APPENDIX F-8
Field Activity Report for March and April 2006

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Summary of Activities and Results For March and April 2006

In March planning and preparation involved networking activities with various groups for the allocation of a venue for formal education activities, and the necessary resources to permit watershed model construction workshops. To enhance the understanding of the environmental concerns in the Pirapora and Beira Rio watersheds, a participatory learning atmosphere occurred with cooperation from broad set individuals including representatives from: municipalities, public companies, local youth, and various community members in Três Marias, Beira Rio, and Pirapora. This process has strengthen the connection amongst various groups, enhanced many social programs and provided many opportunities for fishing communities to learn more about their surroundings. Field trips in each location extended the perceptions of the environment by providing a better sense of place or understanding of their surroundings.

Repairs and presentations with the Três Marias Model were successful, while workshops for the construction process of watershed models for Pirapora and Beira Rio (B.R.) transpired. To build the confidence of the youth's abilities and skills obtained in building the Três Marias model, they were encouraged to work independently and use the Watershed Model Construction Manual as a reference. The youth have become articulate, and with their improved knowledge on the environment they have obtained confidence to effectively discuss environmental issues found within various watersheds. At the Water Forum, held in Belo Horizonte, presentations reaching, politicians, other environment groups, several schools, and the general public were effective in reaching various communities within the state with an improved awareness and understanding of the local environment in a watershed context.

In Pirapora the youth with previous experience were allowed to contribute their experiences. This assisted with the workshops, and allowed for processes to be more driven by a local influence in understanding the many micro basins of the Sao Francisco River. The process was highly participative with many youth from the Agente Jovens and Unimontes working with members from the municipality and SAAE to identify local

environmental, economic and social concerns and then proceed with the construction of a watershed model in Pirapora.

Watershed Model Repairs

The Três Marias Watershed model is the first model built in Brazil with a participatory method. It was heavily used and traveled to various locations through the months of December 2005 to February 2006. Problems arose relating to water leaking at a couple of locations along the edge of the model. Spray expanding foam material was purchased in Canada, and successfully applied. Repairs were completed by the youth, in which the sides of the model were removed, sanded, and stained with several protective coats of varnish. An extra layer of Styrofoam was added to one area of the model surface in order to increase the elevation and prevent water from pooling along one of the edges. The model was repainted, the edges were sealed with the spray foam and silicon, and several additional coats of varnish were applied to the entire model for further waterproofing.

Observations:

The repairs were successful in preventing the leaks from occurring, and the spray expanding foam was sought out and purchased in Belo Horizonte for use with the construction of the Beira Rio and Pirapora watershed models. The youth were keen to repair the model and offered many ideas as they were engaged in problem-solving discussions.

Formal Education Activities

Janet Strauss was brought from Canada to work with Barbara Johnsen of Três Marias. Together ideas and planning strategies were developed. Networking with the Secretary of Education led to a meeting with the director of the Professor Johnsen Elementary School where a digital version of the school learning outcomes was obtained from the director. This school became a focus school for class activities and provided space for watershed model repairs. An introductory presentation with Janet, Barbara and the youth was successful in gaining interest and support from the teachers. Community mapping in the classroom was effective in extending the perception of the community activities amongst teachers, and students.

Observations:

An idea of having a pilot school in Três Marias was discussed and observations highlight concerns of teachers being capable of infusing watershed and sustainability concepts into their classes. The main concerns include providing support for teachers in classroom activities and the time and resources necessary to properly prepare teachers in understanding the watershed concerns.

Barreiro Rio Watershed Model

Once the material and supplies were gathered the youth were able to gather the maps and take on construction of the model with minimal assistance. A presentation was done for the community of Beira Rio to inform the community of the upcoming events and allow for broader participation in the construction process. Building on the success of the Três Marias model, support was obtained from the Municipality of Três Marias. This permitted the use of the carpenter space to build the base, and two pairs of knockdown sawhorse for the legs (one for Pirapora, one for Beira Rio).

To obtain space for constructing the watershed model in B.R. the youth approached many businesses. Most businesses were not able to provide space, however it was made available in a vacant building beside the church. The space was deemed small without much ventilation. Although it is a central location in the town, the space restricted the number of participants. Therefore, in April, permission was obtained from the local Catholic Priest to allow use of the church for construction and display of information.

In March the number of youth involved in the watershed presentation seems to have been streamlined. Several youth originally involved in the construction and presentation during the launching no longer seem engaged in the process. In Três Marias it was apparent that several youth were not aware of the construction of a second watershed model, and inquired about the process. However, follow up with the youth did not seem to occur in the initial stages as the focus remained on the youth involved in activities occurring in Beira Rio. These youth were keen to construct another watershed model representing the area of Sao Francisco from the reservoir to the confluence of the Abate River. In April, the youth constructed a banner to announce the presence of the construction of a watershed model. It was hung on the outside of the building in a location visible to anyone entering the town. Furthermore, in April, the youth went to their local elementary school to present what they are doing, and spent time showing

elementary students how to build landmark features. After this many local youth were present and assisted in making the construction of the watershed model.

Observations:

The youth's ability and workmanship is impressive. Each week a work plan was reviewed and direction was provided. The quality of the work completed in the construction process surpassed expectations. The youth seem proud when they are able to involve others. However there are times that particular individuals are overly possessive of wanting to do the work.

Permission to use the church space allowed for more people to be aware of the watershed model. With materials displayed in the church the project was allowed to reach more people.

Watershed Model Presentations

The youth in B.R. and Três Marias presented the watershed model at the Water Forum in Belo Horizonte, assisted in the workshops in Pirapora, and did a presentation to introduce teachers in the Professor Johnsen School to the Três Marias Watershed Model. They are able to adapt the presentation to the varying audience and able to individually conduct the entire presentation if required. At the Water Forum, held in Belo Horizonte, the project and the youth received a lot of attention. The press was attracted to the model and during the grand opening the politicians stopped by and paused for approximately three minutes. The youth became more comfortable with the media through interviews and the request of doing several takes of the presentation on camera. For a live broadcast, on the state legislature's public T.V. channel (*Assembleia TV*), the media began with showing the pollution being placed on the model and then scanned to a few other booths. Broadcasts were conducted on *Assembleia TV* on March 21st, and University Channel and TV CEMIG on March 22nd. Many different newspapers conducted interviews with the youth and an article was printed in the OTEMPO on March 22nd (p.B7). The watershed model was a unique feature at the Water Forum and engaged many different people in discussions. Four schools did visit the forum and spent the majority of their time with the watershed model as the youth from B.R. continued offering presentations to the public.

Observations:

For many of the youth traveling to Belo Horizonte this was their first visit to a big city, and it was full of many new sights and experiences. It was a liberating experience for them as they gained knowledge of media activities, political processes, the work completed by many other environmental groups, as well as city markets and lifestyles.

It was evident that youth have become articulate in discussing pollution concerns in a watershed context. A presentation at Unimontes involving two members from the B.R. team in Pirapora allowed for the opportunity to share experiences with university students. With many different experiences the youth have overcome much of their initial fears of speaking in public. They have gained confidence in their ability and have found their comfort zones in public speaking. This was evident in many situations outside of the presentations, such as approaching businesses for use of space, and in speaking to the visitors from other communities, and funders from the Banco do Brasil group.

Pirapora Workshops

The opening workshop in Pirapora was very successful and obtained support from the municipality, students and directors from SAAE. During this workshop the directors of SAAE confirmed they would provide the funds and support necessary for a watershed model to be built in Pirapora. Space in Pirapora was provided by SAAE, and the municipality provided transportation for the Agente Jovens.

In the early stages of the workshops, a survey to gather baseline knowledge on watershed and pollution concerns was distributed to many participants. The initial activities of the workshops involved the planning of upcoming activities and having participants understand the support networks available in Pirapora. The youth from Barreiro Rio were a great addition to each workshop and assisted in explaining various processes involved in constructing model and conducting public presentations. They provided a local influence in understanding the many micro basins of the Sao Francisco River. Further workshops focusing on how to construct a watershed model in a participatory manner involved being cognizant of the cultural, recreational, environmental and social concerns in the area. The Agente Jovens, representative from various NGOs and several University Students from Unimontes participated in the workshops. Eventually historical photos of Pirapora were obtained to assist in understanding the area.

The unique features of land depressions and many lagoons were successfully represented. The movement of water on the model accurately depicted the drainage and hydrology of the surface water. Many Agente Jovens assisted in the construction process and time was allocated to assisting the youth with understanding the watershed area, location of landmark features and how they could present and paint the watershed model.

Observations:

The watershed model is unique since the city is built on the flood plains of Sao Francisco River and contains many lagoons. The details on the landmark features are very creative. Participants are becoming very artistic and making features to represent many different concerns, such as not having open water tanks on the roofs of residence in order to reduce breeding grounds for mosquitoes.

For the participatory process with the B.R team it is evident that the youth have gained confidence in their work. It appears 'mental leaps' were made with the youth as they took the initiative to explain the importance of having a participatory and interactive process in which people build the land mark features and pour water on the model, rather than automating any of the construction or presentation processes.

The SAAE employees became dedicated, and to avoid any further disruption in their schedule they volunteered time on a holiday. The directors were very excited and became very involved by receiving positive press on the construction process. Many links were made between representatives of NGOs, SAAE, the municipality and Agente Joven. The watershed model construction manual was used by SAAE to do weekly tasks on the model and it was apparent that the employees are eager to have a new tool for environmental education.

Field Trips

In the first week of April 2006 a boat trip from B.R. to several kilometers up the Abate River allowed the youth to observe the complex issues surrounding community sustainability. Recording their observation on maps they became familiar with the maps, topography, various tributaries, pollution issues, the local ecology and the beauty within the watershed. Information collected by the youth was discussed and placed on a larger map of the watershed for reference while constructing the watershed model.

The process of seeking to learn about the watershed occurred with a field trip within the watershed of Pirapora. With over twenty-eight participants we visited several sites including: lagoons, discharge areas, rivers, and industrial sites. Several discussions of pollution concerns occurred. A listening exercise to compare the sounds of a lagoon highly polluted with garbage, with one that is not, was successful in stimulating different thought and extending the perception on the environments. It involved a comparison and interpretation of the surroundings through hearing seeing and smelling.

Observations:

In each field trip the majority of the participants have never been to the sites. Therefore it was a new experience for most individuals, including municipal employees in Pirapora. Participants were provided with a direct experience of being in nature and were allowed to experience their surroundings. The field trips provided a better sense of place, which can extend into caring more for their surroundings with new perceptions of the environment.

In Pirapora the youth provided a drawing and a summary of their observations. Comments from the municipal employees were that they loved the field trip, especially the listening exercise. Many participants, including the bus driver, were contributing to the knowledge of the area.

Difficulties:

Planning and preparation:

The planning activities and support networks were not conducted prior to commencing work in Brazil. Maps were not prepared, space was not provided, and groups in Pirapora seemed hesitant about constructing a watershed model. Therefore much time was allocated to building the support network, obtaining maps, arranging for supplies and construction material. Due to time allocated for the gathering of resources and obtaining support in March, it was apparent the actual construction of the watershed models would likely not be completed within the time allocated in April. Therefore, the construction of the new models began during the last week in March. With a reduced time frame of three weeks for completing the construction of two watershed models,

more time was allocated to the workshops in Pirapora, while the youth in B.R. continued to receive support to work independently.

Map availability in Pirapora:

Although a request to gather maps was made in December of last years it was surprising to learn, while in Pirapora, of problems in obtaining topographical maps of the area. This should have been discovered prior to beginning the workshops. Therefore, extra time was spent on developing maps, while workshops focused on understanding the concerns of the area and the resources available. Once it was apparent topographical maps of the area were not available, SAAE contracted individuals to develop digital topographical maps of the municipality. For areas without topographical lines, several elders were sought to offer their observations regarding the hydrology of the area. Once in agreement with the majority of participants, the topographical lines were drawn in for the areas without the original data.

Perceptions of the terrain in Pirapora:

Every watershed has its unique features and associated problem solving. During the construction process, in late April it was determined, due the small scale (1:2) of the model, that the publics perception of the topography would be contorted by the appearance of Pirapora residing on a large hill when it is relatively flat. Therefore, adjustments were made to remove several layers without losing the many topographical features.

Results

- Repair the Três Marias Watershed Model.
- School venue and support for formal education activities.
- Introductorily presentation of watershed education activities for teachers.
- Links between Canadian and Brazilian partners for class education activities.
- Watershed model presentations to politicians, general public and four schools.
- Media coverage by *Assembleia T.V,* the University Channel, T.V. CEMIG, several newspapers including OTEMPO in Belo Horizonte
- Media coverage on the radio and in several print media in Pirapora.

- Youth involvement in conducting workshops and construction of watershed models.
- Support from SAAE and the Municipality of Pirapora for the construction of a watershed model.
- Involvement of University Students from Unimontes and the Agente Jovens in Pirapora.
- The development of a survey to gather a baseline of watershed knowledge.
- Maps and supplies for B.R. and Pirapora watershed models.
- 2 Power point presentations on the building process.
- 11 Watershed Model workshops in Pirapora.
- 3 watershed field trips.
- 1 presentation to the Rotary Club.
- 1 presentation to students at Unimontes involving the B.R. team.
- Links in Pirapora between local NGOs, the municipality, SAAE, students from Unimontes and the Agent Jovens.
- 1 meeting with Secretary of the Environment in Três Marias to discuss Best Management Practices.
- Construction process for two watershed models.
- 1 tour of CEMIG with youth from B.R.
- English and Portuguese language training.
- Improved knowledge of countries with exchange of information with Canada and Brazil.

Next Steps and Recommendations

- The watershed models are almost complete. Each model is at a stage of being painted and having the landmark features placed onto the model. Having each group finish the model will provide more ownership and responsibility for the construction process. In B.R. this has provide for an excellent activity to assist with the formation of a youth group.

- To assist in understanding how the learning and understanding of watershed progressed, the introductory survey should be followed with an exit survey after the launching of the Pirapora Watershed Model in June. This will provide for a more scientific approach understanding and evaluating the educational effectiveness of the process.

- The Agente Joven involved in the construction should be given a second watershed tour in Pirapora to assist in making their own presentations for the watershed model. Following a similar process done in November 2005 another tour will assist in confirming the youth's original thoughts and observations and in engaging the youth in developing a presentation.

- The repairs process should be included in the Watershed Model Construction Manual. This should become an extra step included in the construction process.

- The youth in B.R. should be supported and provided with the mean of how to involve others in their activities. For social inclusion for many of the youth could be provided with assistance in finding work. Their skills obtained in constructing and presenting the watershed models may assist in finding work. Showing them how to plan and obtain support for the construction of a watershed may allow them to build other watershed models. Allowing them to take the lead on such a process will put the onus on them to obtain work, and provide them with knowledge to pursue future work with building watershed, and provide them with the confidence to achieve what they want. Prior to building a watershed model, an outreach strategy consisting of conducting presentations of the models in various schools may allow for more student participation if coupled with participant sign up sheets.

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- The use of the watershed model can be used in the classroom education activities. Integrating the abilities of the youth involved during informal activities with the needs of the formal education activities, processes of sustainable learning can be achieved. The informal education process of building and presenting the watershed models serves the needs of educating the general public, while building a watershed model. The youth have gained much experience in working and speaking with various age groups by conducting many public presentations. Many of them are very good with children. The formal needs of providing support for teachers working in the classroom could be met with the involvement of these youth as support for teaching activities. Using the Três Marias watershed model in the classroom setting, we can expand the knowledge of the area by having more information and represented features placed on the model. In particular, information pertaining to the types and location of different fish species, the *cerrado* ecosystem, history of the area, and social functions could be studied and represented on the model.

The goal would be to represent the interconnectedness of each area of study and provide a dynamic approach of working towards identifying various interests while establishing processes of reconciliation. This could involve four classes, in which each takes one of the four subjects to infuse the learning into their classrooms. Having four classes participate, the information gathered within each subject area will have an outcome that matches the curriculum and allows for artistic abilities through creating 3-D features that are placed on the model. The corresponding information will be placed into an atlas to act as a legend of items of the model. Then each class may use the watershed model to present the information to each other in an interactive atmosphere. The information and work done is recorded in the atlas, which may travel with the model and provide reference material for future public presentations. In turn, it assists the informal education activities. Teachers can swap subjects and train each other in how they achieved the learning outcomes, and build on the information provided in the atlas. A reward of having the classes present the information and the material placed on to the model and into the atlas will provide a reward for the teacher's efforts.