

GIS/Mapping

Case Study: Kofiase

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for the OSI Information Program*



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OSI - GIS/Mapping Project

Case Study: Kofiase, Ashanti Region, Ghana - Conflict Management

Person Contacted: Peter Kwaku Kyem

ISSUE: How can native groups come to terms with state officials in the management of forests in the Ashanti region of Ghana?

SOLUTION: A Ghanaian-born, US-based GIS Expert works with local groups to develop mutually agreeable maps that provided a forum for foresters and representatives of local community groups to jointly plan and collaborate to protect local forests.

(Adapted from a series of interviews with Dr. Kyem and from his article, "Promoting Local Community Participation in Forest Management through the Application of a Geographic Information System: a PPGIS experience from Southern Ghana ")

Dr. Peter Kyem, a professor of geography and GIS technology at Central Connecticut State University in New Britain, was acutely aware of the reputation that academics had gained for swooping into the developing world, conducting research, and quickly leaving. Yet for his own PhD research, Kyem could not resist the urgent need for transferring his skills to people in his own homeland, Ghana. Eschewing his hometown of Bibiani to work instead in the larger Ashanti region of the country, Kyem sought to carry out a study on alternative uses of GIS. The participatory GIS (PGIS) project was intended to foster local capacity building in GIS applications. The project was also implemented to study the myriad issues surrounding ownership of forested lands and apply map-based approaches to resolve conflicts and facilitate discussions between local farmers and foresters in the rehabilitation and protection of local forests.

The Ghanaian system of forest reserves was established to protect cocoa farms in southern parts of the country from harsh, dry winds from the north, and to also ensure a future supply of timber. Yet the law establishing the forest reserves maintained local ownership of the lands despite state tenure of the forest reserves. Over time, as urban areas grew, the demand for forest resources increased exponentially. This aside, unfavorable environmental conditions and frequent forest fires drove native communities to seek greater control of local forest land, turning some protected forests into food farms. Conflicts have thus arisen over land use across Southern Ghana, pitting local farmers against forestry officials and people with a greater commercial interest in the forest. In 1990, the Ghanaian government adopted a new land use policy that sought to integrate local community groups into the management of the forests but mistrust between local farmers and foresters threatened this new partnership.

Motivated by the proposed favorable changes in official

forest management practice and the presence of GIS and remote sensing facilities within the Forestry Department, Kyem and his colleagues designed a PGIS project and implemented it in the area to facilitate the establishment of collaborative forest management institutions in the country. Kyem first identified stakeholders within the town of Kofiase and used them to establish a Collaborative Forest Management Committee (CFMC). The group comprised of fifteen natives and six professional foresters, who together represented various interest groups all with interest in the outcome of the forest management project. After this, a series of participatory exercises were planned for members of the forest committee, including stakeholder analysis, historical and participatory mapping, ranking and brainstorming. Each stakeholder analysis activity helped to gauge interest in different elements of the project, allowing discussion to include, for example, the low level of official input by locals, despite their relatively high understanding of and experience in local forestry issues. The CFMC thus initiated a dialogue between contentious groups where only hostile conversation had previously existed. Building upon this foundation, Kyem explained the concepts behind participatory GIS mapping and instructed the group in the interpretation of GIS-designed maps.

Members of the forest committee were then led to draw maps of their community and its surroundings on the clay ground to depict the geographical location of their village, then the forest, its land cover categories and the location of known resources within the reserve. The maps were later transferred onto a paper flip chart, and finally digitized into the GIS program where it was fitted with geographic coordinates to facilitate further discussions. "I did much of the mapping, but I explained every aspect of the process to the participants," Kyem says. "I remained neutral and tried to show them how the maps were a neutral tool, but that when we plugged the subjective information into the ArcView GIS program, they could see the manifestation of their own ideas and preferences."

Earlier in the discussions, the brainstorming exercise had revealed two serious threats against the local forest. These were annual wild fires that had degraded much of the forest and a dispute between a local businessman and his supporters who wanted to log the forest and several inhabitants of Kofiase who were against the logging. As part of the participatory mapping exercise, Kyem led the group to prepare a fire hazard risk map of the forest for use in monitoring fire outbreaks within the reserve. By this time, the mapping exercises had prepared the grounds for negotiation between the two factions in the forest logging dispute. Kyem had therefore invited the groups to a series of meetings to attempt a management of the conflict with GIS. Using physical, tangible maps to illustrate the conflict allowed the groups to see not only where they diverged, but also locations within the forest where they shared common interests.

"As a conflict management tool, we found that one great advantage the GIS held was with the farmers - when they focused their minds on the maps, the bickering stopped. They realized they couldn't talk without substantiating their words with data... Cross-classifying data to create a conflict map of preferences from both parties helped to redirect the focus of discussions on areas in the forest where disagreement occurred between the two groups.
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To evaluate the PGIS project, Kyem prepared questionnaires and gave them to members of the forest committee to survey expected contributions of GIS and participants' feelings about the efficacy and relevance of the technology. The evaluation revealed that although the majority of committee members had expressed reluctance or disdain for GIS prior to the project, the simple and effective applications of the technology led to a complete reversal, and most participants expressed satisfaction with the role GIS played in the exercise. They were also pleased that GIS helped to enrich the communications among the adversarial factions in the committee.

After fifteen months in Ghana, Kyem returned to the US, distributing maps to the entire CFMC prior to his departure. Having hard copy maps in their possession permitted each group to recognize both the firmness of their own needs and the relative similarity of their positions. The relative neutrality of the maps, with their depiction and analysis of empirical facts, helped to reinforce and give value to the cultural and social beliefs of the involved parties. The villagers called this a form of "empowerment," paving the way for their inclusion in forestry management and protection. The GIS helped to catalyze the collaborative and consensus building processes for the project, but did not function as a substitute for them. It also helped not to limit the issues at stake exclusively to land and resource management.

Unfortunately, upon Kyem's return to Ghana two years later, he found that the local committee had fragmented and no final resolution had been met between local farmers and the Department of Forestry. Many of the committee members, particularly the youth who had been eager to cut down forest timber for economic opportunity, had moved to larger cities and others who remained had begun to abuse the power bestowed upon them as members of the forest committee. Although Kyem still sees the Kofiase work as a great example of PGIS work, he feels that the success of the project would have been ensured in the longer term had there been involvement from a local NGO. Harnessing the enthusiasm of a local nonprofit organization dedicated to the cause would have seen the problem through to its resolution. The organization would have also utilized the GIS and mapping technologies for additional scenarios that could have empowered the underprivileged groups within the community. As Kyem suggests,

ideally the stakeholders in the situation would use the technology as supportive of their cause: "We have to think like activists."

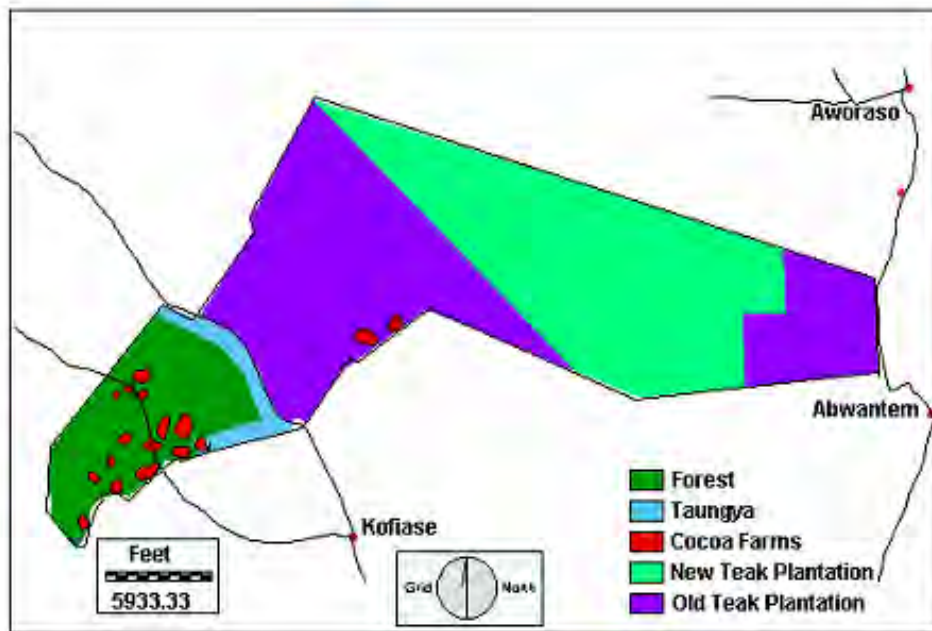


Figure 1: Aboma Forest Reserve- Landcover Types

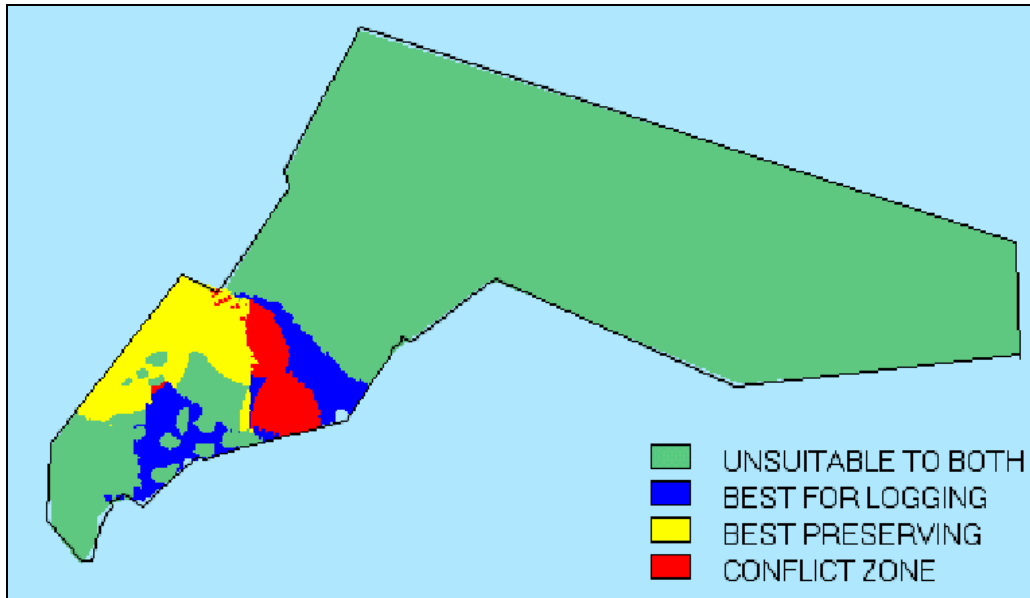


Figure 2: Aboma Forest Reserve- Cross-classified Map for Logging and Forest Preservation Objectives