levels of communication problems: (1) between Colônia and politicians, and (2) between fishers and several sectors of society. Political divergence between Colônia board of directors and government agencies may impede communication and co-operation between them. This barrier may be overcome by increasing social and political awareness through courses on co-responsibility and conflict management workshops. Prejudice against fishers may also impede the dialog between them and the governmental and non-governmental sectors. To deal with it, a medium-term program shall be developed for valuing fishers and their work and for bringing to a legal status fishers working illegally.

Colônia's lack of infrastructure

The type of administration and material acquisition varies among the Colônias visited. A Colônia board of directors encompasses a president , vice-president, secretary, vice-secretary, treasurer and vice-treasurer. In some Colônias, the president plays several of these roles because the secretary and/or treasurer, for example, are not qualified (formally educated) for the position they hold. At Colônia Z-3, for example, the board hired an outside, educated secretary to overcome this problem. On the other hand, some fishers refuse to run for a board position because they are not well qualified for it (e.g. they might not be versatile in writing and mathematics). We suggest that each Colônia should hire an accountant to avoid accounting mistakes and minimise risks of corruption.

At least one Colônia (Z-3) is well equipped, owning freezers, boat, and computer, among other items. At the opposite side, Colônia Z-1 sold its equipment donated by the government, and Colônia Z-2 let its equipment deteriorate. To avoid such problems, Colônia affiliated fishers need to be aware that they are co-owners of such equipment's and hence should take care of them.

Colônias' culture of corruption

Corruption culture is a problem of society in general and not only of Colônias; nevertheless this issue should be tackled. Some fishers mentioned incidents of corruption at Colônia Z-2; e.g. they had to pay one third of their unemployment benefit to the president. A strategy to help change this culture is to provide information on Colônia accounting to all fishers in a transparent way, and to provide capacity building on accounting for the board of directors.

Politization in Colônias

In some Colônias, the board of directors uses the Colônia infrastructure towards their private political interests, such as to run for a political position. We see it as a hindrance because the person (people), instead of looking after the fisher's needs and interests, focuses efforts towards his/their own interests (candidacy). We also understand, however, that a former president of a Colônia may bring benefits to fishers while in a government position. To avoid conflict of interests, we suggest incorporating a new regulation into the Colônia statute that impede members of the board of directors to run as candidates in government election during two years after finishing their administration period in a Colônia. We also suggest that members of the board should be re-elected only once in order to allow for renewal and to avoid the same people in the administration of the Colônia for a long period.

Municipal government's lack of engagement with environmental problems

Not all municipalities hold a Secretary for the Environment. Often, environment issues are dealt within the Secretary of Tourism and Sports or the Secretary of Health. Nevertheless, we were able to identify at least one person responsible for environment issues in most municipalities visited. We recommend involving these people in the co-management process.

Communication problems among government, NGOs and local population

Lack of communication among government, NGOs and civil society is quite common in Brazil's history. Notwithstanding, this situation is changing lately due to an increased number of active NGOs and recent changes in the Brazilian legislation, which encourages civil society's participation in decision making. We suggest the establishment of a discussion forum involving all these groups (such as the case of SF Watershed Committee) to minimise communication problems.

Corruption in municipal governments

As stated before, corruption culture is quite disseminated in Brazil. In two of the municipalities we visited, the Majors were impeached.

4. FINAL CONSIDERATIONS

This report has shown a series of socio-economic and environmental data about fishing communities along the SF River. Such information may be used in elaborating strategies to overcome current problems and conflicts, which are better adapted to the local scenario. This report is a result of a *rapid assessment* focusing on observations regarding the main socio-economic and environmental problems and on interviews with resource users and other stakeholders, including government agencies in the region. More information on the socio-economic situation and environmental degradation of the SF river are presented by other researchers including Cavalcanti e Cruz (1992), Cappio, Martins e Kirchner (1995), MANDACARÚ (2000), and Valêncio et ali. (s.d.).

Along the SF River, there are many professional fishers living exclusively on fishing; some are affiliated to a Colônia, some are not. Over the past two centuries, fishing communities have accumulated a rich body of local knowledge about the river and its resources. This knowledge has often been disregarded (neglected) in governmental decision making about fisheries and water resource use. Integrating local and scientific knowledge is an important pre-requisite in the

search of viable and sustainable solutions for socio-economic and environment problems at the SF river basin.

This research shows the critical situation of social and economic exclusion that fishers and their families are facing. Most of the families interviewed make on average less than a month minimum wage in Brazil; many practice subsistence agriculture and/or have their members working in day-labour activities to complement the household income.

To minimise poverty levels in these communities more income opportunities need to be sought, for example, by aggregating value on fish products or by creating alternative income sources. Some options are: fish farming with autoctone species (while trying to avoid side-effects of this activities); industrial or hand-crafting processing of fish secondary products, such as fish leather; establishing fish processing plants; etc. In order to provide a better and fairer income distribution, all of these activities should be managed through a joint effort such as co-operatives. To diversity income sources in these communities, the project should offer specific training in fish utilisation and processing, marketing and commercialisation, and other activities adequate for the local social-cultural context (e.g., hand-crafting, small-scale agriculture, boat building, tourism). The project may as well introduce new low-cost technologies adequate for the region.

Social exclusion of fishers can be seen through the low, or complete lack of, mobilisation and participation of fishers in decision making and/or in efforts to guarantee their rights and improve their well-being. Many factors account for this situation, including: (1) government agencies' (federal, state and municipal) lack of concern with artesanal fisheries issues; (2) the establishment of top-down fisheries policies, with no consultation or participation of fishers; (3) more powerful river resource users, such as farmers and hydroelectric companies, that historically have imposed their interests on public policies to the detriment of the fishers' ones; and (4) the severe enforcement of fisheries regulations (considered inappropriate by many fishers) causing fishers to pay exorbitant fines or to lose their gear, which puts them into an even worse marginalized position.

In this sense, any effort towards the social inclusion of fishers and a sustainable resource management at the SF river needs primarily to work with regulatory government agencies (e.g., IBAMA, IEF, municipal secretaries), so that they can start changing their attitudes and accept sharing the decision making power with resource users, including fishers. Further, it is necessary to help enforcement agencies (e.g., Environmental Police, IBAMA, IEF) to change their attitude towards fishers, so that actions become more educational than punishing.

Generally, fishers are poorly educated through the formal educational system; hence, many are illiterate. This becomes a problem in accessing information; as well, there is a lack of appropriate information routes and ways designed specifically for fisher needs. Fishers are found to be extremely vulnerable and "disempowered". In order to revert such a situation continuous work should be carried out to strengthen citizenship and self-esteem, informing fishers about their rights and duties, teaching them to write and read, and capacitating them to get involved in co-management processes. Activities such as improving verbal expression, communication and negotiation skills, data analysis, and information dissemination should be pursued. Implementing a radio program turned to fisher needs may help to transmit knowledge, spread information, and strengthen fisher citizenship and self-esteem.

Environmental degradation was found along all sites visited along the SF river. The factors behind such impacts are complex and actors generating them are many. These include farmers

(cattle raising and monoculture); hydroelectric companies; industries (e.g., mining) and agribusiness. Government omission about domestic sewage treatment is another important factor contributing to water pollution and to threatening fisheries and human health.

It is important to survey the sources of pollution and degradation and to identify the responsible actors . In each of the pilot project sites, the community shall carry out a *community study of the local environment*, that is, a participatory survey of the local environment. An expert in participatory surveys (from NGO, university, or government agencies) should advise the community on research methodologies. The survey should map, for example, the damming of marginal lakes, the spots where river water is extracted for agriculture irrigation, the spots where discharged water and sewage is drained into the river, and all those actors responsible for these impacts. This participatory mapping will serve to identify conflicts, mobilise main actors, and start a process of conflict resolution. Indeed, the project's success will depend on its ability in bringing together different actors (fishers, farmers, industries, ONGs, government agencies, scientists, etc) to a negotiation table and in involving them within a transparent and constructive dialogue.

So far, actors responsible for environmental impacts have not done much to revert the situation; in addition, government actions are often quite punctual, and do not always lead towards greater sustainability (e.g., stimulation of tilápia fish farming). This project, on the other hand, aims to contribute to conflict resolution and fisheries sustainability. For this purpose, the project intends to adapt the *acordos de pesca* (fishing agreements) methodology developed by IARA Institute. This methodology has been able to solve serious conflicts among several users in the Lower Amazon Region. The authors of the current report have not participated in any of the experiences in the Amazon River, and all the information we have about these fishing agreements result from readings and conversation with Regina Cerdeira from IARA. To adapt this methodology to the historical, cultural, social, economic and ecological scenario of the SF river, it is necessary to get quite familiar with such proposals to better asses its potential. Our previous experiences from other projects and research on participatory management makes us believe that adapting the IARA methodology for the SF river has an enormous potential for conflict resolution. Here, we suggest working with *interactive learning* in order to achieve more sustainable results. It is not worth establishing new agreements if users do not practice them in their everyday activities. Previous experiences with innovative and creative strategies using interactive learning already exists (Borrini-Feyerabend et ali. 2000).

The present moment is quite appropriate to intervene in social and environmental conflicts. For most fishers, their situation is at the limit of precariousness. Fisher's willingness to change that situation varies from place to place, depending on the mobilising abilities of the Colonia board of directors. In Buritis, Pedras de Maria da Cruz, Três Marias and Penedo, the Colônia mobilising potential is much higher than in Januária and Pirapora. In all localities visited, however, artisanal fisheries are experiencing a crisis, which reflects resource degradation and fishers' social and economic exclusion. Immediate actions are required towards the co-management of the SF river resources.

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APPENDIX 1: THEMATIC SUMMARY OF SEMI-STRUCTURED INTERVIEWS

1. Estado da arte das comunidades de pesca (generalidades e particularidades)

1.3 Situação econômica dos pescadores
- Atividades econômicas no município
- Renda média da pesca
- Formas de comercialização
- Conservação e processamento do pescado
- Tempo gasto com atividade da pesca
- Existem outras alternativas de geração de renda entre os pescadores
- Nível de pobreza dos pescadores (indicadores)
- Sistema de crédito para pescador (microfinanciamento)

1.2 Situação social e qualidade de vida
- Principal origem da população
- História da migração
- Nível de êxodo
- Número de filhos
- Controle de natalidade
- Escolaridade
- Situação de saúde
- Condições de infraestrutura
- Principais problemas em termos de infraestrutura
- Problemas sociais

1.3 Mobilização e coesão social
- Tipo de organização social (colônia, associação)
- Número de associados
- Principais atividades da colonia/associação
- Principais problemas com a colonia/associação
- Quem são os outros lideres locais (qualidade)
- Existe alguma mobilização em torno da questão ambiental?
- Apoio ao projeto
- Comunicação pescadores/colonia com os órgãos do Governo
- Comunicação pescadores/colonia com o resto da comunidade
- Quais são os prncipais conflitos com pescadores
- Grau de cooperação entre as organizações e os atores sociais
- Qual é a estratégia atual de mobilização e organização social?
- Funcionamento dos órgãos de controle, monitoramento e fiscalização
- Conflitos com a fiscalização

1.4 Avaliação do capital humano
- Auto estima do pescador
- Percepção do pescador pela sociedade
- Capacidade de organização
- Nível de informação
- Contextos culturais
    - formas de engajamento, organização, participação
    - agendas locais
    - papel das mulheres

- Conhecimento local (regras, controle)

2. Situação ambiental (específica para cada município visitado)
- Água
  - Esgoto e resíduos sólidos
  - Assoreamento
  - Indústria
  - Agropecuária
- Rio
  - Pesca esportiva
- Mata ciliar
- Contaminação e desmatamento
- Lixo

3. Situação da pesca
- Abundância de recursos naturais
- Acesso aos recursos
- Problemas referente aos recursos (sobrepesca, contaminação, técnicas de pesca, conflitos)
- Manejo atual dos recursos:
  - Qual é o papel dos órgãos oficiais no manejo?
  - Qual é o envolvimento dos pescadores organisados com o manejo?
  - Qual é o papel do conhecimento local no manejo?
- Legislação e fiscalização

4. Considerações técnicas da pesca
- Frota e artes de pesca
- Quantidades pescadas
- Época de pesca
- Locais de pesca
- Material necessário para a pesca
- Número de pessoas envolvidas

5. Sugestão para estratégias apropriadas para o manejo da pesca e o trabalho de desenvolvimento comunitário
- Nível de preparo da comunidade para o co-manejo
- Nível de treinamento, educação ambiental dos parceiros e das comunidades
- Conhecimento e consciência sobre meio ambiente e recursos naturais
- Potencial de policiamento (law enforcement)
- Resolução de conflitos pelo recurso água e pesca
- Perspectivas

APPENDIX 2: ENVIRONMENTAL INPACTS, STAKEHOLDER CONFLICTS AND POTENTIAL AND HINDERANCES FOR CO-MANAGEMENT

Tabela 1a: Impactos Ambientais - MG[27]

	Localidades	**Três Marias**	**Pirapora**	**Buritizeiro**	**São Francisco**	**Januária**	**M ª da Cruz**	**Buritis**
	Ambiente	**Lêntico e lótico**	**Lótico**	**Lótico**	**Lótico**	**Lótico**	**Lótico**	**Lótico**
Poluição da água	Esgoto urbano	sim	sim	sim	sim	sim	sim	sim
	Lixo urbano	sim, más já existe uma iniciativa de coleta seletiva	sim	sim	sim	sim	sim	sim
	Industrial	CMM	indústria têxtil e de liga de ferro					
	Agrícola	sim	sim		sim	sim	sim	sim
	Pecuária					sim		sim
	Hidroelétrica	CEMIG						
Alterações físicas do rio	Barramento de lagoas marginais	sim	sim	sim	sim		sim	sim
	Represamento do SF e tributários	sim					sim	sim
	Assoreamento	sim	sim			sim	sim	
	Desvio do leito	sim						
	Irrigação	sim	sim		sim			sim
	Mineração - areia				sim			
Alterações na cobertura vegetal	Desmatamento na área da bacia	sim	sim			sim	sim	sim
	Desmatamento da mata ciliar					sim	sim	sim
Alterações nos recursos pesqueiros	Espécies exóticas	Tucunaré, Tilápia	Tilápia em tanque-rede					
	Diminuição de pop. de espécies nativas	sim	sim	sim	sim	sim	sim	sim
	Pesca predatória	mergulho, fisga	litro, pesca na piracema		uso de molinete por pescador amador			mergulho com arpão

[27] Os espaços vagos significam que não foi possível obter informações sobre este assunto no município em questão.

Tabela 1b: Impactos Ambientais - AL

	Localidades	**Entremontes**	**Piranhas**	**Penedo**	**Marituba do Peixe**
	Ambiente	**Lótico**	**Lótico**	**Lótico**	**Lótico**
Poluição da água	Esgoto urbano	sim	sim	sim	sim
	Lixo urbano	sim	sim	sim	sim
	Industrial				
	Agrícola				sim
	Pecuária				
Alterações físicas do rio	Hidroelétrica	sim	sim	sim	sim
	Barramento de lagoas marginais	sim	sim	sim	sim
	Represamento do SF e tributários			sim	sim
	Assoreamento	sim	sim	sim	sim
	Desvio do leito	sim	sim		
	Irrigação	sim	sim	sim	sim
	Mineração - areia	sim	sim		
Alterações na cobertura vegetal	Desmatamento na área da bacia			sim	sim
	Desmatamento da mata ciliar			sim	sim
Alterações nos recursos pesqueiros	Espécies exóticas	Tilápia	Tilápia	Tilápia	Tilápia, Tambaqui
	Diminuição de populações de espécies nativas	sim	sim	sim	sim
	Pesca predatória	uso de bombas, arpão	arpão	rede batida	

Tabela 2a: Conflitos entre os diferentes stakeholders - MG

	Localidades	**Três Marias**	**Pirapora**	**Buritizeiro**	**São Fco**	**Januária**	**M ª da Cruz**	**Buritis**
Conflito entre grupos de pescadores	entre comunidades							
	profissional X amador (entre diferentes petrechos)	Sim (arpão x rede)			Sim (molinete x caceia)	sim		sim (arpão x rede)
	colonizado X não-colonizado				sim			
Conflitos entre pescador e outros atores	Pesc. X fazendeiros	sim	sim	sim	sim	sim	sim	sim
	Pesc. X polícia ambiental		sim	sim	sim			sim
	Pesc. X IBAMA/IEF	sim	sim	sim	sim	sim		sim
	Pesc. X hidroelétrica	sim	sim	sim	sim	sim	sim	sim
	Pesc. X mineradora	sim						

Tabela 2b: Conflitos entre os diferentes stakeholders - AL

	Localidades	**Entremontes**	**Piranhas**	**Penedo**	**Marituba**
Conflito entre grupos de pescadores	entre comunidades	sim (Pão de Açúcar)			
	profissional X amador (entre diferentes petrechos)	sim	sim (arpão x rede)	sim (rede espera x rede batida)	
	colonizado X não-coloniz.				
Conflitos entre pescador e outros atores	Pesc. X fazendeiros			sim	sim
	Pesc. X polícia ambiental				
	Pesc. X IBAMA/IEF	sim	sim		
	Pesc. X hidroelétrica	sim	sim	sim	sim
	Pesc. X mineradora				

Tabela 3a: Avaliação rápida do potencial de mobilização para o desenvolvimento do projeto em Minas Gerais

Localidades	**Três Marias**	**Pirapora**	**Buritizeiro**	**São Francisco**	**Januária**	**M ª da Cruz**	**Buritis**
Pop. município	20.000	20.300	25.900	51.400	63.500		20.400
Colônia	Z 5	Z 1	Z 1	Z 3	Z 2	Associação	Z 11
Abrangência da Colônia	23 municípios			7 municípios	9 municípios		
População de pescadores cadastrados	1.200	300	300	710	390	120 (total)	130
População de pescadores não-cadastrados	poucos	300	300		910		
É a Colônia uma liderança comunitária?	sim	não	não	sim	não	sim	sim
Outras lideranças comunitárias	Prefeitura, SMA, federação	Comissão de Solidariedade dos Trabalhadores		Secretaria da Ação Comunitária	SESC	Escolas	ambientalistas, vereador, ABIMA
Experiência com mobilização social	sim	sim	sim	bastante	sim	sim	
Apoio colônia	sim	sim		sim	não	sim	sim
Apoio prefeitura	sim					sim	
Apoio Secret. MA	sim			sim	sim		sim
Apoio IEF				provavelmente	sim		sim
Apoio IBAMA							
Apoio Polícia Ambiental	provavelmente			sim	sim		provavelmente
Apoio ONGs		provavelmente		sim	provavelmente		sim
Apoio Universidade e órgãos de pesquisa	Unimontes, CODESVASF	Unimontes	não tem	não tem	não tem	não tem	não tem
Apoio Comitê da Bacia Hidrog. e consórcios	COMLAGO, Comitê da Bacia Hidrográfica				sim	não tem	não tem
Facilidades e infra-estrutura	Centro de treinamento para pescadores	Unimontes		Caíque (escola)	SESC	SESC, rádio comunitário	rádio comunitário
Demanda local*	alta	média		alta	baixa	alta	alta
Risco de fracasso	médio	alto	alto	médio	alto	baixo	baixo

* relativa à conscientização sobre os problemas sócio-ambientais locais e à disposição para solucioná-los.

Tabela 3b: Avaliação rápida do potencial de mobilização para o desenvolvimento do projeto em Alagoas

Localidades	**Entremontes**	**Piranhas**	**Penedo**	**Marituba**
Pop. município			56.800	63.500
Colônia	Z25	Z25	Z12	
Abrangência da Colônia			1150	
População de pescadores cadastrados	110	110		85 famílias dependem da pesca
População de pescadores não-cadastrados				
É a Colônia uma liderança comunitária?	recentemente reativada	recentemente reativada	sim	em fase de reestruturação
Outras lideranças comunitárias	Associação das Bordadeiras (2)		IPMA, Amigos do Velho Chico (ONGs), Pastoral dos Pescadores, Grupo de Mulheres Pescadeiras	
Experiência com mobilização social	sim		sim	não
Apoio colônia	sim	sim	sim	
Apoio prefeitura	sim	sim	sim	sim
Apoio Secret. MA		sim	sim	sim
Apoio IEF				
Apoio IBAMA				
Apoio Polícia Ambiental				
Apoio ONGs	sim		sim	
Apoio Universidade e órgãos de pesquisas/outros órgãos do Governo	UFAL	CHESF, Instituto Xingó, UFAL	Escola Estadual Teotônio Ribeiro, SEBRAE, UFAL, CODEVASF	UFAL
Apoio Comitê da Bacia Hidrográfico e consórcios			sim	sim
Facilidades e infra-estrutura		CHESF		
Demanda local*	media	alta	alta	alta
Risco de fracasso	médio	médio	baixo	médio

* relativa à conscientização sobre os problemas sócio-ambientais locais e à disposição para solucioná-los.

Tabela 4a: Empecilhos para o desenvolvimento do projeto - MG

	Localidades	**Três Marias**	**Pirapora**	**Buritizeiro**	**São Francisco**	**Januária**	**M ª da Cruz**	**Buritis**
Colônia	Mobilização	alta	baixa	baixa	alta	baixa	alta	alta
	Comunicação entre níveis políticos e colonizados	alta	baixa	baixa	alta	baixa	alta	média
	Infra-estrutura	boa	ruim	ruim	ótima	média	ausente	em construção
	Corrupção					alta		
	Representatividade	média-alta	médio	médio	alta	baixa	alta	alta
	Politização	médio	baixo	baixo	alto	alto	baixo	médio
Governo Municipal	Engajamento na área ambiental	boa	boa		boa	ruim	aparentemente boa	muito boa
	Comunicação entre Governo, ONGs, e população	boa	boa		boa		aparentemente boa	boa
	Corrupção				sim	sim		

Tabela 4b: Empecilhos para o desenvolvimento do projeto - AL

	Localidades	**Entremontes**	**Piranhas**	**Penedo**	**Marituba**
Colônia	Mobilização	alta	alta	alta	media
	Comunicação entre níveis políticos e colonizados	alta	alta	alta	
	Infra-estrutura		Prefeitura	Prefeitura	
	Corrupção				
	Representatividade	alta	alta	alta	media
	Politização				
Governo Municipal	Engajamento na área ambiental			boa	media
	Comunicação entre Governo, ONGs, e população	boa	boa	boa	boa
	Corrupção				

APPENDIX 3: CONTACTS

Cidade	Name	Institution	Telephone
Belo Horizonte (MG)	Marcelo Coutinho Amarante	IEF	(31) 3295 3614 dgp@ief.mg.gov.br
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	Beatrix Booschi	IBAMA	
	Comandante Arley	PM Minas Gerais	arley@pmmg.mg.gov.br
Brasília (DF)	Sávia Dumont	Arte Educadora (oficinas ambientais)	(61) 3682598 saviadumont@uol.com.br
	Tadeu Assade	Secretaria Nacional de Aquicultura e Pesca. Subsecretaria de Planejamento	(61) 2182112 assadmar@agricultura.gov.br
Buritis (MG)	Jesus Lopes Siqueira	ABIMA Associação Buritinense Integrada do Meio Ambiente	(38) 3662 1212 dimal@netibr.com.br
	Mário Rodrigues de Farias	Presidente da Câmera dos Vereadores	(38) 3662 1527
	Gladystone Alves de Magalhães	IEF-Buritis	(38) 3662 1112
	Manoel Pereira de Sousa	SEMA Chefe de Setor	
	Dr. João Alberto Campos Valladares	Ambientalista (Químico)	
	Clorimundo de Jesus Mariano	Ambientalista	(38) 3662 1634
Buritis (MG)	Jarbas Noronha	Radio Alternativa 97.7 FM	
Entremontes (AL)	Dona Fátima	Associação das Bordadeiras Entremontes	(82) 686 6000
	Dona Ione	Cia de Bordados de Entremontes	(82) 686 6023
Cidade	**Name**	**Institution**	**Telephone**
Januária (MG)	Mércia Moreira	Prefeitura de Januária, CBHSF	(38) 9965 0005

	Wellington Viana (?)	Prefeitura Januária Secretaria de Turismo	(38) 3621 1770 Ramal 236 (38) 9979 6675
	Sônia	Gerente do SESC Minas Gerais	(38) 3621 1076 sescmgjr@uai.com.br
Maceió (AL)	Anivaldo de Miranda Pinto	Secretário Executivo do Meio Ambiente, Recursos Hídricos e Naturais de Alagoas	
	Paulo Nunes	Secretário Estadual da Pesca	
	Sandra Maria Lopes de Moura	Secretaria do Meio Ambiente (Comitê de Bacia)	smlmoura@yahoo.com.br
Montes Claros	Maria Neuma Nunes (mobilização social e planejamento participativo)	Secret. do Estado de Desenvolvimento Social e Esportes (SEDESE)	(38) 3222-2938 neumanumes@hotmail.com
Pedras de Maria da Cruz (MG)	Lorivaldo Evangelista de Souza	Presidente da Associação de Pescadores de Pedras de Maria da Cruz	(38) 3622 4229 (recados com Maria ou Antonio) Praça Don Pacheco, 7 CEP 39481-000
	Manoel Carlos Fernandes (Prefeito)	Prefeitura	
	João	EMATER	
	Prof. Charles	Escola Dona Cila	
Penedo (AL)	Antonio Gomes dos Santos (Toinho Pescador)	Vice Presidente da Federação dos Pescadores de Alagoas e Titular do Comitê Nacional de Bacias para a Bacia do Rio SF	(82) 5514463 (res.) (82) 3216200 (Federação em Maceió) 93096143 (cel.) Praça da Alegria, 69 Bairro Sto. Antonio, CEP 57200-000 Penedo, AL
	Antonio Avila	Rádio AM Penedo	
Cidade	**Name**	**Institution**	**Telephone**
Penedo (AL)	Dona Angelincia	Presidente do Grupo de Mulheres Pescadeiras de Penedo	(82) 5516488
	José Marinho Júnior	Coordenador Unidade Executora de	(82) 551 3333

		Projetos, Prefeitura de Penedo	(82) 9302 9009 (cel.) uep.penedoal@ig.com.br
	Rosangela de Queiroz Ana Tavares	Unidade Executora de Projetos, Secretaria do Meio Ambiente, Prefeitura de Penedo	(82) 9991 9009 (cel.) uep.penedoal@ig.com.br
	Fernando Pedro	IPMA (ONG) trabalha sobre: turismo, preservação da mata e reflorestamento da mata ciliar e conscientização ambiental	
	Socorro Barbosa	CODEVASF Psicultura	(82) 99811237
Piranhas (AL)	Gabriel Araujo Gonçalves	Presidente da Colonia de Piranhas Z25	(82) 686 6023 (recados)
	Flávio (filho do Sr. Yonas)	Tesoureiro da Colonia Z25	
	Ignacio Loyola	Prefeito de Piranhas	
Poço Redondo (SE)	Frei Noque	Prefeito de Poço Redondo (Sergipe) Colabora com Piranhas	
	João Alves	Governador de Sergipe	
Pirapora (MG)	Geraldo Diniz	Prefeitura SEMA (reciclagem)	
	Prof. Redelvim Dumont	UNIMONTES	(38) 3741 2412
	Prof. Ivo Chagas (Mestrado na França em Geografia)	UNIMONTES Geografia	
	Prof. Sandra Torres	UNIMONTES Geografia	(38) 3741 2412 (38) 3741 4377

APPENDIX D – SUB-PROJECT 2 RESULTS

TRIP REPORT

Community Assessment Visit for Determining Alternative Livelihood Activities

Três Marias and Pirapora, Brazil, September 19th – 20th, 2003

Erika de Castro
University of British Columbia, Centre for Human Settlements

This report outlines the activities undertaken by Erika de Castro, Research Associate at the Centre for Human Settlements - University of British Columbia (CHS-UBC) for the **Brazil Inland Fisheries: Sustainable Livelihoods and Conservation** project in the period from September 18th to 19th, 2003. During this period, Erika de Castro accompanied the project' team, lead by Inês Mancuso (UFSCar), Barbara Johnsen (Secretária do Meio Ambiente de Três Marias) and Raimundo Marques (Federation of Artesanal Fishers MG), in their fieldwork in two locations: Três Marias and Pirapora, Minas Gerais, Brazil.

The project focuses on the northeast and central-west portions of the country in the basin of the São Francisco River, and has the overall aim to create and implement a model for sustainable socio-environmental river management. The project intends to balance the transfer of "hard" fisheries technologies with an equal social component. As this project places greater emphasis on the social side of Brazilian inland fisheries, it shall incorporate participatory planning processes both in the discussion and in the implementation of activities, which will increase the communities and municipal capacity to enhance the involvement of youth and women in decision-making processes.

To this end, activities were developed according to the project's agenda to assess the potential for initiatives related to community economic development, particularly those involving youth and women's participation, at the municipal and community level. These activities included meetings with several stakeholders and members of the communities involved in the project, as well as the municipal Secretariat for Environment and the staff responsible for women and youth issues in the municipality.

The meetings and visits showed that specific activities should be developed to increase the involvement of municipality staff (in both municipalities) and other stakeholders (Federação de Pescadores, ComLago) in a clear agenda to assess the potential for creating opportunities for youth and women, not only in community economic development but also in terms of increasing their effective participation in the project. One example could be the stimulation, through events and training, for micro enterprises that could capture the existing social capital and enhance the potential for local economic activities amenable to the river (co-ops for craftsmanship, sewing, cooking, childcare, vegetable gardens, herbs, etc). A municipal "co-op incubator" could be set off to organize all the necessary actions and prepare the staff to help and foster the local economic activities. Another initial step could be the survey of local "talents", for example, carrying out a "Talents' Fair" in the municipalities and/or neighborhoods.

There is a strong commitment of all involved, and undoubtedly the potential exists in the participants to carry out an ambitious agenda for the next stages of the project. However, the focus should be clearer towards the "creation" of an identity for the project regarding community participation, especially for the involvement of women and youth. Activities aimed at the municipalities' staff would help to foster the trust necessary between them and the communities, and should enhance their capacity to sustain the project's actions focus. The existing facilities of the Federacão are a powerful asset to be further explored for this "identity" and have the potential to become a "core" for these project's activities.

Ultimately, the project should foster processes of learning involving new institutional knowledge where, in collaborating with communities' members and by promoting community participation, the municipalities and other institutional partners as public organisations will commit themselves to the long-term goal of the project.

In order to maximize the project's participatory dimension and effectiveness in involving the communities, activities, such as gender analysis workshops, youth participation activities, and other participatory planning tools (like biomapping, for example), should be added to the project's agenda. Youth and women (specially wives of fishermen, but not exclusively since other women who are part of the communities could be engaged in activities that act as support for the fishing activities - for example, tourism, craftsmanship, etc) should be directly involved in these activities.

Another aspect that should be addressed more vigorously is the involvement of regional stakeholders (other surrounding municipalities, regional agencies, educational institutions, NGOs, etc), as they represent a crucial aspect to guaranteeing the sustainability of project results and their dissemination throughout other riverine communities. A diversity of mandates will provide different approaches and learning processes for similar goals, therefore enriching the project's approaches.

CONFERENCE REPORT

World Aquaculture 2003 – Freshwater Aquaculture and Environment in Brazil: What's Next?

Salvador, Brazil, May 20th, 2003

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SESSION AGENDA

< Projeto **Peixes e Pessoas** >

Freshwater Aquaculture and Environment in Brazil: What's Next?

A Roundtable on Developing Environmental Protocols for Brazilian Freshwater Aquaculture

World Aquaculture 2003

Tuesday May 20, 2003 13:20-17:50 Room Oxalá 2

Chair: **Joachim Carolsfeld**, World Fisheries Trust

13:20 **Raimundo Ferreira Marquez**, Federação dos Pescadores Profissionais MG. "Fishing families' concerns for the environment"

13:40 **Joachim Carolsfeld**, World Fisheries Trust, Victoria, B.C., Canada "Environmental impacts of freshwater aquaculture in Brazil: Are there practical solutions?"

14:00 **Dr. Allan Castledine**, Director - Aquaculture Development, Ministry of Agriculture and Fisheries, Government of British Columbia, Canada: "Evolution of the Canadian aquaculture industry and regulatory environment"

14:20 **TBA** - IBAMA and Secretaria de Pesca, Brasília - Perspective on environmental standards for aquaculture in Brazil

14:40 **Márcia Noela Eler and Evaldo Espíndola** - CRHEA (Centro de Recursos Hídricos e Ecologia Aplicada) - Universidade de São Paulo (USP) - "Case study: Environmental impacts of fee-fishing ponds in the State of São Paulo"

15:00 **Carlos Bernardo Mascarenhas Alves**, Fish Passage Center, Universidade Federal de Minas Gerais (UFMG): "Introduced fish species in Minas Gerais (Brazil): what will be the environmental impacts?"

15:20 **Gerald Kurten**, A.E. Wood State Fish Hatchery, Texas Parks & Wildlife, San Marcos, Texas: "Practical considerations for Inland aquaculture in environmentally sensitive areas"

Break 15:40-16:10

16:10 **Open discussion**: (Joachim Carolsfeld, moderator): Recommendations for protocols

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Federação dos Pescadores Profissionais MG

AWARENESS PAMPHLET

Freshwater Aquaculture and Environment in Brazil:

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Federação dos Pescadores Profissionais MG

ROUNDTABLE SESSION NOTES

Prepared by: Carmen Ross, World Fisheries Trust

PRESENTATIONS

Raimundo Ferreira Marquez, Federação dos Pescadores Profissionais MG

"Fishing families' concerns for the environment"

Mr. Marquez spoke about his communities' concerns for the environmental impacts of aquaculture on the São Francisco River (SF), from the headwaters to the mouth. He described the SF as unrecognizable compared to what it was 50 years ago and attributed these changes to urban development, deforestation and the release of industrial effluents into the river. Mr. Marques stressed that methods of dealing with these problems need to change, and provided some examples (see below).

The first example is the almost complete deforestation of the great plains of Minas Gerais. Many of Brazil's rivers, including the SF, originate from this area. The plains have been destroyed despite laws that were written to protect them, because they are not adhered to in practice. One of these laws states that a minimum of 50 meters of forest must be preserved along riverbanks; however this is believed to be insufficient. Mr. Marquez feels that this band should be at least 100 meters wide, given that the Eucalyptus tree has a root system, which can extend more than 50 meters.

Other examples of negative environmental impacts on the SF River are related to mining, agriculture, and urban development. Mining affects both the SF River and its tributaries. The expansion of agricultural plantations for soy, rice, and cane, for example, has resulted in the deforestation of huge amounts of land in this basin. Industries and urban development also contribute to declining water quality through the release of effluents into the river system.

Mr. Marquez cites an example of the kind of damage that is related to some of these activities. A friend at the mouth of the SF River reported that he could no longer see fish in the river due to high levels of silt. He feels that this is an unacceptable situation and needs to be rectified. To save the SF River we need to protect not only the mainstream but also all the tributaries and the headwaters that feed the river. Finally, Mr. Marquez stresses that everyone, including individuals, community groups and governmental organizations, needs to be concerned about the welfare of our rivers. No one is paying enough attention to this issue, even though the bottom line is that: when the water is not healthy, neither are the people who depend on it for their livelihoods and well-being. For example, poor water quality has caused high levels of kidney disease, not only amongst the people of Minas Gerais, but throughout Brazil. For these reasons, the need for clean water has to be given very high priority.

Unfortunately, there are many factors that complicate this issue. For instance, while agriculture and industry are needed to support growing populations, the fishing community is being negatively impacted by these activities. Yet many Brazilians see fishermen as the only reason for the decline in fish stocks. However, Mr. Marquez points out that the present-day fishing methods employed on the SF River have been used for centuries without causing the severe population declines of recent times. Thus he feels strongly that declining populations are clearly related in large part to the effects of industrial effluents and other effects of urbanization, rather than over-fishing.

Fishermen have a deep connection to the river in their everyday lives. They gauge water quality on a daily basis, as they observe the river and see, smell and "feel" the quality of the water. Although this is not done in a scientific way, *per se*, Mr. Marquez feels that this knowledge and understanding can contribute a great deal to helping improve the quality of the SF River and its people. His community understands that technology can help provide better methods for improving environmental conditions; however he stresses that, ultimately, their livelihoods are at the mercy of natural processes such as rainfall, which cannot be controlled.

Overpopulation and the ability to feed future generations is another major concern. One solution that has been offered is aquaculture; however Mr. Marquez is reluctant to see this as a simple answer. Brazil has a history of introducing non-native species without giving careful thought to the species that are introduced and the possible consequences. For example, the African Catfish has escaped from fee-fishing ponds and is expanding into more and more Brazilian rivers and competing with native fish. The Tucunaré, a fish that is native to the Amazon River, has also wiped out many of the native species of the SF River.

Mr. Marquez suggested that aqualculture of non-native fish species such as Carp and Tilapia is, in some ways equivalent to the broiler chicken industry. At first, Brazilian people did not accept the mass production of poultry, but preferred to only eat free-range chicken. However, chicken has become a very large part of the Brazilian diet, so with growing populations it would be impossible to fill the market needs without farmed chicken. Likewise, we need aquacultural ponds to fill the market needs for fish and to develop jobs. Furthermore, he believes that small scale (50 – 100 lbs) is not sufficient, but that only large-scale operations will be able to fill these market needs.

Allan Castledyne, Ministry of Agriculture and Fisheries, BC

"Evolution of the Canadian aquaculture industry and regulatory environment"

Dr. Castledyne stated that the fishing industry is a very valuable resource in Canada, with commercial, recreational and aquacultural components totaling about 9 billion dollars in revenue per year. Aquaculture is an important part of this and in his talk he explained how the Canadian industry has evolved, as well as providing some examples of policies that have been developed to deal with the environmental concerns related to this industry. He stressed that everyone

needs to realize is that this has not been a simple process, and it has taken Canada over 100 years to get to this point. The main complicating issues have been geo-political boundaries and jurisdictional issues between federal and provincial governmental agencies. One example of a successful strategy is to include the groups using this resource (fishers, communities groups, industry, etc.) in discussions related to environmental concerns, early on in the process.

Aquaculture in Canada is not done at the subsistence level, but on larger scale and for export. Our national aquaculture objectives are to sustain a diverse economy, to improve food production, and to maintain biodiversity. Some of the environmental issues related to this industry include: the release of solid wastes into the environment; the introduction and magnification of disease; and the introduction of exotic species. In addition, there are the human issues relating to aquaculture, such as social implications, planning and communication, which are also important to consider. Historically, we have had a tendency to concentrate on technical issues and forget to deal with the human issues.

Canada has a history of allowing the introduction of non-native species, both on purpose and by accident. Brown Trout, Common Carp, Yellow Perch and Goldfish were all intentionally introduced from Europe and other parts of Canada, and have always managed to escape into the wild! It has proven to be almost impossible to keep fish contained. These escapes of non-native fish have genetic, ecosystem and disease implications on native fish populations. For example, in British Columbia we are experiencing a problem with the possible magnification of sea lice populations. This problem has been linked to fish farming and could pose a serious problem for wild salmon.

Control and management in the Canadian aquaculture industry meets international, national and local standards. International standards include FAO, ISO 14001 and fish health/disease certification. These standards don't solve environmental problems; they just provide guidelines to achieve effective management. Canada has both a Federal Fisheries Act and provincial regulations that relate to aquaculture operations. It is not only necessary to have environmental regulations in place, but these regulations must be enforced in such a way as to demand compliance.

Some examples of regulatory mechanisms include:

- Waste management regulations: These are performance based and measure the effect of aquaculture operations on the river or ocean bottom. They provide models for solid separation, appropriate feeding systems and waste output.

- Specific mechanisms: All fee fishing ponds must have a permit, which is approved, with or without conditions, after the operation has gone through a thorough risk assessment process (AORA).

- Regional control mechanisms: These provide control for the movement of fish.

- Disease control mechanisms
- Industry-based codes of practices

In summary, the first thing that needs to be done is to define the objectives of both aquaculture and management of wild fish stocks. It is difficult for governments to manage this industry when they are dealing with many separate individuals or operations, so it is important for users to be organized and to have strong associations to represent their concerns. In order to meet these needs, a comprehensive approach to management, possibly including the hazard analysis approach, must be taken.

It is important to realize that there will always be people opposed to the idea of aquaculture, and that this is often based on lack of information, but as a group this opposition is very influential. Thus, Canada is moving toward an area-based approach where all user needs and concerns are taken into account. We hope that this will provide a good model for other countries embarking on aquaculture management.

Márcia Noela Eler and Evaldo Espíndola, CRHEA, USP

"Case Study: Environmental impacts of fee-fishing ponds in the state of São Paulo"

Marcia Noela Eler

Ms. Noela Eler's work began a long time ago in IBAMA (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis) while she was doing her Master's research. She noticed that the one concern that wasn't being addressed was the negative environmental effects associated with fee-fishing operations. The effluent from these operations was having a huge impact on the environment; however, the link between pond production and environmental impacts had not yet been recognized.

The research team used the hydrographic basin as the basis of their area of study. They were asked to look at water samples to determine why fish in fee-fishing farms were dying. The study looked at many aspects of farm operation, including water treatment, feed, and proximity to agricultural operations. The analysis was based on data collected from a questionnaire that was sent to operators of fee fishing farms within the basin, including questions on environmental factors.

In the upper part of the basin there are many plantations and many fee-fishing farms. The study showed that the major effect these fish farms had on the environment was the escape of non-native fish species into the basin. For example, African Catfish escaped from one farm, built within 30 m of the river, and found their way into the river. Many other "exotic" species, including the Tucunaré (a native of the Amazon River), had also been released into the river.

Another major difficulty is that many installations are unlicenced, and have been built without following any regulations. Even those that have been built to code and receive their license often stop following regulations, but run little risk of losing their license. The regulations that are in place are also not very inclusive. For example, water quality studies only require an operator to measure pH, but don't include nitrogen levels. Often, farmers are not honest about their use of chemicals, which is unfortunate since many of these were developed for use on land, not in water. The study found levels of chemicals in fee-fishing farms that were well over the maximum allowable legal levels.

Finally, 80% of fee-fishing installations had high levels of cyanobacteria, with blooms occurring in levels that were lethal to mice. Organophosphate insecticides (neurotoxins) were also present in many farms.

Evaldo Espíndola

Dr. Espíndola's study focussed on the operators of fee fish farms. Only 45% of the installations were profitable and 45% of owners also did not comply with regulations that were in place for fee fish farms. Most operators were farmers or tradesmen with no previous experience in fish culture and there was no technical assistance available to them.

This study also examined the public perception of fee-fishing activities. An attempt was made to raise the level of public awareness of the negative impacts of small-scale, non-regulated aquaculture on the environment. This was done in an attempt to promote an ethic of ecological responsibility.

Some possible solutions were discussed. These were based both on the results of this study and input from owners and proprietors and are listed below:

- Improved training in the areas of technical, administrative, and environmental control;
- Incentives for complying with regulatory practices related to reforestation, composting, etc.;
- Formation of co-operatives;
- Quality control, including classification of installations; and
- Use of effluents for hydroponics or brick making

Future work should include the evaluation of the situation in the context of the entire basin, taking into account other activities in the basin as well as socio-economic factors and other community issues. The group proposed that a protocol for evaluating aquacultural activities, which considers both environmental and socio-economic aspects, needs to be established. However, such a protocol would need to be rigorously applied and continually re-evaluated.

Carlos Bernardo Mascarenhas Alves, UFMG

"Introduced fish species in Minas Gerias (Brazil): what will be the environmental impacts?"

This presentation is part of a scientific publication on the introduction of exotic species to Brazil. Mr. Alves is currently working on two federal projects concerning introduced species, one of which highlights legal aspects and the other concerning the original purposes of these introductions.

The introduction of exotic fish species is only one of the many factors, such as deforestation, urbanization, development of dams, and release of industrial effluents, which have a negative impact on native fish populations. The introduction of non-native fishes is very common in Brazil. It began in the late 19th century with the introduction of the Common Carp. The introduction of the African Catfish is a more recent example that has happened without any controls during the last 30 years.

Legal aspects:

Mr. Alves' research shows that the existing laws regarding the introduction of exotic species tend to be ignored. One of the main problems with these laws is that they are so filled with jargon that they are difficult to interpret. For example, the words "introduction", "translocation" and "re-introduction" are all used extensively, but lack a common definition, which has been agreed upon. Since these important concepts are never clearly defined, the laws are difficult to interpret and are subject to different interpretation by different people, making them very difficult to enforce.

Purposes of Introductions of Exotic Species:

Mr. Alves found that exotic fish species have been introduced to Brazil for many different reasons. These include: expanding the aquaculture and sport fishing industries; stocking reservoirs; controlling undesirable species; developing the ornamental fish industry; and accidental escapes, such as the release of the African or Walking Catfish into the SF River during a large flood in the summer of 96/97.

Whatever the original reason for these introductions, they have many well-known and adverse effects on native populations. This can be so far-reaching as to cause the extinction of native species. Some of the adverse effects that can lead to extinction of native species include: limnological perturbations; the introduction of diseases and parasites; changes in competition and predation rates; hybridization with native species; and changes in the composition of the fish fauna.

Mr. Alves stresses that although there have also been numerous benefits from these introductions, including increased fish production and improvements in the sport fishing industry,

the maintenance of biodiversity is a much more important issue than fish production and should be given priority.

Minas Gerais (MG) is known as Brazil's headwater state. The number of exotic species found in the six largest basins in MG has increased dramatically since 1997. Dr. Mascarenhas Alves expressed concern about the situation in which two species, one exotic and one native, live in the same area, feed on the same food, and utilize the same habitat. He feels that in all likelihood, under these conditions, the native fish fauna would become extinct in the near future. In fact, he estimates that approximately one third of native species could become extinct within 30 years.

Tilapia is a very good example of the impact of an introduced species on native populations. They are now known to be established in more than 90 countries, and have negatively impacted native species in many ways. These include: hybridizing with native fish (where native Tilapia exist), causing declines in other native species populations and fisheries production; and ultimately leading to extinction of endemic fish and mollusk species. In fact, the introduction of *Tilapia* to northeastern Brazil was followed by a decline in fisheries production of all native species.

Future Recommendations:

- Aquaculture operations should always try to use species that are native to the specific basin within which they are operating. This will require improved technical knowledge relating to the culture of native fish species.
- Improve the control of live fish transportation between sites.
- Educate people regarding the dangers associated with the introduction of exotic species.
- Stimulate the development of native fish culture techniques.

Gerald Kurten, Texas Parks & Wildlife

"Practical considerations for Inland aquaculture in environmentally sensitive areas"

Mr. Kurten's main area of study is how to manage an aquaculture facility while being sure that the facility is adhering to the highest standards of environmental considerations. He presents experiences from the A.E. Wood Fish Hatchery, situated on the San Marcos River in Texas as an example.

The key issues that Mr. Kurten considers are: water quality issues related to fish hatchery effluents; water rights; and genetic "pollution", (including escape of introduced species of fish, their hybridization with native fish and competition for resources between native and introduced species).

Water quality:

In 1994 all aquatic chemicals were made illegal by the US government, forcing all hatcheries to apply for permits to release effluents into the environment. The government has regulations and legislation specifically dealing with the use of fresh and saltwater and its release back into the natural environment. In addition to these government regulations, the public in San Marcos demanded that the water of the San Marcos River remain clear and clean in order to protect the local ecosystem. The San Marcos River provides critical habitat for at least 4 threatened or endangered species (2 fish, 1 plant and 1 reptile).

A recent study of effluent discharge into the San Marcos River revealed that water quality was highly variable but good, and that no measurable difference in water quality and microorganisms was found between water upstream and water downstream of the hatchery.

In order to achieve such high standards, the hatchery had set up a "best practices guideline" that includes: slowing down the rate of pond drainage*;* using the minimum effective fertilization regime; removing excess sediment in rearing ponds; and diluting effluent, as necessary. Analysis of the removed sediment was done, and since no chemicals had been used, it was even feasible to sell or use it as plant fertilizer.

A draft permit required a maximum of 10 ppm Total Suspended Solids (TSS), which was less than the hatchery's current average of 17.6. The hatchery employed a variety of techniques to meet this standard and improve effluent management. This was accomplished by: increasing the capacity of the treatment system to 8,000 gpm; developing a system to re-use the water; installing a gravity flow system; and improving control of escapees. (Note that escapees are considered pollution, just like chemicals and solid wastes.)

The new effluent filtration system, with a 40μ screen size, decreased solids in the effluent by 50%. The total cost of the system was $3 million, which is a big investment for a facility that is valued at about $28 million. The high cost of such a system may make this an impractical solution for most managers in Brazil, but some alternatives to removing particles from solutions include improved screening and disinfections.

Genetic and Exotic Pollution:

In order to avoid the problems associated with genetic and exotic pollution, Mr. Kurten recommended that the production of non-native fish should be avoided, unless they already exist in the river. The regionalization of hatchery production was suggested as a way of limiting disease transmission. Finally, he suggested that monitoring fish for disease at the time of harvest; putting new fish into quarantine; and monitoring both the water source and ponds, for disease should be carried out on a routine basis.

In reality, Texas stocks substantial numbers of non-native species and any hatchery produced fish, even of native species, can be considered "genetic pollution" of the native fish fauna. The

hatchery is diligent in its attempts to reduce the level of this genetic "pollution". This is accomplished by investigating triploidy and tetraploidy stocks, ensuring that genetic certification of broodstock is carried out, doing genetic screening of offspring and ensuring massive stocking of genetically pure fish in order to overcome hybridization issues.

Fátima Pereira de Sá, Universidade Federal de Alagoas

Dr. Pereira de Sá works in the lower São Francisco (SF) River, with a project concentrating on the Várzea da Marituba. (Note that a "várzea" is the area of low, flat, floodplain along a waterway.) The lower SF River is negatively impacted by a myriad of problems which originate in the upper SF. Millions of people who live below the dam have seen their lives affected, especially those that depend on small-scale fisheries. This situation has severely impacted the lives of Brazilians living in the lower reaches of the SF River.

Deforestation related to sugar cane production is one example, which has had many negative repercussions. It has caused massive loss of habitat and high levels of siltation, resulting in the formation of large islands at the mouth of the river, which didn't exist in the past. Since large areas of the shoreline are now covered by microphytes rather than forests, these communities no longer have a source of wood for such things as crafts, boats and oars, all of which are essential to their traditional livelihoods. The sugar cane industry has also caused extensive air and water pollution, which has further compromised quality of life in this region.

The building of the dam has also had other far-reaching consequences. For one thing, it acts as a barrier to fish migration so that fish from the lower river are unable to reach their spawning grounds, resulting in deceased native fish populations. Those involved in the sugar cane industry have even begun to put up small dams on the tributaries in the headwaters in an attempt to improve irrigation during the dry season. As a result, the water has become inappropriate for fish and many fishermen have been forced to turn to harvest sugar cane in order to support their families.

Agricultural practices used to also depended on periodic flooding along the river. The absence of flooding imposed by the dam has resulted in the loss of fertile land and decreasing levels of production. Thus, the large tracts of floodplains along the river's edge and lagoons have been lost and the water has become stagnant. This has had a negative effect on fish populations as well.

Aquaculture has also impacted the traditional livelihoods of the people of the SF River Basin. Exotic species have disturbed the natural biodiversity of this river system. Fátima notes that the introduction of species such as the Tucunaré, that are native to other parts of Brazil, into the SF River has been just as damaging as the Carp or Tilapia from other countries. Problems such as higher levels of pathogens, competition and eutrophication are typical in areas of the SF River with large concentrations of aquaculture nets and pens.

Fátima describes a situation in which the fishermen in the lower SF River complain that aquacultural activities have divided the community. She notes that it is very difficult to change people's opinions and to get them to embrace modern technologies and ideas. Thus, introducing technical knowledge and methods to people in these communities is a very sensitive issue and must be very well planned and done very carefully.

Fátima feels that it is very important to first define small-scale vs. large-scale aquaculture, the positive measures that can be taken to ensure their successful implementation, and the positive impacts they can have on fishing communities. For example, it will be very important for CODEVASF (Companhia de Desenvolvimento do Vale do São Francisco) to provide training for fishermen moving into the aquaculture industry, and to make it clear that it can ultimately lead to higher incomes and increased sources of food for the community.

The Federation of Fishermen has proposed that aquacultural activities be conducted through them, rather than on an individual basis, so that they can better control and regulate environmental impact as well as adding value to the resource through increased organization.

Dr. Pereira de Sá concludes her presentation by emphasizing the importance of paying serious attention to the devastation that have been caused to the traditional life along the SF River. She cites an example in the Várzea da Marituba, in which the main native species, the Marituba, are rarely seen anymore. She refers to them as the "living dead", because only one or two individuals might be caught or seen per year. Since they can no longer reproduce, it is only a matter of time before they are gone for good.

OPEN DISCUSSION – RECOMMENDATIONS FOR PROTOCOLS

Carlos Eduardo Proença – SEAP (new Secretariat of Aquaculture & Fisheries)

Dr. Proença wanted it to be understood that IBAMA still controls Brazilian fisheries and that there are laws in place to regulate aquaculture. Unfortunately, they are rarely followed or enforced. One example he cites is the introduction of the African Catfish, which is prohibited by law but was introduced to Brazil by CODEVASF in direct contravention of the law. He does not know of a single case of illegal introduction that has been punished and emphasized that it is crucial that laws that already exist, also be enforced.

Comment (A CODEVASF representative): CODEVASF itself did not introduce the African Catfish. Rather, it was introduced by an individual working for CODEVASF, but was done on that person's own initiative after returning from vacation in Africa. CODEVASF only works with tambaqui in the lower SF River.

Question: How can this be avoided in future?

Answer (Carlos): It is very difficult to control these types of introductions. These species should never have gotten through customs. While working at IBAMA he received requests to introduce at least six different exotic species, all of which were denied. Enforcement is the main issue to prevent future introductions. Offenders must be prosecuted and fines and punishments must be given for infractions such as this.

Question: Is education important?

Answer (Carlos): Yes. Education can help to dissuade people from doing these types of things on their own initiative. Anybody can get to the river and it is impossible to enforce laws 24 hours a day, so it is important that people understand the negative consequences of these introductions to their communities.

Question: Is it possible that this person got past customs because he worked for CODEVASF?

Answer: We think he snuck it by customs in his luggage.

Comment (IBAMA representative): In IBAMA many things don't get done, not because we don't want to do them but because we just don't have the staff. Thus far in this discussion, we have been isolating aquaculture from other types of food production. If you look at it in an isolated way, the problem looks much bigger than it actually is. I feel we should shift the focus of the discussion more toward the strengthening of aquaculture legislation.

Answer (Carlos): Aquaculture operations have a huge number of registration processes to go through before they are fully licensed. Operators need to pay 15 different taxes to 15 different agencies before they can legally operate. It is important that these licensing bodies start to co-ordinate their processes. An operator should have only one document to prepare that will register him as a rural producer. I suggest that licensing be centralized so that what a producer needs to do in order to operate an environmentally and legally sound operation, is both manageable and affordable. In Brazil there are over 2,000 aquaculture operations, but not a single one is fully legal because it too complicated to get all the correct paperwork in order. The bureaucracy is much too complicated.

Question (Raimundo): From personal experience, I can attest to how difficult it is to get all the paperwork that is necessary to start a legal aquaculture operation. It is so difficult that most people start to operate before they are legally licensed and continue to operate regardless of the licensing. This also happens in forestry. Can we throw away the whole Brazilian system? How can this be improved?

Answer (Carlos): It is almost impossible to regulate after the fact. When the law was enacted in 2001, more than 1,000 aquaculture operations were already in service. It is only more recently that regulations for aquaculture have been created. I only know of two cases in which producers were made to stop production or move their operations based on infractions. People are taking the easy route – they build their installations first and then think about making it legal.

Comment (Raimundo): The law has already been modified. There needs to be a clear beginning to the process.

Question (CODEVASF representative): I work for CODEVASF near Três Marias and we are developing an experimental unit to look into net culture. We started the documentation process for licensing and copies were sent to all the different associations and ministries, but authorization did not come. Is it true that if you don't get authorization within 30 days, that authorization can be assumed?

Answer (Carlos): The decree has a mistake in it. It doesn't specifically deal with water rights, but deals with the occupation of federally controlled areas. The federal government can concede the use of these areas, which includes water rights. There are two distinct processes that need to be followed: one for the physical space and another for the water rights. We want to bring these two processes together, but are experiencing delays in accomplishing this. Approximately 80% of requests for water and land use are given authorization, but it is also necessary to get an environmental license from IBAMA. Environmental license applications are usually denied or take a very long in coming because they have no specific legislation relating to aquaculture. Currently you have go through the same process to build a major bridge as you do in order to put three aquaculture tanks in a river.

Comment: I think we have to think of a new licensing system. I don't think we put enough faith in technical knowledge and experience. I think if there were a single law, aquaculture professionals and technicians within IBAMA could be responsible for licensing and helping small producers out on an individual basis.

Answer (Carlos): Ninety-nine percent of aquaculturists are not capable of preparing their own documents because the licensing process is so complex and expensive. Farmers are forced to hire expensive consultants to help them with their applications. For example: For each application you must have the exact GPS location of proposed installations. This has to be done by an expert. These experts are not experts in aquaculture.

Comment: The cost of licensing can be about 12% of the total cost of production. This makes licensing impossible for small producers.

Comment (Carlos): It is not only necessary that the environmental application process be simple and cheap, but it is also important that after approval is given there be regulations in place to control operation. These operational protocols must be prepared by the appropriate experts and must lay out detailed and specific methods of operation that meet all environmental regulations. It takes six to eight years to change a law in Brazil. We have been trying to get a new fisheries law approved for over 10 years, but the process is continually stalled by bureaucracy.

Antonio Gomes dos Santos

Antonio, 71 years old, is a long-time artesanal fisherman and member of the Federation of Professional Fishermen of Alagoas and the National Basin Committee for the São Francisco

River. He felt that he had to participate in the meeting when he found out this discussion would be dealing with issues relating to the lower SF River. He feels that it is the area of the river most affected by environmental degradation. The islands and areas where soils accumulate from annual flooding are used by local fishing families to harvest shrimp and plant rice. These important areas are disappearing. He also feels that it is not true that the river water is wasted in the ocean. The mouth of the river is crucial to many people's livelihoods. In the past any fisherman in the lower SF River could catch 20 kg of fish per day. Now if they can get 5 kg a day it is unusual.

Antonio felt that a lot has been said about aquaculture here today, but that the activity has also caused destruction. He felt that the small-scale fisherman needs to be better respected. He was involved in a CODEVASF project in his community that bought six tanks to start an aquaculture operation. However, they were unable to get these tanks into the water because of bureaucratic delays. This cost the community a lot of money. The people that ended up being successful were those that operated completely illegally.

Antonio appreciates the people who have come from all over the world and are interested in improving the situation here in Brazil. It is so important that fishermen be given the opportunity to control their own destiny. Government aide programs would be unnecessary if fishermen were able to work to sustain themselves, their families and their communities.

Antonio then read and sang a poem that he wrote about the life of a fisherman on the SF River and their dependence on, and unity with, the natural world.

PRESENTATION

Given by: Raimundo Ferreira Marques (FPMG) and Norberto dos Santos (Colônia Z5)

PROJETO PEIXES, PESSOAS e ÁGUAS
SEMINAR ON CONTINENTAL AQUACULTURE IN BRAZIL

THEME: ENVIRONMENTAL CONCERNS OF THE FISHERMEN'S FAMILIES

Presented at the World Aquaculture Society Conference,
Salvador, Bahia
May 19-24, 2003

Norberto A. dos Santos
Raimundo F. Marquez
Federation of Artesanal Fishermen of Minas Gerais

Good afternoon, moderator Joachim Carolsfeld

Dear friends:

I am Raimundo, President of the Federation of Artesanal Fishermen of the State of Minas Gerais (FPMG) and I am with my colleague, Norberto, a member of Colony Z5, a fisherman of the São Francisco River. We will give a brief report on the environmental concerns that affect the fisheries sector and our families, which also represent a range of socio-economic impacts.

1) Dams on rivers interfere with fish migrations and the flooding of the lagoons along the margins of the river that are nurseries to the native fish.

2) The control of flooding by the hydroelectric companies, and the reservoirs, cause a slowing of the water flow in the rivers. In the first kilometer below [the dam at] Três Marias there are banks of invasive plants, large quantities of mud and excessive sediments. A diver would have difficulty perceiving that the bottom is a gravel bed.

A substance attaches to these invasive plants that we think are chemicals used for cleaning CEMIG's equipment and turbines as we can detect the presence of a thin layer of liquids on the water surface in the first kilometer of the river that doesn't mix with the water.

These substances cause very serious cutaneous eruptions in cast-net fishermen that affect their arms, torso and reproductive area**,** wherever this "water" comes in contact with the body. We already expressed our concern in recent years, however CEMIG doesn't take responsibility and claims not to know anything about any such cleaning practices for its equipment.

3) The compensatory measures for damming the São Fransicsco River in Tres Marias, are summarized by the agreement between the Hydrobiological and Fish Culture Station – CODEVASF and CEMIG - for the production of native fishes, with which we do re-stocking.

Methods of re-stocking are questionable and the Station, with its high scientific calibre, deserves more financial endowment and incentives to develop research that actually promote the sustainability of fishery resources and of fishermen of the São Francisco River.

4) Indiscriminate introduction of species to the São Francisco are highly damaging to the maintenance of native stocks, such as:

- Tucunare (Peacock Bass)
- Bagre americano (Channel Catfish)
- Cachara (Pacu)
- Tilapia tailandesa (Thailand Tilapia) - recently introduced in a cage culture program
- Tilapia comum (Common Tilapia)

5) Support for introductions by agencies and companies of the government: EMATER, IBAMA, CODEVASF, the organizations that allege to be “monitoring” the illegal process of introduction, should guarantee security against escapement. (Consider the example of transgenic soya in the south of the country).

“We are throwing the Amazon into the Sao Francisco River” without a notion of the losses of native treasures, not yet even catalogued. The environmental agencies don’t use the Precautionary Principle. There are no resources from the governments for research that is relevant to the fisherman and his family.

6) Governments and their companies hold control of the genetic stocks introduced into the river basins.

7) Existing research isn’t communicated to the public, nor consolidated for use and or supporting appreciation of the productive fisheries sector.

8) The scientific group, environmental agencies and other institutions, collect traditional knowledge to give a social basis to their research, and apply the practical knowledge of the fisherman and their families, yet confer neither the credit due nor the financial compensation owing.

World-wide there is a consensus that those who deserve to be paid for their knowledge are doctors that have gone to University.

9) Governments and other groups looking for financing need to “create” situations that interest investors. For example: “the fishery stock is at risk” is an example of a negative affirmation, which doesn’t take into account the social impact that these affirmations can cause.

10) There is no publication of projects and research in the areas that are ongoing or were already completed. In this case, there is not prioritization of local interests or incentives for the participation of the communities involved, neither for contesting the data, nor even for the methods used in the evaluation of stocks.

Communities don't have access to the information gathered, as this becomes the monopoly of the financed groups and institutions and the funders.

11) Market demands, as related to quality control of the catch and the lack of: specific training programs on increasing the value of the catch; transportation; [and] storage, and on policies that are accessible to colony members, even something like co-operatives; are all impacting factors.

We are forced to carry on partnerships with economically stronger groups, which have a great ability to organize their membership, even though we are the biggest collector-producers of fish.

12) The police don't have the training to lead on environmental and social questions. They don't know the fishery. They are educated to work with robbers and bandits - the police are highly repressive.

Enforcement should be educative and community driven. This depends upon training and conversation together [with fishermen].

13) The media has great power to mold social preconceptions labelling the fisherman as predators of fishery resources, with neither scientific data nor technical knowledge of the reality of the national fishery.

Fishermen don't have financial resources to promote public awareness about the truth of the fish and the fishermen as food producers and [as] those the most interested in the preservation of stocks because this is what their livelihood depends on.

14) To the imagination within Brazil and the world, few Rivers exist besides the Amazon, and today the São Francisco River has become a new star. The danger is that we will not delve into the problems – we will forget the small springs and veredas (oases) that are "out of sight" of the cameras and films, but that guarantee waters that make the river flow.

The Fishery Federation of Minas Gerais, only as an example, possesses thirteen colonies, only six of which are on the São Francisco. Minas Gerais is a state that is formed by an incredibly vast but unknown hydrographic network.

In Brazil there is no data about the extent, geography, impacts and populations, other than for the principle tributaries of the São Francisco.

15) The absolute disregard for the laws that preserve the national landscapes, natural resources, socio-economic heritage**,** represented by the veredas or what's left of the savannah and permanently preserved areas (APP). Even though enforcement is insipid, the terms of adjustment aren't discussed at the municipal level or with those directly affected by the laws, nor is any investment in divulging the values of those ecological systems. There is no public communication about any of these businesses, their production or their planning, and they are never incriminated or publicly criticized.

16) Vast devastation is caused by a lack of: enforcement, monitoring, mapping, and creation of databanks with real data. There are fictitious studies about impacts, and integrated licensing system are nonexistent; for example the system of the National Department of Mineral Production, the drilling of artesian wells by CODEVASF based on indiscriminate criteria and processes, and, finally, the Eucalyptus plantations in the state of Minas Gerais that are licensed by IEF and other agencies that are active in the municipalities, without consulting the communities or public authorities.

IEF's data about vegetation and reforestation are from 1994 and CODEVASF doesn't know exactly where and how many artesian wells are already in place. The DNPM gives exploration and extraction licences without consulting or prioritizing the landowners.

17) Investments of governmental and business interest are noticeably focussed on larger wealth like mineral extraction, vast plantations, solicited research**,** amongst others.

Even with the propaganda about the value of nature, there is little investment in "what's left of the savannah," preservation of springs and other aquatic resources, because the population and the media don't see them, access to rural locations is more difficult. So the focus remains on the mainstem of some river that is the star of the moment.

"Sao Francisco River – Historical and Cultural Heritage of Humanity"

" … fishing is prohibited in the section between Três Marias and Pirapora, in the name of saving the environment; however extinguish the people - exist the fisherman, who has made the history and culture of the River live. Humanity is left out ..."

18) The large environmental liabilities of companies on the margins of the São Francisco River are a national scandal. The practice of Public Audiences does not exist, and we are contaminating our children with a totally vague notion of what "heavy metals" represent, or other technical terms generally used to minimise the reality of the facts.

19) The cities don't worry about their garbage and sewage that pollute the water and the soil. The poor social classes don't have access to the norms of cleanliness and environmental health.

How are the great aquifers and groundwater levels that percolate to join together with the river waters? If what we see flowing on the surface is already scandalously poorly known and undervalued, how will we preserve the subterranean waters?

20) Is not knowing how to read [illiteracy] an environmental impact to you?

The fisherman doesn't need to read to put fish on the people's table.

Today we complain about the lack of schooling because the participative methods and systems and the communication are from structures and logic exclusively of people from the formal teaching network.

When the fisheries sector is invited to participate, it ends up being just a mass of signatures of those present, sirs: there is nothing less democratic than the pretence of participation.

We need to understand the laws and our rights, by paying the lawyers we are giving them our blind trust. We sign to show our presence in planning meetings that can usher in our own extinction: the meandering words that the river people don't use and document details that appear to have nothing to do with their daily life.

Prepared by:

Raimundo Ferreira Marques – Federation of Professional Fishermen, MG
Norberto dos Santos – Colony Z5
Barbara Johnsen – Secretary of the Environment

APPENDIX E – SUB-PROJECT 3 RESULTS

PROGRAMS AND NEWS COVERAGE

1st Conference of the Cities of the Três Marias Reservoir Region

Três Marias, Brazil, August 7th – 8th, 2003

I CONFERÊNCIA REGIONAL DAS CIDADES DO LAGO DE TRÊS MARIAS

Abaeté, Biquinhas, Felixlândia , Morada Nova de Minas, Paineiras, Pompéu, São Gonçalo do Abaeté, Três Marias

"Cidade para Todos"

"Construindo uma Política Democrática e Integrada para as cidades"

07 e 08 de agosto de 2003
Local: Três Marias Tênis Clube
Três Marias - MG

Cidade para Todos

A Conferência Nacional das Cidades, convocada pelo Presidente da República, será realizada em Brasília, no mês de outubro, com participação da sociedade em parceria com os Estados e os Municípios, visando a busca de propostas para a elaboração das políticas nacionais das cidades brasileiras.

A Conferência Regional do Lago de Três Marias tem como objetivo discutir com as comunidades as questões de urbanismo das oito cidades do Lago, apresentar propostas e escolher os delegados para a Conferência Estadual das Cidades de Minas Gerais.

Este é mais um espaço de integração regional para a expansão da cidadania e fortalecimento da democracia, promovido pelo COMLAGO, em busca de solução dos problemas e do desenvolvimento sustentável da região com geração de trabalho, emprego e renda para redução das desigualdades sociais.

Você é nosso convidado! Participe deste momento importante de renovação das políticas para um Brasil com todos e para todos. Vamos juntos definir o futuro das nossas cidades.

A sua presença e de toda a comunidade é de suma importância.

Pe Geraldo da Silva Macedo
Presidente do COMLAGO

Convite

O Prefeito Municipal Pe. Geraldo da Silva Macedo, Presidente do COMLAGO, convida Vossa Senhoria para participar da I Conferência Regional do Lago de Três Marias.

PROGRAMAÇÃO

QUINTA-FEIRA (07.08) - Três Marias Tênis Clube

18:00 horas - Credenciamento
19:00 horas - Abertura Oficial
19:30 horas - Palestra - Gestão de Reservatórios
Dra. Guida Martiniano Projeto Brasil-Canadá
20:30 horas - Analise e aprovação do Regimento da Conferência

SEXTA-FEIRA (08.08) Três Marias Tênis Clube

08:00 horas - Palestra - Desenvolvimento Urbano
09:00 horas - Estudo, discussão e levantamento de propostas:
Tema:"Construindo uma Política Democrática e Integrada para a cidade".

Subtemas:
- Política habitacional;
- Saneamento;
- Transporte urbano e segurança pública;
- Meio ambiente e gestão de reservatório;
- Espaços sociais e de lazer na cidade;
- Pontencialidades locais e regionais para geração de emprego e renda.

12:00 horas - Horário de almoço
14:00 horas - Apresentação dos trabalhos em grupos e aprovação de propostas
16:00 horas - Escolha dos delegados para a Conferência Estadual das Cidades de Minas Gerais
17:00 horas - Encerramento

Conferência das CIDADES

Comlago
CONSÓRCIO DOS MUNICÍPIOS DO LAGO DE TRÊS MARIAS

Prefeituras e Câmaras Municipais

Informações :

Prefeituras Municipais das Cidades do Lago

Prefeitura Municipal de Três Marias
Praça Castelo Branco , nº 03 - centro
Telefone 38 .3754.5261 / 3754.5281
Site: www.tresmarias-mg.com.br
e-mail: 3marias@progressnet.com.br
Três Marias - Minas Gerais

Participação Cidadã nas políticas públicas

O Conselho Nacional das Cidades, a ser formado durante a Conferência Nacional, será um dos principais componentes da estrutura do Ministério das Cidades para articular as políticas setoriais de desenvolvimento urbano e incorporar de forma transparente e propositiva a sociedade civil organizada.

Será integrado por representantes dos Poderes Executivo e Legislativo - federal, estadual, municipal e do Distrito Federal;

Movimentos sociais e populares;

ONGs, entidades profissionais, acadêmicas e de pesquisa;

Trabalhadores(as), através de suas entidades sindicais;

Empresários(as) relacionados ao desenvolvimento urbano;

Operadoras e concessionárias de serviços públicos.

Pretende-se que o Conselho Nacional das Cidades conte com câmaras setoriais de Habitação, Saneamento Ambiental, Transporte e Mobilidade Urbana e Programas Urbanos e participe da definição da política urbana e das políticas setoriais, bem como equacione a distribuição e a fiscalização dos recursos, contribua para o aprimoramento dos programas e da legislação e proponha diretrizes, instrumentos, normas e prioridades da política nacional de desenvolvimento urbano.

Maioria para a sociedade

O processo de realização das conferências e de formação dos conselhos das cidades reservou prazo até 30 de junho para o exercício, pelos governos municipais, da prerrogativa de convocarem as conferências, mediante a composição da Comissão Preparatória – para fixar data, local, regimento e temário - e da edição do decreto de convocação.

Caso aquela prerrogativa não seja usada, a convocação pode ser feita por representantes de, no mínimo, quatro segmentos diferentes, que devem comunicá-la às comissões preparatórias estadual e nacional para que a validem.

A Comissão Preparatória municipal ou estadual deve ser formada por representantes de todos os segmentos previstos na Conferência Nacional, mas é desnecessário que a representação seja no mesmo percentual. Deve ser garantida a participação de, ao menos, um representante por segmento. E deve ser garantida também a proporcionalidade de 1/3 do Poder Público (Executivo e Legislativo) e 2/3 da sociedade civil.

Na Comissão Preparatória Estadual cada segmento pode ser representado, preferencialmente, por entidades de caráter estadual. Na municipal, as entidades representantes deverão ter caráter municipal.

Para promover as conferências regionais devem ser seguidos os mesmos passos previstos para as conferências municipais. E cada município deve formalizar sua adesão a um processo regional, sendo vedada ao governo estadual e às associações a convocação de conferências regionais sem a participação dos municípios.

Ministério das Cidades CAIXA BRASIL UM PAÍS DE TODOS

Conferência das CIDADES

"Cidade para todos"

Etapa Municipal
até 15 de agosto

Etapa Estadual
de 16 de agosto a 28 de setembro

Etapa Nacional
de 23 a 26 de outubro

e-mail: conferencia@cidades.gov.br
site: http://www.cidades.gov.br
fone: (61) 411-4641

Conferência das Cidades

Debates para a vida urbana Quem terá voz e voto

Construindo uma política democrática e integrada para as cidades

As Conferências das Cidades deverão ser sobretudo, nos níveis municipal, estadual e federal, ambientes privilegiados para a discussão dos grandes problemas há muito tempo acumulados nos espaços urbanos de todo o país.

No âmbito nacional, os objetivos da Conferência das Cidades são:

- Identificar os principais problemas que afligem as populações das cidades brasileiras, mediante manifestações dos vários segmentos e agentes produtores,consumidores e gestores.

- Propor princípios e diretrizes das políticas setoriais e da política nacional das Cidades.

-Avaliar os programas e legislações nas áreas de Habitação, Saneamento Ambiental, Programas Urbanos, Trânsito, Transporte e Mobilidade Urbana, desenvolvidas pelos governos federal, estaduais, municipais e do Distrito Federal.

- Indicar ao Ministério das Cidades as prioridades de atuação.

- Avaliar o sistema de gestão e implementação das políticas urbanas, intermediando a relação com a sociedade na busca da construção de uma esfera público-participativa.

- Avaliar os instrumentos de participação popular presentes na elaboração e implementação das políticas públicas.

- Propor as formas de participação no processo de formação do Conselho das Cidades.

- Propor a natureza e novas atribuições bem como eleger os membros do Conselho das Cidades.

A 1ª Conferência Nacional das Cidades terá uma composição total de 2.510 delegados(as).

Serão 1.698 eleitos(as) nas Conferências Estaduais - veja quadro abaixo, 562 indicados(as) pelas entidades nacionais e 250 representantes indicados(as) pelo Governo Federal e o Congresso Nacional.

Na etapa nacional a Conferência terá a seguinte representação de cada segmento:

a) Administradores públicos e legisladores municipais, estaduais e do Distrito Federal - 749
b) Movimentos sociais e populares – 626
c) ONGs, entidades profissionais, acadêmicas e de pesquisa - 193
d) Entidades sindicais de trabalhadores - 251
e) Empresários relacionados à produção e ao financiamento do desenvolvimento urbano - 193
f) Operadores e concessionários de serviços públicos - 248

Os participantes da etapa nacional se distribuirão em duas categorias:

1) delegados (as) com direito a voz e voto.
2) convidados(as) com direito a voz.

UF	Delegados Eleitos	Movimento Popular	Trabalhadores	ONG's	Empresários	Concessionário Privado	Concessionário Público	P. Público Municipal	P. Público Estadual
Acre	34	09	04	03	03	02	02	07	04
Alagoas	45	13	05	04	04	02	02	10	05
Amazonas	45	13	05	04	04	02	02	10	05
Amapá	32	09	03	03	03	02	02	07	03
Bahia	99	27	11	08	08	06	06	22	11
Ceará	68	19	07	06	06	04	04	15	07
Distrito Federal	42	11	05	04	04	02	02	09	05
Espírito Santo	47	13	05	04	04	03	03	10	05
Goiás	56	16	06	05	05	03	03	12	06
Maranhão	59	16	07	05	05	03	03	13	07
Minas Gerais	123	34	14	10	10	07	07	27	14
Mato Grosso do Sul	42	11	05	04	04	02	02	09	05
Mato Grosso	43	12	05	04	04	02	02	09	05
Pará	63	17	07	05	05	04	04	14	07
Paraíba	48	13	05	04	04	03	03	11	05
Pernambuco	71	19	08	06	06	04	04	16	08
Piauí	45	13	05	04	04	02	02	10	05
Paraná	79	22	09	07	07	04	04	17	09
Rio de Janeiro	104	29	11	09	09	06	06	23	11
Rio Grande do Norte	44	12	05	04	04	02	02	10	05
Rondônia	37	11	04	03	03	02	02	08	04
Roraima	32	09	03	03	03	02	02	07	03
Rio Grande do Sul	83	23	09	07	07	05	05	18	09
Santa Catarina	59	16	07	05	05	03	03	13	07
Sergipe	40	11	05	03	03	02	02	09	05
São Paulo	222	61	25	19	19	12	12	49	25
Tocantins	36	10	04	03	03	02	02	08	04
TOTAL	1698	469	189	146	146	93	93	373	189

RESULTS REPORT

1st Conference of the Cities of the Três Marias Reservoir Region

Três Marias, Brazil, August 7th - 8th, 2003

CD WORKSHOP PROCEEDINGS

Fish Passage in Brazil, special session held at the annual meeting of the Brazilian Ichthyologists' Society (SBI)

São Paulo, Brazil, January 27th - 31st, 2003

CD in sleeve here…

CD WORKSHOP PROCEEDINGS

Effects of Dams on the Environment and Fish in Brazil, special session held at the annual meeting of the Brazilian Ichthyologists' Society (SBI)

São Leopold, Rio Grande do Sul, Brazil,
January 7th - 12th, 2001

CD in sleeve here…

TRIP REPORT

12th International Conference on Aquatic Invasive Species

Windsor, Ontario, June 8th – 14th, 2003

Marcia Divina Oliveira
EMBRAPA, Brazil

The "12th International Conference on Aquatic Invasive Species" held on June 09 to 12, 2003, in Windsor, Canada provided me the opportunity to gather information and improve my understanding of Zebra Mussel research. I presented a paper entitled "Invasion of Golden Mussel, *Limnoperna fortunei* in the Pantanal Wetland, Brazil", in which I discussed the invasion of the Golden Mussel in Brazil, with a case study in the Pantanal wetland region.

At the conference I was able to collect valuable research materials, including a book, entitled "Zebra Mussel monitoring and Control", from World Fisheries Trust and a CD containing a database on the Zebra mussel that was distributed by the US Army Corp of Engineers. I was also able to spend some time at the University of Windsor library, where I found and photocopied several pertinent scientific papers.

In addition, my trip to Canada provided a valuable opportunity to visit an English speaking country and improve my language skills, which is very important for the exchange of scientific knowledge. I also appreciated the experience of visiting another culture and found the city of Windsor, a very different urban space, very interesting.

CONFERENCE SUMMARY

Countries participating in the conference included Italy, New Zealand, China, USA, Canada, Brazil, Philippines, England, India and Netherlands. The conference was separated in sessions on the following issues:

- Science, Policy and politics
- International perspectives on AIS management
- Control options for industry I, II
- Ecosystem interactions and impacts I, II
- Implications for Human and Ecosystem Health: Pathogens, toxins and toxics
- Economic impacts
- Shipping as a vector for new species introductions I, II
- Tolerances and Physiology of invasive species
- Management case studies
- Control of AIS in non-industrial settings
- Education and outreach
- Techniques and risk assessment
- Unauthorised Fish Introductions
- Developing an International response to prevent the spread of Zebra Mussel in North America the 100th Meridian initiative

Conference presentations covered topics such as: ballast water introductions and management issues, current technologies for the control of organisms in ballast water, and various aspects of Zebra Mussel invasion, biology and control in the US and Canada. Discussions focussed on

Zebra Mussel, the introduced species that causes the most economic and environmental impact in the US and Canada.

100TH MERIDIAN INITIATIVE

One important initiative highlighted during the conference was the 100th Meridian Initiative (www.100thmeridian.org). The initiative was established to define the risk of the accidental introduction of Zebra Mussel into the western waters of the US and Canada by tourism boat traffic and includes many projects designed to stop the spread of the Zebra Mussel in the US and Canada. The initiative has 2 main objectives: 1) to prevent the spread of Zebra Mussel and other invasive species and monitoring, and 2) control of Zebra Mussel and other invasive species in these areas.

The following steps are being taken to meet these objectives:

Information and Education: Inform and educate the public about the ecological and economic impacts of Zebra Mussels, the pathways by which they spread, and what actions can be taken to prevent their spread.

Voluntary Boat Inspections and Boater Surveys: Prevent the spread of Zebra Mussels in the 100th meridian jurisdictions and west through voluntary boat inspections and boater surveys.

Commercially Hauled Boats: Prevent the spread of Zebra Mussels in the 100th meridian jurisdictions and west by boats being hauled commercially and/or for professional fishing tournaments.

Monitoring: Establish monitoring sites on waters in the 100th meridian jurisdictions and west to determine if Zebra Mussels and other invasive species are present.

Rapid Response: Eradicate or contain Zebra Mussels immediately following detection.

Identification and Risk Assessment of Additional Pathways: Establish a program to identify additional pathways by which Zebra Mussels and other invasive species could be introduced west of the 100th meridian. Evaluate these pathways and develop an action plan for those having potential risks.

Evaluation: Ensure the effectiveness of the 100th Meridian Initiative in preventing the westward spread of Zebra Mussels and other invasive species.

BALLAST WATER MANAGEMENT

Brazil is one of the 6 participants in the Global Ballast Water Management Program (GloBallast), however, at this time, no management plan or national strategy is in place in Brazil.

An inventory and monitoring program for invasive species following International Marine Organisation (IMO) recommendations and protocols was conducted in Sepetiba Port. A group of leading scientists from IEAPM/Navel Service of Brazil researched oceanic change and concluded that 95% of ballast water can be changed by dilution method. However, a national strategy based on IMO recommendations is necessary for the realisation of this concept. One

possible strategy, which includes the ports in the planning and execution of action plans, is that used by Agência Nacional de Vigilância Sanitária (ANVISA, national agency of sanitary vigilance). This type of strategy would use questionnaires to gather information about the origin of the vessel, making it possible to make decisions about ballast water discharge, if necessary. It will also be necessary for Brazil to study biological and chemical ballast water control methods.

In two recent events, the "1st International Workshop on Guidelines and Standards for Invasive Aquatic Species Surveys & Monitoring" in Rio de Janeiro and the "First Course on Ballast Water Management", institutions from Brazil and other countries discussed the topic of invasive species and ballast water control. I was able to participate in both events, along with many other scientists, port managers, environmental agencies and sanitary agencies, to name a few.

As discussed at the 12th International Conference on Aquatic Invasive Species, for ballast water management plans to be effective, federal, state and municipal agencies must be involved. This is often particularly difficult in Brazil due to priority differences for each level of government. Many management plans in place in both the US and Canada have not been very effective because they are either not properly implemented or are not sufficient enough to control ballast water discharge. This demonstrates the complexity of the ballast water issue.

One of the main ballast water control issue discussed at the conference was sediment, as it is not completely removed during ocean exchange. Mario Tamburri of the University of Maryland presented on the de-oxygenation method, a promising and interesting solution to ballast water control. Unfortunately, this method is both expensive and requires more research. While the treatment of ballast water is recommended, no method presented at the conference was efficient and economically viable enough to install on a large scale in Brazil.

GOLDEN AND ZEBRA MUSSEL BIOLOGY

Research on the biology of the Golden Mussel is just beginning in Brazil. Understanding the relationship between the Golden Mussel and water quality characteristics (pH, temperature, dissolved oxygen) and the behaviour of the Golden Mussel in different environments is necessary so that control options can be identified. It is also important to understand the reproductive cycle of Golden Mussel, because the use of various treatments may be dependent on this information.

Research conducted in Argentina found that 50% of *L. fortunei* individual died within 57 to 61 hours when exposed to air, depending on their size, and by day eight, mortality was 100%. Exposure to air may therefore represent one alternative to control the spread of the Golden Mussel (Darrigran & Damborenea, 2001). However, it will be necessary to repeat this experiment in Brazil, due to differences in air temperature and humidity.

Darrigran et al. (2001) also analysed the response of Golden mussel larvae to various concentrations of quaternary ammonium polymer, collected in La Plata River for the prevention/control of *L. fortunei* larvae. The results obtained demonstrated the efficiency of this

technique, despite the fact that the concentrations used in this experiment did not induce 100% mortality in 24 hours. The same authors analysed the effectiveness of biocide (BULAB 6002®) on juvenile and adult Golden Mussels as a method for cleaning industrial cooling systems and for use by hydroelectric companies. They found that 20 mg/l is sufficient to obtain 100% of mortality for adults in 144 hours.

Invasive mussel species, such as the Zebra Mussel and the Golden Mussel, have similar biological characteristics, such as a reproductive cycle with free-living larvae, the presence of byssus for fixation, and tolerance to different environments conditions, which make them good invaders. For example, the release of Zebra mussel gametes into the water column occurs at temperatures of about 12 °C in North America (Claudi and Mackie, 1994). They can survive in temperatures from about 0 to 30 °C, for short periods of time, with the optimum temperature generally below 25 °C (Machon, R.E., Britton, D.K.2003 – Conference). For the Golden Mussel, the peak for larval survival occurs in temperatures between 24 and 28 °C, with a decrease in activity below 16 °C (Cataldo & Boltovskoy, 2000).

Mihuc et al. (1999) studied the acclimatisation of zebra mussel populations. They observed that mussels from colder zones can survive in warmer climates, and that the upper tolerance limit can change after years of selection pressure. Similarly, in the Pantanal region, research indicates that several environmental factors, such as the dissolved oxygen concentration in the water, temperature, pH, and calcium, may control the population density in the river. However, more time is necessary to make any conclusions, as selection may occur over time.

Temperature also has a significant effect on mussel growth. The minimal temperature for growth and development of the Zebra Mussel is approximately 10 °C (Karatayev et al. 1998). High feeding rates are directly correlated to high growth rates. Aldridge et al. (1995) reported that: 1) the feeding rates of Zebra Mussel declined by 73% when the temperature was between 20 and 32 °C, and 2) above 28 °C, feeding activity ceased (data from Zebra Mussel information system). Therefore, individuals can exist in the environment in low densities, limited by an environmental factor.

GOLDEN MUSSEL CONTROL OPTIONS IN BRAZIL

Several methods currently being used for Zebra Mussel control should be considered for testing on Golden Mussel populations in Brazil. These methods include both preventive and reactive strategies. Preventive methods include: toxic construction materials, anti-fouling coatings, chemical treatment, thermal treatment and mechanical filtration. Reactive methods, those applied after an infestation has been detected, include: mechanical cleaning, high-pressure jets of water (pressure washing), carbon dioxide pellet blasting, freezing and desiccation. Thermal treatment and chlorination can be used initially as a reactive treatment to clean a system, then preventively as regular maintenance to prevent further incrustations.

Reasons for accepting or rejecting Zebra Mussel control methods are varied. All control strategies have advantages and disadvantages. Criteria for selecting an appropriate control

method include environmental and economic concerns and ease of application. Given the nature of the strategy, one type of control method may be more appropriate for a particular habitat or situation than another. Multiple control strategies may be applied depending on the extent of the Zebra Mussel infestation, although the strategies chosen will be the most cost-effective, environmentally sound, and easy to apply. Careful attention must be given to existing physical habitat conditions, facility characteristics, desired results, water chemistry, water flow rates, temperature, and the types and numbers of vulnerable structures within the raw water system.

Particular attention must be given to any effluent water or system discharge that has been treated with chemical or thermal methods to avoid the release of contaminated water. These contaminants need to be carefully disposed of or dispersed prior to their release into downstream waters and the surrounding environment. Although very little is known about the biology of the Golden Mussel in Brazil, it is probable that chemical controls are being used in the Itaipu Dam and in Rio Grande do Sul State for fouling control. However, Industry doesn't divulge their control strategies, the chemicals used, or the economic costs.

Chlorine is the most common chemical used to control zebra mussel infestations in Europe, the US and Canada as it is effective for larvae and adults, is cheap when compared to other methods, and can be used for large areas. More recently, chloramines have been recommended because they do not form trihalomethanes, a product formed by the combination of chlorine and organic compounds (Claudi & Mackie, 1994). On the Paraquay River, the use of chlorine is not recommended during the flooding phase due to high concentrations of organic materials available for the formation of trihalomethanes.

It is important to pursue studies on non-chemical methods of control such as sand filters, UV, Electroshock, flux speed (Claudi & Mackie, 1994), deoxygenating, thermal shocks, and the use a bacterial toxins (method developed by Molloy et al 2002, in experimentation). Biological methods are very limited by cost and the size of the area to be cleaned.

CURRENT BRAZILIAN SITUATION

In the Paraguay River, the Golden Mussel will most likely spread in the north of the basin of the high Paraguay, due to the intense commercial navigation between Corumba and Caceres. These ships stay in the Paraguay River long enough for encrustation to occur. Navigation is also principally responsible for the spread of Golden Mussel into and within the Paraná River, which contains many reservoirs and dams for the generation of power. Special attention should be paid to the Tocantins and the São Francisco Basin. The potential of Golden Mussel introduction in these basins is high due to occurrences in adjacent basins. Dispersal will likely be caused by tourist boats, which are frequently moved from one place to another. The Amazon basin must also be monitored for exotic species because there is a potential for invasion via ballast water from ships from others places in Brazil and from other countries that enter freshwater ports from Manaus and Belem.

The 1st South American Meeting of Integrated Actions for Golden Mussel Control (*Limnoperna fortunei*) took place at the Itaipu hydroelectric plant, on the July 4, 2003. The objective of this meeting was to exchange experience and knowledge about Golden Mussel control and to prepare recommendations for the next meeting of the Development and Integration Council for the South (CODESUL) (Porto Alegre, RS, July) and the International Water Forum/UN, in October. A technical-scientific co-operation between Brazil, Paraguay and Argentina was established to study the Golden Mussel. During the event I did a presentation on the experience of studying the Golden Mussel in the Pantanal and made recommendations related to reducing the spread.

In order to execute these recommendations in the Upper Paraquay basin I intend to form a working group that includes scientists Argentina, the Catholic University of Rio Grande de Sul (PUC/RS), the Nucleus for Fisheries and Aquaculture Research (NUPELIA), the Federal University of Mata Grosso (UFMT) and the State Technological Research Foundation (CETEC), which will meet in Corumbá, probably in September 2003. Monica Campos (CETEC) and I are interested in combining our field and laboratory expertise and capabilities to better meet our research goals. However, as is common with all researchers in this area, financial support is needed to conduct current research and establish new projects. In September we will submit a proposal to the National Environmental Foundation/Environment Ministry (MMA). In addition, the Technological Centre at Itaipu will present our proposal to various Brazilian agencies in the hopes of obtaining funding. However, we are not confident that these avenues will be fruitful.

RECOMMENDATIONS

The cost of prevention has been estimated to be much less than the cost of controlling existing invasions. The hydro companies and governmental agencies in Brazil should therefore spend more time and money on the study of golden mussel biology and on prevention as a means of control. Although the total area invaded by golden mussel in Brazil is still small, considering the large amount of habitat available for invasion, these invasions occurred very quickly. On a positive note, there is still time to invest in education and awareness to slow the spread of Golden Mussel in Brazil.

The following steps need to be taken to prevent the spread of the Golden Mussel into the rivers and reservoirs of Brazil:

1. Establish a working group including scientists, federal, state and municipal agencies, stakeholders, technical employees of hydroelectric and water treatments plants, representatives of aquaculture activity, and a risk analysis specialist to develop an action plan for the management of the Golden Mussel in Brazil.
2. Establish new projects to study the biology of the Golden Mussel to improve understanding of their survival potential in different aquatic habitats.
3. Continue the study in Guaiba River system and Pantanal region. These studies are dependent on temporal series and results are not expected until 2004-2005.

4. Map the area of occurrence of Golden Mussel in Brazil. The Golden Mussel project co-ordinated by the Institute for Studies of the Admiralty Sea Paulo Moreira (IEAPM) and the MMA plans to accomplish this goal by 2004.
5. Establish a monitoring program for locations with an increased likelihood of invasion by the golden mussel (as concluded by risk analysis).
6. Establish a public information/education program that targets boaters, fishers and aquaculturists in areas where Golden Mussel occur.
7. Establish a method for boat inspection, train people for this function and establish boat inspection stations where boat traffic is most intense.
8. Conduct a risk analysis of Golden Mussel invasion in Brazilian watersheds. Unlike the Zebra Mussel, the water characteristics and requirements for the Golden Mussel are still poorly known. This will make the development of a risk analysis for the Golden Mussel more difficult then those being developed for the Zebra Mussel. For example, in a presentation at the 12th Conference of Aquatic Invasive Species, Michelle Babione of Silvio National Fish and Wildlife Refuge/USA, used limnological variables to determine the potential for Zebra Mussel invasion in a Connecticut basin. Such studies will, however, provide valuable guidelines for future studies in Brazil.

CONCLUSIONS

The knowledge obtained during the Conference, mainly about the ecology and control of the Zebra Mussel in the US and Canada, will be very important for the development of basic research and the preparation of Golden Mussel control strategies in Brazil. A group of specialists in Brazil, co-ordinated by IEAPM and MMA, have been discussing these issues in several meetings and I intend to inform them about the issues discussed during this conference.

Although the environmental requirements for the Zebra and Golden Mussel are different, mainly in terms of water characteristics, their behaviour is similar. Therefor the North American Zebra Mussel experience can provide crucial guidance for the control the Golden Mussel in Brazil. We need to better understand the characteristics of aquatic environments in Brazil and the behaviour of the Golden Mussel in order to analyse the risk of invasion of Golden Mussel to new areas, and the risk of a Zebra Mussel invasion in Brazil.

Corumbá, MS, Brazil, July 5, 2003

Márcia Divina de Oliveira,

Brazilian Agricultural Research Centre (EMBRAPA)

TRIP REPORT

12th International Conference on Aquatic Invasive Species

Windsor, Ontario, June 8th – 14th, 2003

Eva Klassen
World Fisheries Trust

The Ontario Ministry of Natural Resources was the host sponsor of the 12th International Conference on Aquatic Invasive Species, held June 9 to 12, 2003 in Windsor, Ontario. This annual four-day conference is widely considered the most comprehensive international forum for the review of accumulated scientific knowledge of the impacts of aquatic invasive species, presentation of the most recent field research, technologies for control and mitigation, discussion of policy to prevent new introductions, and approaches to effective public education and outreach initiatives. Even so, the main focus of the conference was Zebra Mussels and other aquatic invasive species (AIS) in the Great Lakes area.

There was a broad range of participants from government, industry, non-profit organizations, and universities. The majority of the participants were from Canada and the United states, with some international participation from: England, France, Brazil, India, China, New Zealand, the Netherlands and Iran.

Session topics included: the 100th Meridian initiative, ballast water as a vector for AIS, control options in industrial and non-industrial settings, and economic impacts of AIS. The presentations covered a wide range of topics including those listed above. Many of the presentations stressed the introduction of exotic aquatic species as an ongoing problem that is causing significant damage to freshwater and coastal ecosystems, and to the economies that depend on them. Common themes included the importance of keeping stakeholders informed and involved, the need to educate the public on the severity of AIS, and the importance of focusing on prevention, not just control and regulation. A discussion forum that took place on the 9th of June echoed many of these themes and pointed out that we are not well organized as a society to deal with invasive species. It was also emphasized that invasive species are not a popular issue. Therefore, economics must be used to get peoples' attention and make the public realize that invasive species will affect and are currently affecting their livelihoods.

Various speakers discussed the economic impacts of invasive species. It was concluded by Hugh MacIssac, of the University of Windsor, that we really don't know how much invasive species are costing us and that the current estimates we have are much lower than the actual value. This is because the costs included in the estimates are only those that can be certified and these estimates do not contain contingent valuations. Renata Claudi, of RNT Consulting Inc., stated that, in regards to the economic impacts of invasive species, Canada has three options:

We can use the pro-rate available from the US as an estimate for the economic impacts that invasive species are having in Canada.
We can create an inventory for Canada and document the direct and indirect effects of the 100 species with the most impact.
Use resources on prevention and control (instead of quantifying impacts).

My primary objective for this conference was to act as a translator and interpreter for Marcia Divina Oliveira, of Embrapa Brazil, and to help her present her research entitled: Invasion of Golden Mussel, *Limnoperna fortunei*, in Pantanal Wetland, Brazil. The similarities between the

Golden Mussel and the Zebra Mussel made this conference the perfect venue to explore control options for industry and methods of controlling the spread of zebra mussels that may be transferable to the golden mussel in Brazil. Consequently, researching options of control options for industry and the control of spread in general became my secondary objective.

Options currently being used by industry to control Zebra Mussel settlement were discussed by Rentata Claudi of RNT Consulting and include:

Mechanical cleaning, when chemicals are not an option.
De-water/desiccate mussels (how long depends on the temperature and humidity).
Thermal wash-32^{o}C for 48h or 40^{o}C for 1h
Freezing (locks in Canals)-3^{o}C for 10h or -10^{o}C for 2h
Oxygen deprivation-2 weeks
Antifouling coatings are available for steel and concrete, however, not easy to apply.
Electrolytic protection- mixed success on steel/concrete
Oxidizing Chemical Treatments such as chlorine and bromine (common with a cost of about 29,500/year for chlorine)
Mechanical sand filtration system

Many presentations, in the control options for industry session, were on novel control methods that are currently being tested or that will be tested in the near future including: electron beam radiation, the use of ozone and the effects of a pulse-power electric field on zebra mussel settlement. At the moment, there is little data available on these options. However, it is clear that many more control options will be available in the near future.

Options for limiting the spread of zebra mussels were also discussed. One method, currently being researched by S. Braithwaite, of the Darrin Fresh Water Institute and Rensselaer Polytechnic Institute, USA, is the use of a benthic barrier mat for localized infestations. The benthic barrier mat may be a useful option for stopping the spread of zebra mussels, as it has a high rate of mortality (due to dissolved oxygen content under mat) and causes only localized environmental damage. The use of education, advertising, and inspection stations for boats, as a means of informing/involving the public and thereby stopping the spread of zebra mussels were discussed during in the 100th meridian session and reflect current methods of controlling the spread of aquatic invasive species.

Several contacts were made during the conference that may be of value in the future. I was able to speak a great deal with Renata Claudi of RNT consulting. Renata is a good general contact, as she has an extensive background working with AIS and knows a lot about control options for industries such as hydroelectric companies. Renata introduced me to Dan Butts, Al Holmes, Kelly Peterson and Darlene Suddard of the ASI group, a consulting agency that is recognized as the industry leader in the research and design of programs for zebra mussel control. Dan, Al, Kelly and Darlene work with various industries in the great lakes region implementing and operating zebra mussel treatment systems. I received a folder of information on public awareness projects sponsored by the Ontario Federation of Anglers and Hunters from Francine

MacDonald. The folder contains a variety of brochures, leaflets and stickers that the OFAH uses to educate the public and increase awareness of invasive species. Additionally, I spoke with Lavon Jeffers of the US Army Corps of Engineers about the technical tour we are planning and expressed an interest in touring their facility. Lavon provided me with the name of the Public Relations Director of the Engineer Research and Development Center, but added that the Center rarely does tours due to new security measures implemented after 9/11. I also discussed the technical tour with Elizabeth Muckle-Jeffs, who invited us to contact her regarding workshops on topics covered by the conference, which could be incorporated into the tour.

Marcia was most interested in sessions that described the tolerance and physiology of zebra mussels. Marcia was also interested in the 100th Meridian Initiative session, as many of the presentations included methods of controlling the spread of the zebra mussel. She found this research very useful, and spoke to a number of experts about the research she is doing in Brazil. Everyone was eager to aid her by providing advice and suggesting pertinent literature. The similarities between the zebra mussel and the golden mussel may allow for the transfer of a wealth of research and knowledge in the area of aquatic invasive bivalves on a variety of topics. This conference provided Marcia with a foundation of literature and knowledge that she can build on while studying the invasion of the golden mussel in the Pantanal. The international atmosphere of the conference and the range of topics on AIS also allowed Marcia to gain an understanding on a variety of other topics that are not directly related to the research she is performing. This knowledge will allow Marcia to be a useful resource on AIS in Brazil and allow her to share her experience with others who study or are interested in AIS.

TRIP REPORT

Technical Assistance in Assessment and Management of Mussel Fouling in Brazilian Hydroelectric Facilities

Belo Horizonte, MG, September 14th – 23rd, 2003

Renata Claudi
RNT Consulting

Work done under contract to World Fisheries Trust, September – October 2003

INTRODUCTION

Limnoperna fortunei invaded South America in the early 1990s. The mussel is presumed to have come in ballast water from Hong Kong to Argentina. It became established in the Rio de la Plata estuary, from which it has been spreading into other waterways of South America. As far as the author is aware, no effort has been made to contain the spread of this mussel up to October 2003.

TRIP REPORT

September 13-14th, Travel to Brazil; meeting with CETEC Research Institute (Belo Horizonte) - Monica Campos (CETEC) and Maria Edith Rola (CEMIG).

September 15-16th Site visit to CEMIG's Volta Grande dam (interior of Minas Gerais), including fish hatchery, led by João de Magalhaes Lopes

September 17th ABRAGE meeting on *Limnoperna* (Niagara Flats Hotel, Belo Horizonte), including presentation titled "Freshwater Bivalve Infestations; Risks to Industry and Current State of Control"

September 18th Abrage meeting (Cont'd). Travel to Itaipu, Parana.

September 19th Tour of Itaipu Hydroelectric dam and fish culture facility, discussion of mussel control measures and research

Sept 20th Tour of Iguassu Falls; discussion of research plans for CEMIG, public outreach, and policy; return to Belo Horizonte.

Sept 21th Tour of Ouro Preto with Maria Edith and Flavio Jose Froes de Oliveira (CEMIG personnel). Discussion of program for upcoming seminar.

Sept 22nd left Belo Horizonte at 8:30 a.m. and arrived in Toronto on Sept 23rd at 7 a.m.

TECHNICAL REPORT

Overview

The distribution of *Limnoperna* is currently restricted to a relatively small geographic area in Brazil on the Parana River. So far, only one hydroelectric dam has experienced an infestation. The Itaipu hydroelectric power plant has been dealing with a Limnoperna infestation for at least two years. How fast this mussel will spread throughout Brazil will depend on number of factors, most important of which are:

preventing the interconnection of separate watersheds to limit the spread of *Limnoperna* through natural water movements;

regulating stocking of fish for aquaculture purposes to make sure that *Limnoperna* is not transferred with the fish stock;

regulating ship and boat traffic from areas infested with *Limnoperna* (such as instituting the use of antifouling coatings on hulls to prevent adult attachment, treatment of ballast water to prevent transfer of larvae);

and educating stakeholders, other government departments as well as general public on the various vectors which may transfer *Limnoperna* and why it is important to prevent spread.

The Brazilian electric power industry sector will suffer the greatest economic losses if *Limnoperna* is allowed to spread. This will be followed by other industrial facilities which use fresh water for cooling or other processes. Aquaculture and fishing sectors are likely to be impacted to various degrees. Municipal drinking water intakes, irrigation channels and private water intakes will also be affected.

Environmental impact will also occur, but is harder to predict. Generally negative impact may be expected on any native clams and mussels due to Limnoperna using them as settling substrate and suffocating them. The *Limnoperna* is a filter feeder and if the infestation reaches high density in a particular body of water, the structure of the plankton community will be affected with the rest of the food chain to follow. By filtering large volumes of water, *Limnoperna* is likely to transfer energy from the pelagic layer to the benthos. This will favour bottom dwelling fish as opposed to pelagic fish. At the same time, the clarity of water may be expected to increase as particles are removed from the water column and deposited on the bottom. This may lead to increased growth of aquatic weeds causing a change to the current fish habitat in many locations.

The key priority at this time is to slow, if not prevent, the spread of *Limnoperna* in Brazil. This can only be accomplished with the help of the government at the federal and state level. Such action will minimize economic and environmental impacts and allow time for research into the life cycle of *Limnoperna* in Brazil. The energy sector, which is facing the greatest economic penalty, is in the best position to insist that the government take regulatory action to help prevent spread and assist in stakeholder and public education.

The model which might have the most success would be to appoint a specific government department as the “lead agency” for invasive species, *Limnoperna* in particular. This agency would then gather representatives of the appropriate stakeholders (drinking water, energy, fish, aquaculture, shipping, ecotourism) to help plan regulatory action, disseminate information and develop communication package for each sector. Given the size and diversity of Brazil it might be necessary to develop an educational package which could be delivered to local governments and industry in the various regions.

OUTCOMES OF SITE VISITS, INTERVIEWS, AND WORKSHOP

CEMIG

The Companhia Eletrica de Minas Gerais is the principal hydroelectric company in the state of Minas Gerais - originally a government monopoly, but now partly privatized. It is experiencing early stages of mussel invasion in some of its more southern dams, and for several years has been working on monitoring and control strategies – effort led primarily by Maria Edith Rola and Vasco Torquato under the supervision of Procópio Rezende. CEMIG has the advantage of having a small, central group clearly in charge of the issue, coordinating research and distributing information to the various CEMIG facilities. They need to develop site specific response plan for each of the dams if and when *Limnoperna* be found at those locations. Such plans would include tracing the cooling water in each facility from the point of entry, through all the cooling circuits to the point of exit and identifying components which might be impacted by

Limnoperna. The next step would be to decide on how best to prevent mussels from impacting the vulnerable components. CEMIG also needs to verify the life cycle of *Limnoperna* in Brazil, the environmental limits (temperature, calcium and pH in particular) and the susceptibility of the mussel to various mitigation strategies (chemicals, UV and filters) under local conditions.

CEMIG's principal field research station is located at the fish hatchery adjacent to their dam in Volta Grande, in the interior of Minas Gerais.

The fish hatchery has a separate intake from the reservoir. If *Limnoperna* should get into the reservoir, this intake will introduce *Limnoperna* into the piping, fish tanks and fish ponds. This would not be desirable from an operational view point. It would be desirable to have a coarse filter on the intake to prevent shells and adults from entering, followed by a UV unit to destroy veligers. An UV unit would also help control algae and bacteria coming from the reservoir, as well as larvae of non-target fish.

After lunch we toured the power plant. I explained that there is a need to trace cooling water in each facility from the point of entry, through all the cooling circuits to the point of exit. We tried to do that at Volta Grande. Cooling water comes in through an inaccessible opening in the face of the dam, protected by a fixed screen. This could be the first point of impact. *Limnoperna* could grow over the screen and reduce or cut off the flow. The cooling water then passes through mechanical strainers. Nobody was able to tell us the gap size of the strainers; they are not self cleaning. If shells start coming from the reservoir, these strainers could become plugged very easily. They should be replaced by self cleaning strainers with a fairly small gap size. On the Great Lakes the gap size tends to be around 5/1000 of an inch.

Following the strainers, the water then branches out into numerous small cooling lines to service various pieces of equipment. To protect this equipment, in the short term, addition of chlorine as sodium hypochlorite or chlorine gas on continuous or semi-continuous basis would guarantee that no settlement of veligers took place in the piping.

There is an independent intake for the fire water pump. There is no strainer on the intake. This introduces a possibility of adults being transported into the Fire Protection system during testing and or use.

At this time it is not clear if the *Limnoperna* will breed continuously at these locations or if there will be discreet breeding season. Monitoring for veligers once adult mussels are found in the reservoir will be necessary to determine the breeding season.

The monitoring program, as well as the site specific evaluation and preparation of individual mitigation strategies is best coordinated centrally with assistance from representatives from individual sites. This suggestion was discussed with Maria Edith who appreciated the value of having site-specific engineering input.

We compiled a list of what might be most useful projects for CEMIG. They include:

- determining the length of the breeding season at each location;
- determining the growth rate of *Limnoperna* in various bodies of water;
- determining the calcium/pH requirements of adult and larval *Limnoperna*;
- determining if the chemical controls established for zebra mussels directly applicable to *Limnoperna*;

determining if UV control Limnoperna veligers the same way it controls zebra mussels;
determining if antifouling coatings, effective for zebra mussels, also work for *Limnoperna*;
determining if *Limnoperna* affects fish habitat the same way the zebra mussels have altered it on the Great Lakes and what is the potential impact on economically important fish species;
determining if is *Limnoperna* likely to be a food source for any of the native fishes;
determining if any of the reservoirs are high in heavy metals and could this become an issue with Limnoperna accumulating them and passing them up the food chain;
determining if CEMIG control the aquaculture stocking in their reservoirs to prevent introduction of *Limnoperna*.

Further, we discussed research methodology, what could be done in the lab and what could be done in the field, perhaps using a mobile laboratory. We also discussed how researchers need to be focused on obtaining information which is of benefit to CEMIG, recognizing that some projects will be more pure science rather then applied.

Information sharing was another topic of interest. I described some of the industry workshops we organized, and the company newsletter which was used to keep various sites informed. We also covered the interaction our company had with the Ministry of Environment and Ministry of Natural Resources to establish achievable mitigation strategies and monitoring to verify lack of impact on the receiving environment.

We also discussed the program for upcoming seminar, making sure as many site people as possible could attend, to invite experts on chlorination systems to give a presentation, encouraging Maria Edith to use a CD of my presentation and to give the presentation again, at the seminar, in Portuguese. She also agreed to use the above list of research projects as a guide for her request for next years funding. We also spent some time discussing how to involve the Ministry of Environment in the issue of *Limnoperna*. There would be no point in developing a mitigation strategy which would not receive the approval from the regulator. If the regulator is involved from the beginning, sees the impact *Limnoperna* is having, is party to developing the best available mitigation strategy, there is better chance for smooth cooperation.

CETEC

The Fundaçao Centro Tecnológico de Minas Gerais (CETEC) has been contracted by CEMIG to research the *Limnoperna* issue for them and develop and implement strategies for its control. Monica Campos is the researcher in charge of this program.

We discussed the above list of research priorities with Monica and discussed on how to structure some of the experiments in the lab. I also described our use of the mobile field laboratory and why the data obtained in the field tend to be different from data obtained in the lab (animals less stressed, local water chemistry may interact with control chemicals differently from dechlorinated water in the lab etc.). We discussed research projects underway as well as plans for the future. We reviewed her proposed presentation for the upcoming Wednesday meeting and made some changes to the presentation.

I also met with Jose Roberto Tavares Branco and his staff. He is the head of the Materials Lab. He was interested in developing an antifouling coating. I explained that this is already a crowded

market and possibly testing those used against zebra mussels would be a better investment. We also discussed a number of other ideas and possibilities for research.

Itaipu

Itaipu Bi-Nacional operates one of the world's largest dams, situated on the Paraná River mainstem on the border between Paraguai, Brazil, and Argentina. The dam is operated jointly by Brazil and Paraguai. This is the first dam in Brazil to experience the invasion of *Limnoperna*, and has been one of the pioneers in dealing with the issue. The program is primarily driven by Carla Canzi, though other individuals from other departments are also involved.

We spoke primarily to Leonida Correia dos Santos, supervisor of the lab. It seems that the work is quite segregated among the different groups, to the point that the biology section does not know what the calcium levels in the water might be as this is handled by the chemistry department.

There was a concern as to what mussels may do to the face of the dam once they settle on it (under deposit corrosion). I suspect the reservoir will be long silted over before there is any impact.

There seems to be a lot of activity going on in the lab but I was not clear as to the purpose of some of the tests and samples that were being done.

Accompanied by Carla we went on the tour of the dam. Tour was given by Mario Lucio Ozelame. He is a very knowledgeable and technically competent engineer, very interested in developing the best possible protection system for his facility. We looked at their experimental chlorine installation, walked the cooling water system and discussed other possible treatment options. He is considering testing an Amiad self cleaning filter which in N.America has been shown capable of excluding zebra mussel veligers from cooling water, provided the flow is fairly moderate. It was a very good tour and productive exchange of information. It gave Maria Edith an idea of how technical plant people could assist in planning a treatment strategy.

In the afternoon we went back to the lab. We hoped to see the fish by-pass system but that did not happen. We did get a tour of their caged fish culture facility. The cages were heavily colonized by *Limnoperna* and there was a number of dead fish floating in the pens.

At the present time the chlorination system has been installed on only one unit of the dam. Further, the installation is not permanent as this was considered a research effort. Permanent chlorine injection needs to be installed on each of the units of Itaipu, possibly in combination with self cleaning filters to protect critical components from ingress of shells. The level of chlorine required to prevent veliger settlement should be verified to make sure only the least amount required is used. Although I was assured that mussel shells could not become lodged in the fire protection system, this is one are which would bear double checking.

Embrapa - Pantanal

The Empresa Brasileira de Pesquisas Agropecuário (Embrapa) is one of the leading government organization for agricultural research, but also addresses water and fisheries management issues through its research station in the Pantanal wetlands (Mato Grosso do Sul). Márcia Divina heads an Embrapa research program on *Limnoperna* in the Pantanal, and, with WFT

assistance, participated in the recent International Conference of Invasive Species in Windsor, Ontario, June 2003.

The Pantanal wetland is likely to see habitat changes should the *Limnoperna* invade. There is some hope that certain tributaries of the wetland have very low pH and this low pH could act as a barrier against *Limnoperna* spread. To verify this possibility, adult and larval *Limnoperna* should be tested for pH tolerance in the lab, using Pantanal water. Further, any shipping or boat traffic entering Pantanal should either have antifouling coatings applied to the hulls or have the hulls cleaned, ideally with a steam lance. As there seems to be a number of ecotourism lodges in the Pantanal, these locations could serve as educational outpost disseminating information on *Limnoperna* and how to prevent transfer of mussels.

ABRAGE - workshop

The Associaçao Brasileira de Grandes Barragens (ABRAGE) is an association of the majority of larger hydroelectric companies in Brazil. The environmental working group, chaired by Procópio Rezende of CEMIG, organized the present workshop on control of *Limnoperna* mussel.

There seems to be increasing awareness of what *Limnoperna* could do to hydroelectric plants and that steps must be taken now to prevent economic impact. There does seem to be some conflicting information on treatment, rates of spread and life cycle. With the exception of Itaipu, there are no concrete mitigation plans in place at any of the facilities.

The workshop took place in the Niagara Flats Hotel, Bello Horizonte, September 17,18 2003. Simultaneous translation was provided on the first day. Personnel from CEMIG and other utilities were there as well as a person from the Ministry of Environment (Robson Jose Calixto) and a person from the Navy (Flávio da Costa Fernandes). The meeting started at 9 a.m. Numerous presentations were made by the various participants. The overall impression was that the industry is getting ready to deal with the problem. Chlorination trials are underway at Itaipu and more information on *Limnoperna* is being gathered. The Ministry representative was not sure how to control discharge from the power plants that might have chemicals in it and what the responsibility of the Ministry was. The Navy has apparently done nothing to help limit the spread. For example they could have required ballast exchange for ships coming from Argentina freshwater ports.

At this point, the *Limnoperna* is not widely spread in Brazil and it could be slowed down through public education, use of antifouling paints on ships and private boats, restriction of shipping of aquaculture fish if the water they are in may contain Limnoperna veligers.
In Pantanal wetland, the *Limnoperna* may find a pH barrier that would prevent colonization of certain parts.

My presentation started at 5p.m. continued till 7p.m. I described our experience with biofouling mussels, some of the mitigation techniques we used and I touched on the impact to the environment. There were lots of questions, mostly aimed at use of various mitigation techniques. After the presentation I had more one on one discussions with the various site people asking for more details on both impact and mitigation.

The meeting resumed at 9 a.m. The purpose was to find a path forward. There was no consensus except to reconvene on October 14 for three days of meetings.

Privately I suggested to Maria Edith that the three days of meetings should be attended by as many plant people as possible. Some presentation from the September meeting should be repeated to help everybody achieve the same level of knowledge (my presentation given by her and the Itaipu presentation). The tracing of cooling water in hydroelectric facilities to discover problem areas should be explained with the help of flow diagrams and each facility should be encouraged to do an evaluation. An expert on chlorination should be invited to give a basic do and do not of chlorination systems. The Ministry of Environment should be there so that monitoring requirements for discharge could be addressed at the same time. I also offered continued help over the Internet to answer questions as they come up.

FOLLOW-UP FROM TRIP

Since my return I have managed to put Maria Edith in touch with Prominent Fluid Controls, a company that specializes in chlorination systems as well as UV sterilization and has an office in Brazil. Representative of the company was invited to attend the October meeting and give a presentation.

Staff member of José Roberto Tavares Branco from the State Technological Research Station (CETC) Materials Lab contacted me for a list of antifouling paints which were successful against Zebra Mussels. I compiled the list as well as manufacturer information and e-mailed it.

João de Magalhaes Lopes from Volta Grande wrote that he is very interested in pursuing a UV installation for the fish hatchery intake. We discussed how best to test the efficacy of a UV system. I suggested a small test installation at Itaipu as a joint experiment.

In the experiment, water would be pumped out of the reservoir, through the UV unit and then through a biobox to see if after the UV there would not be any settlement. Before and during the experiment they would monitor that there are veligers in the incoming water and they would examine what is coming out of the biobox (checking if the veliger look damaged or not). To prove that it is the UV doing the job they would also have to run a control. Same exact set up but no UV before the biobox. So ideally, UV protected line, no settlement in biobox, while in the control you would get settlement.

I suggested they run the experiment for 3 month at least; find out how often they have to change the UV bulbs and other mechanical things. Only after such an experiment would they be sure the UV unit would do the job,

João also reported that he went to the dam at São Simão with Mônica and Maria Edith to survey for *Limnoperna* and track the path of incoming cooling water in the plant, as I had demonstrated at Volta Grande. They identified a number of filters that can be closed by the *Limnoperna*, but fortunately could not find any larvae in the plant or in the reservoir.

Maria Edith was also in touch to verify how best to look for veligers in large volumes of water they collect. I explained the sugar separation method described in my book. It may not be appropriate for all locations; heavy silt load would probably make sugar separation unusable.

FINANCIAL REPORT

I had no additional expenses as I was very well looked after by CEMIG personnel.

MEETING REPORT

Brazilian Association of Large Hydroelectric Companies (ABRAGE) 3rd Technical Meeting on the Golden Mussel (*Limnoperna fortunei*)

Belo Horizonte, MG, September 17th - 18th, 2003

Maria Edith Rolla
CEMIG

3rd Technical Meeting of ABRAGE on the Golden Mussel (*Limnoperna fortunei*, Dunker, 1857)

Maria Edith Rolla (CEMIG)
(Translation: J. Carolsfeld)

Location: Niagara Flat Hotel - Belo Horizonte
Date: 17-18/09/03

Objective: Evaluate and integrate the results of the 2nd Technical Meeting of ABRAGE on the Golden Mussel (*Limnoperna fortunei*, Dunker, 1857) and of the 1st South American Meeting for the Integration of Actions for the Control of the Golden Mussel, promoted by the PTI, appendix 3.

Participants:

Number of participants: 49

Companies - CEMIG, Furnas, Duke Energy, Eletronorte, CESP, Copel, Tractebal, Itaipu, Chesf, Eletrobras, AES Tiete, Light.

Invitees: CETEC, MMA, Lactec, EMBRAPA Pantanal, IEAPM/Navy, RNT, WFT, UFSCar, SANEPAR, FEEMA-RJ.

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André Cavallari – Cemig – cavallari@cemig.com.br
Estela C. de Jesus – Cemig – Estela@cemig.com.br
Luis Carlos Freitas - Cemig – lfreitas@cemig.com.br
Marcelo de Deus Meco – Cemig – mdeus@cemig.combr
Ronaldo Jucá – Chesf – Juca@chesf.gov.br
José Roberto B. Carrasco – Light – jr.carrasco@light.com.br
Fernando Batalha – Feema /RJ – fbbatalha@uol.com.br
Paulo Roberto P. de Araújo –Feema/RJ – prparaujo@ig.com.br
Mônica de Cássia Souza Campos – Cetec/MG – monicac@cetec.br
André dos Anjos Cardoso – Copasa/MG – dvhd@copasa.com.br
Estael Araujo – Cetec/MG – estael@cetec.br
Fábio de Castro Patrício - Cetec/MG – fabin@cetec.br
Gabriela Von Ruckert Heleno – Cetec/MG – gruckert@hotmail.com
Rodrigo Martins de Amorim - Eletrobrás - r.Amorim@eletrobrás.com
Daihodara Luide Mirian Gomes – Cemig - luide@cemig.com.br
João M. Lopes – Cemig – joaoml@cemig.com.br
Ricardo Pinto Coelho – UFMG – rmpc@icb.ufmg.br
Rodrigo De Filippo – Furnas – defilippo@furnas.com.br
Rodolfo Nardez Sirol – Duke Energy – rnsirol@duke.energy.com
Carla Canzi - Itaipu -

Activities:

1st day - 16/09/.03

As per the program, the invitees made presentations, all of which were recorded on a CD and distributed to participants at the end of the event. The program was as follows:

09:00-09:15 Opening of the meeting by Dr. Flávio Neiva (President of ABRAGE) and Dr. Antônio Procópio Sampaio Rezende (coordenator of the Golden Mussel Working Group).

09:15-09:55 The Golden Mussel (Limnoperna fortunei) in Itaipu Binacional - Carla Canzi

09:55 - 10:10 Coffee

10:10 - 10:50 Management and control of the Golden Mussel in the power plants and reservoirs of CESP - André Luis Mustafá

10:50 - 11:30 Occurrence and behaviour of the golden mussel in the Pantanal - Márcia Divina de Oliveira - Embrapa Pantanal

11:30 - 12:10 Project on the Golden Mussel in the Globallast Program - introduction and impact of the Golden Mussel, Limnoperna fortunei, in Brazil - Flávio da Costa Fernandez - IEAPM (Navy)

12:10 - 13:40 Lunch

13:40 - 14:20 Prevention and control of Limnoperna fortunei (Dunker, 1857). Case study: Volta Grande reservoir - Mônica Campos, Maria Edith Rolla & Estael de Araújo - CETEC & Cemig

14:20 - 15:00 The Golden Mussel in Paraná State and the Perspectives for the Electrical Sector - Carlos Eduardo Belz, Copel/Lactec

15:00 - 15:15 Coffee

15:15 - 15:55 Socio-economic and environmental problems created by the invasion of the Golden Mussel - Measures adopted by the MMA - Robson Calixto

15:55 - 17:30 Coping with invasive fresh water mussels: Impacts and Mitigation strategies - Renata Claudi - RNT Consulting Inc.

17:30 - 18:00 Debate and discussions

2nd day - 17/09/03

Discussion & deliberations:

A division of topics was proposed according to the following themes:

- Preventive and corrective actions for industry
- Preventive and corrective actions for the environmental impact on natural ecosystems
- Institutional actions.

These items make up a matrix that will need to be discussed to define measures that ABRAGE should adopt in the next meeting.

Federal and state environment institutions, universities, and sanitation company have been invited to this meeting.

The MMA announced the formation of a Working Group, whose objective it is to decide who will coordenate the work and to establish new terms of reference for this work. Another objective of this Working Group is to develop a plan to be brought before the Legislative House, with participants covering their own expenses for flights, diaria, etc. An invitation was made for ABRAGE to participate in this Working Group, whose first meeting is to take place in Brasília on the 22/10 of 2003.

The consultant to WFT (Canada) - Dr. Renata Claudi - suggested important points that need to be implemented, such as inspection of boats and an awareness program to inform the public. She confirmed that in Canada, industry paid for media coverage without help from the government, and that pressure must be applied on: 1) the ministry to avoid the entry of new invadors and 2) other users, such as agriculture and fish culturists, to take measures to avoid the spread to other areas. She warned that many magical solutions will appear, but none actually exist.

It was decided to hold a new meeting on the 14-15 of October to discuss the participation of ABRAGE in the meeting of the Working Group being formed by the MMA.

From an institutional point of view, the liberation of licencing of products used in control was suggested, remembering the difficulties that CESP had for the control of aquatic plants in Jupiá. The MMA requested that ABRAGE provides pressure to get the ballast water legislation ratified, as otherwise its signing will be very delayed. They also confirmed that, as Renata Claudi had warned, they are receiving many magical proposals for control of the mussel.
ABRAGE made its web-page available for posting information on the mussel, and asked that companies collaborate by sending such information.

New training [for identification and control of mussels] was requested, with a new methodology and format, which should be done on the level of the companies.

It was suggested that contracts for the use of sand, clay, and fish must contain norms for the use of equipment etc. [that avoids the spread of mussels].

It was suggested that Public Relations officers of the companies be present in following meetings so they become aware of the importance of the problem and help in defining the format of the public communications.

SEMINAR REPORT

Aguas do Lago 2003: Directions for Participatory Multiple-User Reservoir Management in Três Marias

Três Marias, MG, Brazil, September 11th – 12th, 2003

TABLE OF CONTENTS

PROGRAM

I Seminário Águas do Lago 2003

Rumos para a Gestão Participativa dos Usos Múltiplos do reservatório de Três Marias – MG

Objetivo Geral

- Definir as atribuições dos órgãos gestores da represa e dos recursos hídricos, levantar problemas e conflitos dos usuários, e elaborar estratégias de gestão participativa dos usos múltiplos.

Objetivos Específicos

- Reunir representantes de instituições gestoras e estratégicas, governamentais e não governamentais, das áreas de operação energética, recursos hídricos, saneamento, irrigação, navegação, meio ambiente, turismo e pesca ligados à represa de Três Marias.
- Informar aos municípios e demais usuários da represa de Três Marias os mecanismos e políticas atuais que regulam o nível da água da represa, além das possibilidades e impactos de modificá-los.
- Informar aos agentes reguladores e gerentes da represa, dos interesses e preocupações dos municípios e seus usuários.
- Criar subsídios para uma gestão mais adequada da represa de Três Marias, visando seus usos múltiplos, apoiando ambientes e modos de vida sustentáveis e integrando requisitos da bacia à jusante e montante.
- Firmar compromissos e plano de ação concretos de acordo com os participantes, inclusive agendas e metas para gestão do referido reservatório.

Data/Local

11-12 de Setembro, 2003.
Centro de Convenções da CEMIG, Bairro Cemig, Três Marias, MG.

Programação

11 de setembro

9:00 Composição da Mesa do **Seminário Águas do Lago**
10:00 Palestra: Histórico do Lago – Dr. Sato
10:20 Apresentações de Participantes (máximo 3 minutos cada)
12:30 Almoço
14:00 Apresentações informativas (15 min):

ANEEL – Agência Nacional de Energia Elétrica

CEMIG – Companhia Energética de MG

ONS – Operadora Nacional de Sistemas

CODEVASF – Companhia de Desenv. do Vale do São Francisco – (irrigação)

ANA – Agência Nacional das Águas

IGAM – Instituto Mineiro de Gestão de Águas

SRH/MMA – Secretaria de Recursos Hídricos – Ministério do Meio Ambiente/CONAMA

COPASA – Companhia de Saneamento de MG

COMLAGO – Consórcio de Municípios do Lago de Três Marias - Prefeitos e Vereadores

Dia 12 de setembro

9:00	Palestra de princípios de gestão uso múltiplo e integrado
9:30	Apresentação do diagnóstico levantado no primeiro dia
10:00	Grupos de trabalho
12:30	Almoço
14:00	Continuação dos trabalhos em grupos
15:00	Plenária: Apresentação das discussões preparadas pela equipe de relatores
16:00	Discussão e aprovação
18:00	Encerramento

Público Alvo

Usuários, gestores, e todos os interessados na gestão da represa de Três Marias; membros do Pró-Comitê da Bacia SF4.

Secretaria de Meio Ambiente
Três Marias - MG
Fone: (38) 3754 - 5034
e-mail: peixespessoas3m@progressnet.com.br

Exmos. Srs. e Sras.

Ao cumprimentar com votos de elevada estima, convidamos para o Seminário Águas do Lago 2003 a realizar-se nos dias 11 e 12 de setembro no Centro de Convenções da CEMIG em Três Marias – MG.

Na I Conferência Regional das Cidades dos 8 municípios do lago de Três Marias, a Secretaria Municipal de Meio Ambiente demarcou a excepcionalidade regional com a proposta do tema: "Meio Ambiente – Gestão de Reservatório". O resultado da Conferência subsidia os palestrantes do Seminário e divulga o direito à co-gestão e à relevância dos recursos hídricos para o desenvolvimento de nossa região.

Vale a pena ressaltar que a maioria dos participantes foram unânimes em afirmar a existência de "caixa preta" quanto a disponibilizacão de dados, critérios e atribuições referentes à gestão do reservatório – base de frustrações profundas. Porém, durante nossas conversações com os órgãos gestores, percebemos que atualmente muitos destes dados na verdade são abertamente disponíveis, e que há vontade de vê-los divulgados. Assim sendo, esta é uma oportunidade de demonstrar e atualizar os conhecimentos para os usuários, e abrir esta concepção da caixa preta.

Agradecemos seu constante interesse e nos honramos com sua importante presença.

Equipe da Secretaria de Meio Ambiente
Prefeitura Municipal de Três Marias

Organização:

Prefeitura de Três Marias
Secretaria de Meio Ambiente

Programa peixes pessoas e água Brasil - Canadá

Conselho Municipal de Meio Ambiente Três Marias - MG

Apoio:

BIRD

CEMIG

SEMAD - MG

Comlago Prefeitos e Vereadores

UFMG

Unimontes

Canadian International Development Agency
Agence canadienne de développement international

REPORT OF SEMINAR RESULTS

Prepared by: Barbara Johnsen, Secretaria de Meio Ambiente

Results of the 1st Seminar Waters of the Lake - Três Marias, MG

11-12 September, 2003

Group 1: Electrical Generation and Water Level

Diagnostic	Proposals for strategy/operation/activity	Agency involved	Due date	Responsible
Permanent protection area, Resolution 302 of CONAMA	Legal analysis by the Public Ministry together with representatives of the Municipalities envolved to enable our tourism projects	City Hall, COMLAGO, TURLAGO	Oct-12	Vicente, TURLAGO
	Send the revision of Article 3 of Resolution 302 to Federal Elected Representatives (Deptudados) with the objective of addressing the demand for sustainable tourism on the lake shores			
	Send the revision of Article 3 of Resolution 302 to the Ministry of Tourism with the objective of addressing the demand for sustainable tourism on the lake shores			
Data on hydrometeorolgical levels by inernet	Send request to CEMIG to provide understandable rainfall and lake level data free of charge	COMLAGO	Oct-12	Vicente, TURLAGO
Relationships	Maintain close, continuous relationship amongst users of the lake	CEMIG, CODEVASF, COMLAGO, TURLAGO	1st year; next seminar	Jose Cesar, CEMIG
	Provide information on the extension of the electrical grid in the COMLAGO region	CEMIG, CODEVASF, COMLAGO, TURLAGO	Immediate	Jose Cesar, CEMIG
	Promote informative meetings on the politics of electrical generation from the Três Marias reservoir	CEMIG, CODEVASF, COMLAGO, TURLAGO	Immediate	Jose Cesar, CEMIG

Group 2: Environment and Mining

Diagnostic	Proposals for strategy/operation/activity	Agency involved	Due date	Responsible
A lot of misinformation and little awareness of the environment	Conduct Waters of the Lake seminars annually and a semi-annual itinerant forum to assist implementation of seminar results along	Environment and Education Secretaries; Companies	Mid and Long	Barbara (SEMEIA)
	Train teachers in environmental questions			
	Promote municipal conferences on the environment and Agenda 21, including youth and school audiences			
Disorganized occupation of areas of risk and road curbs and pavement that prevent absorption of rainwater	Speed up the approval and installation of the City Plans of the municipalities on the lake based on Agenda 21 concepts	COMLAGO, UFMG, ULTRAMIG, IEF, IBAMA, CEMIG	Short	Silvia - COMLAGO
	Initiate a plan for occupying the Permanent Protection Area (Pilot project in Três Marias)			
Society is not well enough organized to guarantee that their interests in the lake and its environments are met	Speed up the approval and installation of the SF4 basin committee in a participatory manner	All 15 municipalities and the society of the SF4 region	Short (February 2004)	Luciano, Mayor of Morada Nova
	Publicize the functions of the committee			
	Promote participatory planning of the committee			
Access to the margins of the lake and the Sao Francisco River is limited because of private property	Initiate necessary actions to create public areas on the margins of the lake and Sao Francisco River	Legislative and Legal Executive bodies; Municipalities	Long: 1 year	Aristeu, IBAMA
Serious problems with siltation, toxic mud, industrial pollution below the dam	Promote studies to understand the source and nature of the mud. Elaborate an action plan to solve the problem	CEMIG, COPASA, CMM, CBHSF	Mid	Waldemiro (CEMIG)
	Do chemical, physical, and biological analises of underground water around and below the CMM dams, as well as of the river sediments			
	Reposition the monitoring stations for the CMM wastewater			

Diagnostic	Proposals for strategy/operation/activity	Agency involved	Due date	Responsible
Serious erosion problems in rural areas and around the lake	Demand projects and action plans from IEF and EMATER to recuperate, maintain, and construct roads in accordance with environmental regulations	EMATER, IEF, EMBRAPA, IBAMA, CEMIG	Long	Nilta Jordao, civil society
	Demand programs and projects based on acroecology that publicize and train in conservation and soil management as well as promote social inclusivity			
	Plan and plant grass and flood-resistant flora to protect the floodable areas on the margin of the lake			
The invasion and introduction of exotic flora and fauna place native biodiversity of the Sao Francisco basin at serious risk	Elaborate biosecurity protocols for growers of exotic fish, other fauna, and flora	CBHSF; Projeto Peixes e Pessoas, CODEVASF, FASFRAN	mid	Dr. Yogi, Canada
	Demand the removal of eucalyptus from veredas to recuperate them and return their water	Silviculturists in the SF4 region	Long	Dr. Sato, CODEVASF
	Incentivate the recuperation of marginal lagoons in the areas of Iguatama, Bom Despacho, Divinopolis, Itatima, Lagoa da Prata, and below the Três Marias dam through directed and severe actions	Aquaculturists, Federation of Arrtesanal Fishermen, Public Ministry	Long	Dr. Sato, CODEVASF
	Research native species for aquaculture potential	CODEVASF station, Três Marias Coopertres, Fisheries Ministry	Long	Dr. Sato, CODEVASF
The statistical projections of water retention in the reservoir by the regulative organs and ONS should incorporate the needs for multiple uses	Guarantee the participation of the muncipalities of the reservoir in decisions of multiple use together with the water managers			Padre Ge, mayor of Três Marias
	Promote research that guarantees real data with regard to the availability of water in the reservoir and its tributaries in the SF4 region	CBHSF, Regualtory organs of the reservoir	Short, medium, and long	

| Diagnostic | Proposals for strategy/operation/activity | Agency involved | Due date | Responsible |

Springs and veredas are seriously devastated and in the process of serious drying up	Establish intermediate and final measures for the recuperation of water bodies through the management plan for the basins	IEF-EMATER; EMBRAPA, IBAMA, CODEMAs	Short	Barbara
	Priorize urgently the recuperation of veredas and water bodies in areas of eucalyptus (pasture and feed areas)	Municipal secretariats, Public Ministry	Short	Barbara
	Promote informative meeting on the current condition of veredas and the environmental caused by activities in their surroundings	Rural Syndicate; CBHSF	Short	Barbara
Extinction of flora, fauna, and native fruit species of the cerrado	Establish nurseries of native flora, including fruiting plants with an eye to collection and value-added products	IEF, SEMAD, CEMIG	middle	Heloise (CEMIG neighbourhood)
	Stimulate the planting of native flora, promote appreciation and expansion of vestiges of cerrado, create legal reserves	IEF, SEMAD, CEMIG, CODEMAS	middle	Waldemiro (CEMIG)
Exploration for and extraction of minerals degrades the environment	Include geological zoning for mineral and subterranean water exploration and extraction in the City Plans of municipalities of the reservoir	ANA, DNPM, UFMG, UTRAMIG, COMLAGO, SEMEIA, CODEMAs	middle	Edimarcio (CMM)
	Create public awareness of the importance of this zoning for this and future generations			
	Create mechanisms for policing and participatory monitoring (through the CODEMAs) of mining activities in the muncipalities			
Transposition of the Sao Francisco is not being discussed with the affected communities	Enable state public audiences with the municipalities of the Sao Francisco to present and discuss the new version of the transposition proposal	Public Ministry, ALMG, Society, CBHSF, CNRH/CERH	middle	Barbara
Hydrological information of the reservoir is inaccessible to the majority of the population	Develop a website with hydrological data consolidated by ANA/SRH/ONS/ANEEL/ CEMIG, Ministry of Mines and Energy, and promote their updating; create methods to publish the data in a format understandable to the public	ANA, SRH, ONS, ANEEL, CEMIG, MME	short	Silvia, COMLAGO

Diagnostic	**Proposals for strategy/operation/activity**	**Agency involved**	**Due date**	**Responsible**

Privatization of water and aquatic resources	Implement legal instruments against privatization of the services of distribution of water, sewers, and electrical energy; create public awareness of the urgency and need of these measures	ALMG, SENADO, Legislature, Mayors, Public Ministry, CEMIG, COPASA, etc.	Medium	Padre Geraldo - mayor Três Marias, President of COMLAGO
Destruction of life by wildfires	Form municipal fire departments; enable funds for IBAMA to prevent fires; develop environmental education for control of fires and promote it; guarantee the participation of farmers, environmental organization, and schools	Silviculturists, IBAMA, IEF, EMATER, Rural Syndicate, Schools	Medium	Carlos (IEF), Roberto (EMATER), Sgt. Eduardo
Environmental impact of eucalyptus plantations	Research alternatives to eucalyptus from native cerrado trees for charcoal production; promote the pilot recuperation of veredas with the goal of developing a more extensive program; carry out a geo-referenced survey of veredas in the UGPSF4 area	Silviculturists, farmers, SEMAGRI, EMATER, IEF	Medium and long	Wilker, Agriculture Secretary of Três Marias

Group 3: Tourism and Fisheries

Diagnostic	Proposals for strategy/operation/activity	Agency involved	Due date	Responsible
Necessity to increase the quantity of fish	Study and implement means for returning the marginal lagoons to their former function as nurseries for fish; set up a centre of reference for fisheries of the Sao Francisco - strengthening and uniting CAP and the CODEVASF station; that the municipality support the project Peixes Pessoas e Agua with an administrative centre in CAP	CEMIG, CODEVASF, Fisheries Federation MG, Agriculture Ministry, Public Ministry, FASFRAN	Long	Jose Cesar (CEMIG), Barbara Johnsen SEMEIA
Little use of the lake for tourism	Pave the principal accesses to the lake, widen and improve existing road accesses, following environmental regulations; pave the access BR 040 to Morada Nova de Minas	DER, CityHalls, State Secretaries, Councillors	Immediate	COMLAGO, Mayors, Councillors
	Facilitate professional and sports fisheries and aquatic sports	Secretaries of Tourism and Fisheries, Federation of Fishermen, TURLAGO	Immediate	SEDETUR, TURLAGO
Diagnostic	**Proposals for strategy/operation/activity**	**Agency involved**	**Due date**	**Responsible**

	Technical training for nuclear reception of tourists	SEDETUR, COMTUR, ADETRES	6 meses	SEDETUR, TURLAGO
	Install adequate infrastucture on public beaches	City Halls and Councillors	Medium and long	SEDETUR, TURLAGO
	Interaction of the public authority and private initiative (productive chain)	TURLAGO, Commercial association, City Halls, ADETRES	Immediate	TURLAGO
	Develop and implement a marketing plan for tourism on the lake	SEDETUR, TURLAGO, ADETERES, COMLAGO	Medium and long	Antonio Carlos Ornelas
	Implement projects for tourism signage and transport	SEDETUR, TURLAGO, ADETERES, COMLAGO	Medium and long	Antonio Carlos Ornelas
	Implement projects of beautification of the cities around the lake	SEDETUR, TURLAGO, ADETERES, COMLAGO	Medium and long	Antonio Carlos Ornelas
	Explore the literary, historic, and cultural potential for developing tourism	SEDETUR, TURLAGO, ADETERES, COMLAGO	Medium and long	Antonio Carlos Ornelas
Lack of reaching maximum level of the reservoir during rainy seasons	Optimize the management of outflows from the reservoir	CEMIG, ONS, COMLAGO	Immediate	Padre Ge, Mayor of Três Marias

Group 4: Irrigation, navigation, water treatment, and others

Diagnostic	Proposals for strategy/operation/activity	Agency involved	Due date	Responsible
The municipalities around and above the lake pollute its water	Establish sewage treatment for municipalities contributing above the dam and to production of water to the SF4 planning unit.	Public Ministry, City Halls, Councillors	Long	Ivonete - COMLAGO

Diagnostic	Proposals for strategy/operation/activity	Agency involved	Due date	Responsible

Requirement for City Plan and water treatment projects of the lake	Facilitate projects and financing of the UFMG/Comlago agreement for preparing the City Plans and proposals for sewage treatment	UFMG, Ultramig, COMLAGO, Environment Ministry	Medium and long	Silvia - COMLAGO
Sewage treatment insufficient or absent	Mobilise and sensitize all the organizations, institutions, and companies involved in an integrated, political, and economical fashion to find economic resources, appropriate technology for sewate treatment plans, sanitary landfills, and water supply networks for the municipalities of the lake,	COMLAGO, COPASA, City Halls	Dec-04	Mayor Padre Ge, Silvia, Claudio (Copasa, Curvelo)
Low water levels prejudicial to irrigation	Promote seminars and search for alternatives to irrigated agriculture	EMAter, IEF, ANA, Secretariat Agriculture, COMLAGO, Farmers Syndicate	Jul-04	Pedro Norberto (Morada Nova de Minas), Luciano Souza, Wilker
Lack of legal instruments with the state and country to implement proposals and actions in the basin	Legalization and recognition of the Comite UGPSF4 of the area around the reservoir of Três Marias	Municipalities of the basin, water users, and civil society	Dec-03	Silvia - COMLAGO
Reform of the ferries in the reservoir	Send request, with justification, to the organization and instituition responsible for maintenance of the ferries and related services	CODEVASF, City Hall	Feb-04	COMTUR, TURLAGO, COMLAGO
City dwellers pollute streets, vacant lots, and creeks	Promote Environmental Education on pollution, including sound and visual pollution; show rural populations how to deal with garbage within specific strategies	SEMAD, MMA		Dulcineia - SEMEIA
Provide incentive for selective garbage collection and strengthen the garbage collectors	Investigate and define means to ensure that the recycling law for PET manufacturers is enforced	COMLAGO	Medium	Silvia - COMLAGO
	Stimulate selective collection through a program prepared by experts; support infrastructure for storage of selective collection by organization of garbage collectors; stimulate the inter-municipal integration of garbage collectors of the Lake to extend the experiences and training.	Association of garbage collectors, UNICEF project, Municipal Secretaries	Medium/ long	Dulcineia - SEMEIA

NEWS COVERAGE

In: O Sertanejo, No. 383, September 2003

In: O Sertanejo, No. 383, September 2003

TRIP REPORT

National Meeting of Watershed Basin Committees

Aracaju, SE, Brazil, August 18th – 21st, 2003

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PROGRAM

ARACAJU/SE
HOTEL PARQUE DOS COQUEIROS
RUA FRANCISCO RABELO LEITE NETO, 1075
BAIRRO: ATALAIA
18 A 21 DE AGOSTO, 2003

Realização:
Fórum Nacional dos Comitês de Bacias Hidrográficas
Governo do Estado de Sergipe Competência e Trabalho.

Apoio:
Aracaju Uma cidade para todos
Secretaria de Estado do Planejamento e da Ciência e Tecnologia
Secretaria de Recursos Hídricos
Superintendência de Recursos Hídricos
Ministério do Meio Ambiente
BANESE O Banco de Sergipe
BRASIL UM PAÍS DE TODOS GOVERNO FEDERAL
ANA Agência Nacional de Águas

Operadora do Evento: PROMASTUR

V Encontro Nacional dos Comitês de Bacias Hidrográficas

Estamos nos preparando para a realização do V Encontro Nacional dos Comitês de Bacias Hidrográficas que acontecerá neste ano em Aracaju/SE.

A reflexão sobre quem e quantos somos, o que planejamos e fizemos, serviu para orientar o Colegiado Coordenador deste Fórum Nacional na escolha do tema central do evento - **"As Relações Institucionais dos Sistemas de Recursos Hídricos"**.

Os Comitês de Bacias Hidrográficas que integram os Sistemas Nacional e Estaduais de Recursos Hídricos têm sua atuação vinculada, legal e institucionalmente, como se fosse uma engrenagem, aos órgãos gestores. Ou acertamos o passo ou não chegaremos a lugar algum.

O V Encontro Nacional é a oportunidade de avaliarmos o processo de implementação dos Sistemas de Gestão dos Recursos Hídricos no que se refere a sua descentralização; de compreendermos o papel do Comitê na aplicação dos instrumentos de gestão e oportunizarmos esclarecimentos sobre a natureza jurídica, o papel político e as competências dos Comitês, além de fortalecermos as relações entre os entes dos Sistemas de Gestão dos Recursos Hídricos, nesta ação conjunta e articulada.

É mais um dos nossos encontros marcados pela emoção e integração daqueles que desde Porto Alegre/RS, passando por Ribeirão Preto/SP, Fortaleza/CE, Belo Horizonte/MG e Balneário Camboriú/SC, vêm contribuindo na construção deste processo e de todos aqueles que se somam nesta caminhada.

Colegiado Coordenador do Fórum Nacional de Comitês de Bacias

Programação

18/08 - SEGUNDA-FEIRA

19:00

- Abertura Oficial

19/08 - TERÇA-FEIRA

Manhã - 9:00

- Painel: A Natureza Jurídica e o Papel Político dos Comitês de Bacias Hidrográficas
- Debate

Tarde -14:00

- Painel: As Relações entre os entes dos Sistemas: Comitês, Órgãos Gestores, Conselhos de Recursos Hídricos e entre os Sistemas Nacional e Estaduais de Recursos Hídricos
- Debate

Final de tarde - 17:00

- Palestra: Os recursos oriundos da cobrança pelo uso da água: caminhos percorridos até a sua aplicação

Noite - 19:00

- Palestra: A proposta de Reformulação da Lei No. 9433/97 – PL 1616

20/08 - QUARTA-FEIRA

Manhã - 9:00

Discussão em Grupos Temáticos:

- A Implementação dos Instrumentos de Gestão de Recursos Hídricos como fortalecimento da descentralização
- Plano de Bacia, Outorga, Cobrança pelo uso da água, Enquadramento legal das águas e Sistema de Informações: problemas na implantação, alternativas e estratégias de superação

Tarde - 14:00

- Plenária: Relato das discussões e propostas de encaminhamentos

21/08 - QUINTA-FEIRA

Manhã - 9:00

- Assembléia Anual Ordinária dos Comitês de Bacias Hidrográficas

TRIP REPORT

Prepared by: Silvia Freedman, President do Pró-CBHSF-04

Pre-Committee of the Reservoir Watershed of Três Marias – UPG – SF04

OF. 035/2003/CBHSF-04

Três Marias, September 3rd, 2003

Illustrious
Mr. Yogi Carolsfeld
Project "Peixes, Pessoas e Água"

The Pre-committee for the Reservoir Watershed of Três Marias, Planning and Administrative Group SF04, compliment you on your successes and thank you for your support. We likewise extend appreciation to Project "Peixes, Pessoas e Agua" for providing this opportunity for us to participate in the Fifth National Meeting of the Watershed Committees, that took place in the Municipality of Aracaju/SE, from August 18th to 21st, 2003.

We take this opportunity to send you our Report of the Fifth National Meeting of the Watershed Committees/2003:

REPORT OF THE FIFTH NATIONAL MEETING OF THE WATERSHED COMMITTEES AUGUST 18TH-21ST, 2003 ARACAJÚ/SE

The National Meeting of the Watershed Committees had the objective of exchanging, amongst the committees, their experiences and their difficulties in implementing administrative tools.

This meeting in Aracajú, was presented according to the following schedule:

18/08/2003 – 19:00h: Official Opening

The official opening was performed by the invited guests: Paulo Maciel, President of the Meeting; João Bosco Senra, of SNRH; Clãudio, of MMA; Afrânio, a representative of ANA; and two hours later, Brazil's Vice President, José Alencar and the Governor of Sergipe.

Once the meeting was opened and the [proposal for] Transposition of the São Francisco River was presented by the Vice President, the formal opening was discretely closed to start the confraternization amongst participants in the same location.

19/08/ 2003 - 09:00h: The Legal and Political Roles of the Watershed Committees:

Speakers: Alaôr Caffé Alves
Debaters: Carlos Hugo Suarez Sampaio (CTIL/CNRH)
Paulo Renato Paim
Coordinator: Maria Lúcia Falcon
Secretary: Luis Roberto Moretti

19/08/2003 – 14:00h: Inter-InstitutionalRelationships of the Systems

Speakers: Stela Goldstein
Eduardo Lanna
Debaters: Dilma Seli Pena Pereira
João Bosco Senra (SRH/MMA)
Cláudio Antonio de Mauro CBH PCJ
Francisco José Coelho Teixeira
Coordinator: Antônio Francisco C. Borges
Secretary: Cacá

19/08/2003 - 17:00h: Money from the Taxing [of Water]

Speaker: Paulo José dos Reis Souza
Coordinator: Antônio Francisco Evangelista de Souza – CEIVAP
Secretary: Eugênio Cánepa

19/08/2003 – 19:00h: Proposal for the Reformulation of Law N9433/97 – PL 1616

Speaker: Deputado Fernando Gabeira – Not Present
Coordinator: Luis Eduardo Cheida
Secretary:

The proposed topics for the presentation were very significant, from the point of view of the current needs of both the committees that are in place and those being formed, especially as the programming and methodology used for the event were very "closed", not permitting a satisfactory the exchange of experiences between the committees.

As to the first topic, the best nature of the legal role of the committees is still being discussed, as the Water Agencies still need to be formed. The importance of working the committees politically was also emphasised, which led me to question what this means. That is, the decisions of the committees should be based upon both technical data and productive discussions between the government sector, those using the water and civil society. For me, "working politically" should be interpreted to refer to the necessity of paying attention to the social side of water use and the needs of the population [living in] the watershed, in which case the decisions need to also be political.

As for inter-institutional relationships, integration, implementation of information and data, sharing experiences and support amongst institutions were all reinforced [as important mechanisms]. For example, the hydrological data from a watershed is very important as a basis for the committees' decisions. Cooperation amongst institutions should be straight-forward and and professional.

[Financial] resources derived from water taxes are still an unknown, so the legal procedures for collecting the taxes haven't been defined, although we know that everyone who uses water will have to pay. However: How? When? and how much? have not yet been clarified. The legal instruments do not yet permit charging for the use of water, and we are still discussing how to collect these taxes and the pathways that this money will follow before it gets back to the watershed at which it originated, suggesting the need to create a "National Fund for Water Resources". However nothing is definitive, and nothing has been agreed upon, yet. My perception is that discussions around these issues are continuing without much advance.

Reformation of Law No. 9433/97 of PL1616, proposes a modification that would increase its usefulness, including how water taxes will be applied with priorization for the watershed of origin. The full text for the modification of Law 9433/97 is attached.

20/08/2003 – 09:00h – THEME GROUP DISCUSSIONS

Sanctioned Authority

Presenter: Leila de Carvalho Gomes
Facilitator: Rosana Garjulli
Reporter: Alexander Max Sá Figueiredo

Watershed Plan

Presenter: Oscar de Morais Cordeiro Netto
Facilitator: Ididoro Zorzi
Reporter: Rogério Dewes

Classification of Water

Presenter: Paulo Maciel Fr.
Facilitator: Jussara de Lima Carvalho
Reporter: Sidnei Gusmão Agra

Taxing the Use of Water

Presenter: Décio Micheles
Facilitator: Cacá
Reporter: Regina Greco

Information System

Presenter: Jose Almir Cirilo
Facilitator: Celso Marcatto
Reporter: Malu Ribeiro

20/08/2003 – 14:00h: Plenary on Legal Instruments

Coordinator: Luiz Roberto Moretti
Reporter: Cacá

The thematic groups divided themselves up for round table discussions about the proposed topics, followed by presentations by the reporters, and the event organisers are to send the final results to everyone. The group that Ceiça and I chose was that dealing with taxation for the use of water and nothing new was brought forward.

On this day (August 20th, 2003) at the time of the group [round table] meetings, I was invited to participate in the informal meeting of the Directors of the CBHSF, presided over by the Exmo. José Carlos Carvalho, in which we were told of the plan for the Transposition of the Sao Francisco River. After the matter was presented, everyone present spoke their opinion, at which time I was given the floor and I explained:

Am I to understand that the political administration in this countryrelies on a process of social mobilisation to legitimise its actions, and then doesn't ask this society that provides that legitamacy, whether it does or does not want the proposed transposition? Furthermore, that confronted by the decision for the transposition, we won't be able to express our views against it, so that we are left to work only on actions that contribute to restoration of the quality and quantity of these waters?

21/08/2003 – 09:00h: General Assembly of the Watershed Committees

Once the Assembly was in place, only the members of the committees that had already been formed had the right to vote in the election for President of the National Forum of the Watershed Committees. As such, we couldn't contribute to the electoral process, but I followed the unfolding of an internal, political dispute in the State of São Paulo, which resulted in Zorzi, of Rio Grande do Sul winning the election for the President of the National Forum of Watershed Committees. This state was also chosen to host the Sixth National Meeting of the Watershed Committees in 2004.

Conclusions

The participation of Pre-CBHSF04 in the Fifth National Meeting of the Watershed Committees was very important in that it linked the different partners participating in the event, setting the groundwork for more viable relationships with administrative agencies for water resources in the State of Minas Gerais and other Brazilian states. It was also important to have participated in a closed meeting of the CBHSF, which happened at the same hotel, and at which the presentation of the transposition proposal for the São Francisco River was initiated. For the Pre-comitê SF04 it was a moment involving a great deal of searching for partners and incentives, including future projects that will be elaborated by SF04. There was also the opportunity to reinforce the request for political and institutional assistance, with the opportunity to collaborate in the restoration of the São Francisco River through projects aiming to improve the quality and quantity of water.

As for the event itself, the presentations were closed, without many opportunities to present experiences and difficulties that the committees have encountered. This point was also questioned by many other participants in the event.

As for the explanations of the Vice President of Brazil, José de Alencar, it demonstrated his acceptance of the project for transposition of the Sao Francisco River, with the intention of moving water to the semi-arid people of northeastern Brazil. This presentation makes us apprehensive, and reinforces for us the urgent need to restore this river of national unity.

We finished the meeting with stronger bonds related to the administration of Brazil's water [issues].

We reiterate our thanks for the first-hand opportunity to learn and collaborate in this important march of the waters.

Respectfully,

Sílvia Freedman Ruas Duraes
President of Pre-CBHSF-04

TRIP REPORT

Prepared by: Ceiça Maria da Conceição Bezerra Correia, Communications Director, Três Marias

FIFTH NATIONAL MEETING OF THE WATERSHED COMMITTEES

"The control of the use of natural resources will, more than anything, control human evolution. To control without annihilating humanity will be the purpose of a sustainable development." - Samuel Murgel Branco

"The law doesn't have legs as such, it moves under the command of mankind." - Alaôr Caffé Alves

The Fifth National Meeting of the Watershed Committees took place on August 18-21 at the Coconut Palm Park Hotel, in Aracaju, SE. The main theme of the meeting was "The Institutional Relations of Water Resource Systems". Jointly sponsored by the National Forum of Watershed Committees, the Ministry of the Environment, the National Secretariat of Water Resources, the National Water Agency (ANA), and the Municipality of Aracaju, the meeting provided for an exchange of experiences amongst its delegates/participants.

The Fifth National Meeting was an opportunity for the appraisal of the implementation process for Water Resource Administration Systems with regard to it's de-centralization; an understanding of the role of the committees in applying administrative tools; making clarification of legal considerations available; understanding the political role and functions of the committees; and strengthening the relationships between the entities within the Administrative Systems of the resources in a co-ordinated and articulate way.

The representatives of the commissions participated in technical lectures about licensing systems for using rivers, charging for the use of water and indications for watershed management planning.

During the meeting there were panel presentations followed by debates, and five workshops (topic groups) in which there were discussions about: watershed planning; sanctions; charging for the use of water; legal damming/impoundment of water; and information systems.

At the opening of the meeting, the Vice-President of Brazil, José Alencar, talked about the "Transposition of the Sao Francisco River" project, that is estimated to cost six billion Reis, of which one billion will be for restoration work. He reiterated that funding for the transposition [project] would be provided by the World Bank (BID) and The National Economic and Social Development Bank (BNDES) and included in Brazil's general budget in 2004. Restoration

should begin with dredging of the riverbed, reforestation of river margins, and the basic sanitation of cities on the river.

Alencar recognized that the [transposition] project is old, but then only dealt with the transposition of river water to the semi-arid northeast. “Now, we are presenting a global project to save the Sao Francisco [River], that is degraded and needs to be recuperated”, commented the vice [president], coordenator of the project.

One of the principal changes made to the old project is the transposition of waters from the Palmas River (tributary to the Tocantins River) to the Preto River of the Sao Francisco drainage.

Transposition of the Sao Francisco to the Vaza-Barris, Jacuipe, and Itapicuru rivers (all in Bahia) is also planned. The vice-president said that the study group is not restricting itself only to the theme of transposition. A broader program will be developed, in which environmental recuperation and revitalization of the hydrographic basin of the Sao Francisco will be included as a priority.

After the instalation of the Forum, Alencar received a Manifesto from politicians of Bahia, Sergipe, and Alagoas against the transposition of the Sao Francisco.

Agreements were signed at the meeting for a value of R$8.75 million for studies and projects to permit the provision of high quality water in eight states of the Northeast and Minas Gerais.

The agreements were signed by the Executive Secretary of the Environment Ministry, Claudio Langone; the National Secretary for Water Resources, Joao Bosco Senra; the director of the National Water Agency, Benedito Braga; and representatives of the governments of Rio Grande do Norte, Alagoas, Bahia, Ceara, Minas Gerais, Paraiba, Pernambuco, Piaui, and Sergipe. The signed agreements are part of the Pro-Agua program, financed by the World Bank, whose objective is the strengthening of the management system of water resources by means of, in the first phase, studies for technical training and identification of the availability of water in the semi-arid region. In a second phase, the program foresees infrastructure projects that will guarantee high quality water for the populations of the semi-arid region.

In the final plenary of the V Meeting of the Water Basin Committees, a motion was voted on to alter resolution no. 5 of the National Council of Water Resources, which regulates the constitution of the water basin committees. According to the text of the motion, Law 9433 establishes that the river committees of rivers that go through more than one state can only be constituted with the approval of the National Council of Water Resources. For this, there is a long list of requirements and documents that need to pass from the state to the union. The documentation needed to create a committee for a river the size of the Sao Francisco – which passes through 503 municipalities - is the same as the documentation needed for a committee of the Mucuri River in Minas Gerais, which passes through only 17 municipalities. One conclusion of the V Forum was that the excessive beaurocracy is compromising the progress of

processes, and that there are groups that have been waiting more than a year for the constitution of their committee.

The technician Rosana Garjulli, of the Superintendency of Management of the National Water Agency (ANA) explained that resolution 05 of the Council is already being discussed and that there are proposals to change it. She agreed that the need for so many steps to form committees is making the process difficult for rivers that cover smaller areas and, because of this, have a greater facility to mobilize users, industry, and non-governmental organizations around the committee.

The V National Meeting was of great importance for the enrichment of discussions, exposition of diverse problems that affect all the committees of Brazil, and principally in the incessant search for resolutions to the impasses and conflicts lived in the states.

"The river is a person. It has a name. This name is very old, because the river, while always a youth, is very old. It existed before man and birds. Since humans were born, they loved the rivers, and as soon as they could speak, they gave them names." - Rémy De Gourmont

APPENDIX F – CROSS-CUTTING THEMES RESULTS

MEETING REPORT

Fishing Decree Review Meeting

Três Marias, August 2nd - 4th, 2003

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OVERVIEW FLYER

Fisheries Co-Management Takes a Forward Step in Minas Gerais

Conflicts over fisheries on the São Francisco River

Small scale (artisanal) commercial and subsistence fisheries have supported families in the upper and middle São Francisco River at least since the immigration of European and African descendents from coastal Bahia in the 1700s, and it's likely there were extensive indigenous fisheries before then. Unfortunately, a half-century of intensive development, including agriculture, industry, urbanization, and hydroelectric dams, has reduced the number of fish available to catch. With these reductions have come increased conflicts on their use.

Violent conflicts, primarily between artisanal fishermen and enforcement agencies, were not uncommon during the Brazilian dicatorship. While such confrontations diminished with re-democratization, the conflict escalated again in the late 1990s, particularly in Minas Gerais, when the state environmental agency (the IEF) created a Fisheries Department with strong conservationist fisheries regulations. A major law implemented in 1998 prohibited the use of fish nets that were considered by artisanal fishermen to be essential to their survival. Unfortunately, the law was formulated without participation of the fishermen, was based on scant fisheries data, and was enforced by police with little training in environmental policing. While the law was valid only in "state" waters, it was also enforced in "federal" rivers - at times with substantial violence.

Photo: Brian Harvey

The role of Projeto Peixes, Pessoas e Agua

The Artisanal Fishing Federation of MG and the Federal University of São Carlos are Brazilian partners in a major CIDA-funded project on inland fisheries of Brazil - Projeto Peixes, Pessoas e Água. Before the project began in early 2003, the Federation and several UFScar faculty organized the affected fishermen, succeeded in having the offending 1998 law revoked, and participated in the formulation of a new law. However, the new law, prepared in 2000, was never implemented and 80% of the concerns voiced by fishermen in a recent problem-evaluation workshop were related to conflicts with regulations and policing.

When Projeto Peixes, Pessoas e Água conducted a baseline survey of fisheries socio-economics in the area in June of 2003, the draft decree for implementation of the new fisheries law was found to be close to approval - again without input from the artisanal fishermen. After some discussion with project partners in the Military Police and the IEF, the draft decree was removed from the approval process and made available for review by fishermen.

Building a better fisheries law

In early August, 2003, Projeto Peixes, Pessoas e Agua organized and facilitated multi-stakeholder meeting in Três Marias, MG, to carry out this review of the proposed new fisheries law. Artisanal fishermen and fisherwomen, NGOs, universities, the IEF, and the military police were all represented at the meeting, including legal representation for the fishermen. Preliminary evaluation of the document by the fishermen left the impression that the decree, as written, would have the effect of reverting to the original 1998 law, thus creating substantial bad feelings. However, adequate prior individual discussion with stakeholders, graduated participation in the review meeting, and substantial goodwill on the part of key people in all groups managed to defuse the situation, resulting in a very productive workshop.

The entire draft decree was reviewed and discussed by the fishermen. All of the key gear restrictions on artisanal fisheries were removed. In addition, provisions were created for participation of the fishermen in the formulation of local laws ("portarias"), policing, stock assessment, and fisheries research. The fishermen agreed to be actively involved in the conservation, re-building, and management of fisheries resources - thus addressing the biological component of sustainability. All changes that were agreed to in the group have been incorporated in the new draft decree, which is currently still under evaluation for approval. If successful, many of the problems identified in the 2001 Sao Francisco workshop, will be resolved - contributing significantly to the sustainability of artisanal fisheries in the area.

Photo: Barbara Johnsen

Immediate benefits of the workshop

While the revised decree has still not been approved and its long term success is unknown, immediate beneficial results of the workshop include:

1) Vastly improved relationship between the IEF and artisanal fishermen,
2) Removal of a controversial "portaria" prohibiting a type of drift gill-net that is essential to the fishery in some section of the São Francisco river,
3) Draft agreement between the hydroelectric company CEMIG, the Fishing Federation, and the city of Três Marias to reduce a controversial exaggerated security zone below the dam to a mutually acceptable

PARTICIPANTS LIST

Insert photocopies of table listing participants names. (6 pages total)

ASSESSMENT OF THE DRAFT OF THE FISHERIES DECREE TO REGULATE LAW 14181-02

PORTARIA PERMITTING THE USE OF "CACEIA" NETS

PORTARIA Nº 96, DE 25 DE AGOSTO DE 2003

Dispõe sobre a normatização da pesca realizada na modalidade de caceia nos rios e bacias hidrográficas no Estado de Minas Gerais.

O Diretor do Instituto Estadual de Florestas - IEF, no uso de suas atribuições que lhe são conferidas pelo inciso IV do art. 9º do Decreto Estadual nº 43.369, de 05 de junho de 2003, e com respaldo na Lei Delegada nº 79, de 29 de janeiro de 2003, com base na Lei 2.606, de 05 de janeiro de 1962, alterada pela Lei 8.666, de 21 de setembro de 1984 e no Decreto 34.271, de 24 de novembro de 1992, considerando também o disposto na Lei 14.181, de 17 de janeiro de 2002,

Resolve:

Art. 1º - Fica permitida a utilização da prática da pesca na modalidade caceia nos rios e bacias hidrográficas no Estado de Minas Gerais

SS 1º - Por Bacia Hidrográfica, deve-se entender o rio, seus formadores, seus afluentes, lagos, lagoas marginais, reservatórios e demais coleções de água.

SS 2º - Por caceia, deve-se entender o lançamento a deriva de aparelho de emalhar, individual ou múltiplo.

SS 3º - Para a pesca na modalidade de caceia, fica permitido a utilização de malhas igual ou superior a 140mm (cento e quarenta milímetros), não devendo exceder a altura de 4m (quatro metros).

Art. 2º - Para efeito de mensuração da rede, considera-se o tamanho de malha como a medida tomada entre os eixos dos nós dos ângulos opostos da malha esticada.

Art. 3º - Redes de emalhar não deverão exceder 1/3 da largura dos rios.

Art. 4º - Aos infratores da presente Portaria, serão aplicadas as penalidades previstas no ordenamento jurídico brasileiro.

Art. 5º - Esta portaria entra em vigor na data de sua publicação

Art. 6º - Revogam-se as disposições em contrário, especialmente a Portaria nº 38 de 16 de abril de 2003.

Belo Horizonte, 25 de agosto de 2003.

Humberto Candeias Cavalcanti.- Diretor Geral.

WORKSHOP REPORT

Training Workshop on Participatory Facilitation

Três Marias, September 13th – 16th, 2003

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WORKSHOP OUTLINE

Welcome!

Course
Facilitation in Participative Processes

Promotion: Secretaria Municipal de Meio Ambiente e Secretaria Municipal de Educação e Cultura da Prefeitura de Três Marias/MG

Support: Projeto Peixes Pessoas e Água (Projeto World Fisheries Trust apoiado pela Agencia de Desenvolvimento Canadense – CIDA)

Instructor/moderator: Margarida M. M. Ramos

Dates: 13 -16 September, 2003
Locale: Três Marias /MG

TABLE OF CONTENTS

INTRODUCTION

This report presents the contents of the course on “Facilitation in Participative Processes” promoted by the City Hall of Três Marias, through the Municipal Secretaries of Environment and Education and Culture. The course was carried out with the resources of the Projeto Peixes Pessoas e Água, (World Fisheries Trust project), supported by the Canadian International Development Agency – CIDA.

The course took place in the period of the 13-16 of September of 2003, and united participants that are active in the promoting Secretaries. The work was carried out in the environment of a workshop, focussing on training to improve how the participants work with groups in their activities. The course offered tools for improving the dynamics of group processes, and sought to create foundations to establihs an effective and long-lasting cooperation between the different actors in the process of participative work.

The present report is divided into three parts: the first presents a methodological orientation for the course and the guiding panels used for discussions, prepared by the instructor, with the proposal of introducing techniques of moderation and visualization, creating conditions to raise the understanding and identification of the people with the contents related to the work of “Facilitation” [1] and making it possible for them to realize how this work is carried out together.

In the second part, the report presents the results of the work carried out by the participants - i.e. the results of the training, the exercises carried out in small groups. The purpose of this part of the course was to intensify the learning of the techniques, sensitize and motivate the group for immediate application of the skills. Once the quality of the group product depended directly on the individual contributions, the groups were directed to provide everyone with space to speak out during the discussions and presentations.

The third part of the report pulls together the results of the continuous and progressive evaluation carried out by Evaluation Committees, by the teams themselves related to the simulated meetings, and a final evaluation of the course. In the final evaluation, the participants had the opportunity to express their opinions about the course and register any advances achieved.

[1] The moderation and visualization techniques are meant to be a source of assistance and reference for anyone working in a participatory manner and who wish to act as facilitators or moderators in these processes.

PART I

1. METODOLOGICAL ORIENTATION

1.1. OBJECTIVES

The course had, as its principal objective, the training for the preparation and realization of participative work, based on initial training in moderation, learning of the core techniques of visualization with the use of cards, and by providing guidance for attitudes conducive to participation in group work. In addition, the techniques used were designed to strengthen participation and facilitate the interchange of information between course participants.

1.2. METHODOLOGY

The methodology used during the course sought to provide discussion on important themes that are not dealt with every day in the work of the participants.

We named the methodological process “learning by doing” - “aprender – fazendo”, in which emphasis is on a discussion of how the work is being done and on a continual reflection on the actions during the course, so that everyone achieves, in their projects:

- Greater contact between the organizations and the populaiton of beneficiaries;
- Provide better information to formulate projects and programs that are closer to reality and more effective;
- Provide an adequate background for coordenation of projects;
- Simplification of complicated beaurocratic processes that result in excessive concentration of power;
- Institutionalize citizen participation in planning and management, creating alternative means for decision-making and administration;
- Permit a greater representation of the various groups in processes of decision-making;
- Favour equity in the distirbution of resources and investments.

The course started with an introduction by the participants, followed by information on methodologies and working tools.

The participants, after they had interviewed each other, presented themselves in pairs or greater, in a plenary session. The dynamic used for the presentations sought from the start a familiarization with the visualization tools and an environment conducive to learning and and a permanent process of auto-evaluation.

Following this, we prsented the objectives of the course, relating them to the expectations presented by the participants during their introductions, with the purpose of addressing any disagreement with the objectives that may have been expressed during the auto-presentations. The first Evaluation and Assistance Committee was formed, and its duties during the course discussed. The daily evaluation activities of this Committee are meant to create a stimulus for participation, exchange of opinions, and an analysis of what is being done. Each day started with a retrospective of the previous day, presented by the Committee reponsible for that day. The group was stimulated to formulate and negotiate amongst themselves “Rules of Working Together,” with the objective of helping establish favourable conditions for communal work during the course.

Soon after these initial questions, the first exercise with content related to the context of the work of the participants was brainstorming (“Chuva e Coleta de Idéias”), used to survey opinions of

the participants about “What to do with the Centro de Atendimento ao Pescador (CAP) of Três Marias ?”

The work evolved as four basic steps: generaiton of ideas, organization, analysis, and conclusions.

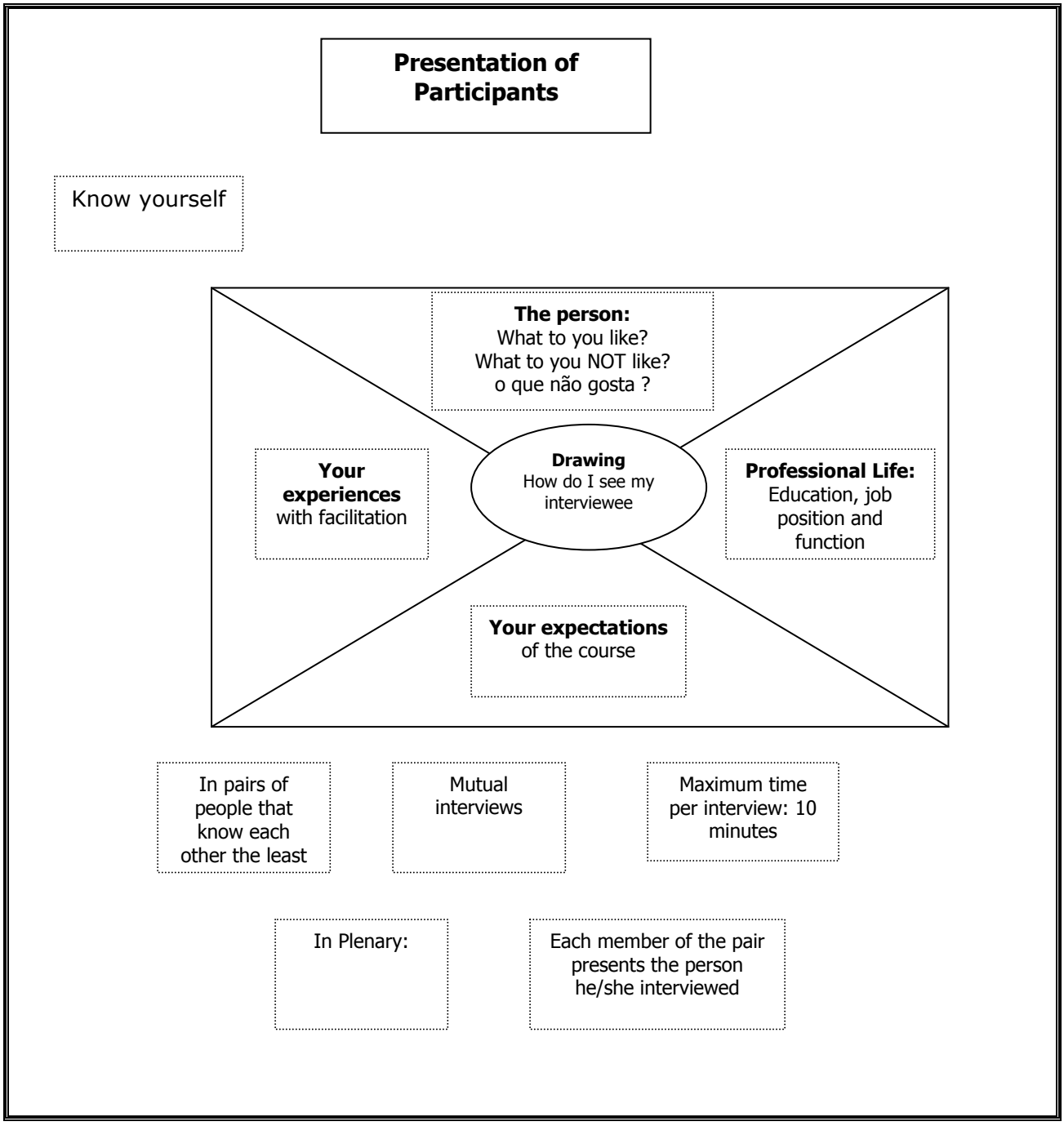
The course followed up with clarification of the methodology for a “Participative Focus” and the carried out work in small groups, alternating with plenary sessions. In the presentations, each group was responsible for the promotion of discussion on the material presented, making additions or corrections according to the contributions from the plenary.

The high point of the group work was the “Simulated Meetings”, for which topics based on the realities of the participants were used. The process emphasised discussion and organization of the participants with a view towards constructing plans of action together, with the rule that all of the information used in the course be used.

The theme used was the planning of a Municipal Seminar - The Environment Conference for Youth in the schools. We took advantage of the course opportunity to carry out a preparatory meeting with external representatives from other schools that, in fact, were putting together such an event.

1.3. Orientation Panels for the Discussions (1 to 27)

PANEL 1



PANEL 2

OBJECTIVES of the COURSE

Train the participants to adopt a participative attitude in conducting their work with groups and to apply the techniques of moderation and visualization in meetings, seminars, and other participative events.

PANEL 3

PROGRAMMING

	08:00 10:15	10:30 12:30	14:00 15:30	15:45 17:00
Saturday 13/9/03	Presentation Objectives Program Committee	Work Princpls. Participative Committee Help/Evaluation	Tools Written recom. Brainstorming Facilitator	Facilitator Recomendations Humorometer
Sunday 14/9/03	Committee Clarification of methodology	Group work	Presentations by the groups	Clarification of methodology Humorometer
Monday 15/9/03	Preparation of simulations	Realization of simulations	Realization of simulations	Evaluation of simulations Humorometer
Tuesday 16/9/03	Clarification of methodologies	Clarification of methodologies	Final Evaluation Closing	

PANEL 4

How will we work:

Basic Principles of Participative work

Everyone is responsible for the results of the group

Search for solutions jointly in a transparent and open fashion

Hierarchy is not respected, but ideas are

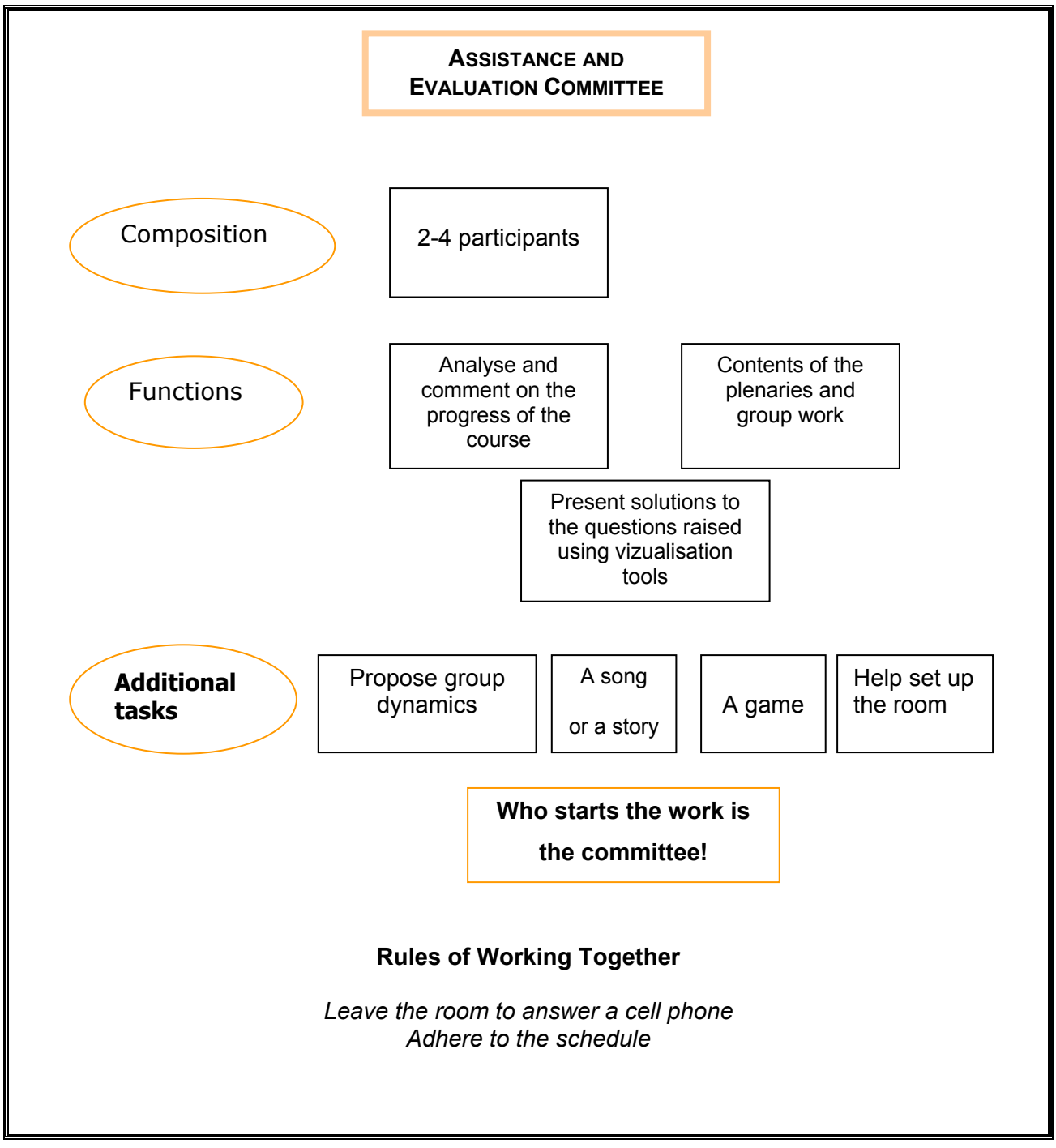
Be brief an objective in presentations to give everyone time

Conclusions, proposals and decisions represent a consensus

Consensus is not unanimity, it is a commitment for action!

Consensus is learned from respect of the opinion of others even if different from ours, and even so working together towards a common objective!

PANEL 5


ASSISTANCE AND EVALUATION COMMITTEE
Composition
2-4 participants
Functions
Analyse and comment on the progress of the course
Contents of the plenaries and group work
Present solutions to the questions raised using vizualisation tools
Additional tasks
Propose group dynamics
A song or a story
A game
Help set up the room
Who starts the work is the committee!
Rules of Working Together
Leave the room to answer a cell phone
Adhere to the schedule

PANEL 6

Tools of the Course

Tools	Didactic excercises	Group work	Simulation of moderation	Exchange of experiences
Used where:	More objective meetings with little time	Conduct meetings without interfering with decisions	Search for transparency	Learn to prepare and conduct meetings
Are used for:	Meetings to make decisions	Meetings for planning and monitoring	Meetings for evaluation of work	
Why workshops?	Immediate management of the tools	Active learning during application	Mobilizes individual responsibility	

PANEL 7

Directions for filling out forms/labels

3 lines per form	Facilitates reading
Use both capital and lower case	Writing in caps alone is difficult
Avoid isolated words and	Reduce wrong understanding
Only one idea per form	Simplify the structuring of


PANEL 8
Brain-storming
What should be done to revitalize CAP ?
Commitment of the partners
Get the partners to do their part in management
Get more effective participation of the members of FASFRAN
Publicize CAP
Create a local television show for public use about CAP
Public awareness of the importance of this idea
Divulge the idea on the internet to attract mor
Planning
Mobilize partners through compromises of everyone
Sensibilize partners of the new phase
Promote survey of updated methods in a participatory manner
Human, physical, and material
Improve access with asphalt
Enable human resources for operation and management
New Goals
Involve more partners that will work effectively
Create new partnerships for
Partnership of the fishermen
New Goals
Train childresn to turn them into Mini-Environmental Guardians with the Eco Escola project
Establish university extension courses at CAP for Natural and Social Sciences
Mobilize for a better quality of life and work for fishermen
Transform CAP into a reference Center for Training in Environmental Education
Involve the fishermen and their family more

PANEL 9

HOW AND WHY MAKE QUESTIONS?

Know how to ask

What? | **How?** | **When?**

Stimulate exchanges	Make the invitation to participate	Motivate reflection	Mobilize experiences and knowledge

Should lead to:

Trigger curiosity	Activate personal interests of the group
Provoke diversity of ideas	Produce other questions and activities

Should NOT lead to:

Answers of "yes" or "no"	Unfruitful discussions
Excuses or feelings of guilt	Difficult, disagreeable, and uncomfortable situations

Avoid

Improvisation	Very specialized questions
Modification for poor formulation	Poor vizualisation

TRAINING CERTIFICATE

Curso de Facilitação em Processos Participativos

Certificado

Certificamos que o Sr (a) _____, concluiu com êxito o Curso de Facilitação em Processos Participativos, realizado nos dias 13 a 16 de setembro de 2003, nos 40 anos de Três Marias - MG.

Pe Geraldo da Silva Macedo
Prefeito de Três Marias

Barbara Johnsen
Secretária Municipal de Meio Ambiente

Dr. Joachim Carolsfeld
Projeto Peixes, Pessoas e Água

Engª Margarida Martimiano Ramos
Coordenadora - Moderadora

Prefeitura de Três Marias
SECRETARIA DE MEIO AMBIENTE

Três Marias 40 Anos

peixes pessoas e água

WORLD FISHERIES TRUST

Canadian International Development Agency
Agence canadienne de développement international

TRIP REPORT

American Fisheries Society 133rd Annual General Meeting

Quebec City, August 10th – 14th, 2003

Carmen Ross
World Fisheries Trust

The 133rd General Meeting of the American Fisheries Society (AFS) consisted of a plenary session entitled “Worldwide Declines in Wild Fish Populations”, 38 symposia, a poster session, and a trade show. Symposia topics included various technical and policy issues relating to fisheries conservation, management and research. Each symposium included numerous 20-minute talks or presentations. Symposia of particular interest to the project included:

- Human impact on the genetics and ecology of wild populations
- Aquatic protected areas as fisheries management tools: the design, use and evaluation of fully protected areas
- Globalization: Effects on fisheries resources
- Where’s the fish: Traditional and contemporary indigenous management of wild fish
- Use of genetic markers for management and conservation
- Stream simulation – a tool for passage of aquatic organisms at road crossings
- Advancing freshwater fisheries conservation through partnerships
- Physical factors affecting salmon and egg survival to emergence: integrating science and remediation management
- New quantitative methods in fisheries stock assessment
- Passive acoustics as a tool in fisheries
- Intentional pathways for aquatic nuisance species introductions: the risk and response
- Aquaculture: a complement to fisheries and an alternative to their decline
- Cooperative research in marine fisheries
- The evolving science of fish restoration: challenges and opportunities

Further to these symposia, presentations of interest were made on more general topics such as:

- Communities and Ecosystems
- Freshwater Ecology
- Habitat and Water Quality
- Human Dimension

In addition to symposia a display of posters and trade show booths were set up in the Convention Hall. Posters and booths were accessible throughout the first three days of the event and a poster session was held on Wednesday morning. The posters featured projects on a symposia topics as well as a wide variety of themes including: fisheries conservation, fisheries management, habitat and water quality, and human dimensions of fisheries. I was able to speak with a number of researchers and collect information about projects relevant to the CIDA project. The trade show exhibits included a number of companies of interest, including Advanced Telemetry Systems, Envirotel 3000 Inc, Grant Systems Engineering Inc, Hydroacoustic Technology Inc, and Northwest Marine Technology Inc. These companies are working with assessment and monitoring technologies that may be adaptable for use in the São Francisco River, although the high cost of these technologies may be largely prohibitive.

SUMMARIES OF PRESENTATIONS ATTENDED

(Authors' abstracts are available at: http://portaltools.fisheries.org/2003Abs/afsform.cfm)

Invasive Species

Kevin Irons – Status and distribution of non-native fish species in the Upper Mississippi River Basin (Abstract CO-032)

The Illinois Natural History Survey has established a long-term exotic species monitoring program that does extensive fisheries sampling and water quality studies. The Mississippi and Illinois rivers now have 134 native fish species and 12 non-native fish species. Non-native species include: Threadfin Shad, Goldfish, Common Carp, Grass Carp, Bighead Carp, Rudd, Muskellunge, Tiger Musky (hybrid) Rainbow Smelt, Brown Trout, White Perch and Striped Bass (hybrid). Introduction pathways include: intentional stocking, manmade canals, bait buckets and other unintentional movements between systems and unintentional release of bilge water. Of the 10,000 - 20,000 fish sampled each year, up to 45% were non-native.

Maureen Walsh – Effects of Rainbow Trout stocking on the native fish assemblage in an Osark stream (Abstract CO-033)

Due to increased pressure by sport fishing groups to stock with rainbow trout Oklahoma State University conducted an evaluation of the fish assemblage in Bush Creek (without native trout) before and after three years of stocking with rainbow trout. The fish assemblage was evaluated at the stream level, mesohabitat level and individual pool level using seasonal electrofishing. During the study period, 2,500 tagged trout were released every year into the creek. The study found no significant difference in fish assemblage pre- and post-stocking in riffle and glide (shallow) habitats but did find a significant difference in pool habitats. In the pool habitats, large-bodied species showed a small decrease in numbers after 2 years of stocking with rainbow trout. The researchers concluded that it would be extremely unlikely that rainbow trout could establish a naturalized population, but the effects of stocking on native fish may be cumulative. Does this mean stocking should be done? Maureen was unwilling to give her personal opinion.

Scott Bonar – Predicting the distribution and impact of exotic fish species in the American west (Abstract C0-034)

A large study was conducted by the Arizona Fish and wildlife Cooperative Research Unit to determine the status of non-native fish species in the western US and to study how their presence and abundance is affected by land-use practices and biotic and abiotic factors. Standardized data from 689 randomly selected Environmental Protection Agency (EPA) and Environmental Monitoring and Assessment Program (EMAP) sites in 12 western states was analyzed. Data included: geographical location, habitat, land-use, riparian structure, human impact, water quality and fish assemblage (species present, abundance and density). 180 fish species (including hybrids) were identified, 28 of which were non-native. Non-natives were found

in 50% of streams. Most common non-native species were trout, common carp and mosquito fish. The study also found that the abundance of non-native species increased with stream integrity (more pristine areas had higher numbers of non-native species).

Christine Mayer – Zebra Mussels: Benthic ecosystem engineers (Abstract CO-035)

Researchers at Syracuse University and Cornell University studied "benthification" of four lakes in the Great Lakes region with zebra mussel infestations. Increased water clarity (caused by zebra mussels) and increased nutrients (a human impact) has lead to increased benthic production, increased benthic foraging by fish, and decreased pelagic primary production. Lab studies confirmed a clearly significant increased benthic foraging efficiency of fish in the presence of zebra mussels, but that increasing light intensity improved foraging efficiency only when zebra mussels were not present.

Heidi Swanson – Time Since Invasion and Lake Productivity as Determinants of the Effects of Rainbow Smelt Invasion (Abstract CO-036)

The University of Alberta conducted a study of lakes in Manitoba, Ontario and Quebec to determine why no increase in predator mercury levels are seen post-invasion of rainbow smelts. Increased mercury levels in top predators would be expected, as smelts feed at a higher trophic level than most native forage fishes and thus lengthen the trophic food-chain. The top 6 fish species (yellow perch, cisco, emerald shad, rainbow smelt, spot-tail shiner and trout-perch) were collected and characterized biologically (weight, length, age, etc.), and biochemically (carbon:nitrogen ratios and mercury concentrations). The study found that rainbow shad and trout-perch had elevated trophic levels and that emerald shad had the highest Mercury concentrations but the lowest growth levels. They concluded that growth rate is more important than trophic level in determining mercury concentration in forage fish communities and that predators feeding on slow growing species should therefore have higher mercury concentrations than those feeding on faster growing species.

Kristen Holeck – Globalization, exotics and ecosystem changes in North America's Great Lakes (Abstract SO-04-13)

162 exotic species are established in the Great Lakes. 60% of these invasions have been identified as being introduced through shipping vectors. Studies have found a strong relationship between concentrations of nuisance invasive species and shipping tonnage. In 1989 Canada introduced voluntary ballast water guidelines, to which about 90% of ships comply. In 1993 the US introduced mandatory guidelines that included ballast water exchange at sea. Invasion rate by exotic species continues to increase despite this legislation and increased efforts to detect invadors. This is due in part to the time lag of getting legislation implemented and increased invasive pressure from increasing ship traffic.

The University of Windsor and the Cornell Biological Field Station conducted a study of shipping traffic, ballast water releases and incidents of introduction of exotic species in the Great Lakes

and identified 4 invasion hotspots. The study found that vessels with small volumes of ballast water (unregulated) dominated inbound traffic, and that Lake Superior receives the most ballast water releases from these ships. They concluded the current ballast water controls are not sufficient to control introduction of exotics. Further prevention methods, such as improved operational management, treatment techniques (ozone, etc.) and refitting of ballast water systems of ships, need to be considered.

Aquatic Protected Areas

Trevor Ward – Marine Protected Areas in fisheries: design and performance issues (Abstract SO-15-05)

Divergent views exist, as to the usefulness of MPAs in fisheries, due to differing expectations and different use of terms. Dr. Ward feels they can, nevertheless, be useful in sustainable fisheries management by assisting stock management and environmental issues arising from ecosystem based fisheries. The benefits of introducing MPAs into fisheries can be both biological and non-biological. Successful MPAs should contribute to multiple objectives such as stock management, improved socio-economic benefits, improved biodiversity benefits, enhanced fisheries stability, and predictability. These factors must be planned into the design of MPAs, or they won't flow out of the process. In order to capture the benefits, a strong emphasis must be put on establishing a network of MPAs designed specifically for multiple objectives. Because some of these objectives may be competitive, a careful and systematic design and a thorough assessment of MPA enforcement are needed.

MPA design elements should include correctly set objectives, carefully planned site criteria (character, size, placement, etc.) to meet objectives, compliance rules, a systematic approach to design and a plan to deal with displaced effort. MPAs should be integrated with existing fisheries management tools and should have a strong underpinning of biophysical data and an effective fisheries management system. Fisheries objectives that should be considered include stock assessment, socio-economic conditions, biodiversity effects and fisheries stability. The biggest problem with current MPA design is the lack of a systematic approach. To make MPAs successful you must work to a predetermined set of decisions, rules and guidelines that reflect these objectives.

MPAs must be properly monitored for performance using set indicators and targets with predetermined limits for detectable and acceptable change. The challenges to designing successful MPAs include: identifying ecosystem surrogates, incurring stock benefits, determining cause and effect, optimizing and setting criteria that deal with multiple costs (including development costs), cost-effectiveness and improving data.

Daniel Pauly – On the need for a global network of large marine reserves (Abstract SO-15-06)

Dr. Pauly feels that we need to think of permanent ocean structures (such as reefs), as forested park and then think of the right to fish as the right to carry a chainsaw. If we restrict the right to carry a chainsaw to every second Sunday we will still have no trees in the park.

Robert Shipp – Harvest benefits: marine reserves or traditional fishery management tools (Abstract SO-15-10)

16% of managed fish stocks are overfished. Marine reserves (or no take zones) can be used as management tools to increase and preserve fish stocks that are overfished. The two main problems with marine reserves are keeping harvesters out (enforcement issues) and keeping fish in (spillover issues). Only about 2% of fish species are both sedentary and overfished and are therefore good candidates for marine reserves (mostly reef species). The 5 species identified in the Gulf of Mexico that could benefit from the establishment of marine reserves are red snapper, gray triggerfish, gap grouper, goliath grouper, bocaccio and canary rockfish. WE need to look outside the box - offshore oil wells provide tremendous habitat for groupers and triggerfish. People must realize that spillover can never match recruitment from a properly managed stock. While marine reserves may not fix everything they can be a very effective management tool when used correctly.

Janet Ley – Effectiveness of fishing closures in estuaries of tropical Australia: a case study (Abstract SO-15-17)

Researchers at the Australian Maritime College, in partnership with government agencies, conducted fisheries-independent sampling to determine if commercial fishing closures were effective in improving biodiversity and target stocks of Barramundi the Great Barrier Reef and in tropical rain forest estuaries in Australia. The study included 3 pairs of estuaries, one open and one closed to commercial fishing in each pair. All estuaries were open to recreational fishing and closures resulted from conflicts between recreational and commercial fisheries. The study found that the biomass of Barramundi was 3½ times greater in closed areas than open areas and that commercial fishing in open areas removed biomass of target species in both legal and sub-legal size classes. Barramundi populations in open areas consisted mostly of males with very few female present and little to no egg production occurring. Given these results it is hard to imagine how these fisheries have remained sustainable. One possible explanation is that dispersals from closed areas are sustaining them. The study concluded that stocks were conserved in closed areas but not in open areas.

Aquaculture/Stocking

E.T. Baum – Interactions between farmed and wild Atlantic Salmon in Maine rivers (Abstract SO-37-11)

Farmed Atlantic Salmon first escaped into rivers in Maine in 1990. Escapes have now been found in 10 rivers and a 1994 survey found that the number of escaped Atlantics often out-numbered wild salmon. In addition, sexually mature formed Atlantics have been found. Measures to reduce escapes from hatcheries include strengthening of containment measures (containment management system, audit policy, improved marking, weir and fish traps on 3 rivers and additional screens and filters at hatcheries), permit measures (new state and federal standards, monitoring requirements, phase out of European stocks, etc.) and fish health measures (aggressive biosecurity). Research programs being conducted to combat escapes includes studies of seal and predator distribution, pit tagging and genetic screening programs, sterilization and escapee movement studies, and an adult stocking program to augment wild populations.

Matt Campbell – Empirical results on the impact of cryopreserved milt and breeding matrices on captive, threatened and endangered population (Abstract SO-37-12)

The Idaho Department of Fish and Game and the University if Idaho's experimental fish culture station have been cryopreserving milt from the Upper Salmon River Basin since 1995. Two of their programs that include cryo techniques are the Redfish Lake Sockeye Salmon Captive Broodstock Program (since 91) and the Salmon River Spring Chinook Captive Rearing Program (since 95). They use cryopreserved milt primarily to maximize founder numbers. Their cryo techniques are still being developed (use small straws) but they have found that cryopreserved milt is very useful in improving effective population size.

Rosamond Naylor – Salmon farming in the Pacific Northwest: a global industry with local impacts (Abstract SO-04-04)

7 out of 10 salmon coming out of BC and Washington commercially are farmed. Interactions between farmed and wild salmon include economic (local, regional and global), biological (escapes, disease, wastes, feed, mammals, etc.) and institutional (fisheries vs. aquaculture, state vs. federal, etc.). The 5 main aquaculture companies in BC (Heritage Aquaculture, Marine Harvest, Pan Fish, Stolt Sea Farms and Mainstream) are largely internationally owned (Norway) and use fish from the US and Europe. The fishing industry in the Pacific Northwest has seen substantial decreases in the price of wild-caught fish (60% decrease in price of sockeye from 1990 to 2002) and the market value of fishing licenses and permits.

A large study conducted out of Stanford University surveyed fisherman in Alaska, BC and Washington to get their perspective on the aquaculture industry and its impacts to the fishing industry. When asked about the impacts to their livelihoods, 47% of fisherman reported decreased income from salmon farming, 61% have had to seek alternate employment, 56% now

participate in other fisheries and 29% have tried direct marketing to improve their profit margin. 84% of fisherman surveyed felt the fishing industry was in crisis, but 70% of these felt the situation will improve and 97% of fisherman plan to continue fishing. When asked to rank the problems facing the fishing industry from most important to least important they listed low prices, salmon farming, over capitalization, management and low run size. When asked to rank their policy preferences to deal with these issues they listed quality and marketing, buy backs, disaster relief, quotas and co-ops. When asked specifically about the fish farming industry, 94% said they were opposed to the industry, 93% said they were aware of the ecological consequences and 98% said they were aware of the relationship between the increases in the salmon farming industry and the decreases in price for wild-caught salmon.

The Norwegian salmon farming industry is currently producing untreated wastes annually (N & P) equivalent to that produced by 3 to 3.7 million people. Over 400,000 Atlantic salmon escapes were reported in 2002, most of which were noticeable escapes of large numbers of fish. The unreported escapes of small numbers of individuals or leakage from the nets probably also amount to very significant number. Escaped Atlantics have been found in 78 rivers in BC and three feral juvenile populations have been found. This poses a serious risk to native salmon populations.

Globalization

Jerry Mander – In the absence of the sacred – the failure of technology and the survival of the Indian nations (Abstract SO-14-03)

In the opinion of traditional and native fisherman the main problem facing fisheries is the flooding of international markets with cheap farm raised fish and the large international trawl fleets. These are both the result of globalization. The World Trade Organization, North American Free Trade Agreement and other free trade agreements have broken down the ability of local people to control their resources and have allowed for the invasion of multinational corporate interests. The International Forum on Globalization Indigenous Peoples' Project conducted a massive global survey of impacts to indigenous people caused by economic globalization, including industries and issues such as: industrial agriculture, biopiracy, cattle, dams, transmigrations, fisheries, water, drug interdiction, loss of land, mining, nuclear, oil, roads, shipping, logging, tourism, militarization, pollution and energy. The forum has found thousands of examples of native communities that are faced with development that threatens their livelihoods, cultures, environments and resources on which they depend. These communities need to get together in some way so that they can combat this trend in concert. This conflict is due to two contradicting and deeply ingrained worldviews and philosophies and will therefore be very difficult to resolve.

As a result of the recently signed US-Chile Free Trade Agreement, 122 new licenses will be given to fish farms in Chile and all trade barriers to the export of fresh, frozen and smoked salmon will be immediately wiped out. Within four years this will also apply to canned salmon. Chilean farmed salmon use 75% more chemicals than do similar sized farms in Norway. This will have enormous environmental and economic impacts on small communities in Chile.

The World Trade Organization is currently attempting to, and will probably accomplish, the following: no restrictions to foreign investment in fisheries quotas, ban labeling of fisheries products as wild vs. farmed or country of origin, stop prejudice against GMOs and prevent banning or labeling of GMOs, and assert priority over all other environmental agreements including the Kyoto Accord, the CBD, the Migration First Treaty, etc.

On a brighter note, optimism and awareness is increasing with millions of people worldwide protesting and fighting global development. The world has seen substantial political change recently with politicians, such as Lula in Brazil, running on anti-globalization platforms. The forum encourages participation in the World Forum of Fish Harvesters and Fishworkers conference to be held in Cancun, Mexico in parallel to WTO meeting being conducted on September 10-14th.

Tracy Dobson – Lets get our values and ethics clear and ordered properly (Abstract SO-04-14)

Researchers at Michigan State University and the University of Waterloo ask: Where are we now? Fish stocks are crashing, we are losing marine mammal populations, our water is contaminated, countless water bodies and critical habitats are being destroyed and politicians continue to dither. How did this happen? Science and our focus on quantitative data and disregard of qualitative data, flawed methods of risk assessment, early simplistic perspectives (Laplacian, Cartesian, Domination, etc.) and Maximum Sustainable Yield still holds way. Also the dominance of the free market system and felonious capitalism has lead to a culture of "enlightened self-interest".

Risk assessment can be broken into the four categories of risk, uncertainty, ignorance and indeterminacy. Current risk assessment methodologies lump these all together into the first category, risks. These need to be considered separately. We need to decide to conserve the fisheries and 5 guiding principles to help accomplish this are: 1) precautionary approaches and principles, 2) public trust doctrine, 3) governing of the commons, 4) women as effective protection role models and 5) FAO codes of conduct for responsible fisheries.

Management and Conservation

Terry Beacham – Individual identification of Sockeye salmon in conservation, management and enforcement applications (Abstract SO-05-11)

DFO's lab at PBS in Nanaimo has developed DNA fingerprinting techniques that allow them to identify individuals as belonging to specific stock assemblages and in some cases to a specific stock. They conducted studies for the Pacific Fisheries Research Council PFRCC and LGL Research Associates, designed to test methodologies. They were given samples of known origin and were asked to identify them. They were able to correctly identify 100% of the samples as belonging to a specific stock assemblage (Barkley Sound, Fraser River, etc.) and 86% as belonging to a specific stock or lake in that assemblage (Babine Lake, etc.). They believe that

sockeye allow for a particularly consistent and reliable stock identification by rearing lake due to high levels of homing fidelity than other species.

Patrick Christie – The search for integrated coastal management sustainability: results from a multidisciplinary examination in the Philippines and Indonesia (Abstract C0-152)

The major factors effecting the inability of these management systems to effectively manage are: devolution of authority and a lack of local capacity, enforcement issues, a lack of equitable sharing and flawed project design.

David Cannon – Human nature – human influences: are Alaska's fisheries resources really that different? (Abstract CO-153)

A recent survey of Alaskan rivers identified 175 documented dams, but felt the real number was more like 500. More than 100 new hydro projects are planned and more than 750 migration barriers have been found on one river. Many rivers have populations of introduced pike and yellow perch and the state stocks many rivers with a pink-spring hybrid salmon. These issues are the same as those faced all over the US. Alaska is just 15 years behind, but heading in the same direction. You can fish in Yellowstone National Park, but you can't hunt. Why?

Brian Cheuvront – Assigning responsibility for North Carolina's declining stocks (Abstract CO-154)

The North Carolina Division of Marine Fisheries conducted a study in 2002, using socio-psychological analysis, of commercial license holders to help inform fisheries managers and guide future management. The study included interviews of 527 commercial fisherman as well as the collection of data on fisheries rates, catch etc. 53% of fisherman interviewed said that it took more effort to catch the same amount and cited reasons such as poor management practices, activities of other commercial fisherman, political influences, environmentalists, increasing coastal populations and local and upstream impacts such as pollution and industry. No fisherman took personal responsibility. Outside of the commercial fishing industry people commonly blame over-harvesting. So who is at fault? Attribution Theory explains the tendency to blame people you don't know or don't like. People tend to explain positive outcomes as luck and negative outcomes as other peoples fault. Four approached can be taken when assigning blame: 1) the Medical Model – people are not to blame and are not responsible to fix it, 2) the Enlightenment Model – it is your fault but your are not responsible to fix it (ex. Alcoholics Anonymous), 3) the Moral Model – it is you fault and you are responsible to fix it (ex. fisheries management) and 5) the Compensatory Model – it is not your fault but you are responsible to fix it. They recommend that fisheries managers adopt the Compensatory Model.

Assessment

Grant Gilmore – Functional variation of fish call behavior: a comparison between Serranids and Sciaenids (Abstract SO-26-04)

Dynamac Corporation is conducting studies at the Kennedy Space Center using passive acoustics to investigate spawning aggregations of Sciaenids and Serranids off the east coast of Florida. Their studies on Sciaenids (black drum, freshwater drum, red drum, silver perch and spotted sea trout), conducted using hydrophones towed by boats, have allowed them to develop life cycles based on the sounds they make and identify spawning aggregations. They are able to determine the % of females and males in the spawning aggregates based on their recordings. Their studies on Serranids (scamp, speckled hind, goliath and Nassau groupers), conducted using specially designed remote hydrophones places on reefs and shelves, have allowed them to identify spawning and sex reversal sites, distinguish between mating strategies and identify complex social interactions. Questions they would like to answer about these intraspecific communications are: 1) How does climate and oceanographic conditions effect sounds? 2) What do predator prey interactions sound like? 3) Why do we see multispecies aggregations in coral reefs? 4) How is female choice linked to sound production and behavior? and 5) What do some of these sound linked to mating strategies look like? Visual record of behavior while making sounds will be required to answer some of these questions.

Don Baltz – Seatrout spawning requirements and essential fish habitat: a microhabitat approach using hydrophones (Abstract SO-26-08)

The Coastal Fisheries Institute at Luisiana State University conducted a passive acoustics study of seatrout spawning habitat in Florida's Tampa Bay and Charlotte Harbour using a microhabitat approach, which is defined as the study of habitat sites occupied at any given time to define larger scale population responses to habitat. Based on their passive acoustic data they discovered shifts in spawning sites of up to 30 Km that seemed to be related to salinity and that environmental conditions seemed to be most important in determining the specific location of spawning sites. Pitfalls of this type of investigation are: non-linear effects, non-representative sampling design, sampling bias, misidentification of drumming sounds, interference of crew, boat and traffic noise, non-verification of spawning and stratified water columns. In this kind of work it is important to know sound intensity and source level when determining the size of spawning aggregations.

Scott Holt – Mapping Red Drum spawning sites using a towed hydrophone array (Abstract SO-26-10)

A study, conducted by the Marine Science Institute at the University of Texas, identified a knock, accelerated knock and drumming calls made by the red drum by towing a hydrophone array through spawning sites in the western Gulf of Mexico. The drumming call occurs more than the knock during prime spawning time of 1 to 2 hours after sunset and can therefore be used to identify spawning.

Sherry Lynne Rowe – Sound production by Atlantic cod during spawning (Abstract SO-26-13)

A study conducted a Dalhousie University Collected Atlantic Cod from two different spawning areas (4X and 4T) and conducted lab experiments, including sound and visual recording of spawning behavior in tanks as well as dissections. Cod make calls using three drumming muscles, they spawn at depths of 10 – 100 m depth and display complex spawning behaviours including dominance hierarchies, female choice and sneaky fuckers. The study recorded behaviour of possible male and female choice that seemed to be guided by acoustic displays. They found a that spawning males had 16% larger drumming muscles than non-spawning males indicating that the functional significance of drumming muscles may relate to mate quality and therefore guide female choice. 4X fish were 8 times more vocal than 4T fish and had larger drumming muscles. 4T fish showed strong dominance, hierarchy and aggression behaviour compared to 4X fish indicating intra population differences. The study also found significant within population behavioural and acoustic differences.

Cliff Goudey – Locating Cod and Haddock using low-cost underwater recorders (Abstract SO-26-14)

Rolling closures are used along the northeast coast of the US to protect spawning areas of cod and haddock. Management and industry want these closures to be effective without restricting economic benefits of the fishery. Research conducted at the MIT Sea Grant College Program has developed a non-invasive technique to determine times and locations of groundfish spawning to guide these closures. Their method involves encasing a Nomad (10 GB hard drive with variable sample rate) in a watertight unit welded to an aluminum base that can be lowered to spawning grounds. The units are low cost (approximately $1,300 each) and durable. They have been editing recordings manually using Cool Edit but are developing an automated system using Ishmael software.

Scott Aalbers – Spawning activity and associated sound production of White Seabass (Abstract SO-26-15)

Dr. Aalbers, from California State University, conducted a study to describe the spawning behaviour, timing and periodicity of White Seabass to better understand natural spawning aggregations. The study was conducted at a net pen site and included video and acoustic behavioural recordings. Dr. Aalbers identified a variety of sound productions including a drum, a drum roll, a rapid chatter, a three-pulse drum and a thump. Based on his observations it appears that the drum is an every day background call, the drum roll is made just prior to spawning, the rapid chatter is made during spawning and the three-pulse drum is made after spawning. He is unsure about the thump, but thinks that it is perhaps related to bladder release.

Restoration

Amy Harig – Factors contributing to successful partnerships in coldwater resource conservation (Abstract SO-33-07)

Watershed scale restoration is not possible without strong partnerships. Trout Unlimited has an internal program called Strategies for Restoring Native Trout that adds money to completed restoration projects to allow for monitoring that provides much needed information and lessons learned to future restoration efforts.

David Sear – Approaches to Salmon habitat remediation in the UK (Abstract SO-08-21)

Declines in Atlantic salmon stocks in Britain have lead to recent efforts to restore physical habitat, specifically spawning habitat. Habitat rehabilitation in the UK to this point has been ad hoc, small scale, expensive and very poorly monitored. Key information that is needed to restore these small creeks and rivers is identification of the source problem (lack of spawning habitat, poor juvenile survival, ocean survival, etc.), the source of fine sediment and the location of spawning habitat.

Dudley Reiser – Comparison of salmonid spawning habitat quality, quantity and utilization before and after channel reconstruction at a Superfund site (Abstract SO-08-22)

A 3.5 mile straight section of the Mill-Willow Bypass channel (northwest of Bute Montana) was replaced with a 5.1 mile sinuous channel as part of a Superfund project in 1995. R2 Resource Consultants conducted a pre and post restoration study to assess the effectiveness of the restoration. The study objectives included assessing: habitat quality, gravel quality, spawning abundance, quantity of spawning and rearing habitat, as well as fish and redd abundance. The study found a 5-fold increase in the number of redds from 1989 to 2001, but by 2001 only about 25% of available habitat was being used. If you build it will they come? In this case yes, but this is still only snapshot monitoring not long-term monitoring, which is dearly needed. Spawning habitat is only one element in salmon survival and it is important to consider all life history stages in habitat restoration. Monitor, Monitor, Monitor!

Piotr Parasiewicz – Defining measures to reduce fish habitat degradation in the Quinebaug River, New England (Abstract CO-273)

A study conducted at Cornell University looked at a section of the Quinebaug River between two dams to determine the effects of flow regimeson fish. They conducted biological and hydrological studies of the area and compared their results to simulated conditions with no human impact. They found very low densities of fish fauna in the test area. Fish species encountered were largely pond species, with no pollution intolerant or anadromous species discovered. When compared to simulated best-case conditions they found that flows were too low, pollution levels were too high and water temperatures were too high. The high number of impoundments on the mainstem and tributaries were found to cause very rapid changes in flow that are potentially very disruptive. They recommended a set of pulse flow augmentation rules to regulate flow, slow the loss of habitat and improve environmental conditions.

Jane Marshall – If you build it will they come? Lessons learned and a look into the future of restoration design (Abstract SC-08-29)

CALFED Bay Delta program conducted a massive Environmental Restoration Program to protect and restore the Bay Delta ecosystem, spending $400 million from 1995-2002. Although many of the projects funded through the program were innovative and thorough, large gaps existed in applying an ecosystem, watershed and interdisciplinary approach. Projects tended to be conducted in an individual manner with little to no coordination and integration between projects. An adaptive Management Panel was formed to review the program and they recommended, among other things, improved project integration and the integration of experimental questions and monitoring into project planning and conceptual models. Designing for experimentation and including long-term monitoring into project planning will allow large-scale restoration efforts such as this to guide improved future restoration efforts.

TRIP REPORT

First World Conference on Environmental Education

Espinho, Portugal, May 20th – 24th, 2003

Inês Mancuso
UFSCar

REPORT FOR CONFERENCE PARTICIPATION

Primeiro Congresso Mundial de Educação Ambiental – FWEEC (www.1weec.net)
[First World Conference on Environmental Education]
20 - 24 May, 2003: Espinho – Portugal

Inês Mancuso(Translation: J. Carolsfeld)

The main objective of the FWEEC was to offer an international platform for educators, scientists, researchers, students, politicians, technicians, activists, media, and professors to debate key topics associated with environmental education. Representatives from all continents participated in the Scientific Committee. Representatives from South America, specifically Brazil, came from the Federal University of Rio Grande do Sul and the State University of Rio de Janeiro. The variety of themes and locations represented (see program) gave the participants an opportunity to view a great variety of contemporary environmental questions.

The paper that I presented, as a poster entitled *Memórias de um rio: caminhos para a Educação Ambiental [Memories of a river: pathways for Environmental Education],* came from a study carried out together with Dr. Norma Felicidade Valêncio, in the project "*Bases para a conservação e restauração dos recursos pesqueiros do Alto-Médio São Francisco [Support for conservation and restoration of fisheries resources of the High-Medium São Francisco]"*, which was pursued from 1999-2002, with support from the Program for Assistance to Scientific and Technical Development (PADCT) /Ciamb of the Science and Technology Ministry. In this study, life along the river is reconstructed from the memories of women. Representations were sought of the river, the fisheries, the work of the fisherman, the house, the family. The case study was carried out in 2000, in the cities of Três Marias, Pirapora and Januária, cities of the High and Medium São Francisco, in the state of Minas Gerais. In this presentation, memories of the past and present were included, as well as expectations of the future. The contrast between old memories and the current perception of the river is that of a river that is dying, and while dying, causing the death of a livelihood. This reaffirms the value of respect for Nature and the possibility of a disinterested culture that is less individualistic. It thus provides, pathways to think about the contribution of memories and inter-generational relations to environmental education.

In this sense, the participation [in the conference] brought, for me, two important returns:

1) An opportunity to be integrated in discussions of Environmental Education at a moment that I am starting to work with the [CIDA] project;

2) [An opportunity to] publicize several questions on the São Francisco River, the area of interest to the [CIDA] project.

The costs of the trip to Portugal were covered by WFT World Fisheries Trust, partner with UFSCar in the Project Continental Fisheries of Brazil - Sustainable Livelihoods and

Conservation. UFSCar paid conference costs and costs of ground travel and living expenses were covered personally.

TRIP REPORT

Municipal Conference of the Youth of Santo André

Santo André, SP, Brazil, September 26th – 28th, 2003

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CONFERENCE SUMMARY

Municipal Conference of the Youth of Santo Andre
September 26-28, 2003

Summary Text

General objectives of the conference

The municipal conference of the youth of Santo Andre has as its objectives:

- Constructing proposals for public policies to address the needs of the youth of the city, among them the guarantee of programs, projects and spaces in the structure of the government (Office of Youth).
- Amplifying the representation of the youths of the city, through participatory instruments and dialogue between the local public sector and civil society;
- Stimulating youth to think about the city's destiny through existing forums and programs: Participatory Budgeting, City of the Future, Master Planning, Councils, etc.;
- Promoting debate of ideas and propositions about the diverse visions of the world of local youths in such a way that proposals from the conference can be approved;

Specific objectives of the conference

- Defining organizational strategies and mobilizations of different groups of youths for issues and activities pertaining to the city;
- Presenting the existing programs and projects, about the coordination and execution of the local public sector, to lead towards construction of new indicators about the ways in which youths of Santo Andre live in and experience the city;
- Qualifying the political intervention of youths to ensure that channels of participation are established for youth;
- Defining the process of construction for a permanent youth forum that is representative, which enables youth to recognize themselves as active agents in the construction of their citizenship.

Conference Methodology

The main event of the Municipal Conference of the Youth of Santo Andre will be structured according to the definition of what strategies the youth movements of the city indicate, to be as representative, legitimate and legal, together with the public power and the local communities, guaranteeing not only the multiplicity of the movement, but also its political, ethnic, cultural and gender diversity.

Accordingly, the carrying out of the conference should guarantee through an unequivocal, procedural and interdependent manner, that the collection of all the actions that are involved in the realization in the event have as a central tenet the organizational and representative strategies of the youth movements of the city.

In doing this, we will achieve a conference which will be a moment, or a landmark of the 'public appearance' of the youths that also make the city what it is: **who these youths of the city are, how they experience their daily projects and objectives, how they organize (and what they organize for), and what they want for the present and the future of the city where they live.**

In order that the conference can, in fact, concretize this perspective, it is necessary that before it occurs, we realize other small moments or encounters to organize the themes that will be worked on in the conference. We are calling these encounters **'thematic mini-conferences'**.

Thematic Mini-Conferences

The thematic mini-conferences have as their principal objectives to debate, organize and systematize the principal proposals of the youths of the city in the form of the following themes that pertain to the daily lives of youths:

- Work
- Health and environment
- Social and Political Organization and Participation
- Sociocultural Expression and Diversity
- Cultures of peace and social stigmas imposed on youths
- Information and digital inclusion
- Education

The names proposed for the mini-conferences are:
Youth: Work and solidarity economy
Youth: Health and environment – for an entire healthy environment
Youth: Participation, expression and social diversity
Youth: The culture of peace as a way of life - violence and its results
Youth: Education as a practice of liberation
Youth: Information, communication and digital inclusion

Objectives and methodology of the thematic mini-conferences

A) Socializing between participants, exploring existing statistics and indicators about the theme and how it is relevant to the daily lives of youths in the city;
B) Deepening the information and understanding of the municipality about youth, from the necessities and experiences of participants.
C) Identifying moments of reflection through the coordinated thematic seminars where partners could contribute to the discussions in an effective way;
D) Producing, debating and approving proposals about the theme to be presented at the municipal conference;
E) Qualifying and providing incentive to youth to activate the channels of participation in the city;

Please note: To register in the thematic mini-conferences, those interested have the possibility to present a brief presentation about a theme, in a format that is creative, inclusive and flexible in its possibilities, such as for example: drawings, poetry, compositions, posters, signs, in whatever form the ideas can best be presented. The format and the content will be constructed through the organization of the conference.

TRIP REPORT

Prepared by: Dulcineia Mônica de Jesus and Adrianna Aragão, Três Marias Prefeitura

Report on Trip to Santo André

September 25th –29th, 2003

Dulceneia Mônica de Jesus
(Translation J. Carolsfeld)

The objective of the trip to Santo André was to participate in the 1st Municipal Youth Conference of Santo André; get to know the Reference Centre for Youth (CRJ); and to make contacts within the [Sto. André] City Hall with a view towards getting to know projects on management of income generation, cooperatives, and environmental activities that they have carried out. Sto. André is a city with fairly unique characteristics. Situated in the São Paulo ABC [capital] region, it has about 650,000 inhabitants and 450 years of history. It is a municipality with a strong industrial, and therefore, worker tradition. It population has a high degree of organization and political awareness, including amongst the youth. In the area of public administration, it has another peculiarity: the current administration is the 3rd PT (Worker's Party) mandate - a situation which allowed the continuity of a number of [long-term] projects that are now starting to show results. At the moment, the city is experiencing a transitional phase, marked by automization of industries, which is creating high levels of unemployment in this sector. In this sense, the city has provided incentives for small business, and the third sector of the economy is expanding.

1 - Reference Centre for Youth - CRJ

The CRJ was created about 4 ½ years ago, and is tied to the Youth Assessory in the Secretariat of Citizenship, Housing, and Social Promotion. Its creation and implementation was marked since the start by activism of the youth. The youth had organized themselves, and within the process of participitative budgetting, insisted on the creation of this centre. It is entirely funded by the municipality, and its principal objective is the promotion of citizenship amongst the population of youths. By way of a variety of programs, the Center stimulates the organization of the youth and the identification and development of their potential, and promotes the support for the projects that come out of this process. The CRJ works on the basis of support and assistance, stimulating the development of independence and autonomy of its clientele. Professionalization is not a central objective of the CRJ, though this may happen as a consequence of the process. Common rooms ("salas de convivência") are used as an action strategy by the CRJ. In these rooms, there are panels, the agenda of the CRJ, information on courses, etc. Multi-use rooms, with TV and video, can be booked by the youth; an informatics room has 8 PCs available with free access and support staff; office support for organized groups (room with telephone, fax, lockers, e-mail addresses, etc.); a monthly cultural healing meeting organized by the youth; a macro-commission of graffiti artists; and a library (currently being installed).

II - 1st Municipal Youth Conference of Sto. André

The general objectives of the Muncipal Conference were to: build proposals for public policies addressing the needs of youth in the city; guarantee the continued existance of programs,

projects, and spaces in the current government, especially the Youth Assessory; increase the representation of youth in the city, through participative tools and dialogue between the local public sector and civil society; stimulate youth to think of the city's future; and finally, define strategies for the organization and mobilization of the different youth in the city.

The organization of the conference started about 1 ½ years ago, with the creation of a Master Organization Group by the public sector, with representatives from the various secretariats of the government. With the idea of having stages of discussion and enable more profound reflection, it was decided in a 2nd phase to carry out 7 thematic Mini-conferences (MCTs). In this stage there was ample participation by civil society and government sectors, in an effort to integrate debates from sectors that normally build their ideais and political actions independently. The work groups of the mini-conferences produced proposals which, together, resulted in a Book of Proposals presented to the Municipal Conference for approval, rejection, or modification. The thematic mini-conferences where carried out between May and August of this year, with these themes: 1) Culture of peace as a way of life; 2) Health, quality of life, and environment; 3) Education as a practice for freedom; 4) Youth in conflict with the law and the law in conflict with youth; 5) Participation, expresion and social diversity; 6) Work and a solidarity economy; 7) Comunicaiton, digital inclusion, and information. These themes were mostly proposed by the youth themselves, through the Youth Assessory.

During the conference, we participated as observers without voting rights. We were impressed by the high level of auto-awareness of the youth's current reality and its implications, as well as the political motivation and training demonstrated by the youth. Thy were organized in various groups, with different political affiliations: the Youth Pastoral and the Socialist Union of Youth (UJS), amongst others. These youth are social actors, and have a perception of of their double dimension: they belong to a particular age faction that they have in common, which identifies them as "youth", but also belong to different social groups, which create other identities, such as negroes, women, social classes, etc. This creates the necessity for an internal dialogue amongst the different "youth", in addition to the external dialogue with society and the public sector.

III - Visit to the Parque Escolar (School Park)

Situated in the urban zone of Sto. André, in a residential area, the Parque Escolar was recently created and is one of the initiatives of the Cith Hall. It is maintained by City Hall, but variosu projects carried out in the park have the support of different NGOs. The park is an architectural concpetion of "sui generis" by the architect Zanetto, being entirely constructed with left-overs of civil construction. In the park there are environmental projects in partnership with municipal schools; an informatics room associated with the city's project for digital inclusion; minicourses on medicinal plants, organic agriculture, bee keeping, and many other topics; greenhouse with saplings; and leisure activites open to the whole population - such as an elastic bed (trampoline), theaters, cultural events, etc.

IV – Secretariat of Development and Regional Action

Meeting with Mr. Cláudio Malatesta, assessor of the cabinet, on programs of income generation and cooperatives, noteably on selective [garbage] collection and processing of solid residues of Santo André.

The Assessor made the following points about the selective collection in Santo André:

- the City decreed that only registered companies can collect garbage from the residences. This service is contracted out.
- Collection is done twice a week (dry garbage) and every other day (wet garbage). All the service is done with the same truck. The dry garbage is taken to the catadores' hanger and the wet garbage is taken to the sanitary dump.
- With recycling, the volume of garbage that goes to the sanitary dump diminished from 900 ton/month to 340 ton/month.

We learnt about the City's programs through a journal edited by the city called "Santo André, City of the Future".

There are nine (9) cooperatives in partnerships with the city:
- 2 of catadores
- 2 of seamstresses
- 1 of gardeners
- 1 of psychologists
- 1 of nurses
- 1 of candy makers
- 1 of drivers

There are two types of incubators: of cooperatives and of mini-businesses. Before the incubators there were pre-incubators.

A suggestion of the Assessor Claudio Malatesta: grind up the heads and carcasses of the tilapia to make fish food. And dry the skin.

Concepts worked on by the cities programs:
- Social inclusion
- Quality of urban life
- Modernization of administration
- Citizen participation
- Future of the city

V – Contacts

The majority of the contacts in the City were realized through Erika de Castro, representative of CIDA in Santo André.

Address of the City Hall of Sto. André: Praça IV Centenário, 01 – Santo André/SP, CEP – 09015-080, Home page: www.santoandre.sp.gov.br

Secretariat of Development and Regional Action

- Jeroen klink – Secretario; tel: 55-11-4433-0150; 7858-2854 (cellular)
- Jklink@santoandre.sp.gov.br

- Claudio Malatesta – assessor to the cabinet: tel 55-11-4433-0166; 4433-0351
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- John Wojciechowski – Commerce Support (Santo André) – GEPAM
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TRIP REPORT

Prepared by: Milton Macedo, Colonia de Pescadores, Três Marias

Translated by: Cathy Carolsfeld

Milton Biguá's Report
Sto. Andre Youth Conference, Sto. Andre, SP.
Sept. 26-28, 2003

The Airplane Experience

Sunset, various types of clouds that looked like rocks, layers of clouds above the ground. Seen from a distance, many burned areas and two reservoirs.

The Youth Conference

Arrival of young people from the slums of the reservoir, together, they came walking along, marching in an orderly way, beating their drums.

Interesting, the domination by one group of youth in particular. But soon, the youth from rival groups controlled this and were taking the proposals of the conference seriously.

A Hip-Hop presentation by the youth.

The youth were very politically astute, well informed and interesting.

The School Park

The experience at the School Park clearly showed the use of recycled material.

Such a structure could be used in Três Marias to lend support to youth to provide training in various interesting activities.

The [plant] nursery is very important.

The Computer room (with eight computers and two facilitators) is open to the public to do school work, play games and use the internet. It attracts people from other regions.

The windows at the school are pieces of cut-up buses and cars.

The youth have a picnic and relax. They made a classroom from a used container, lifting the ceiling for air circulation and cutting open windows on the sides.

The municipality's publication through City Hall is a very interesting method. (The magazine: "Santo André, City of the Future".)

Everything was innovative and it's not even possible to explain what was learned, because it was lived so intensely.

The political and environmental awareness of Santo André is done in a very good and constant way, an example to be followed.

Posters/Expositions

The diversity of expression of areas by groups, very marked. Graphite drawing of a pregnant woman. Technique of making lively portraits with perfection.

MEETING PRESENTATION

CONFERÊNCIA MUNICIPAL DA JUVENTUDE DE SANTO ANDRÉ

1 - APRESENTAÇÃO

O Governo de Santo André tem um compromisso objetivo na construção e consolidação de políticas públicas de juventude. Criou a Assessoria da Juventude de maneira pioneira, colocando a cidade de Santo André enquanto uma referência na construção de políticas públicas que têm em seus princípios e programas a diversidade social como marca e referência.

Por conseguinte, é que há quatro anos fundou o CRJ – Centro de Referência da Juventude. Trata-se de um espaço público de afirmação da identidade, potencialidade, multiplicidade, cidadania e principalmente da participação da juventude na construção da cidade e de si mesma.
Essa participação ativa da juventude culminou na própria existência de um conjunto de políticas públicas, não só com Orçamento próprio, mas também por meio do Orçamento Participativo, cujas necessidades apresentadas pela primeira vez, foi aprovada pelo conjunto da sociedade e não apenas pelo segmento juvenil.

Como resultado, a cidade tem hoje por volta de cento e dez grupos organizados de juventude, em suas formas mais diversas, desde religiosas, até culturais e políticas, fato este que foi amplamente estudado pela ONG Ação Educativa. Além disto, a existência de outros projetos, todos integrados ao CRJ, garantiram ampla visibilidade e reconhecimento, como por exemplo, os projetos Inclusão Digital, WWW.Jovem e o Graffiti Nossa Parte, que dentre outras contribuições diretamente para a juventude, contribuíram para a revitalização de espaços públicos, e para a construção de uma cultura de paz, tendo tido, inclusive, repercussão internacional.

A garantia de todas estas ações e resultados esteve no fato do governo municipal assumir, por meio de seu **Plano de Governo,** a demanda da juventude, colocando-se como co-responsável por ela, juntamente com o conjunto da sociedade.

E é neste contexto, que a realização da Conferência Municipal de Juventude se coloca como um **compromisso de Governo** assumido por esta gestão e afirmado através de suas marcas de Governo, principalmente na que se refere à participação da sociedade na sua diversidade, como também na gestão da cidade. Desta forma, a Conferência Municipal de Juventude é uma oportunidade da sociedade, como um todo, dialogar com as "juventudes". Entretanto, a Conferência também poderá permitir a constituição de mais um canal de participação da juventude, não substituindo os atuais, mas qualificando e ampliando a intervenção da própria juventude na gestão da cidade e nas políticas públicas. Por isso é que optamos, por uma Conferência, cuja metodologia contribua para o aprofundamento do debate sobre a cidade a partir dos temas que tanto interessam a juventude, tais como: Trabalho, Cultura, Educação, Saúde, Meio Ambiente, Participação e Direitos da Juventude. Entretanto estes são apenas alguns dentre outros, pois, afinal, todos os temas interessam à juventude.

Através da Conferência Municipal procuramos obter mais um canal de participação da juventude, onde esta poderá dizer não só **o que pensa**, mas também **o que quer, indicando possivelmente a forma de como também poderemos realizar estes projetos de maneira conjunta,** pois é desta maneira, que, de fato poderão participar ativamente da construção da cidade e principalmente de si mesma, e não de uma maneira apenas simbólica, mas efetiva, objetiva, e principalmente, criativa.

A realização desta **I CONFERÊNCIA MUNICIPAL DE JUVENTUDE**, afirmará, mais uma vez, o governo de santo André como um governo democrático e participativo, contribuindo para a construção de uma cultura de participação e de apropriação, pelo coletivo, das responsabilidades da gestão da cidade, num claro e necessário acerto histórico, pois isto **significa permitir que a juventude participe da**

construção do presente, não sendo apenas um mero "receptáculo" de nossa herança histórica, que nem sempre é a que merecemos.

E além de mobilizar a juventude da cidade, a I Conferência Municipal também irá articular em torno do seu processo organizativo e constitutivo, um conjunto de entidades parceiras que já vêm desenvolvendo inúmeros projetos e programas dirigidos à juventude da cidade, procurando garantir não só a representatividade de movimentos e organizações, mas garantir um verdadeiro espaço de debates entre aqueles que são sujeitos da ação e os "sujeitados" deste conjunto de ações. Talvez possamos dizer, que este debate colocará na cena principal o protagonismo de fato e de direito da juventude da cidade.

Por isso também, é que optamos por não realizar desde o início a construção do projeto da I Conferência. Desde a sua fase embrionária, contamos com o apoio metodológico e técnico da Fundação Friedrich Ebert Stiftung – ILDES, e também da Ação Educativa, entidades respeitadas e reconhecidas pela maneira ética de como tratam as relações não só com o poder público, mas, sobretudo com o compromisso com os sujeitos da nossa história.

Por fim, apresentaremos de agora em diante, o que queremos com esta I Conferência Municipal da Juventude, como iremos realizar este conjunto de objetivos, e como iremos nos organizar para viabilizarmos todo este processo. Vale ressaltar que esta I Conferência é um processo e não só um ou um conjunto de momentos fragmentados que irão ter seu ponto alto ao término desta.

1 – DOS OBJETIVOS DA CONFERÊNCIA

OBJETIVOS GERAIS

A Conferência Municipal da Juventude de Santo André tem por objetivos gerais:

- Construir propostas de políticas públicas voltadas às necessidades da juventude da cidade
- Garantir a existência de programas, projetos e espaços existentes na atual estrutura de governo, com especial destaque para a Assessoria da Juventude;
- Ampliar a representatividade das 'juventudes' da cidade, a partir dos instrumentos participativos e de diálogo entre o setor público local e a sociedade civil;
- Estimular a juventude a pensar os destinos da cidade a partir dos fóruns e programas já existentes: Orçamento Participativo, Cidade do Futuro, Plano Diretor, Conselhos, etc.
- Definir estratégias organizadoras e mobilizadoras das diferentes juventudes pertencentes à cidade;

OBJETIVOS ESPECÍFICOS

- Apresentar os programas e projetos existentes, sob coordenação e execução do setor público local;
- Construir novos indicadores sobre o modo como os jovens de Santo André vivem e vivenciam a cidade;
- Qualificar a intervenção política da juventude pela afirmação de canais de participação focados para a juventude;
- Promover o debate de idéias e proposições sobre as diversas visões de mundo da juventude local de tal forma que se materialize por meio propostas aprovadas na Conferência;
- Criar uma instância pública que permita a juventude se reconhecer como agente ativo na construção de sua cidadania;
- Definir processo de construção de um Fórum de Juventude permanente e representativo, que possibilite a juventude se reconhecer como agente ativo na construção de sua cidadania.

2 – METODOLOGIA DA CONFERÊNCIA

A Conferência Municipal da Juventude de Santo André deve ser vista enquanto um processo onde a sua organização, concepção e gestão -- participarão o governo municipal em conjunto com a sociedade civil -

-, como também os momentos de definição de quais estratégias os movimentos de juventude da cidade indicarão, para se fazer representar legítima e legalmente junto ao poder público e a comunidade local, e que vem sendo construído já a alguns anos, serão os momentos principais mais não os únicos. Portanto, a Conferência não começa e nem termina com um cronograma de realizações. Ela apenas vem revelar num determinado momento histórico, um processo de concepção de políticas públicas, cujos eixos principais assentam-se na participação popular, na inclusão social, no respeito à diversidade política, étnica, cultural e de gênero presentes em nossa sociedade, e na ampliação dos direitos de cidadania, que tem sido incansavelmente conquistados e construídos ao longo destas três últimas décadas.

Por isso, acreditamos que o acontecimento "**Conferência Municipal da Juventude**" deverá garantir, em seu processo de realização:

1. Os princípios e as ações em torno da transversalidade temática;
2. A matricialidade enquanto um princípio ético e político de construção e gestão das políticas públicas; e
3. As diferentes estratégias de organização, representação e expressão dos diversos movimentos de juventude da cidade.

E para podermos garantir estes três elementos em todo o processo de construção da **Conferência Municipal da Juventude**, optamos por construir um caminho – metodologia - que procure revelar a todos os participantes:

1. quais são as políticas públicas locais existentes cujo principal foco ou objetivo sejam as juventudes;
2. **quem são estes jovens da cidade, como vivenciam seus objetivos e projetos no cotidiano, como se organizam (e para que se organizam), e o que querem para o presente e o futuro da cidade e onde vivem; e**
3. e quem são e como atuam os diferentes atores e parceiros da sociedade civil, que no dia-a-dia estão ao lado das juventudes e seus problemas, desafios e perspectivas.

Esse caminho escolhido apresenta-se, para efeitos didáticos e organizativos, dividido em quatro momentos:

- 1ª fase: constituição do grupo Matricial de Organização pelo setor público;
- 2ª fase: a realização das Mini-Conferências Temáticas, cuja preparação e realização deverão ser articuladas entre a sociedade civil e a prefeitura;
- 3ª fase: a realização da Conferência Municipal da Juventude; e
- 4ª fase: a sistematização e a publicização de todo o processo de preparação, organização, produção de conhecimentos e de deliberação da Conferência.

2.1 – 1ª fase: Constituição do Grupo Matricial de Organização

O principal objetivo desta fase é o de contribuir para o aprofundamento da formação dos agentes públicos locais, envolvidos na construção de uma política pública que tenha as "Juventudes" enquanto um tema transversal, e a matricialidade como um princípio de elaboração e de gestão das respectivas políticas públicas, existentes ou em fase de elaboração.

A melhor maneira de viabilizarmos este processo de formação será através da constituição do **Grupo Matricial de Organização** da Conferência que, na melhor das hipóteses poderá continuar existindo após a realização da Conferência Municipal.

Para a formação deste grupo são indicadas as seguintes ações:

1. realização de uma reunião a convite da Secretaria a qual a Assessoria da Juventude faz parte, com o objetivo de apresentar e debater os objetivos da Conferência, sua metodologia e a criação do Grupo Matricial;
2. realização de um Seminário interno sobre "Políticas Públicas de Juventude", e que deverá ser voltado a tod@s aquel@s envolvid@s com a questão das juventudes. Este deverá ser um primeiro momento de aprofundamento sobre as questões da transversalidade e matricialidade em políticas públicas considerando-se o nosso tema principal;
3. realização de um 2º Seminário em seguida às Mini-Conferências Temáticas para sistematização e elaboração de documentos para a Conferência Municipal.
4. realização de um encontro de avaliação da Conferência Municipal logo após a realização desta, buscando, novamente aprofundar o processo de matricialidade ligado ao tema "juventudes".

O Grupo Matricial de Organização terá como atribuições principais:

- Organizar as Mini-Conferências temáticas, definindo os locais, as datas e os horários de realização das mesmas;
- Definir a estratégia de divulgação das MCT's e da Conferência Municipal na cidade (definir locais de divulgação, os grupos, as regiões e a forma da divulgação (principais veículos));
- Buscar articular os acontecimentos da cidade durante todo o processo de realização da Conferência;
- Mobilizar e articular-se com os parceiros e demais atores da sociedade civil na realização não só das MCT's como também de outras atividades dirigidas à Conferência Municipal;
- Levantar e garantir todos os recursos de infra-estrutura e apoio para as MCT's; e
- Levantar informações ou dados sobre a juventude no município antes, durante e depois da Conferência, através da **Ficha de Projeto de Juventude** (vide ANEXO 1); e
- Garantir que as deliberações da Conferência Municipais da Juventude sejam implementadas a partir deste grupo Matricial de Organização.

Abaixo apresentamos uma relação mínima das áreas que poderão estar fazendo parte de todo este processo da Conferência Municipal:

- Sub-prefeitura de Paranapiacaba
- Secretaria de Combate a Violência Urbana
- Secretaria de Inclusão Social e Habitação
- Secretaria de Educação
- Secretaria de Saúde
- Secretaria de Cultura, Esporte e Lazer
- Secretaria de Desenvolvimento, Ações Regionais e Captação de Recursos
- Secretaria de Serviços Municipais – DEPAV e Educação para o Trânsito
- Secretaria de Orçamento e Planejamento Participativo
- Secretaria de Relações Empresariais
- Secretaria de Governo
- Coordenadoria do Projeto Centro
- Coordenadoria do Projeto Cidade Futuro
- SEMASA
- GEPAM

2.2 – 2ª fase: Realização das Mini-Conferências Temáticas

Considerando o modo como as políticas públicas são organizadas e geridas – fragmentadas e muito pouco articuladas entre si --, considerando que muitas das organizações juvenis existentes também se apresentam de maneira fragmentada ou articuladas na forma de "grupos de interesses" , e considerando a necessidade de um maior aprofundamento de conhecimento e de debates em torno das políticas públicas para as juventudes, estamos apresentando a realização de "Mini-Conferências Temáticas" que antecederão a **Conferência Municipal**. AS MCT's têm como principais objetivos:

- Estimular os jovens a apresentarem propostas para os respectivos temas de interesse ou de envolvimento direito ou indireto;
- Contribuir para o processo de formação dos participantes das MCT's: juventude, poder público, sociedade civil, etc, socializando dados e indicadores existentes sobre o tema e de como ele afeta o cotidiano das juventudes na cidade;
- Aprofundar as informações e as realizações da prefeitura municipal voltadas às 'juventudes', a partir das necessidades e reivindicações dos participantes;
- Mobilizar as juventudes para uma forte participação na Conferência Municipal, mantendo em evidência durante o período das MCT´s até a Conferência, a Juventude como tema estratégico e transversal;
- Propiciar momentos de reflexões a partir de Mesas Temáticas Coordenadas, onde parceiros poderão contribuir com as discussões de maneira efetiva;
- Produzir, debater, organizar e sistematizar as principais propostas das 'juventudes' da cidade em torno dos seguintes temas que dizem respeito ao cotidiano dos jovens:

Trabalho e Economia Solidária
Saúde, Qualidade de Vida e Meio Ambiente
Participação, Expressão e Diversidade social
A cultura de paz como modo de vida
Educação como prática de Liberdade
Informação, comunicação e inclusão digital
Garantia de direitos para juventude

As Mini-Conferências acontecerão nas seguintes datas, e terão as seguintes áreas e os seguintes responsáveis ou coordenadores por parte do poder público:

Atividadde	**Datas**	**Período de Realização (Indicativo)**
Conferência Municipal	13,14 e 15 de junho de 2003	
MCT "Trabalho e Economia Solidária"	23/04/2003	Noite: a partir 18:30
MCT "Saúde, Qualidade de vida e meio ambiente"	26/04/2003	Tarde: a partir 14:00
MCT "A cultura de paz como modo de vida"	30/04/2003	Noite: a partir 18:30
MCT "Informação, comunicação e inclusão digital"	06/05/2003	Noite: a partir 18:30
MCT "Garantia de direitos para juventude"	07/05/2003	Noite: a partir 18:30
MCT "Educação como prática de liberdade"	09/05/2003	Noite: a partir 18:30
MCT "Participação, Expressão e Diversidade Social"	10/05/2003	Tarde: a partir 14:00

Mini-Conferencia	**Áreas Responsáveis Pela Preparação e Organização**	**Responsáveis e Contatos**

Trabalho e Economia Solidária	SISH-CIS / Saúde do Trabalhador / GTO/SHIS-DDDC / DESENVOLVIMENTO E AÇÃO REGIONAL - DGTR / Relações Empresariais	Casquinha DGTR – 7º ANDAR Tel: 44330490
Saúde, Qualidade de Vida e Meio Ambiente	GEPAM / SISH – DAS / SAÚDE /Subprefeitura de Paranapiacaba e Pq. Andreense / (SEMASA)	Rosana Voltolini (Saúde) Tel: 44330212 / 0373 / 0677 rvoltolini@santoandre.sp.gov.br
Participação, Expressão e Diversidade social	SISH-DDDC / SOPP – DPP PROJETO CIDADE DO FUTURO / SISH-DAS / SCEL	Fernanda (SCEL) Tel: 4433-0289 ppmanso@santoandre.sp.gov.br
A cultura de paz como modo de vida	SCVU / Educação e Formação Profissional / SISH-DDDC-AJ / SDAR - DGTR	Alessandra Porto (SCVU) Tel: 4433-0562
Educação como prática de Liberdade	Educação e Formação Profissional / SISH-DDDC-GTO	Bete – Séc. Educação Tel: 4996-1993 etonobohm@santoandre.sp.gov.br
Informação, comunicação e inclusão digital	Educação (Núcleo de comunicação de Governo), (CRAISA), WWW.JOVEM / Rede Cidadania (SOPP/DPP), (Saúde)	Mariana – AJ Tel 44330195 / 4994-7918 jsooma@santoandre.gov.br
Garantia de direitos para adolescentes	SISH – DAS / SAÚDE	Jefferson – AJ Tel: 4433-0195 jsooma@santoandre.gov.br

Os nomes propostos para estas Mini-Conferências são:

- **JUVENTUDES: TRABALHO E ECONOMIA SOLIDÁRIA: UM OUTRO MODO DE TRABALHO É POSSÍVEL?**
- **JUVENTUDES: SAÚDE, QUALIDADE DE VIDA E MEIO AMBIENTE – POR UM AMBIENTE INTEIRAMENTE SAUDÁVEL.**
- **JUVENTUDES: PARTICIPAÇÃO, EXPRESSÃO E DIVERSIDADE SOCIAL.**
- **JUVENTUDES: A CULTURA DA PAZ COMO MODO DE VIDA**
- **JUVENTUDES: EDUCAÇÃO COMO PRÁTICA DA LIBERDADE**
- **JUVENTUDES: INFORMAÇÃO, COMUNICAÇÃO E INCLUSÃO DIGITAL.**
- **JUVENTUDES: GARANTIA DE DIREITOS ATRAVÉS DE UM ESTATUTO PARA AS JUVENTUDES?**

Para se inscrever nas MCT´s os interessados terão que apresentar por escrito uma reflexão mínima sobre o tema, de tal forma que se possa materializar as idéias. O formato e o conteúdo deverão ser construídos pela organização da Conferência;

A realização das MCT's deverão garantir além dos objetivos, alguns princípios metodológicos básicos, como:

1. a participação de todos aqueles que desejarem expressar suas idéias e propostas, de tal forma a evitar situações de inibição ou intimidação a participação;
2. a apresentação do que vem a ser a Conferência Municipal, seus objetivos e resultados esperados, bem como as MCT's, objetivos e resultados esperados;
3. privilégio à apresentação didática das informações, dos conteúdos e dos projetos existentes, coordenados ou não pelo poder público local;
4. a pluralidade das idéias evitando-se a discriminação por motivos religiosos, raciais, étnicos, etários, de gênero, ou por orientação sexual;

5. a realização de atividades de apresentação, integração e aquecimento do grupo para o tema a ser desenvolvido;
6. a sistematização dos debates e propostas dos participantes, de forma que não se perca a maioria dos acontecimentos das MCT's (gravação em vídeo, sonora, fotográfica e escrita.); e
7. a produção de propostas a serem encaminhadas para aprovação e reflexão geral na Conferência Municipal de Juventude.

As MCT's servirão como prévio credenciamento dos participantes para a Conferência Municipal. Portanto, dela sairão os representantes para participar da Conferência. Desta forma os delegados das MCT´s terão acúmulo de discussão para apresentar as resoluções para o conjunto na Conferência. A idéia é fazer com que na própria MCT´s se eleja representantes para apresentarem uma síntese dos debates e do que foi a MCT, as propostas concluídas, seu proposto e resultado. Veja no ANEXO dois (2) uma proposta contendo um roteiro de organização da MCT.

2.3 - 3ª fase: a realização da Conferência Municipal da Juventude

A Conferência Municipal da Juventude está prevista para acontecer entre os dias 13 e 15 de junho de 2003, em local ainda a ser confirmado.

A organização desta deverá se dar através da criação ou de comissões ou de grupos de trabalho, que poderão contar tanto com a presença do poder público como tanto das entidades que apóiam o evento, como também de jovens engajados no processo ou até mesmo das entidades parceiras.

A preparação da Conferência envolverá os seguintes grupos ou comissões de trabalho:

1. Comissão de Elaboração dos critérios de participação nas MCT´s e na Conferência temática, que já foi constituía e tem como membros: **Jefferson, Mariana, Beth (Educação) e Fernanda (SOPP/DPP).**
2. Comissão de Sistematização e Registro das MCT´s e da Conferência Municipal.
3. Comissão de Infra-Estrutura e Apoio Material.
4. Comissão de Organização da Conferência Municipal e das MCT's.
5. Comissão Orçamentária.
6. Comissão de Divulgação, Comunicação e Cobertura dos eventos.

A criação destas comissões deverá ser realizada até pelo menos o dia 20/03/2003, quando estarão sendo apresentadas as propostas de realização das Mini-Conferências Temáticas. Entretanto, é necessário que duas delas sejam articuladas e que tenham um conjunto de ações antes desta data: a comissão Orçamentária e a comissão de Divulgação, Comunicação e Cobertura dos Eventos.

Uma agenda rápida de trabalho deverá ser indicada desde cedo, e estas duas deverão pautar suas ações a partir das principais necessidades da **Conferência Municipal**:

- Definir o total de recursos que serão investidos e as fontes possíveis de captação (própria ou de terceiros);
- Elaborar projetos de captação de recursos;
- Definir as estratégias de divulgação e abordagem das juventudes, tanto para as MCT´s, como também para a Conferência Municipal.

Antes do final de março, estas comissões deverão estar com seus planos de ação prontos e deverão ser apresentados numa reunião conjunta, de preferência com todo o grupo matricial de organização.

2.4 - 4ª fase: sistematização e publicização de todo o processo de preparação, organização, produção de conhecimentos e de deliberação da Conferência.

Essa 4ª fase caracteriza-se pela continuidade de todo o processo até então realizado, e que culmina não só na sistematização, mas no seu principal desafio que é o de garantir que as deliberações sejam encaminhadas às respectivas autoridades da cidade.

Nesse caso, as entidades que apóiam o evento poderão dar importante contribuição, principalmente no processo de sistematização, publicização e assessoria ao poder público no que diz respeito ao encaminhamento das eventuais proposições de políticas públicas que surgirão.

Um outro aspecto a ser considerado é a criação de um **FÓRUM PERMANENTE DE JUVENTUDE,** até mesmo como resultado da conferência.

Seria formado um Fórum representativo da juventude da cidade. Seria eleito um conjunto de representações por temática que seria responsável por articular as continuidades dos debates e das ações, bem como a organização das próximas conferências e agendar os outros encontros. Esse Fórum poderá ter suas principais atribuições e constituição definida pelo Grupo Matricial de Organização.
Santo André, 27 de fevereiro de 2003

ANEXO 1- Prpoasta de "Ficha Projetos de Juventude"

Nome do projeto ou programa: _____

1. Qual secretaria é a coordenadora deste(s) projeto(s)?
2. Qual é o Departamento Coordenador?
3. Quem são os técnicos responsáveis e de quais áreas?
4. Faça uma breve descrição do projeto.
5. Quais os objetivos do projeto?
6. Quem é o público que se quer atender? Indique os limites da faixa etária ou outros que possam existir.
7. Quais os locais onde estão sendo desenvolvidas as atividades do projeto?
8. Qual o tempo de existência e de duração do projeto?
9. Quantas pessoas foram atendidas neste período?
10. Quem são os parceiros internos do projeto?
11. Existem parceiros externos? Se sim, quem são e como participam.
12. Quais os recursos próprios e de terceiros para o projeto?
13. Caso o projeto continue para 2003, que metas ou conjunto destas pretende atingir?

ANEXO 2

Proposta de organização das Mini-Conferências Temáticas

1. Nome da MCT

2. Coordenador (a) responsável pelo poder público

3. Data prevista da realização do evento

4. Local previsto para a realização do evento. Justificativa.

5. Horário previsto de realização da MCT.

6. Com quais parceiros (entidades) contará na organização e realização do evento?

7. Jovens indicados para participar da organização/coordenação do evento.

8. Proposta síntese de como poderá se realizar a MCT.

9. Cronograma das 02 próximas reuniões preparatórias da MCT, envolvendo as entidades parceiras e outros convidados a estarem na organização do evento.

10. Nome do responsável da MCT pelo poder público (contato) e que dará continuidade à preparação do evento.

Proposta Padrao de MCT

A idéia é fazer a MCT com uma dinâmica geral, ou seja que todas tenham uma estrutura de trabalho semelhante, mas que possibilite a cada tema acrescentar suas especificidades.

Propomos que na MCT tenha:

- uma coordenação do evento
- uma coordenação de mesa;
- um relator com proximidade com o tema;
- uma mesa prevendo um debate ou aprofundamento temático, sendo 01 representante – especialista – do Poder Público e 01 representante – especialista – da sociedade civil;
- Preparação de material ou texto com subsídios, sendo também a exposição de trabalhos apresentados na inscrição pelos participantes;
- Uma pessoa para moderar o trabalho do grupo e a plenária;
- Apresentações e performances culturais sobre a temática; e
- Eleição de representante que apresentará os resultados da MCT na conferência em si.

PUBLIC PRESS ANNOUNCEMENTS

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PROJECT ANNOUNCEMENT

In: O Sertanejo, No. 382, August 2003

MEETING ANNOUNCEMENT

In: O Sertanejo, No. 377, March 2003

APPENDIX G – MANAGEMENT RESULTS

TRIP REPORT

Project Management and Technical Mission

Brazil, July 30th – September 23rd, 2003

Joachim Carolsfeld
World Fisheries Trust

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TRIP AGENDA:

July 29/30 - Travel Canada-Brazil; meeting Jutta Gutberlet in Sao Paulo (review fisheries review mission and original meeting that liberated the fisheries decree for review); travel to Belo Horizonte; meeting Margarida Ramos in Belo Horizonte (plan fisheries decree meeting)
July 31: meetings with IEF and Policia Militar in Belo Horizonte (plan fisheries decree meeting); travel to Três Marias.
Aug. 1: Organize Fisheries decree meeting
Aug. 2-4: Conduct fisheries decree meeting; participate in meeting of Federation re: Secretaria Especial de Aquicultura e Pesca (SEAP)
Aug. 5-7: Meeting wrap-up & reporting; organize Conference of the Cities meeting; arrange other project activities
Aug 7-8: Conference of the Cities meeting, Três Marias
Aug 9-14: Meeting wrap-up & reporting - Três Marias and Felixlândia; arrange other project activities including Canada mission; travel to Brasilia
Aug 15-16: Meeting Brasilia - CIDA & ABC; MMA Environment conference
Aug 16-17: Travel Belo Horizonte; arranging project activities
Aug. 18-24: Meetings and project development (CEMIG, IEF, CETEC, SEAP, UFMG)
Aug. 24: Travel São Paulo
Aug. 25: Meet Merle Faminow (IDRC); travel to São Carlos
Aug. 26: Meetings w/ IDRC at UFCSCar; CIDA project development; travel to Três Marias
Aug. 27: Meetings & tours in Três Marias - IDRC, SEMEIA, CEMIG, Federation, fish market, CODEVASF; travel Brasília
Aug. 28: travel Santarém; meeting IARA, demonstration of radio programming
Aug. 29: Santarém fish market, meetings with associations & colonies
Aug. 30: IDRC de-briefing, meeting IPAM, travel to Manaus
Aug. 31 - Sept. 1: Manaus fish market & meetings at colony and confederation
Sept. 2: Travel to Brasília; meetings SEAP, MMA; travel Três Marias
Sept. 3-8: Meeting organization & project development, Três Marias
Sept. 9: Travel Belo Horizonte; meeting with GEF - São Francisco project; view fish leather project.
Sept. 10: Meeting SEAP (BH); return Três Marias
Sept. 11-13: Workshop Aguas do Lago 2003 in Três Marias
Sept. 14-15: Conference wrap-up and reporting
Sept. 16: Travel Rio de Janeiro; meeting COPPE-UFRJ & Petrobras
Sept. 17-18: Travel Belo Horizonte, meeting ABRAGE (golden mussel).
Sept. 19: Set up trial recirculating aquarium system CETEC; travel Três Marias; meeting for gender and youth strategy
Sept. 20: Wrap-up meetings, Travel Belo Horizonte
Sept. 21-22: Wrap-up meetings Belo Horizonte (CEMIG, SEAP)
Sept. 23-24: Travel to Canada.

CONTEXTUAL SUMMARY OF TRIP RESULTS:

Fisheries:

Fisheries decree review meeting and follow-up:

The state of Minas Gerais began exercising control of fisheries within its boundaries with a Fisheries Law published in 1998. However, the law was overly restrictive of professional fishermen through the prohibition of the use of nets, and public protest forced the law to be withdrawn. A new state Fisheries Law was prepared in 2000, with input from fishermen. In June of 2003, our project's fisheries review mission discovered that the Decree needed to implement the Law was on the desk of the State Promotor (Attorney General) for approval, but prepared without review of the fishermen. As a result, our representatives of the Military Police and the Instituto Estadual Florestal (IEF – responsible for state fisheries) managed to withdraw the decree and make it available for review by the fishermen in a multiple stakeholder meeting. We organized this meeting together with the Federation of Fishermen.

The draft decree also prohibited the use of nets, as had the first law, so was not well received by the fishermen, and they initially refused to participate in its review. This created a challenge, so we arranged (from Canada) prior consultation with the principal groups, a stepped participation for the meeting, and professional facilitation (the facilitator, Margarida Ramos, had trained with the CIDA project in Sto. Andre and GTZ).

Initial consultation occurred with the IEF and the Policia Militar in Belo Horizonte on the first day of my trip (after reviewing details of the original meeting with Dr. Gutberlet in São Paulo), confirming their support of the event and participation on the 2nd and 3rd days. Subsequent consultation in Três Marias was with the Federation President, the Federation's legal advisor, the facilitator, and staff of SEMEIA (Secretaria do Meio Ambiente of Três Marias) and CAP (Centro de Apoio ao Pescador) to agree on meeting strategy and set up logistics.

The meeting itself was held at CAP, with institutional support of SEMEIA. All presidents of the professional fishing colonies and associations in Minas participated, most with one or two assistants from the colony (including several wives and fisherwomen). The first day was used to review the manuscript, focussing initially on building a good working environment in the group as a whole with a discussion of positive elements. A presentation of the legal evaluation then set the stage for break-out groups to review the document in detail and make a series of substantive recommendations on how to improve it. Ms Ramos, several people from UFSCar (Inês, Norma, Sandro) and SEMEIA (Barbara) and I assisted in this process, as well as the newly-appointed state representative for the federal Special Secretariat for Aquaculture and Fisheries (SEAP - Edson). The representatives of IEF (Marcelo Coutinho) and the Military Police (Arley Ferreira) arrived for the evening supper, allowing for initial networking.

On the second day and the morning of the third day, results of the break-out groups' evaluations were presented in the group as a whole and discussed. Marcelo and Arley participated in this stage, with a very open and generally positive discussion that provided good clarification from both sides and a consensus recommendation on most points. A consensus document was prepared on-site and signed by everyone present. Care was taken throughout the meeting, also by consensus, not to modify elements that would restrict sport fishing – as this group was not present in the discussions.

Most of the expenses of the meeting were covered by the CIDA project (including travel and lodging of participants), other than the considerable institutional support provided by SEMEIA and CAP.

The report of the meeting, along with the group census recommendations, was prepared with the facilitator and, together with a more in-depth legal evaluation of the document, were submitted officially by the Federation to the IEF in the following week. Arley and Marcelo committed themselves to preparing the revised decree and re-submitting it for legal evaluation by the Attorney General. Our initial plans were to hold a second review meeting with a broader stake-holder participation (to be facilitated by Maureen Maloney of the Uvic Dispute Resolution Centre), but most participants (including the IEF representative) felt quite strongly that this would not be necessary at this point, and that it would only slow the process unduly. While understanding the importance of transparency of process, most of our partners felt that these other interest groups had already had their input unofficially and felt it best not to pursue this other meeting at this point. We thus cancelled plans for the second meeting, but the Federation made their preparedness to present and discuss their views in a broader audience clear in the cover letter of their submission to IEF of the revised decree and agreed to my distributing it unofficially to other user groups.

By August 6th the revision of the decree by Marcelo and Arley was almost complete. We (Marcelo, Arley, Godinhos and I) discussed again, at IEF, the importance of including provisions for a consultative council and a participative review mechanism of local regulations (portarias) that included the fishermen. This was agreed upon, and a council was roughed out, to be led by Hugo Godinho (as indicated by the head of the IEF division). Marcelo voiced his intention to informally already pass “portaries” by Raimundo’s Federation before any publications. The first of these was a Portaria to lift the prohibition of “caceia” nets, essential for the fishery on the river below Pirapora.

IEF Consultative Council

Our initial meeting with IEF at the beginning of August, together with Vasco Torquato (CEMIG) and Hugo Godinho (UFMG) included a discussion with the head of the fisheries division (Dr. Celio) on the importance of multi-lateral user input to fisheries mangement. Such a council was guaranteed in the new Fisheries Law, but was removed by the new governor, along with other similar councils in other areas. Dr. Celio suggested that such a council be re-created, under the leadership of Dr. Hugo Godinho, but so far there has been no further progress on this idea.

IBAMA:

IBAMA is a partner in our project, but their participation was understood to be organized by the Ministerio de Meio Ambiente (MMA). However, with delays in getting the Brazilian management of the project organized, establishing the MMA counterpart contribution, mis-comunications, and internal politics, the relationship with IBAMA has not yet been defined. In addition, the past director of the Belo Horizonte office of IBAMA has not had a good relationship with a variety of our partners. However, the new director, Roberto Messias, is well respected by everyone and is very positive about the project. Unfortunately, during much of my current trip IBAMA was on strike and/or Dr. Messias was unavailable. Other than keeping them abreast of proceedings, IBAMA thus did not participate significantly in activities during this trip.

Secretaria Especial de Aquicultura e Pesca (SEAP):

The Special Secretariat for Aquiculture and Fisheries (SEAP) was set up by President Lula in late 2002 to better address development of these areas. The secretariat was built primarily from staff of the Department of Fisheries in the Agriculture Ministry (which became extinct), supplemented by staff from both CODEVASF and IBAMA. Representation in each of the states and areas was built out of local Agriculture Ministry offices, with politically indicated new heads. The Secretariat appears to have a loose mandate to develop and organize the fisheries and aquaculture sectors, but has backed off on policing and regulation - leaving this to IBAMA. The respective responsibilities of the different organizations was still quite ambiguous during my trip, and the SEAP had not yet received a budget.

In Brasilia, we had made earlier contact with the SEAP, delivered our project proposal, and had discussed various means of working together. However, an official invitation outlining this understanding had not yet been received during my trip. Nevertheless, when Raimundo and I visited them on the return from Manaus/Santarem, they indicated that proposals on lagoon revitalization, aquaculture, and processing centres would be positively entertained once money came in.

In Minas, a Dr. Edson had been appointed the state representative of the SEAP two days before our meeting in Três Marias to review the Fisheries Decree. We managed to arrange his participation in this meeting, including a half-day session at the end of the event to discuss the fishermen's expectations of the SEAP (including animated discussions on environmentally benign aquaculture, participatory stock assessment, and participatory research). Dr. Edson also expressed substantial interest in participating/partnering with our project. However, one week later he had been replaced by another appointee - Wagner Benevides. We also met with Wagner, had similar discussions, and agreed to help him organize a state fisheries meeting in Três Marias in October (immediately prior to Lessons Learned).

Technical visit for community policing:

Arrangements for the mission to Canada to review policing were on-going throughout the trip. The initially proposed timing in September appeared to be acceptable to nobody, whereas October would work for Arley and Marcelo. All needed official invitations quite soon. The new timing also worked for others, such as Barbara and Raimundo, and tied in well with Lessons Learned (though this expanded the size of the group considerably). Participation by IBAMA was also considered very important, but by the time we had confirmed that there would be room for everyone, our invitation for IBAMA was too late.

Fisheries Co-management - IDRC proposal:

By the start of my trip, the IDRC-funded IARA project was basically approved, having been modified to incorporate UFSCar as an equal partner and a salary at the UFSCar to assist both the IDRC and CIDA projects. In theory, only a check on the budget, a letter from the UFSCar, and a field review were still needed. Merle Faminow carried out this field review from August 25th to 30th, and asked me to accompany him. I agreed, extending my planned visit to Brasil, but also insisted on taking Raimundo (Federation President) along to Santarem to familiarize him with the partners and situation in the Amazon and to get his feed-back on the planned project.

I picked up Merle at the airport in São Paulo with a UFSCar car and driver and accompanied him through meetings we set up in São Carlos (UFSCar) and Três Marias (SEMEIA, CAP, Federation, Colonia, CEMIG). The meetings went very well in both locations, with open

discussions and a clear presentation of Merle's expectations (including that of an effective interaction between the IDRC and CIDA projects and a focus on gender and race issues). Merle was well received in both locations, in particular in Três Marias, where SEMEIA went to extra effort to provide him with a tour of the region, as well as picking us up in Belo Horizonte at the start of the visit.

In Santarem, we were received and hosted by Regina Cedeira and Gilviandra of IARA. Meetings were set up at the IARA office and with fishing associations and colonies. Iara also demonstrated their community radio program (which they feel is central to keeping co-management agreements together) and a visit to a community fisheries meeting in one of the lagoons in the area was arranged for Raimundo and myself (this visit failed, as the motor of the boat we were in burned up and we had to hitchhike back to Santarem at midnight). Ties between some of the associations and Raimundo have since continued, has he is lobbying for their independent colony and federation status in the Confederation of Fishermen. A meeting was also held with IPAM, another fisheries-related NGO in Santarem. Marcelo Grossa, a researcher at IPAM, was a participant in the radiotelemetry course we ran in 1999, and is conducting some interesting participatory radiotelemety research on the piraracu with fishermen. He has found that the fishermen's participation in the research (despite being quite high-tech) has enhanced their interest in co-management substantially and has reduced poaching to zero from about 60-80% of the allowable catch. Raimundo agreed that this would be an interesting idea to pursue in the São Francisco River.

Merle appeared to have good meetings and discussions with IARA as well, though some were *in camera*. He questioned why we had chosen IARA as partners (vs other possible organizations), but in the end appeared satisfied.

Environmental threats & mitigation:

Golden mussels & CEMIG:

Golden mussels (*Limnoperna* sp.) are an invasive freshwater species from China that was introduced into the estuary of the Parana River at Buenos Aires in the 1990s. The species has moved up the river at a fast rate, and reached Minas Gerais in the last few years. It has caused considerable problems in hydroelectric plants, municipal water supplies, and irrigation systems on the way, much as the zebra mussel has impacted Eastern Canada and the USA. CEMIG, and all of the other Brazilian hydroelectric companies, are scrambling to develop control strategies. There is also a very real danger that the mussel will jump to the São Francisco River within the next few years, unless effective control mechanisms are implemented. The headwaters of the Rio Grande and part of the São Francisco drainage are separated by very little, and small boats, aquaculture fry, fishing nets, and aquatic birds are all commonly transferred between the two basins - providing very likely transfer mechanisms for the mussels or their larvae.

Canada has world-class expertise on mussel control, based on the zebra mussel experience, so this is an area that our project could contribute to well – both helping to avoid a future serious impact on the São Francisco and strengthening our partnership with CEMIG.

The current response to the golden mussel invasion in Brasil is very much like that of North Americans to the zebra mussels ten years ago. A principal characteristic of this stage is that the situation is not taken seriously by senior management nor the government, even as the damage caused by organisms mounts. Appropriate steps in our strategy thus could include:

1) Create adequate corporate and institutional priority for the problem by bringing senior CEMIG and government personnel to North America to view the zebra mussel impacts and control strategies;

– this step was to have been accomplished by funding the participation of a senior CEMIG person and an associated researcher at the 12th International Invasive Species Conference in Windsor, Ont. before my trip. Unfortunately, the event coincided with the SARS outbreak, and these people could not travel. Nevertheless, we received unexpected interest from our EMBRAPA – Pantanal partner, and funded the participation of Marcia Divina Oliveira to the conference (assisted by a WFT person – Eva Klassen). Marcia subsequently presented her Pantanal research and her Canadian experience to a variety of meetings in Brazil, including those organized during my stay, and has since gone on to be one of the lead researchers for developing strategies for controlling the spread of the mussels in an embryonic MMA study group (in collaboration with Monica Campos of CETEC (see below);

2) Bring Canadian expertise to Brazil within an appropriate venue for maximum exposure and impact:

- An appropriate venue for this step presented itself early in my trip, when I was invited to participate in the planning for the annual meeting of the Environmental Working Group of the Brazilian Association of Large Hydroelectric Companies (ABRAGE). Procopio Rezende, of CEMIG, is the current chair of this working group, and was arranging a focus on the Golden Mussel invasion. We quickly organized the participation of Renata Claudi, a Canadian expert on zebra mussel control, at this meeting, together with a technical training tour. I extended my planned visit in part to accommodate this development. Both the meeting and the technical visit went extremely well, with CEMIG, CETEC (research centre in Belo Horizonte contracted by CEMIG to study and develop mussel control mechanisms), EMBRAPA, and Itaipu, in particular, receiving exceptional technical pointers for control mecahnisms, strategies, and appropriate research directions. Potentially very good collaborations between these groups was also set up, and a strong presence has been established in the MMA national working group on mussels (an outcome of the ABRAGE meeting). The connection developed between Renata and CEMIG also appears strong - she is hosting a technical visit to Canada by Maria Edith Rolla (CEMIG staff responsible for the mussel startegy) in the near future (to be paid for by CEMIG), is assisting in the participation of Maria Edith, Monica Campos (CETEC) and Marcia (EMBRAPA) at the 13th International Invasive Species Conference, and is assisting all of these remotely in research and program development strategies.

In terms of the partnership with CEMIG, this activity with mussels triggered a renewed interest in the partnership with UFSCar (the partnership agreement has been revised and is being reviewed by the respective lawyers), substantial participation and support of the participatory reservoir meetings outlined above, and a draft agreement with the city of Três Marias and the Fishermen's Federation to review the exaggerated safety zone below the Três Marias dam (the last has since stalled again).

3) Focus any inertia created on the prevention of a mussel invasion of the Sao Francisco basin

- We are set up to help out with this next step through the partnerships and networks we have created, but the focus should be on government bodies, not the industry. We

probably need to wait for appropriate opportunities and to define our working agreement with MMA better before pursuing this further.

Community-based water monitoring

CETEC - Fundação Centro Tecnológico de Minas Gerais

CETEC was recommended to us by both CEMIG and UFMG in the latter stages of proposal development as a suitable partner in the areas of environmental analyses. This is the group that is commonly contracted by the police or CEMIG to evaluate causes of fish mortalities. However, despite some discussion, they were not included in the proposal at the time - partly as they work on a cost-recovery basis and would possibly need to be paid to participate and partly because the fishermen perceived them as being too industry-oriented.

With the implementation phase of the project, personnel at CETEC had changed somewhat - including the hiring of Cristiane Lopez, whom we had trained earlier in fish larviculture when she worked for CODEVASF in Três Marias. CETEC has also now been contracted by CEMIG to research the Golden Mussel, so Monica Campos - lead researcher on this topic - was quite involved in the project's mussel events. During my trip, I designed a re-cicrculating water system to help her in the lab-based mussel research.

Of particular other interest at CETEC are a program with Projeto Manuelzao in which they train community members to monitor water quality and benthos, and a project within the GEF-Sao Francisco initiative on recuperation of the veredas. I held some preliminary discussions with the people involved in these initiatives to see how they could help out our program, but without definitive answers.

Mineral company:

The Companhia Mineira de Mineração (CMM) zinc refinery in Três Marias has been operating for over 30 years – being one of the principal reasons to build the hydroelectric capacity of Três Marias dam. During this time it has created considerable controversy as a purported major pollutor of the river. Rumours about past heavy-handed denial of environmental impacts and suppression of evidence are plentiful, but they appear unlikely to refer to recent events. The company is not currently a partner in our project, but will need to be approached in the near future if we are to build sustainable multiple stakeholder accords.

Upon invitation of Edimarcio, the environmental officer for the company, I made a preliminary visit of the installations to open conversation. The company has ISO 14001 certification, and has just completed a new recycling system and settling pond for residues. My conversation with the company focussed on the development of better community relations based on more transparent environmental monitoring. I talked to one of the environmental officers, and they are clearly interested in a good environmental image, and apparently in good practices. A representative of the National Water Agency (ANA), now responsible for reviewing monitoring programs, also agreed in principal to push for requirements for community involvement in environmental monitoring during a discussion with me in Brasilia.

A rumoured "surprise" environmental review of the CMM by ANA on the 21st of August did not materialize, but highly contaminated sediments have been found recently in the river (possibly quite old sediments) - so some kind of action is likely in the future.

Fish ladders & radiotelemetry:

Our initial proposal included assistance and training in radiotelemetry to groups studying fish migration in the São Francisco River and the Uruguai River, in addition to applying this technologoy to the development of fish passes. Lisiane Hahn (of UFSC/Nupelia: Federal University of Santa Caterina in Florianopolis, SC and the Nucleus for Fisheries, Limnological, and Aquaculture Research, Maringa, PR - both partners in the proposal) prepared a proposal for monitoring the new fish pass at Itaipu with radiotelemetry, with Angelo Agostinho's group at Nupelia. This fish pass, an 18km artificial river, is probably the world's most extensive fish pass, at least 5x the size of any other pass of its kind. However, the monitoring proposal was not yet very good, the equipment to carry out the work was not likely to show up before January of 2004 (at the end of the spawning migration), and Lisiane was very keen to participate in the training and assistance promised in our proposal.

The canal is an exceptional opportunity to demonstrate ecologically appropriate options for fish passes, with great potential for international profile for any work done with it, and an exceptional outdoors laboratory for studies and training on fish migration and movements. Itaipu and Nupelia are also very important partners for us to maintain as a resource for support in other areas of the project. The danger of the current situation is that radiotelemetry could easily, though erroneously, be seen as an expensive tool of little use, and data required for any reformulation of the fish pass would be delayed by over a year. I think this is an excellent opportunity for us to train people from our study area in a politically neutral arena (including fishermen, to build the capacity for participatory research), build networking between the various radiotelemetry and fish pass study groups and our Canadian partner (LGL), and to strengthen our partnership with Nupelia and Itaipu.

Environmental education & Environment policy:

There is a National conference on the environment planned for November of 2003, meant to document the Brazilian peoples' environmental priorities and concerns. Municipal and state conferences are supposed to lead up to this, as are several other satellite conferences. A youth conference is to take place in parallel, being organized by friends of Barbara's. We could help by researching organizational lessons learned at the Children's conference in Victoria. I managed to get contacts and information from Jason Boire (DFO-Ottawa), who was involved in the conference, and sent it on to Georgina Correira, the lady at MMA organizing the conferences, but I had no replies.

During my visit, the MMA sponsored a week-long workshop on Sustainable Development in Brasilia, led by Fritjof Capra of the University of California. Capra's fame is a series of books on ecologically-designed living options. Barbara and I were invited to the summary session, but it coincided with the ABC meeting and others we had set up in Brasilia, so she went to some of it and I to very little. Results from the meeting were quite interesting, in many cases going well against commonly promoted "industrialized" resolutions to environmental problems, in particular with lots of conversation about eco-agriculture. However, while the Minister expressed avid support for the principles, it is unclear how they could be implemented on a large scale in reality. There were many reports of quite an acrimonious week of the meetings, with many adamantly territorial Brazilian academic and NGO groups, and in the final meeting, demonstrations of indigenous people claiming their views were being ignored.

Water management

Participatory Reservoir management meetings:

Water management is one of the areas we proposed to work in. However, it is also an area that Brazil has made many advances in since our proposal was developed, and it remains unclear how, and if, Canadian expertise and the CIDA project can contribute effectively.

Two meetings occurred during the current trip that helped assess and address some of the needs of our partners. The project contributed particiaptory facilitation to both meetings.

The first event, held in Três Marias August 7-8th, was part of a series of "Conferences of the Cities", promoted by the new Ministry of Cities to assess the needs and problems of Cities throughout the country. In the case of the meeting at Três Marias, a conjoint meeting was held with all of the municipalities adjacent to the reservoir (organized in the COMLAGO consortium). Our project provided organizational advice and professional participatory facilitation to the whole meeting (with Ms. Ramos), as well as introducing a specific theme on the aquatic environment and reservoir management and organizing a keynote speaker on participatory reservoir management (Dr. Fred Mauad, of the USP – São Carlos: a project partner). One of the suggestions made after this meeting was that Fred, with collaboration from BC Hydro, could produce a new participatory water plan for the reservoir.

The second event, building on the results of the first one, was a workshop to assess more specifically issues of reservoir management of concern to the local communities and to provide information to these communities of regulatory mechanisms - "Aguas do Lago 2003". The event was initially planned by Barbara Johnsen of the Três Marias SEMEIA for earlier in the year, as part of her Master's course work, but the event could not be realised at the time for lack of needed support.

We worked with Barbara on a revised program for the workshop, and participated in arranging institutional participation from Brasilia and Belo Horizonte. We also assisted the participation of Silvia Freedman of COMLAGO and Ceica , of the Três Marias City Hall, in a conference of the Brazilian Basin Committees in Aracaju, to bring updated national issues to the meeting. COMLAGO also assisted in arranging participation of the leaders of the various municipalities at Aguas do Lago 2003. We took advantage of Ms. Ramos' presence after the Conferencia das Cidades to provide a 2-day training course to a number of community members of Três Marias for participatory facilitation and to assist in the Aguas do Lago workshop – several of these from the SEMEIA also immediately assisted with a youth environmental conference in the schools of Três Marias.

The workshop of Aguas do Lago took place Sept. 11-13th, with all the major regulators of water management presenting on their role on the first day, and discussions in break-out groups taking up the second day and third morning. The result was a tabular report of concerns and action plans to address locally important water management issues and to improve networking between users and regulators.

The meeting thus produced a lot of information that can be useful for planning our strategy in the project – in particular, we could focus on bridging the gap between regulators and users. It is unlikely that producing an alternative water use plan, as was contemplated earlier, is constructive. Many sophisticated plans already exist with the regulators, with apparent

opportunity for input from the community. Our project should probably be working on ways to optimize avenues for this input.

The meeting also produced very positive interactions between the various regulators and between the regulators and the community. I think that this positive atmosphere will need to be pursued aggressively and quickly for best results.

Alternative livelihoods - Ecotourism:

Fred Mauffat (USP-São Carlos) also wrote a thesis on environmental impacts of tourism and has some graduate students working in this area. He offered to provide support for this activity in Três Marias as needed. We will have to see how this evolves.

Networking with other projects:

A substantial Global Environment Fund (GEF) project for the São Francisco River has been going since about 1997. We had earlier seen some of the results of this project, and had tried to track down some of the participants, but with little luck. However, during my visit, we became aware that the second phase of this project was being developed, and we (myself, Raimundo and people from the Três Marias City Hall) were invited to a planning meeting being organized by a person from CEMIG. I gave a presentation of the CIDA project, emphasising areas of potential collaboration. Raimundo, Padre Gê (Mayor, Três Marias), and Silvia Freedman (COMLAGO) all also cited the importance of this project in their presentations. Reception was good, as was the interest by other participants, but we have had no subsequent returns.

The MMA is promoting a substantial project within the umbrella of “Revitalização of the São Francisco”. There have been some calls for proposals for this investment, and our project certainly falls within this scope. However, we were assured by Mauricio Laxes (the person in charge of this umbrella) that the counterpart contribution we are promised from the MMA is from this source, and that there is no need for us to apply for further support. Unfortunately, we have not yet received any of these funds. We had managed to get absolute assurance from both Dr. Basileo (Executive Secretary at the MMA) and Mauricio of the approval of our request in early September, but in late September whn the evaluation meeting of proposals was held, our paperwork was not complete (the project between ABC and CIDA had not been signed) and the proposal was derailed. We have not had further positive indications of recovering this support.

Project management:

Ines (UFSCar) and I had a meeting in Brasilia with project representatives for ABC (Melissa and Denise Maceio) and the Canadian Embassy (Louis Verret) with regard to the delay in getting the project signed by ABC. Denise and Melissa explained the nervousness the UFSCar letter on the project approval had induced at ABC, as they interpreted it as meaning UFSCar would drop out. Ines explain that they continued to be very keen to do the project, and had no intention of dropping it. ABC agreed to proceed with signing, including approving the inclusion of the Federation as a signing partner. This needs to be done quickly though, as the head of ABC is changing at the beginning of October. Ines promised to follow this up. Louis said it was a bit of an unconventional meeting, but otherwise appeared to come out alright. He`s very pleased by the partnership we are developing with IDRC.

Lessons Learned Conference:

Discussions were held during the trip on appropriate participation in CIDA's Lessons Learned conference in Ottawa in October. This was triggered by a request for candidates by Louis Verret during our meeting in Brasilia. There is also interest in representation of the last project, so Hugo, Ines and Barbara are the most likely to be invited by CIDA. However, participation by Ana Thé, Raimundo, and Arley would also be interesting, as all have expressed a lot of interest in the strategy of the overall project.

We felt that it would be good to look at linking the Lessons Learned event to the planned "policing" technical visit, broadening the focus of this trip to incorporate other issues (e.g. gender, participatory training, community development, environmental education) that are complementary to community policing and build bridges between trip participants. This was agreed upon, and I started to arrange travel agendas during my trip.

FOLLOW-UP ACTIVITIES:

Specific activities that we should follow up on as a result of this trip include:

- Investigate community: fishermen-led stock assessments (also track down Petrere work in SF)
- Follow up on reservoir workshop results
- Build relationships with GEF and revitalizacao projects
- Letters of agreement & invitations with Secretaria, IBAMA, CEMIG
- SEAP Fisheries meeting set-up and invitations
- Investigate other activities around Lessons Learned – gender & environment
- Write an alternative proposal for Itaipu canal, building openings for Alexandre's Center and LGL; consider purchasing some receivers from Habit as loaners to get things started
- Write journal articles on aquaculture protocols, professional fishermen, CEMIG
- Investigate the Capra philosophy to foresee where the MMA is going
- Letters of invitation for Arley, Marcelo (IEF), and others for the technical visit to Canada.

MANAGEMENT REPORT

MMA Proposal for Counterpart Funding

August 14th, 2003

São Carlos, September 14, 2003

Dr. Maurício Cortines Laxe,
Ministerial Assistant
Ministry of the Environment – MMA
Executive Secretariat

Dear Maurício and Members of the Committee,

The project "Continental Fisheries of Brasil: Sustainable Conservation and Livelihoods", known as "Project Peixes, Pessoas e Agua" ("Project Fish, People and Water") represents a holistic vision in the sense of contributing to the revitalisation of the São Francisco River in a manner that integrates human and ecosystem needs. Focussed on the fish, riverine communities, participative management of the environment and resources, the project doesn't allow one to forget that this "River of Integration" in Brazil is of interest to all Brazilians, and that its revitalisation depends on the integration of all users and governmental and administrative groups.

The proposals put forth in the project have already been adopted by the communities involved, including: during the First Regional Conference of Eight Municipalities at Três Marias Lake; the Seminar of the Lake Waters 2003; the Meeting of the Artesanal Fishermen of Minas Gerais (Três Marias, August 2-4, 2003); and in the manifesto of the mayors of COMLAGO (Consortium of Municipalities of Lago Três Marias) to the Ministry of the Environment.

With relation to fisheries, the project has a tripartite co-ordination of: the Federal University of São Carlos – one of the Brazilian leaders in [the area of] citizenship development; the Federation of Artesanal Fishermen of Minas Gerais; and the World fisheries Trust (a Canadian NGO). This co-ordination team has the ability to act as a link to improve river conditions as well as ensuring sustainability of this healthier environment and, at the same time, contributing to the survival of a traditional way of life, the latter of which integrates important knowledge and practices from the point of view of the relationship with the environment. In this way, the project also contributes to the improvement of quality of life for low-income people, that are included in the population of artesanal fishermen, and augments the availability of high quality protein to the Brazilian people.

The project proposal includes a group of 29 Brazilian and 15 Canadian institutions, with financial support for $2.9 million (Canadian) that has already been approved by the Canadian International Development Agency (CIDA), and counterpart contributions estimated at approximately $3.9 million (Canadian). We are attaching a detailed summary of plans for the application of these funds.

Although the counterpart portion is not completely confirmed, the project "Peixes, Pessoas e Agua" is underway and demonstrating exceptional effectiveness in carrying out the proposed activities and in the development of a variety of new sub-projects that guarantee the implementation of results achieved in the main project.

Some of these sub-projects are currently being formulated or are in progress:

1. **The implementation of the capacity to co-manage the fishery in artesanal fishermen's communities.** The project "Peixes, Pessoas e Agua" put together a rapid review of the fishery situation in the São Francisco, in the project's focal areas, and managed to implement modifications in the law and the fishery policy for the State of Minas Gerais in order for these to be more receptive to participative administration. It also managed financing from the International Development Research Centre (IDRC), for a sub-project that proposes to bring the experience of fisheries co-management from the Amazon to the São Francisco. This project, a partnership between the UFSCar; the Amazon Institute of Sustainable Management of Environmental Resources (IARA, an NGO); and fishermen of the mid-upper reaches of the São Francisco River; will begin in October, 2003.

2. **Practical restoration of marginal lagoons.** Marginal lagoons are very important to São Francisco fish stocks, and those of its tributaries, acting like nurseries for eggs and larvae of a great variety of migratory fish, and contributing to the enormous fishery potential of the river. With the advent of large dams and the resulting lack of seasonal flooding, many of these marginal lagoons stopped producing young fish. The project "Peixes, Pessoas e Agua" is creating partnerships and surveys to put together a sub-project for restoration, with practical and viable techniques, for fish production in the marginal lagoons. The proposal for this sub-project already has the support of CEMIG and the Special Secretariat for Fish and Aquaculture, with the aim of beginning in 2004 in the mid-upper reaches of the São Francisco.

3. **Restoration of the Fishermen's Support Center (CAP) in Três Marias, Minas Gerais.** The CAP project was approved and constructed as per Agreement no. 001-95 of the PNMA-PED (National Environmental Program –Executive Project for De-centralisation) with the objective of supporting the artesanal fishery with training and livelihood support [facilities], as well as providing environmental education to the general public. Currently, CAP contains the Eco-school Francisco Borges, which offers important ecological experiences to the schools in Três Marias. [However,] due to a lack of resources, it is not attaining its potential as a model of integration in education, ecology and human use of natural resources, focussed on the fishery and the restoration of the São Francisco watershed. A proposal exists to promote CAP together with CODEVASF's Hydrobiological and Fish Culture Station in Três Marias, (both are located as neighbouring properties on the shores of the São Francisco). In this way, the result will be a Center of Reference for Fisheries of the São Francisco, performing research, education, training, environmental restoration and support for the fishery sector – thus demonstrating the potential that exists here. The project "Peixes, Pessoas e Agua" is headquartering itself at CAP, with the aim to re-create this potential, and is looking for supplementary partners to take this on in a sustainable way.

4. **Restoration of the São Francisco Veredas.** Other than the seasonal rains, the springs of the "veredas" (artesanal oases) and are the principal contributors of water to the mid-upper reaches of the São Francisco River, as well as supporting unique ecosystems. With the growth of intensive agriculture and silviculture, these veredas are drying out, putting at risk an important basic element of the River. The project "Peixes, Pessoas e Agua" is looking for partners and collaborators to provide continuity to the studies, develop proposals, and carry out restoration with relation to this problem. This activity provides continuity to the project "Freshwater", carried out within Agreement no. 0123-2000 between the MMA and the Municipality of Três Marias.

Other sub-projects are being promoted with the activities of project “Peixes, Pessoas e Agua”. Amongst these are included:

- activities, originating in the community, to restore and provide added value to production and productivity of the Três Marias reservoir, in addition to the participatory administration;
- optimise fish passage mechanisms for the Brazilian fish fauna;
- control the spread of Golden Mussell, an exotic mollusc that is dangerous, very aggressive and approaching the Sao Francisco River;
- socio-economic studies of the riverine communities and the fisheries of the São Francisco River;
- incentives for the management and practice of artesanal fisheries in the whole country, in a way that is socially profitable and compatible with the conservation of resources and other uses of the environment;
- Survey of and resolution of requirements for the improved processing of fish catches in the artesanal fishery of Minas Gerais.

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Raimundo Ferreira Marquesi – Federation of Fishermen

Project “Peixes, Pessoas e Agua”
Timeline for work Solicited by the MMA
Summary

Project “Peixes, Pessoas e Agua”
Timeline for work Solicited by the MMA
Summary

Parcel	Cost ($R)	Period of Application	Date Required
1	200,000	October - December, 2003	October 1, 2003
2	64,500	January - March, 2004	January 1, 2004
3	56,400	April - June, 2004	April 1, 2004
4	63,400	July - September, 2004	July 1, 2004
5	74,200	October - December, 2004	October 1, 2004
6	72,300	January - March, 2005	January 1, 2005
7	53,400	April - June, 2005	April 1, 2005
8	50,800	July - September, 2005	July 1, 2005
9	65,000	October - December, 2005	October 1, 2005

PROJECT PAMPHLET

Attach pamphlet here – English side up…….

CAP MANIFESTO

Partnership Expression

Centro de Apoio ao Pescador - Três Marias

Barbara Johnsen
(Translation J. Carolsfeld)

CAP - the Center of Assistance to the Fisherman, is directed by FASFRAN - the São Francisco Municipal Foundation, and receives its full support from the Três Marias City Hall. In its partnership with the bilateral project Brasil - Canada “Peixes, Pessoas e Agua”, it has participated both in the development of the proposal and implementation of the project, and thus has strengthened the fisheries sector of the State through the provision of infrastructure on the margins of the São Francisco River and, through the Municipal Secretary of the Environment (SEMEIA), provision of vehicles, human and technical resources, consumable materials, and social communication.

This integrated partnership is represented throughout the project, whether through the direct contact with the communities for the consolidation of co-management, or in the conduct of socio-environmental and cultural policies promoted for the revitalization of the River and the estimation of the fishermen and their families.