TARGETING INVESTMENTS FOR POVERTY REDUCTION FOR DECISION MAKERS

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ABSTRACT

Developing tools that decision makers can easily use to better improve the targeting of investments is important in developing countries. Deployment of a simple tool like ESRI's ArcPublisher® extension application provides the decision maker with a good way of quickly understanding village conditions compared against locations of historic investments. The intent of this application was to improve the targeting of and planning for future investments. The paper will describe the steps in creating the database and the ArcPublisher® application developed for the Maradi Region, one of Niger's most populated and poor regions. The paper will explore the critical aspects of developing a design that a decision maker can effectively use to help provide simple access to current information from an analytical perspective.

INTRODUCTION

Given limited investment dollars targeted to poor countries, there is a need for developing tools that assist decision makers improve the targeting of investments. The development and deployment of a simple spatial analysis tools are critically needed to support not only donor organizations but also the countries in need of help. This paper presents a description of efforts to identify and develop a spatial analysis application tools that are designed to help improve development decisions in poor countries. Geographic Information for Sustainable Development (GISD) is a term developed by the donor community in an effort to focus the use of GIS technology for improving underdeveloped countries. The potential and need for this tool is obvious from the professional GIS community, but getting decision makers and national leaders to not only invest in such a system but actually use it in aiding the targeting of investments or understanding the complexity of poverty it has proven historically difficult. This condition is rapidly changing as the evolution of the technology becomes more embedded and dispersed. This has happened because of dramatic successes of the tool used in disaster recovery and management as well as the widespread use in navigation and tracking applications. Historically in the international development arena, technologists have spent lots of resources building "GIS's" rather than integrating a "solution" context.

The Millennium Declaration of 2002, adopted by 189 states of the United Nations, mainstreams 8 development goals. (See Box) In concert with this effort, the World Bank has in the last five few years begun a program that targets the poorest countries (Highly Indebted Poor Countries or HIPCs) that includes a "principal debt forgiveness" program with strings related to poverty reduction and redirection of interest payments to education and health care.

Box 1: Millennium Development Goals

- Eradicate extreme poverty and hunger
- Achieve universal primary education
- Promote gender equality and empower women
- Reduce child mortality
- Improve maternal health
- Combat HIV/AIDS, malaria and other diseases
- Ensure environmental sustainability
- Develop a global partnership for development

In May 2001, Stone Environmental participated in a World Bank Appraisal Mission in Niger to determine progress in their Poverty Reduction Efforts (PRP). This was a follow-up to our earlier efforts in creating a village-based poverty/vulnerability GIS application and atlas. The appraisal team members wanted to learn whether the last few years of investments at all correlated with the areas that had been categorized as most vulnerable. The investment locations were overlaid on the poverty living condition information developed from recent census and climate/land use data. The Maradi Region Poster on the next page is an example of using ArcView® to capture the essence of investment.

The result had an immediate impact as the team realized that few of the investment decisions were based on helping the villages in most need. They also were cognizant that investment decisions are made with a healthy dose of political reality. This did not stop the team from recommending that the implementation program in Niger include the development of a National Information System to underpin the poverty reduction planning, monitoring and evaluation efforts. This gave us hope that the people in the development investment community were beginning to understand the power of using GIS as solid planning and evaluation tool.

SPATIAL ANALYSIS SUPPORT FOR IMPROVED GOVERNANCE PROJECTS

In many African countries developing decentralized governance is a major program effort. The deployment of simple tools for understanding the condition of each "new" administrative district is important. The three components related these efforts are:

1. Building participation and partnership at the local level among commune leaders;
2. Strengthening financial management systems and procedures at the community level;
3. Strengthening the national macro-political environment for decentralization.

Governance projects can realize a number of concrete benefits from an information management system that supports both general understanding of the resources and basic conditions of the priority communes and for tracking and reporting of progress in achieving desired outcomes. A sub-national information system could easily become part of a synergistic donor, national and communal project that could become a component a national information system. Bringing readily useable information to subnational administrative units is critical for program success. The information system imagined would help bring transparency of effort and opens the opportunity for substantive discussion of issues on governance and commune needs.

Working with all levels engaged in such projects, an agreement on desired commune information uses would set the stage for the effort. Box 2 contains a sample of the kind of data that could be compiled by commune for further understanding commune capacity for either taxing or raising revenues. A low cost GIS tool can be developed for easy retrieval and display of commune data. A simple mapping tool that will enable any user at any project or government level to see the status of governance actions accomplished planned or delayed. This shareable and reusable tool can be based on using either GIS software tools such as ArcPublisher® , ArcIMS® or Map Objects® (Run Time Application) and/or ArcExplorer®.

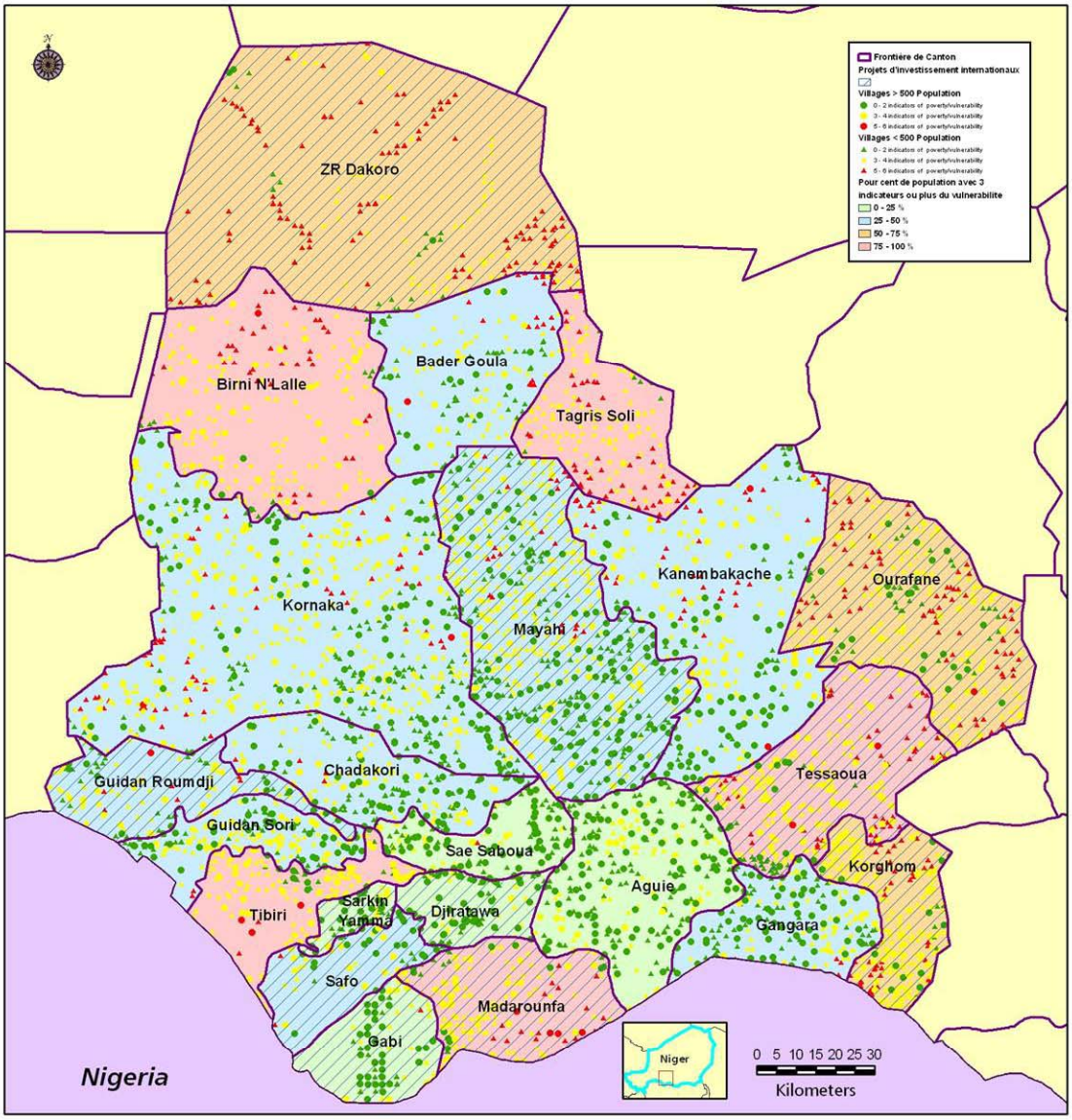
Box 2: Commune Resource Capacity

Examples of a "capability/resource" capacity information database would include:

- Kilometers of road/track by commune by paved and unpaved status.
- Kilometers of streams and rivers/hectares of water in ponds, wetlands, lakes.
- Ecologic zones/Landscape zones—production capability
- Number of schools by type
- Number of wells by village
- Number of health centers

PRIORITISATION DES BESOINS D'INVESTISSEMENT À DES FINS DE RÉDUCTION DE LA PAUVRETÉ

Région de Maradi, Niger



Il s'agit de la région la plus peuplée du Niger. C'est aussi le « grenier à blé » du Niger et une région productrice de productions végétales pour l'exportation. Néanmoins cette région présente des poches de grande pauvreté, qui doivent être identifiées et classées par ordre de priorité en matière d'investissements. À la demande de la Banque Mondiale/ CAP et à l'appui du PSRP du Niger, Stone Environmental a effectué une analyse comparant le niveau de pauvreté aux investissements en cours réalisés par le gouvernement, les donateurs et les ONG. À cette fin, Stone Environmental a représenté graphiquement les villages fonction de leur niveau de pauvreté pour six types de conditions de vie. La pauvreté relative des populations villageoises a ensuite été récapitulée pour chaque canton/commune. Les cantons/communes avec les tons les plus sombres sont les plus vulnérables. Ces information ont alors été superposée et comparée aux emplacements des projets actuels d'investissements par les donateurs. Les lignes diagonales indiquent les cantons/ communes bénéficiaires actuels de l'assistance. Cette analyse montre que les cantons de Birni N'Lalle, Targis Soli et Tibiri sont les cantons les plus vulnérables, ne recevant aucune assistance, et qu'ils sont donc des cibles parfaites pour les investissements futurs. L'analyse montre aussi que certains cantons qui sont relativement pourvus reçoivent une certains assistance. C'est la première fois qu'une telle information est présentée visuellement et donne des indications quant aux priorités concernant les investissements.

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PERFORMANCE MONITORING

Spatial analysis tools could be valuable in assisting in the measuring progress in project completion or programmatic impact. This measurement is a typical requirement in most investment related programs. Spatial analysis tools are ideally suited assessing and visualizing program and indicator information. Providing project participants and project managers can both benefit from this approach.

The development of a responsive system of performance monitoring can be likened to that of an electronic scorecard. The concept comes out of the "Balance Scorecard" work done by Robert Kaplan and David Norton. In their new book, *The Strategy-Focused Organization, How Balanced Scorecard Companies Thrive in the New Business Environment*, they outline five principles to follow:

- "Translate the strategy to Operational Terms
- Align the Organization to the Strategy
- Make Strategy Everyone's Everyday Job
- Make Strategy a Continual Process
- Mobilize Change through Executive Leadership."

The desktop/scorecard envisioned contains those performance monitoring indicators critical to measuring program investment success for each level of operation. The scorecard must provide valuable performance information at multiple levels and for programmatic accomplishment and financial accountability. The scorecard needs a hierarchical construct so that decision makers at each level get the appropriate level of information mapped to their function in the organization.

- At the executive level
- At the program level
- At the project level
- At the field operational level

A recent USAID Request for Proposal laid out a highly detailed set of performance indicators for measuring success in meeting program goals in family planning (FP). We believe that their framework can easily be transformed in a spatially enabled reporting system using simple GIS tools. "The overall goal of USAID's Private Volunteer Organizations/Non-Governmental Organizations (PVO/NGO) in the Family Planning/Reproductive Health (FP/RH) Flexible Fund (FF) is to strengthen PVO/NGOs role in family planning/reproductive health programming worldwide. … The program has three main strategies:

1) Stimulating and strengthening USAID's involvement of PVOs/NGOs in FP;
2) Advancing the state-of-the-art practices among NGOs; and
3) Establishing evidence of PVO/NGO contributions to FP at all levels.

Each of the Flexible Fund's main strategies is designed to help PVOs and NGOs achieve the following Strategic Objective (SO) and intermediate results (IRs). The Results Framework for the Flexible Fund is as follows:

Strategic Objective: Increased FP use and Improved FP/RH Practices			
IR1: Increased **knowledge and interest** in FP through PVO/NGO involvement	IR2: Improved **quality** of FP service delivery in facilities and in the community	IR3: Increased FP **access** in communities	IR4: Improved social and **policy** environment for FP/RH services and behaviors"

The results framework could easily be enhanced by the use of simple spatial analysis tools. We also believe that the financial management/report tracking elements of these programs can be integrated within a similar framework. A "spatially-enabled" approach would provide program managers and grant administrators a tool to understand many multifaceted aspects of their programs.

COMBINING SPATIAL ANALYSIS WITH ECONOMETRIC SIMULATION MODELS

The World Bank has developed *SimSIP* (Simulations for Social Indicators and Poverty) as a macro-level simulation tool to provide a better understanding the costs of reaching MDG targets. (http://www.worldbank.org/simsip) The *SimSIP* application was developed using MS Excel as its shell and consists of a series simulators that facilitate the analysis of issues related to social indicators and poverty. The simulators were prepared to assist governments preparing their Poverty Reduction Strategies. One of these simulators, *SimSIP Education*, measures the efficiency of the education system and simulates the cost of reaching education targets. The costing is done through cohort analysis for various cycles of schooling (preschool, primary, secondary, etc). Three sets of assumptions must be entered by the user in the simulator: country demographics, the performance of the education system (age at entry in the various schooling cycles, as well as structure of repetition, promotion, and drop out rates), and costs (supply-side costs, including teacher wages and teacher-student ratios; investment costs related to the training of new teachers and the construction of new classrooms). All variables are allowed to change over time. Simulations are provided for education outcomes or targets and for the cost of reaching these outcomes.

The *SimSIP* simulators are useful tools at the macro level, but they can not assess spatial differences in the MDG indicators or poverty distribution within regions of the country. They are helpful in evaluating the budgets needed to reach the MDGs but not where this budget should be allocated. Stone Environmental is currently working with the World Bank in developing a spatially enabled simulator extension that would incorporate village level information. This tool allows the user to geographically simulate investments and to estimate the effects they could have on achieving the MDGs indicators.

This requires not only an allocation algorithm, but also a formula to estimate the MDGs indicators once the simulation is done. In the case of education, we are assisting the World Bank in building a school allocation GIS-tool for the West African Republic of Mali. We are using 1998 census data for 10 000 villages that had information village level school information and a 2001 nationally representative household survey.

The spatial allocation simulation tool is being built in VBA, both in MS Excel® and ESRI's ArcGIS®. MS Excel is used to store the input data and analyze the output data to evaluate the impact of the simulation on school enrollment. The spatial allocation tool operates within ArcGIS®. The input data includes budget, cost of schools, and a regression coefficient. The tool uses the allocation algorithm to create schools, update the village database and export the output with the new schools into Excel.

CONCLUSION AND NEXT STEPS

We have attempted to describe is the development of spatial tools for assisting both developing countries and donor community improve there efforts at targeting resources and measuring results. The next step is the development of these tools for universal application. The GIS tool kits currently available make all of this development possible.

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