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## **Strengthening Mozambican Capacity for Agricultural Productivity Growth, Policy Analysis, and Poverty Reduction**

**Annual Project Narrative Report - FY08 (2007/08)  
Mozambique Associate Award / Food Security III LWA CA  
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**Annual Project Narrative Report FY08  
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# **Strengthening Mozambican Capacity for Agricultural Productivity Growth, Policy Analysis and Poverty Reduction**

## **Introduction**

Three major activities of policy interest were either initiated by the Ministry of Agriculture (MINAG) or the Government of Mozambique, namely the preparation of strategic plan for the agricultural sector, agriculture public expenditure review (AgPER ) and preparation of a three year action plan for food production in response to the world food crisis.

The agricultural sector has been geared by the Agrarian Policy and Strategy for Implementation (known by the Portuguese acronym: PAEI - “Política Agrária e Estratégia de Implementação”) approved by the government in 1995. The PROAGRI I and II and the sub sector policies such as for land, forestry and wildlife were based on the PAEI. The PAEI is more than 10 years old and required to be reviewed to reflect new domestic, regional and international development priorities such as Poverty Reduction Strategy Papers (PRSP), millennium development goals and the Comprehensive Africa Agriculture Development Program (CAADP) from the New Partnership for Africa’s Development (NEPAD). The strategic plan for the agricultural sector will reflect these new realities and will be orientated to the sector and not limited to the functions implemented by the Ministry of Agriculture. The strategic plan when concluded and approved will be complemented by an investment plan. MSU is represented in the strategic plan commission by Danilo Abdula with backstopping from other MSU team members.

In 2003 an agriculture public expenditure review document was produced by the World Bank but was never approved by the Government of Mozambique. The interest to implement another AgPER arose from the need to a) monitor how the country is progressing towards satisfying the NEPAD’s Maputo declaration of allocating at least 10% of the budgetary resources to agriculture by 2008 and b) evaluate the quality of spending in terms of the structure of spending on public and private goods and also spatial allocation of spending. The aim is to assess to what extent the structure of public expenditure is aligned to policies and strategies. A task force led by MINAG and including members from the Ministry of Fisheries, Ministry of Finance, Ministry of Planning and Development, MSU, the Regional Strategic Analysis and Knowledge Support System (ReSAKSS) and World Bank is providing the general policy guidelines and direct liaison with key policy makers to guarantee buy-in by top policy makers in the government. Technical support for implementation is provided by the World Bank, MSU and Human Science Research Council.

Another event that marked this fiscal year was the world food crisis. In response to the world food crisis, the government of Mozambique set up an inter-ministerial team led by the Ministry of Planning and Development, comprising representatives from MINAG, the Ministry of Finance, Ministry of Industry and Commerce, and Ministry of Transport and Communication. The team was responsible for preparing a three-year action plan that will enable Mozambique to be self sufficient in main food staples. Draft documents have been produced but these have not been made officially available for discussion. The general impression being presented is that the action plan will involve a substantial government intervention in terms of resources and actual implementation. Government attention is focused on this action plan, such that the long term view for the development of the sector, including the preparation of the strategic plan, is a lower priority.

The mechanisms for the implementation of the government's three-year Action Plan for Food Production (known by the Portuguese acronym PAPA) are still not well-defined. A key measure is to encourage the use of fertilizers and participation in product markets; however, it is not clear how the plan intends to achieve the changes on input and output markets. The fertilizer and seed pilot voucher program can be one promising way to induce the uptake of productivity enhancing technology while simultaneously promoting private input market development, although its implementation is delayed. With colleagues in the Directorate of Economics (DE) of MINAG and the Agricultural Research Institute of Mozambique (IIAM), MSU can play an important role in informing policy decisions to promote profitable value chains and public investment decisions that will induce productivity increases under the market-led economy.

Another activity of strategic interest is the preparation of the strategic plan for IIAM. MSU continues to be an important partner in this exercise, building from earlier work on priority setting for Agricultural Research and Investment Plan for IIAM.

At project level a revised scope of work (SOW) and budget were prepared to reflect the key recommendations emanating from the mid-term evaluation of the project which took place in February-March 2007. The revision of the SOW involved the key stakeholders from DE and IIAM. The modification of the Cooperative Agreement (CA) was approved on the 20<sup>th</sup> of December 2007 and a draft work plan was submitted to the United States Agency for International Development in Maputo (USAID/Maputo) in late January 2008. Given the potentially drastic USAID/Maputo budget cut for FY09, the project revised the work plan to reflect the available resources and looked for other partners to finance some of the project activities in order to guarantee staff retention for the remaining period of the project.

Among the initiatives undertaken to solicit additional financial resources include:

- a) MSU Food Security Group members submitted a project proposal under Dry Grain Pulses Collaborative Research Support Program (Pulses CRSP). This project, "Expanding Pulse Supply and Demand in Africa and Latin America: Identifying Constraints and New Strategies" is one of nine worldwide that were approved and will provide moderate resources for MSU work with the Center for Socio-Economic Studies (CESE) of IIAM. These resources will contribute to implementing of the first activity on the MSU work plan for CESE and provide resource to finance degree training for one Masters of Science trainee in Agricultural Economics. Eng Feliciano Mazuze, the Coordinator of CESE, is the principal investigator (PI) on the side of IIAM and Duncan Boughton is the PI from MSU;
- b) Michigan State University Land Policy Institute with the Department of Agricultural, Food and Resource Economics submitted a proposal to the Millennium Challenge Corporation (MCC) on the Impact Evaluation and Capacity Development Services for the Mozambique MCC compact. The proposal covers the Land Tenure Services and the Farmer Income Support Projects (FISP) within the Compact. MCC has approved the Phase One of the proposal which involves the design of the impact evaluation methodology, as well as design and implementation of a baseline survey. Team members Gilead Mlay and Ellen Payongayong will participate in this work along with Cynthia Donovan and Duncan Boughton. This project will also benefit from MSU faculty Mywish Maredia, Songqing Jin and Gerhardt Schultink who have expertise in impact assessment and land policy;

- c) Discussions were held between the MSU Project and ReSAKSS to see if additional resources can be drawn from the Mozambique-SAKSS multi-donor project which is under preparation. Given the similarity between MSU's amended SOW and the Moz-SAKSS proposal, and the recognition that MSU has comparative advantage for some components of the Moz-SAKSS, collaboration between the two projects is essential. The ReSAKSS Coordinator invited the project to submit a proposal on components of interest including a budget. While the Swedish International Development Agency (SIDA) appears, regrettably, to be backtracking on its earlier enthusiasm for a multi-donor multi partner platform, the International Food Policy Research Institute (IFPRI) through ReSAKSS, MSU and the Ministry of Agriculture remain firmly committed to making this an operational reality;
- d) The Cooperative League of the United States of America (CLUSA) and Dunavant Cotton developed a Cotton Value Chain Development Project, funded by the Bill & Melinda Gates Foundation. MSU staff member Cynthia Donovan led a subcontract with CLUSA to provide expert advice on the baseline survey design and implementation.

During the fourth quarter, there were some changes in local staff at the MSU project. Danilo Abdula's contract with the project ended on the 30<sup>th</sup> of September 2008, after 10 years of study, analysis, and efforts to help build the Agricultural Market Information System (known by its Portuguese acronym SIMA) of MINAG. Danilo was very dedicated to his work and his contributions are highly appreciated by the project and the Ministry. The experience he has accumulated over the ten year period will be valuable and we have no doubt that he will continue working in areas related to Mozambican agricultural development. We wish him all the best and expect to continue collaboration with him when opportunities arise. In mid-September the project was joined by Helder Zavale. Zavale is a permanent staff member on leave from Eduardo Mondlane University, and will be working with the project on part-time basis on the Agricultural Expenditure Review and on several comparative advantage studies, as requested by MINAG. Zavale's area of specialization is Agribusiness.

At MSU, the Department of Agricultural Economics officially changed its name in January 2008 to the Department of Agricultural, Food, and Resource Economics (AFRE), to reflect the breadth of activities undertaken within the department.

This report covering FY08 (October, 2007 – September, 2008) is organized by project objective and the corresponding activities as stated in the project work plan for this fiscal year.

**Objective 1: To assist MINAG in building institutional capacity to raise smallholder productivity and income through improved technology, markets and policies**

**1.1 Strategic Plan for Agricultural Sector and for IIAM**

The Ministry of Agriculture is in the process of preparing a 10-year Strategic Plan for the Development of the Agriculture Sector (known by its Portuguese acronym: PEDSA). PEDSA accommodates the green revolution strategy in terms of strategic actions for implementation but its coverage goes beyond food to forestry and non-food crop activities. It takes into account policies and strategies that are beyond the competency of MINAG, but which influence the performance of the sector. MSU is contributing in the preparation of the strategy through Danilo Abdula who is a member of the task-force and through regular consultation with the MSU in-country Director. The draft of the strategic plan is expected to be ready in early August for consultation with stakeholders.

The Directorate of Economics (DE) of MINAG presented a draft of PEDSA to the second Coordinating Council Meeting of MINAG which took place in Malema, Nampula Province, in August 2008 and to a meeting of the private sector as part of the consultation process. The comments focused on the role of the private sector in agriculture development, commercialization, and agro-processing. Danilo Abdula and Gilead Mlay participated in the discussions on the proposed changes which are in the process of being incorporated in the revised document.

Although DE was given a deadline of October to have a final document to be presented to the Council of Ministers, it is doubtful that this goal will be met given that some components are yet to be written, the need for wider consultation and editing of the final document.

The Institute for Agricultural Research of Mozambique (IIAM) is also in the process of preparing its ten-year strategic plan. Project staff members have been providing input and the in-country Director participated in writing up the monitoring and evaluation component of the strategy. The component on institutional arrangements is yet to be written, followed up by a general review and harmonization of the document. The strategy document benefited from earlier work on priority setting and investment plan led by MSU project staff.

**1.2 The three-year action plan for food production (PAPA)**

When the PAPA was presented at the second Coordinating Council Meeting of MINAG in Malema, Nampula Province, the following concerns were raised:

- a) The plan lacked specificity on profitable technology packages adapted to specific zones. The Minister of Agriculture charged IIAM with the task of leading the process of preparing technical facts sheets which include enterprise budgets (“fichas técnicas”). On returning to Maputo, the Minister and the Director General of IIAM visited Eduardo Mondlane University (UEM) to solicit their help given the urgency of preparing the technical fact sheets to be used during the on-coming agricultural season. The implementation of the activity involves the Directorate of Economics, IIAM, the Directorate of Agriculture Services and the UEM’s Faculty of Agronomy and Forestry Engineering (FAEF). FAEF has replaced IIAM in the coordination

function. The technical fact sheets when completed will include the cropping calendar and associated activities, recommended levels of inputs, use of labor and mechanization (including animal traction), and the expected yields. The information provided will be sufficient to prepare farm budgets and to evaluate the profitability of technologies based on expected input and output prices. With FAEF, MSU will work with IIAM and DE staff members to assist in the implementation of the activity;

- b) Supply of and demand for inputs (especially improved seeds) was another issue discussed during the Coordinating Council Meeting. On the supply side, there were still some doubts as to whether the inputs will be available timely for this year's planting season. On the demand side, the plan is based on subsidies to induce effective demand, starting with a subsidy of 70% to be gradually reduced to zero. The government is still discussing the potential implementation of a pilot voucher program for fertilizers and seeds, based on the expectation of about 20,000 metric tons of fertilizers from Egypt;
- c) PAPA focuses heavily on production and it is not very clear how marketing issues will be addressed. The key component of marketing will involve the construction of silos in strategic locations throughout the country. The government has stated that it will act as a buyer of resort.

### **1.3 Human resources development in MINAG-DE and IIAM-CESE**

During the first quarter of this fiscal year, progress was made in recruiting new socio-economists for IIAM to be allocated to CESE Maputo, and to the South and the Northwest Zonal Centers. There were 23 applicants out of which 10 were short listed for formal interviews. Five candidates were selected out of which 4 are males and 1 is a female. Contract papers have been prepared and forwarded to MINAG for clearance and transmission to Administrative Tribunal for final approval.

The in-country Director assisted the Department of Policy Analysis of DE to identify potential candidates to be contracted. The process for short listing the potential candidates for employment in DE was initiated but was quickly frozen following the removal from office of most National Directors and their Deputies. The new Director of Economics, Victorino Xavier, has been given a mandate to re-organize the Directorate to improve its performance in the implementation of its strategic functions. It is not yet clear when the process of contracting news staff will be restarted and therefore the human resource situation in the DE departments of Statistics and Policy Analysis continues unchanged.

#### ***Training of new socio-economists for the IIAM***

A group of five new socio-economists started intensive in-service training on the 22<sup>nd</sup> of January 2008. The training was completed on the 21<sup>st</sup> of April 2008. After the training, the participants left for their work stations at the Northwest and South Zonal Centers, and at CESE headquarters in Maputo. The training was being conducted by project staff (Raul Pitoro, Ellen Payongayong, Danilo Abdula, and Gilead Mlay) and Feliciano Mazuze the Coordinator of CESE. The program for the course is presented in appendix 1.

### ***On-job training***

The MSU survey specialist Ellen Payongayong assisted and guided the staff of the Department of Statistics to compile agricultural statistics from the most recent five TIAs. She also provided training to the Department of Statistics staff as well as provincial supervisors on the new sampling design, use of enumeration area maps and geo-referenced information. Gilead Mlay provided training to the Department of Statistics staff on sources of errors in agricultural surveys.

CESE socio-economists received training about preparation of enterprise budgets. Basic material was prepared and distributed to the staff and were assigned to work on enterprise budget for maize under supervision of MSU project staff and coordinator of CESE. In order to guarantee regular updating of technologies being developed and disseminated by IIAM, a guide was also distributed to the socio-economists and discussed, and each analyst was assigned a group of products to work on. Raul Pitoro and Gilead Mlay provided some orientation to CESE staff in Nampula and Lichinga on enterprise budgets based on material prepared in Maputo. Gilead Mlay prepared a short document to orient the socio-economists about data collection for enterprise budgets. The socio-economists in Lichinga, Nampula and Maputo are presently preparing enterprise budgets for maize on the basis of secondary data.

A two-day in-service training on STATA was provided to the Northeast Zonal Centre socio-economists by Eng. Raul Pitoro. The training was intended to kick-start the analysis of the survey data by the two socio-economists under supervision by project staff.

### ***Graduate training***

Alda Tomo continued with her coursework for her MS training at MSU and Isabel Siteo started her MS training in Agricultural Economics in Australia. Tomo's graduate training is being financed by USAID through the project while that of Siteo is being financed by the Australian Government. Tomo is expected to return to Mozambique in late 2008 or early 2009 upon completion of her thesis.

Eunice Cavane, a Mozambican PhD candidate at Michigan State in Community, Agriculture, Recreation and Resource Studies (CARRS), with a specialization in extension, successfully defended her PhD thesis in December 2007 and was awarded her degree. She was funded from non-FSG sources, however, Cynthia Donovan served on her guidance committee, and Cavane worked with IIAM/CESE staff members from the Central Zonal Center to conduct her field research. Her thesis, *Farmers' Attitudes and Adoption of Improved Maize Varieties and Chemical Fertilizers in the Manica District, Mozambique* will be available soon on the web.

Emma Bradley, a student at Eduardo Mondlane University with a specialization in Rural Development, wrapped up her field research on livestock and adult mortality impacts, and will proceed to data analysis, under the supervision of Cynthia Donovan



## **Objective 2: To strengthen IIAM's capacity to identify and disseminate improved agricultural technologies**

### **2.1 Evaluation of levels of adoption of Nicaragua – CTAR 198 sesame variety and Nametil peanut variety in Nampula Province**

The field study was conducted in the district of Monapo and involved 200 households. Preliminary results indicate high adoption rates in Monapo district increasing from about 17.3% in 2003/4 season to 31.8% in 2006/7 season in the case of Nametil peanut variety and from 14.0% in 2003/4 season to 32.5% in 2006/7 in the case of CTAR 198 sesame variety. For both crops, the principal factor influencing adoption is market access. The majority of the holdings producing the two crops rely on seed retained from past harvest (more than 50% of the holdings in 2006/7 season). The purchase of seeds from the market was realized by only 12.7% of the holdings producing groundnuts and 21.1% of the holdings producing sesame. For the holdings which never grew the improved varieties of peanuts, the lack of seeds was given as the principal reason for non-adoption and the lack of purchasing power was the principal reason for the sesame crop. The results indicate that adoption can be significantly improved through improvement of market access for final product and availability and access to seeds.

### **2.2 Estimating the levels of adoption of Nikwaha cassava variety**

A survey was carried out in September/October in the Districts of Memba, Mossuril, Mogincual and Nacala-a-Velha with the objective of estimating the current levels of adoption and to validate the ex-ante analysis<sup>1</sup>. The results of the survey show that the adoption rate of Nikwaha appears to be slightly lower than anticipated in the ex-ante analysis. The survey found 18% of the area planted with Nikwaha cassava in 2006/07 season compared to a projected 20% in the ex-ante analysis. While early diffusion depended heavily on NGO efforts, the current diffusion rate appears to be increasing mainly due to farmer to farmer diffusion, and is occurring away from the initial centers of distribution. These more distant zones are more costly for NGO extension, so farmer to farmer diffusion can be more efficient. Although a larger percentage of the farmers are aware of the Nikwaha variety than previously, adoption is constrained by access to planting material.

The research has found that tolerance to cassava brown streak disease (CBSD) was often not the main reason for the adoption of Nikwaha. Taste, yield and drought resistance were as important as or more important than CBSD resistance. The estimated percentage of Nikwaha growers with incidence of CBCD was above 50% and the general perception is that Nikwaha is becoming less tolerant.

The following implications of the survey findings are highly relevant to next generation Multi-Year Assistance Programs (MYAPs) implemented in cassava production zones:

- a) There is a strong farmers' interest in sweet, high yielding and drought resistance cassava varieties;

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<sup>1</sup> [Economic Impact on Food Security of Varietal Tolerance to Cassava Brown Streak Disease in Coastal Mozambique](http://www.aec.msu.edu/agecon/fs2/mozambique/iiam/rr_1e.pdf). S. McSween. T. Walker. V. Salegua. R. Pitoro. IIAM-DFDTT Research Report No. 1E. August 2006. [http://www.aec.msu.edu/agecon/fs2/mozambique/iiam/rr\\_1e.pdf](http://www.aec.msu.edu/agecon/fs2/mozambique/iiam/rr_1e.pdf)

- b) If CBSD remains a significant threat to food security, then Nikwaha may not be the solution;
- c) There is a need to obtain farmer feedback during on-farm testing and early diffusion in order to assess which cassava variety attributes are being improved upon versus duplicated by new introductions and which attributes still represent targets of opportunity;
- d) Active promotion of varieties with improved relevant attributes through multiplication of planting material that builds on farmer-to-farmer diffusion will have a high payoff for rural households.

### **2.3 Evaluation of the impact of vaccination against New Castle Disease in Central and Southern Mozambique**

Alda Tomo; MS candidate at the MSU' Department of Agricultural, Food and Resources Economics; conducted preliminary analysis of the survey data. She traveled to Mozambique to collect additional information and conduct interviews with farm households to elicit their perception of risk and losses with the disease. Alda has established collaboration with the University of Wageningen for dynamic poultry modeling and expects to finish her thesis in late 2008 or early 2009.

### **2.4 Diagnostic study to identify constraints and opportunities for bean/cowpeas production and marketing in Central Mozambique**

The bean/cowpea value chain research project under the USAID Dry Grain Pulses Collaborative Research Support Program (USAID Pulses CRSP) has been awarded. This project "Expanding Pulse Supply and Demand in Africa and Latin America: Identifying Constraints and New Strategies" is being led by Dr. Richard Bernsten at MSU, and includes collaborative research with Feliciano Mazuze and IIAM/CESE. Feliciano Mazuze and Cynthia Donovan attended a planning meeting for the Pulse CRSP from February 29-March 4, 2008 in Barcelona, Spain, developing the final work plan and activities on the bean and cowpeas value chain in Mozambique. The project involves research and training in Angola and Honduras as well. See the Pulses CRSP website <http://pulsecrsp.msu.edu/rfp/> for a brief description of the project.

The Bean Value Chain Research Project under the USAID Pulses CRSP has moved forward in collaboration with SIMA staff. IIAM/CESE and SIMA staff combined the bean research with SIMA's Annual Windshield Survey of traders and producers in order to conduct the market rapid appraisal in Central and Northern Mozambique. MSU staff C. Donovan participated in the field research, with collaboration from D. Boughton and G. Mlay on the design of the research. Based on the assessment by buyers and the observed price behavior, there is an indication that the crop harvest for the crop season 2007/08 will be lower than in the previous season. New agents in the bean sector and reduced transport and communication costs have increased efficiency in the bean value chain, with high potential for further growth, although availability of quality seeds continues to be a constraint.

Additional survey research was conducted by SIMA staff in Southern Mozambique. In October 2008, SIMA staff will revisit the research areas to follow up on the earlier work. Analysis and write-up of the Bean Value Chain Report will be completed.

## **2.5 Identification of potential for recommendation domains for conservation agriculture**

Dr Donovan started working with TIA data and other data to establish recommendation domains for conservation farming technology in Mozambique. She is being assisted by a part-time research assistant at MSU who will use mapping skills as well as analytical skills to identify zones in Mozambique that are most apt for development of conservation farming, based on existing farming systems, rainfall, risk of drought, and animal traction use. Prior research in Zambia has indicated that animal-traction minimum tillage may have excellent potential in zones of Mozambique amenable to animal traction.

MSU graduate student Christina Plerhoples submitted a draft of the report which is under review, but additional work is needed to include more detailed information in the development of the recommendation domains for conservation farming technology in Mozambique.

## **2.6 IIAM research report series**

The working paper based on Eng Mazuze's MS thesis was finalized and published under the IIAM working paper series. The working paper entitled "Analysis of Adoption of Orange-Fleshed Sweet Potatoes: The Case Study of Gaza Province" can be accessed from <http://www.aec.msu.edu/fs2/mozambique/iam/rr-4e.pdf>

Raul Pitoro updated the working paper on cotton. The working paper is currently being edited by Duncan Boughton.

## **2.7 Other activities**

- a) The project continued to support the development of IIAM webpage and uploading of documents, including the USAID-funded COMPETE project. MSU backstop team member Steve Longabaugh visited Mozambique from October 24 to November 2, 2007 to participate in a two-day website workshop whose main objective was to review IIAM's website development and management and advise the institution on a strategy to be adopted for the sustainable development and management of the site. The following were the main recommendations from the workshop:

- A website group be created;
- IIAM should initiate the process of moving the site to Eduardo Mondlane University's server. It was agreed that the domain name IIAM.GOV.MZ will be purchased and used;
- Dream Weavers should be the primary software;

- The proposed website layout and structure be passed to a website designer to be contracted by IIAM;
- The current website hosted by MSU should remain operational and updated until the new site becomes operational.

The IIAM website has been turned over to IIAM staff members who will further develop and maintain the website. All of the initial work contributed by MSU staff member Steve Longabaugh with his colleagues has paid off, as IIAM staff are able to move forward from an established site. The experience of developing that site with Steve ensured that they understood the key design components and had the basic content available. The domain on the UEM server was purchased. The new site can be seen at [www.iiam.gov.mz](http://www.iiam.gov.mz);

- b) The project staff continued to collaborate with the Directorate of Training, Documentation and Technology Transfer (DFD TT) on matters related to technology transfer. The Project Country Director participated in meetings between DFD TT and the Directorate of Extension (DNE) to define actions to improve information flow about agricultural technologies from IIAM to DNE. A working group was created to look into the modalities for production of extension manuals;
- c) Eng Raul Pitoro participated in the national cotton sector meeting organized by the National Cotton Institute (IIAM) which took place in Nampula, 7-8 November 2007. He made a presentation of a research proposal on the Evaluation of Economic Benefits of Bt Cotton in Mozambique: Implications for smallholder farmers and cotton companies. The presentation is available at <http://www.aec.msu.edu/fs2/mozambique/policypapers/btcotton-Econbenefit.pdf>
- d) The Project Country Director has continued to be involved in the COMPETE Technical Committee charged in evaluating project proposals;
- e) The Project Country Director and the Coordinator of CESE provided technical assistance to staff from the Directorate of Extension on the design of a study to be undertaken on fish farming in Manica and Zambeze Provinces;
- f) Dr. Cynthia Donovan conducted a three-day poster training in December, 2007 which involved 5 participants, two from IIAM and three from DE. The participants finalized print ready posters to be printed in Maputo;
- g) Raul Pitoro assisted in preparing CESE's proposal for the implementation of activities of the STABEX project;
- h) Gilead Mlay, Raul Pitoro and Duncan Boughton reviewed the terms of reference for two commodity studies that IIAM is planning to tender;
- i) The Country Director visited the Central and Northeast Zonal Centers with the objective of assessing the progress made in integrating the socio-economists in Zonal Centre activities to provide some guidance required in on-going research activities

- The Central Zonal Center has been paying house rents for the two socio-economists and with effect from the month of March these two have moved to government houses provided by the Provincial Directorate of Agriculture;
  - The Central Zonal Center management is in the process of transferring the two socio-economists to the research department to facilitate the integration of their activities in the on-going research program. In the meeting between the head of Research Department (Eng Dias) and project coordinator, it was agreed that socio-economic research activities will be formulated as an integral part of biological/physical research programs. Planning for the 2008/09 research activities has been started with active participation of the socio-economists. A seminar will take place to discuss the proposed plan and the project staff will be invited to provide their input;
  - The team visited maize field trials in Sussundenga, and the researchers agreed to involve the socio-economists in future on-farm trials;
  - Discussions were also held with head of research and CESE staff member Ana Lidia about training needs. Institutional support was sought to enable two socio-economists to prepare for TOEFL and GRE. It is expected that the successful candidate will pursue MS training at MSU under the USAID funded Pulses CRSP;
  - The MSU Country Director worked with the Northeast Zonal Centre socio-economists on the analysis of the sesame and peanut adoption study. The preliminary results on the cassava adoption study were discussed with the two socio-economists and presented to the Zonal Director Eng Chitio. The Country Director was invited to present a seminar to the Zonal Center staff. The subject chosen was “Making agricultural Research more Relevant and Productive” The topic was chosen to make a case for socioeconomic research to be viewed as an integral part of technology development and transfer work of the Zonal Centers. As a result of the presentation and the ensuing discussion, commitment was made by the Cashew Research Program to provide resources and integrate the socio-economists in their research activities.
- j) The housing situation for the Northeast Zonal Center socio-economists is still not resolved. While the houses were completed several months ago, electricity and water are not yet available. The electricity problem is likely to be solved soon since the line has already been extended to the proximity of the houses and as soon as a contract is signed between IIAM and the power company (EDM), electricity will be available. The water problem is likely to take longer and in the short run will have to be transported in by the Center’s water tanker. Another problem foreseen is security and transport to and from town since the houses are isolated and without public transport. The Director of the Center has promised to provide security guards but the issue of transport to support the families cannot be guaranteed.

### **Objective 3: To strengthen the capacity of the Directorate of Economics to provide supportive policy environment and market information**

#### **3.1 Publication and dissemination of on-going panel data analyses – Mortality/HIV Aids and Household Income**

Drs. Cynthia Donovan and David Mather's report on the impact of HIV/AIDS on rural households, based on TIA data and financed by the World Bank, has been translated into Portuguese and is being proofread. The World Bank invited Cynthia Donovan to present the results from analysis of the impacts of adult mortality on rural households in a conference on Gender, Poverty and Demographics, organized by the World Bank and held on March 25, 2008, in Washington D.C. The work was very well-received and the organizers have requested that the research be a contributed paper to a special journal edition of Population and Development Review.

Two additional reports with the TIA panel datasets on the determinants of crop income and panel analysis of total income and its components, especially crop income diversification, are under development and review. A report on income and poverty dynamics will also be published, and key results were presented at a MINAG/ReSAKSS workshop on April 2, 2008 in Maputo. Various presentations have been done using key results from the research with the TIA panel data. Appendix 2 presents a summary of the key results from the descriptive analysis. Some results from this work were presented to the US Government Accountability Office (GAO) in December (discussed below).

On January 17, 2008, Duncan Boughton and Cynthia Donovan presented a seminar on "Food Security in Mozambique" to the faculty and graduate students of the Department of Agricultural, Food and Resource Economics at MSU, in the Graduate Students Brown Bag series. The presentation addressed key food security issues and future directions for the public sector in Mozambique. This presentation, based on the presentation to the US Government Accountability Office, uses the income diversification, marketing, and poverty analyses of ongoing research with the TIA panel data.

#### **3.2 Analysis of the dynamics of poverty**

Benedito Cunguara's Masters Thesis "[Pathways out of poverty in rural Mozambique](#)" was finalized and was made available on the website. Supported by his advisory committee, which was led by Duncan Boughton, Cunguara's work demonstrates the challenges for policy makers in addressing both rural poverty reduction and economic growth. Using the TIA panel data, his research suggests that diversified income is very important for households to be able to leave poverty, along with access to price information and access to selected cash crop income. The risk of drought presents a primary threat to escaping poverty. Appendix 3 presents the abstract of the thesis, and results from this analysis have already been presented in Mozambique on various occasions.

#### **3.3 Analysis of Public Expenditure for the Agricultural Sector**

The first formal meeting of the public expenditure working group took place in December with representatives from MINAG, Ministry of Finance, Ministry of Planning and Development, SIDA and MSU country team. The Ministry of Fisheries had not appointed a

representative when the group met. The Project Country Director presented the terms of reference as proposed by ReSAKSS and a synthesis of the methodology to be followed for the implementation of the study. The group also had several meetings with the World Bank (WB) Mission for Agriculture Public Expenditure Review between the 10<sup>th</sup> of December and the 21<sup>st</sup> of December 2007. The objective of the meetings with WB team was to define common terms of reference to allow the implementation of only one study to be co-financed by ReSAKSS and WB. The modalities of joint financing of the study by ReSAKSS and the WB and the institutional arrangements for study implementation are still to be concluded. The Project Country Director worked with ReSAKSS to move forward on a proposal regarding the Agricultural Public Expenditure Review (AgPER).

The initial expectation that the World Bank (WB) would fund part of the costs for MSU work in AgPER did not materialize, such that only the initial pledge of USD 30,000 from ReSAKSS will be available to fund MSU's participation. WB hired local consultants for data collection and data base development plus an international consultant who will be involved in the whole processes of implementation of the study. In addition to the involvement of WB and MSU, ReSAKSS has contracted the Human Science Research Council to carry out GIS work which will involve overlaying the spatial investment data with other socio-economic data. Apart from the general AgPER, more detailed analysis is being carried out for the irrigation component with financial support from the European Union, while USAID is funding a separate study on private investment.

Data collection was initiated from the Ministry of Finance and the Ministry of Agriculture under the support of project staff (Gilead Mlay and Danilo Abdula). The collection of basic data was concluded in mid-September. MSU is playing a double role, advising MINAG on technical issues related to the implementation of the AgPER and providing technical advice in data collection. MSU will also play an important role in analysis and report write-up.

Gilead Mlay and Helder Zavale have started working on the descriptive tables and performing consistency checks. A meeting was held with the local consultants responsible for data collection to discuss some of the inconsistencies observed. Descriptive results will be presented to the AgPER taskforce for comments before proceeding with further analysis. The presentations will be done jointly with WB as they are performing complementary analyses.

### **3.4 Profitability and comparative economic advantage of wheat production in Mozambique**

A concept note was drafted by Gilead Mlay and circulated to DE staff members. A rapid appraisal was initiated towards the end of September by Gilead Mlay and Ana Lidia Gungulo in Manica and Tete Provinces, coinciding with harvesting. Ana Lidia had earlier conducted a sample survey in Rotanda to collect baseline data from 67 smallholder farmers. In all sites visited the farmers grew the short season Nduna variety in 2008 using seed distributed by the government on "credit". The farmers are required to pay back the seed in kind. In general, the farmers don't use fertilizers and yields are very low (less than 500kg/ha in Manica Province compared to expected yields of at least 2 MT/ha, with good yields at 5-7 MT/ha).



### **3.5 Analysis of trends of food prices in three regions of the country**

The world food crisis manifested by rapid price rise motivated MSU and its collaborators to carry out a rapid analysis of domestic price trends for maize, rice, maize flour and wheat; and import parity prices for maize and rice for Mozambique. The possible cost implications on the basic food basket were also evaluated. The results and practical recommendations were presented in Flash no 50P “*A Realidade a Cerca da Subida de Preços: A Dinâmica dos Preços de Alimentos em Moçambique e as Implicações Políticas*” and can be found at: [http://www.aec.msu.edu/fs2/mozambique/flash/flash\\_50P.pdf](http://www.aec.msu.edu/fs2/mozambique/flash/flash_50P.pdf)

The issues of food prices and food supplies continued to be important in discussions at the national level and in the provinces. The results and practical recommendations from Flash 50P along with insights from the Windshield Survey of markets conducted in June 2008 were presented on various opportunities by staff from the Agricultural Market Information System (SIMA), with MSU staff input into the various documents and presentations.

### **3.6 Market outlook survey**

The annual Windshield Survey was carried out in June by the SIMA team with the participation of Cynthia Donovan. Conducted each year, the Windshield Survey uses rapid appraisal methods to provide a market outlook for the current marketing year. Presentation of the preliminary results was given to MINAG/DE staff as well as the Famine Early Warning Systems Network (FEWS NET) and the World Food Program (WFP) staff, and served as the basis for presentations in the provinces. Based on the Windshield Survey results, with input from Cynthia Donovan, the SIMA team prepared two flash documents available in both English and Portuguese:

- [As Perspectivas da Comercialização Agrícola do Ano 2008: Vozes das Zonas Rurais](#). Por Equipe Técnica do SIMA. Setembro 2008. Volume 51P.
- [Perspectives on Agricultural Marketing in 2008: Voices from the Rural Areas](#). SIMA Technical Team. September 2008. Volume 51E.

Both Flash 51 and Flash 52 (draft form) indicate that local traders and producers feel that this was not a very good crop production year, with a few exceptions. As a result, the SIMA team will go back to the field with a second Windshield Survey to verify what is happening. The team is also working with Cynthia Donovan on the Bean Value Chain report, mentioned earlier, as well as on an additional, more quantitative Flash which will come out early in the next fiscal year.

### **3.7 Outreach and promotion of policy debates**

Project staff participated in seminars and workshops and in collaboration with partners from MINAG and IIAM, made presentations based on-going policy analysis work using TIA data. Appendix 4 contains a printout of the website <http://www.aec.msu.edu/fs2/mozambique/index.htm> and all presentations can be found there.

Below we present a summary of the subjects covered and type of seminar or workshop.



- a) The Impact of Prime Age Mortality on Rural Households. Presented at the Annual workshop of COMPETE (IIAM Competitive Research fund financed by USAID);
- b) Strengthening Mozambique's Capacity to Increase Productivity and Food Security and Reduce Poverty. Presented at the Workshop for Strengthening Partnership and Reciprocity in Research, Food Security and Agricultural Growth;
- c) Analysis of Rural Income and Poverty Dynamics in Mozambique. Presented at the National Workshop for the Harmonization of Planning for 2009. After the presentation of the study, the provincial staff working in the Department of Economics requested that DE look for possibility to provide some basic training on analysis to enable them to use the TIA data in planning and monitoring;
- d) Experiences of Different Models for Promoting Cotton Production in Africa and Implications for Mozambique: Learning from the Reforms in West, Central, Eastern and Southern Africa. Presented at the National Cotton Meeting for negotiation of minimum producer price;
- e) Market prospects for 2008. The presentation was made to staff of Directorate of Economics, Directorate of Agricultural Services and World Food Program. The presentation is based on a visit to major trade routes in Central and Northern Mozambique during the annual Windshield Survey of SIMA. The general indication of price behavior and assessment by buyers is that the 2007/2008 harvest for maize and beans is below that of last crop season;
- f) [Mortalidade de Adultos na zona rural, definição de prioridades e programas de investigação](#). Raúl Pitoro with support from C. Donovan, F. Mazuze and G. Mlay. Presentation at the First Annual Workshop of the COMPETE Project, held at the Eduardo Mondlane University, on August 12, 2008;
- g) A evolução do desempenho das pequenas e médias explorações e o bem-estar dos agregados familiares rurais 2002-20005. Gilead I. Mlay with support from D. Mather, B. Cunguara, D. Abdula, C. Donovan, E. Payongayong and D. Boughton. Presented to the provincial governments and Provincial Directorates of Agriculture in Cabo Delgado, Maputo, Gaza, Niassa and Nampula Provinces, July 2008. Each of the five presentations was tailored to reflect the situation the corresponding province;
- h) Tornar a investigação agrária relevante e produtiva. Presented to IIAM researcher at the Zonal Center in Lichinga on July 10, 2008.

### **3.8 Other activities**

A presentation on food security issues was made to an IEHA (Initiative to End Hunger in Africa) review team from US Government Accountability Office (GAO) Team at USAID offices in Maputo on November 14, 2007. In January 2008 follow-up meetings with the GAO, MSU Food Security Group research in Mozambique, Zambia and elsewhere provided evidence of the difficulties with IEHA funding and the need for increased investments in the agricultural sector. As demonstrated in Mozambique, IEHA programs were funding key activities for agricultural development, but the funding is threatened by congressional

earmarks and low budgets. The December presentation can be found at [http://www.aec.msu.edu/fs2/mozambique/policypres/gao\\_final.pdf](http://www.aec.msu.edu/fs2/mozambique/policypres/gao_final.pdf)

Cynthia Donovan presented a seminar on “[Food Staples and African Farmers: An Investment Opportunity in a World of Rising Prices](#)” to staff members of EGAT/Agriculture and other services. The seminar was arranged by George Gardner of USAID/EGAT/Agriculture and used the Mozambique analysis of incomes from TIA panel data to stress the relationship between income growth, food staple production, and asset accumulation. This was based on the article by Boughton et al on smallholder marketing in Mozambique recently published in the journal *Faith and Economics* ([http://www.aec.msu.edu/fs2/mozambique/market\\_participation\\_rural\\_households.pdf](http://www.aec.msu.edu/fs2/mozambique/market_participation_rural_households.pdf)).

Danilo Abdula continues to assist MINAG/DE in trade related matters and has contributed significantly in advising MINAG about tariffs on agricultural products.

Ellen Payongayong and Raul Pitoro undertook a rapid appraisal in the principal coconut growing areas to ascertain the distribution of the lethal yellowing disease of coconuts in order to assist in the design of the impact evaluation of the income support project of the MCC Mozambique compact. The rapid spread of the disease was noted. This research, funded under MCC, has been important for MCA design of project implementation.

Gilead Mlay participated in a one-day seminar organized by the Directorate of Agriculture Services (DNSA) to discuss the arrangements for seed supply for the 2009/10 season. The meeting was attended by representatives of the seed industry, research and extension and was chaired by the Minister of Agriculture. MINAG wanted to know what they can expect from research and seed industry in fulfilling the seeds supply targets for the crops covered by PAPA. The following were among the concerns raised during the meeting:

- i) The promotion of local seed production by farmers to meet local needs is one of the hindrances for the development of the private seed market, since certified commercial seed has difficulty competing with locally produced seed;
- ii) The takeover of SEMOC by the government is viewed with hostility by the private seed producers because of uncertainty of fair competition for government contracts;
- iii) The supply of basic seed by research is likely to be the main constraint in production of certified seed;
- iv) It was the view of the major suppliers of certified seeds that lack of effective demand for improved seed as major factor constraining the development of the seed industry.

Gilead Mlay and Anabela Mabota from SIMA participated in conference on “Challenges of Rural Development in the Context of the Food Crisis”. The event was organized by Foundation for Community Development (Fundação de Desenvolvimento das Comunidades, FDC), Ministry of Industry and Commerce, Oxfam and G20. Farmers, policy makers and researchers were brought together to discuss the main issues. Anabela Mabota made a presentation on “Food Price Trends in Mozambique and Policy Implications”, using the analysis from Flash 50P. In this conference, the main constraints to food production as seen by farmers include: market access, financial services access to mechanization to expand

cultivated areas and water for irrigation. Conservation farming was cited several times as a promising technology in southern Mozambique.

Gilead Mlay acted as co-supervisor of one MSc student at the Faculty of Agronomy and Forestry Engineering of Eduardo Mondlane University and evaluated one undergraduate thesis.

Danilo Abdula provided technical input in the preparation of the second Coordinating Council Meeting of MINAG. He assisted in preparing the presentation on the Action Plan for Food Production, organized topics for group discussions about the strategic plan (PEDSA) and was one of the people responsible for the production of the minutes of the meeting.

#### **Objective 4: To institutionalize the capacity to provide information for monitoring and evaluation of agricultural sector performance within MINAG**

##### **4.1 TIA 2007**

Fieldwork for TIA 2007 was concluded and data processing was initiated. With contributions from Ellen Payongayong, the MINAG Department of Statistics (DEST) staff produced and gave a presentation of the preliminary results of TIA 2007 to the PROAGRI group. The results are also being used in the diagnostic analysis of the agricultural sector as part of the process for the preparation of the strategic plan. Ellen Payongayong used in-service training methods to improve data cleaning procedures and other data processing. Further training activities were limited due to the lack of new DEST staff. She also worked with DEST technical staff on an internal assessment (balanço) of TIA 2007.

Preparation of TIA results tailored for dissemination in the provinces was initiated and the first presentation was made in Manica Province, specifically to the provincial government and technical staff of the Provincial Directorate of Agriculture (DPA). The general TIA 2007 results were also presented in the national workshop for harmonizing planning activities. The workshop was attended by senior staff from DE, DPAs and representatives from PROAGRI. It is envisaged that dissemination of TIA 2007 results at various provincial level meetings will continue.

##### **4.2 Documentation of TIA datasets**

Ellen Payongayong continues to work with TIA datasets. She worked with sampling expert David Megill on assessing TIA panel and non-panel weights for TIA 2005. With DEST staff members, Ellen Payongayong continued in-service training to familiarize current staff with all the steps of TIA data management, through the production of the CD for each TIA and towards the development of a synthetic questionnaire and database to facilitate dissemination and access to all TIA databases.

Ellen Payongayong continued to assist DEST on documentation and data cleaning. The preparation of Agricultural Statistics year book was initiated by compiling all the main statistics from the last five TIAs. Presently the preliminary compiled results are available in CDs and were shared with provincial authorities, although work continues on these datasets and tables. These will be made available on CD's, in hard copy and on MINAG web site after

being verified and approved by relevant organs in MINAG and INE as the official agricultural statistics.

### **4.3 Preparation of TIA 2008**

Preliminary work was initiated with the revision of TIA questionnaire. The implementation of TIA 2008 is likely to face some financial constraints given that most vehicles used in previous years either need to be replaced or will require major repairs. Ellen Payongayong has been consulting with potential agencies to fund the vehicles, including the World Bank (WB) and the Bill & Melinda Gates Foundation. WB has shown interest in providing limited financing if TIA can accommodate additional modules and survey design to meet their objectives under special projects with the Bill & Melinda Gates Foundation. Negotiations between MINAG and WB continue.

Preparations for TIA 2008 continued, although the financial challenges remain and put the data collection in doubt. As part of MSU work supporting the development and use of the TIA, Gilead Mlay facilitated communication between the Director of Economics and the Director of Mozambican Millennium Challenge Account (MCA), such that MINAG and MCA can finalize the agreement to implement the Farmer Income Support Project (FISP) and Land Project surveys.

The following preparatory activities for the implementation of TIA 2008 took place with technical assistance from Ellen Payongayong:

- a) Preparation of the questionnaire: the draft questionnaire was circulated to different stakeholders for comments. The draft questionnaire was also discussed in a general meeting of DE staff in which Danilo and Gilead Mlay had an opportunity to participate and contribute;
- b) Ellen assisted in the preparation of testing and training material;
- c) Ellen participated in the training of staff.

### **4.4 Other activities**

Ellen Payongayong continued to support DEST staff members with various requests from donors and other agencies. She met with WB staff members assessing the potential for including the TIA in a possible World Bank/Gates Foundation initiative to develop panel datasets in 8-10 sub-Saharan Africa countries. Cynthia Donovan, along with Valerie Kelly from MSU, were invited to Washington to meet with the World Bank team to share experiences and insights on agricultural production data collection design and implementation, and many insights were drawn from TIA, along with other work in West, Central and Southern Africa. There are good prospects for collaboration on this work.

Ellen Payongayong provided extensive information for a consultant from the General Data Dissemination System (GDSS) project, jointly sponsored by the World Bank and the International Monetary Fund (IMF). The GDSS was established by the IMF in 1997 and

Mozambique joined in 2003, with a basic objective to improve statistical systems and create a system for easy access to reliable comprehensive data.

She also helped DEST develop the draft of a small agricultural module that could be added to the *Inquérito Orçamento Familiar* (IOF) survey instrument, at the request of INE. She provided additional support to DEST on the sampling issues for TIA 2008, interfacing with sampling expert David Megill on TIA. She assisted various efforts to link TIA data to mapping efforts with MSU graduate students and IFPRI staff members. In the near future, there will be increased capacity for mapping and possible spatial analysis using TIA data.

## **Objective 5: To strengthen the National Market Information System (SIMA)**

### **5.1 Provide SIMA staff with technical backstopping**

Cynthia Donovan continued to provide technical backstopping to SIMA, primarily focused on the price analysis and reporting for the Windshield Survey. SIMA staff members have continued to regularly produce the weekly market information bulletin Quente-Quente and during this period editions 639 to 690 were published. The Nampula provincial market information system produced Esisapos editions 256 to 262 in the first quarter. Only two editions of Esisapos (editions 271 and 272) were produced in the month of April due to computer problems and staffing. Beginning with the July 8, 2008 bulletin, the Nampula provincial market information system is becoming more active again. Full information is available on SIMA website <http://www.sima.minag.org.mz>.

Cynthia Donovan continued to work with SIMA staff members on new developments with communications technology. The partnership between Technoserve and BusyLab to use SMS messaging with the SIMA system has been formalized, and there will also be formal contracts between Technoserve and MCell for the SMS messaging system. The SMS messaging of SIMA data on a trial basis has begun. While we have expressed some reservations about the direction taken with the SMS system, it is good to see forward motion on this front.

In addition, Donovan is coordinating with SIMA staff on the development of an MSU project with the Angolan National Cereals Institute that will include SIMA participation for technical assistance on the development of a Market Information System (MIS).

### **5.2 Update SIMA database and systems**

Ellen Payongayong began an analysis of the SIMA database, to target needed improvements and identify possible modifications in systems. She has evaluated parts of the SIMA database, and she is working with SIMA staff to make modifications and corrections in the key databases.

## **Objective 6: To assist USAID-Mozambique and partners to measure program impacts**

Ellen Payongayong has begun pulling together the previous household surveys conducted by the NGOs. The draft calendar for the implementation of the INCPROX was prepared by Payongayong, and circulated to the USAID funded NGOs for feedback. Ellen Payongayong

continued with preparatory work in collaboration with the PVOs for the implementation the INCPROX. She also worked with NGOs in developing customized agriculture and nutrition questionnaires and assisted David Megill in the sampling design for the overall survey and for each NGO. Training of survey teams for FHI, ADRA, WVI, CARE and SFC took place and data collection is on-going.

## Appendix 1: Training Program for IIAM Socio-economists



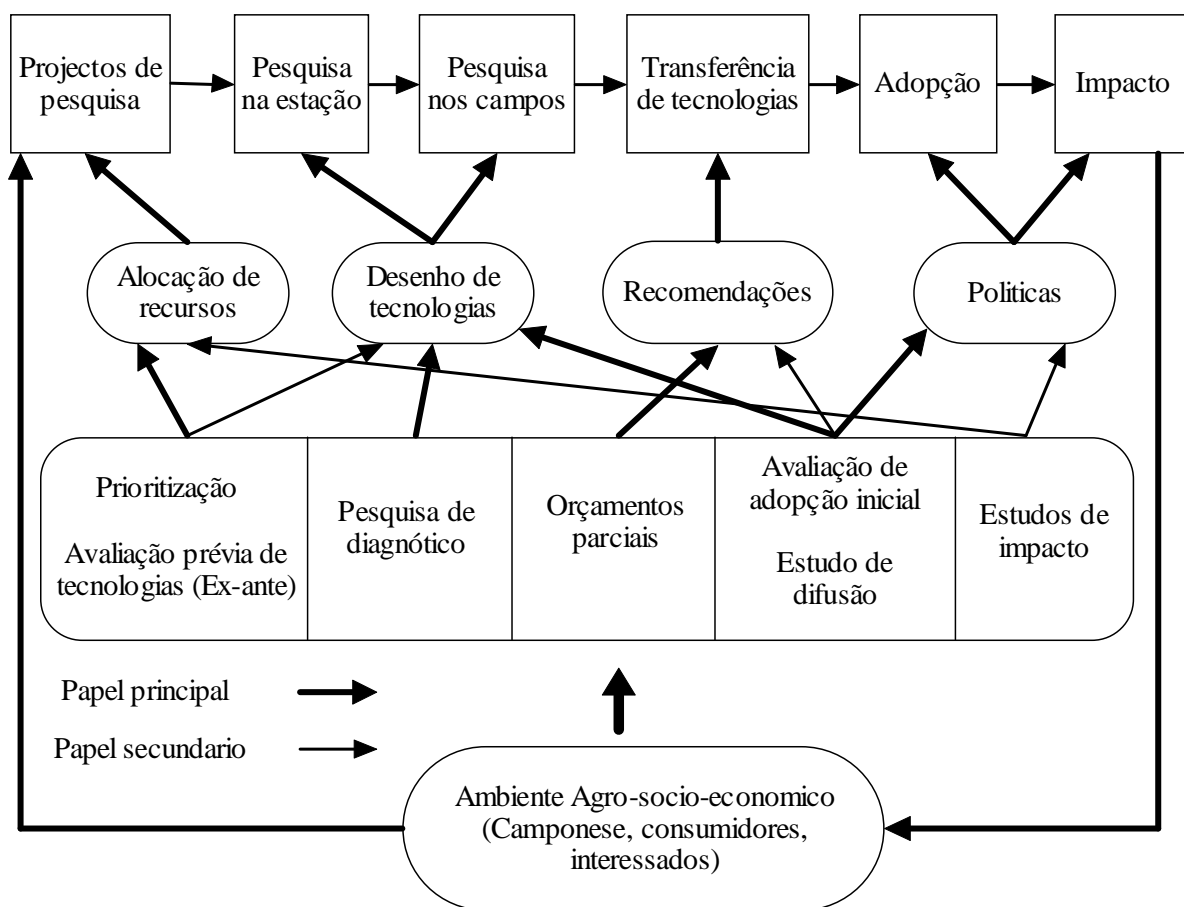
### Programa de Treinamento em Ciências Sociais para a Pesquisa Agrária para o IIAM, Edição 2007-2008

#### Introdução

A redução dos níveis de pobreza absoluta através de promoção do crescimento económico rápido, sustentável e abrangente é uma das prioridades do governo e, o desempenho da agricultura que é considerada como sendo a base de desempenho económico e social do país, vai determinar o grau de cumprimento desta prioridade. O programa quinquenal do governo e os outros programas e planos subsequentes tais como o PARPAII, PROAGRI II apresentam os objectivos e linhas gerais de acções a serem levados a cabo para permitir que a agricultura contribua para a redução dos níveis de pobreza e a insegurança alimentar. Recentemente o governo aprovou a estratégia de revolução verde cuja implementação pretende acelerar o desempenho do sector agrário. Os objectivos a serem alcançados nos programas de desenvolvimento da agricultura incluem aumentar a **produtividade agrária**, melhorar a **competitividade** e promover a **exploração sustentável** dos recursos naturais.

IIAM sendo uma instituição pública de investigação agrária é um sector importante do governo para o desenvolvimento e/ou adaptação e transferência de tecnologias agrárias apropriadas e rentáveis para responder aos objectivos traçados para o sector agrário. Dada a escassez de recursos IIAM deve estar capaz de definir as suas prioridades de investigação de modo que as tecnologias desenvolvidas e transferidas tenham maior impacto em termos de redução dos índices de pobreza e melhoramento do bem-estar dos agregados familiares rurais. Isto significa que IIAM precisa de fortalecer a sua capacidade de identificar as áreas prioritárias de investigação, diagnosticar os estrangulamentos nas cadeias de valores e as oportunidades de investigação; avaliar ex-ante o impacto das potenciais intervenções tecnológicas, analisar a difusão e adopção das tecnologias libertadas e subsequentemente avaliar o seu impacto. Estas tarefas requerem uma capacidade humana nas ciências socio-económicas e sua organização institucional que permita sua integração na investigação agrária. A criação do CESE ao nível central e unidades socio-económicas nos centros zonais pretende satisfazer o objectivo do IIAM de fortalecer a capacidade socio-económica na investigação agrária. A figura abaixo apresenta sumariamente o papel das ciências socio-económicas na investigação agrária.

Figura 1. O papel da ciência social no desenvolvimento e difusão de tecnologias agrárias



### Objectivos:

O presente curso visa dotar os novos técnicos do CESE em conhecimentos e habilidades para conduzir estudos socioeconómicos relevantes para o desenvolvimento e transferência de tecnologias agrárias rentáveis.

Espera-se que no final do curso, os técnicos estarão capacitados a:

1. Aplicar a metodologia de orçamentos parciais para avaliar a rentabilidade de tecnologias agrárias propostas pela investigação;
2. Conduzir estudos diagnósticos para identificar problemas e oportunidades para a pesquisa,
3. Realizar estudos de difusão e adoção de tecnologias agrárias
4. Avaliar o impacto das tecnologias agrárias

### Duração do curso

O curso terá uma duração de 12 semanas com início no dia 21 de Janeiro de 2008.



## PROGRAMA

DATA	CONTEÚDOS	RESPONSÁVEL
22/01/2008	<ul style="list-style-type: none"> <li>• Boas vindas e inaguração de treinamento</li> <li>• Aspectos administrativos</li> </ul>	<p>Mazuze</p> <p>Mazuze</p>
<b>INTRODUÇÃO</b>		
23/01/2008	<ul style="list-style-type: none"> <li>• Avaliação de base (173 perguntas)</li> <li>• Resultados da avaliação de base</li> </ul>	<p>Pitoro</p> <p>Mazuze, Mlay</p>
<b>MODULO 1: ANÁLISE ECONÓMICA DE DADOS EXPERIMENTAIS</b>		
<b>ORÇAMENTOS PARCIAIS</b>		
<p><b>Objectivos:</b></p> <ul style="list-style-type: none"> <li>• Dotar os cursantes de ferramentas de organização e análise de dados experimentais e a informação sobre custos e benefícios de vários tratamentos alternativos</li> </ul> <p><b>Resultados esperados:</b></p> <ul style="list-style-type: none"> <li>• Espera-se que no final deste capítulo os cursantes estejam habilitados a realizar análises marginais, de sensibilidade e de variabilidade usando os orçamentos parciais com a finalidade de fazer recomendações de tecnologias rentáveis.</li> <li>• Espera-se também que no final deste capítulo, os técnicos compreendam a necessidade de conduzir os orçamentos parciais e bem como a forma como os resultados destas análises devem ser reportados.</li> </ul>		

DATA	CONTEÚDOS	RESPONSÁVEL
23/01/2008	<ul style="list-style-type: none"> <li>• Orçamentos parciais: Introdução e definição de conceitos</li> <li>• Orçamentos parciais: Análises marginais</li> </ul>	<p>Pitoro</p> <p>Pitoro</p>
24/01/2008	<ul style="list-style-type: none"> <li>• Orçamentos parciais: Análises de sensibilidade</li> <li>• Orçamentos parciais: Exercícios em grupos</li> </ul>	<p>Pitoro</p> <p>Pitoro</p>
25/01/2008	<ul style="list-style-type: none"> <li>• Orçamentos parciais: Análises de variabilidade</li> <li>• Orçamentos parciais: Exercícios individuais</li> </ul>	<p>Pitoro</p> <p>Pitoro</p>
28/01/2008	<ul style="list-style-type: none"> <li>• Orçamentos parciais: Comunicação de resultados</li> <li>• Orçamentos parciais: Exercícios individuais</li> </ul>	<p>Pitoro</p> <p>Pitoro</p>
29/01/2008	<ul style="list-style-type: none"> <li>• Orçamentos parciais: Outros conceitos</li> <li>• Orçamentos parciais: Exercícios individuais</li> </ul>	<p>Pitoro</p> <p>Pitoro</p>
30/01/2008	<ul style="list-style-type: none"> <li>• Orçamentos parciais: Exercícios individuais</li> </ul>	<p>Pitoro</p>

DATA	CONTEÚDOS	RESPONSÁVEL
<b>ORÇAMENTOS MULTI-PERIÓDICOS</b>		
01/02/2008	<ul style="list-style-type: none"> <li>• Orçamentos periódicos: Descostos (“Discounting”)</li> <li>• Custo da pesquisa, Extensão e de outros aspectos ligados a tecnologia</li> <li>• Excel: exercícios individuais em orçamentos multi-periódicos</li> </ul>	
<b>REVISÃO DE ESTATÍSTICA E INTRODUÇÃO AO PACOTE ESTATÍSTICO “STATA”</b>		
<p><b>Objectivos:</b></p> <ol style="list-style-type: none"> <li>1. Dotar os participantes de métodos estatísticos para: <ol style="list-style-type: none"> <li>a) Comparar as inovações tecnológicas com as práticas actuais;</li> <li>b) Avaliar os determinantes para a difusão e adopção de tecnologias agrárias.</li> </ol> </li> <li>2. Capacitar os participantes no uso do pacote STATA para resumir dados de inquéritos e conduzir análises estatísticas.</li> </ol> <p><b>Resultados esperados:</b></p> <p>No fim deste modulo os participantes estarão capazes de:</p> <ol style="list-style-type: none"> <li>a) Aplicar testes de hipóteses para comparar as intervenções tecnológicas com as praticas actuais</li> <li>b) Interpretar os resultados de regressão múltipla</li> <li>c) Aplicar o pacote STATA para resumir dados de inquéritos, conduzir testes de hipóteses e estimar modelos de regressão múltipla</li> </ol>		
01/02/2008	<ul style="list-style-type: none"> <li>• Revisão de Estatística: Nível de medição e estatística descritiva</li> </ul>	Mlay
	<ul style="list-style-type: none"> <li>• Revisão de Estatística: Estatística descritiva</li> </ul>	Mlay
04/02/2008	<ul style="list-style-type: none"> <li>• Revisão de Estatística: Estatística descritiva</li> <li>• Revisão de Estatística: Estimação ponto e de intervalo</li> </ul>	Mlay Mlay
05/02/2008	<ul style="list-style-type: none"> <li>• Revisão de Estatística: Estimação ponto e de intervalo</li> <li>• Teste não paramétrico U de Mann-Whitney</li> </ul>	Mlay Mlay
06/02/2008	<ul style="list-style-type: none"> <li>• Revisão de Estatística: Modelo de regressão linear múltipla</li> <li>• Revisão de Estatística: Os pressupostos do modelo de regressão linear múltipla</li> <li>• Revisão de Estatística: O significado dos coeficientes do modelo de regressão linear múltipla</li> </ul>	Mlay Mlay Mlay
08/02/2008	<ul style="list-style-type: none"> <li>• Revisão de Estatística: Interpretação dos resultados da análise de regressão linear múltipla</li> </ul>	Mlay



<b>DATA</b>	<b>CONTEÚDOS</b>	<b>RESPONSÁVEL</b>
21/02/2008	<b>As circunstâncias dos produtores e o seu papel na planificação da pesquisa agrária – continuação</b> <ul style="list-style-type: none"> <li>• Identificação de problemas e a escolha de componentes tecnológicos para experimentos on-farm</li> </ul>	Mlay
	<b>A lista de verificação (“check list”) das circunstâncias dos produtores:</b> <ul style="list-style-type: none"> <li>• Circunstâncias naturais</li> <li>• Circunstâncias socioeconómicas externas</li> <li>• Constrangimentos de recursos</li> <li>• Os objectivos do produtor</li> <li>• As interacções nos sistemas de produção</li> <li>• Descrição das tecnologias em uso pelo grupo alvo</li> <li>• Identificação dos factores limitantes</li> </ul>	Mlay
22/02/2008	<b>Como obter informação sobre as circunstâncias dos produtores</b> <ul style="list-style-type: none"> <li>• Dados secundários em geral e análise de dados de inquéritos nacionais</li> </ul>	Mlay
25/02/2008	<b>Como obter informação sobre as circunstâncias dos produtores (continuação)</b> <ul style="list-style-type: none"> <li>• Inquéritos informais</li> <li>• Análise de género, escalas de riqueza, calendários e sazonalidade</li> <li>• Pesquisa de diagnóstico: Definição de domínios de recomendação e a escolha de opções para testar</li> </ul>	Mlay
26/02/2008	<b>Como obter informação sobre as circunstâncias dos produtores (continuação)</b> <ul style="list-style-type: none"> <li>• Inquéritos formais</li> <li>• Regras para desenhar questionários</li> <li>• Algumas recomendações para obter tipos específicos de informação</li> <li>• Amostragem</li> <li>• Como tratar os casos de “non-response”</li> <li>• Análise de dados do inquérito</li> </ul>	Mlay
27/02/2008 8:30 – 12:50 13:00–15:30	<ul style="list-style-type: none"> <li>• Tempo livre</li> <li>• Exercícios individuais (Aula prática)</li> </ul>	
28/02/2008	<ul style="list-style-type: none"> <li>• Priorização de opções tecnológicas baseadas em pesquisa diagnóstico</li> <li>• Exercício em grupo</li> </ul>	Mlay/Pitoro
29/02/2009	<ul style="list-style-type: none"> <li>• Exercício em grupo</li> <li>• Apresentação e discussão de exercícios em grupo</li> </ul>	Mlay/Pitoro
03/03/2008	<b>DRP – Trabalho de campo [Regadio de Umbeluzi: Cooperativa 25 de Setembro]</b>	Mlay/Pitoro

<b>DATA</b>	<b>CONTEÚDOS</b>	<b>RESPONSÁVEL</b>
04/03/2008	<ul style="list-style-type: none"> <li>• <b>Apresentação do relatório DRP</b></li> </ul>	Mlay/Pitoro
05/03/2008 8:30 – 12: 50 13:00–15:30	<ul style="list-style-type: none"> <li>• Tempo livre</li> <li>• Exercícios individuais (Aula pratica)</li> </ul>	
<b>MODULO 3: ADOPÇÃO E DIFUSÃO DE TECNOLOGIAS AGRÁRIAS E AVALIAÇÃO DE IMPACTOS</b>		
<b>ADOPÇÃO E DIFUSÃO DE TECNOLOGIAS AGRÁRIAS</b>		
<p>O objectivo geral deste tema é de dotar os participantes com ferramentas usadas no estudo de adopção e difusão de tecnologias agrárias</p> <p>No fm deste modulo os participantes devem estar capazes de:</p> <ol style="list-style-type: none"> <li>a) Determinar a curva logistica de adopção de uma dada tecnologia</li> <li>b) Ter dos modelos frequentemente usados nos estudos de adopção de tecnologias</li> <li>c) Perceber os principais determinantes de adopção de tecnologias agrárias</li> <li>d) Ter um conhecimento base sobre o tipo de tecnologias disseminadas no país e avaliar os potenciais pontos fracos e fortes das mesmas</li> </ol>		
06/03/2008	<ul style="list-style-type: none"> <li>• Adopção e Difusão: conceitos gerais e perspectivas de sociologia rural</li> <li>• Adopção e Difusão: a logistica como instrumento</li> <li>• Adopção e Difusão: adopção prematura, percepções e outros determinantes</li> <li>• Excel: modelar a adopção – exercício individuais</li> </ul>	Pitoro
07/03/2008	<ul style="list-style-type: none"> <li>• Adopção e Difusão: Porque é difícil transferir tecnologias para os camponeses?</li> <li>• Adopção e Difusão: Algumas tecnologias disseminadas no país</li> <li>• Adopção e Difusão: Exercícios individuais</li> <li>• Adopção e Difusão: Exercícios em grupo (abordagem metodologica – revisão de literatura)</li> </ul>	Pitoro
10/03/2008	<ul style="list-style-type: none"> <li>• Adopção e Difusão: Exercícios em grupo (abordagem metodologica – apresentação e discussão)</li> </ul>	Pitoro
11/03/2008	<ul style="list-style-type: none"> <li>• Excel: Modelar a adopção exercícios individuais (5 projectos)</li> <li>• Excel: Modelar a adopção exercícios individuais (Apresentação e discussão dos projectos)</li> </ul>	Pitoro

<b>DATA</b>	<b>CONTEÚDOS</b>	<b>RESPONSÁVEL</b>
12/03/2008 8:30 – 12:50 13:00–15:30	<ul style="list-style-type: none"> <li>• Tempo livre</li> <li>• Exercícios individuais (Aula pratica)</li> </ul>	
13/03/2008	<ul style="list-style-type: none"> <li>• <b>Projecto</b></li> </ul>	Pitoro
14/03/2008	<ul style="list-style-type: none"> <li>• <b>Projecto</b></li> </ul>	Pitoro
<b>PALESTRAS</b>		
<b>PESQUISA E CIÊNCIAS SOCIAIS</b>		
<p>O objectivo geral deste tema é providenciar informação técnica detalhada sobre as áreas temáticas de investigação desenvolvidas pelo IIAM e dos aspectos sociais, económicos e ambientais a serem tomados em consideração no processo de definição, desenvolvimento e transferência de tecnologias agrárias</p> <p>No fim deste modulo os participantes devem estar familiarizados com:</p> <ol style="list-style-type: none"> <li>a) As áreas temáticas de investigação em curso no IIAM</li> <li>b) Ferramentas usadas para análises económicas e sociais das opções tecnológicas</li> <li>c) Aspectos ambientais a serem tomados em consideração no desenvolvimento de pacotes tecnológicos</li> </ol>		
17/03/2008 9:45 – 10:30	<ul style="list-style-type: none"> <li>• Pesquisa agrária e meio ambiente</li> </ul>	Esp. Chamba
18/03/2008 8:30 – 9:30 9:45 – 10:30	<ul style="list-style-type: none"> <li>• Aspectos sócio-económicos dos pesticidas</li> <li>• Pesquisa agrária e sistema de sementes</li> </ul>	Anabela Mabota Maria Estrela
19/03/2008 8: 30 – 12:50 13:00–14:30 14:45–15:30	<ul style="list-style-type: none"> <li>• Tempo livre</li> <li>• IPM e pesquisa agrária</li> <li>• Pesticidas e pesquisa agrária</li> </ul>	Sancho Cumbi Sancho Cumbi
20/03/2008 12:30–13:30 14:00–15:30	<ul style="list-style-type: none"> <li>• A Biotecnologia e a pesquisa agrária</li> </ul> <p>Visita de S.Excia Ministro da Agricultura</p>	Ana Monjane, Ana Isabel
21/03/2008 9:30–10:30 10:45–11:30	<ul style="list-style-type: none"> <li>• Aspectos Sócio-económicos e pesticidas</li> <li>• A extensão e a pesquisa agrária</li> </ul>	Anabela Mabota Albertina Alage

<b>DATA</b>	<b>CONTEÚDOS</b>	<b>RESPONSÁVEL</b>
24/03/2008 9:45–10:45 11:00–11:45 12:00–12:45	<ul style="list-style-type: none"> <li>• Crédito e tecnologias agrárias</li> <li>• Florestas</li> <li>• Fertilizantes e tecnologias de conservação de solo incluindo a lavoura mínima</li> </ul>	Marcos Freire Teresa Alves Ricardo Maria
25/03/2008 9:45–10:30 10:45–11:10 11:15–11:45 12:00–12:45 14:00–14:30 14:45–15:30	<ul style="list-style-type: none"> <li>• A investigação pecuária e os cientistas sociais <ul style="list-style-type: none"> <li>• Sanidade animal</li> <li>• Reprodução</li> <li>• Nutrição</li> <li>• Pastos e forragens</li> </ul> </li> <li>• Novas culturas emergentes a pesquisa agrária</li> </ul>	Rosa Costa Rosa Costa Luisa Meque Olga Nguluve Sérgio Gouveia
26/03/2008 8:30–12:50 13:00–15:30	<ul style="list-style-type: none"> <li>• Tempo livre</li> <li>• Extensão agrária e pesquisa</li> <li>• Apresentação de projectos individuais</li> </ul>	Albertina Alage
<b>CONTINUAÇÃO DO MÓDULO 3</b>		
<b>AVALIAÇÃO DE IMPACTO</b>		
<b>Princípios gerais de avaliação de impactos</b>		
	<ul style="list-style-type: none"> <li>• Avaliação ex-ante e avaliação posterior do impacto</li> <li>• Dinâmicas entre a monitoria e avaliação de impacto</li> <li>• Conceitos de avaliação de impacto: desenvolvimento tecnológico, difusão e o fluxo de benefícios líquidos, trajetória de impacto, os pressupostos chave, atribuição institucional, o domínio de recomendação, o contrafactual, a dupla diferença</li> </ul>	Mlay Mlay
28/03/2008 8:30–9:45 10:00–11:45 12:00–15:30	<ul style="list-style-type: none"> <li>• Estratégias de desenho de avaliação de impacto</li> <li>• Implementação de avaliação de impacto</li> <li>• Teoria do excedente económico</li> </ul>	Mazuze Mazuze Mlay
31/03/2008 8:30–10:45	<ul style="list-style-type: none"> <li>• Introdução ao modelo DREAM</li> </ul>	Mlay

<b>DATA</b>	<b>CONTEÚDOS</b>	<b>RESPONSÁVEL</b>
01/04/2008 8:30–9:45	<b>Avaliação posterior do impacto</b> <ul style="list-style-type: none"> <li>• Estimaco dos custos de pesquisa, extenso e outros ligados com o desenvolvimento e disseminao da tecnologia</li> </ul>	Pitoro
10:00–12:45	<ul style="list-style-type: none"> <li>• Avaliao dos outros custos e benefcios da tecnologia</li> </ul>	Pitoro
13:00–15:30	<ul style="list-style-type: none"> <li>• Mtodos quantitativos (diferena simples, dupla, alta ordem e varivel instrumental)</li> </ul>	Pitoro
02/04/2008 8:30–12:50 13:00–15:30	<ul style="list-style-type: none"> <li>• Tempo livre</li> <li>• Tipos de dados disponveis em Moambique (IAF, DHS, QIBB, LFS, TIA, etc)</li> </ul>	Mazuze
03/04/2008 8:30–10:45	<ul style="list-style-type: none"> <li>• Avaliao de benefcios lquidos por hectare ou unidade animal com base no oramento parcial</li> </ul>	Pitoro
11:00–12:45	<ul style="list-style-type: none"> <li>• EXCEL: exerccios individuais</li> </ul>	Pitoro e Ellen
13:00–15:30	<ul style="list-style-type: none"> <li>• EXCEL: apresentao dos resultados de exerccios individuais</li> </ul>	Pitoro e Ellen
04/04/2008 8:30–10:45 11:00–12:45 13:00–15:30	<ul style="list-style-type: none"> <li>• O fluxo dos benefcios lquidos</li> <li>• A taxa de desconto</li> <li>• O clculo do VAL e TIR</li> </ul>	Pitoro e Ellen Pitoro e Ellen Pitoro e Ellen
07/04/2008	<ul style="list-style-type: none"> <li>• Avaliao posterior do impacto: Reunindo todo o conhecimento</li> </ul>	Pitoro
08/04/2008	<ul style="list-style-type: none"> <li>• Exerccios individuais</li> <li>• Reviso de exerccios individuais</li> </ul>	Pitoro, Mlay, Mazuze e Ellen
09/04/2008 8:30–12:50 13:00–15:30	<ul style="list-style-type: none"> <li>• Tempo livre</li> <li>• Exerccios individuais (Aula prtica)</li> </ul>	
<b>PALESTRAS</b>		
10/04/2008 9:45–10:30 10:45–11:10 11:15–11:45 12:00–12:45 14:00–14:30 14:45–15:30	<ul style="list-style-type: none"> <li>• Pesquisa Agrria para o Desenvolvimento</li> <li>• Terra e Gesto dos Recursos Naturais</li> <li>• Recursos Fitogenticos</li> <li>• Melhoramento de Plantas e Pesquisa Agrria</li> <li>• A Biodiversidade e a Pesquisa Agrria</li> <li>• Diagnstico Rpido Participativo (FAEF/UEM)</li> </ul>	DG do IIAM J. Mafalacusser Carlas do Vale Manuel Amane Paulino Munisse Luis Artur



DATA	CONTEÚDOS	RESPONSÁVEL
<b>SPSS E ANÁLISE DE REGRESSÃO</b>  O objectivo deste tema é de introduzir os conceitos básicos de níveis de dados, os métodos de organização de dados, descrição breve sobre a estrutura de ficheiros no SPSS e comandos básicos de manipulação e análise de dados. A análise de regressão pretende expandir os conhecimentos e habilidades introduzidos no primeiro módulo.		
11/04/2008 8:30–10:45	<b>Análise de dados: SPSS</b> <ul style="list-style-type: none"> <li>Estrutura de ficheiros para SPSS (Data, Syntax and Output windows)</li> </ul>	Danilo Abdula
11:00–12:45	<ul style="list-style-type: none"> <li>Análise descritiva e transformação de dados</li> </ul>	Danilo Abdula
13:30–15:30	<ul style="list-style-type: none"> <li>Reestruturação de dados: Tables look up &amp; aggregate</li> </ul>	Danilo Abdula
14/04/2008 8:30–10:45	<ul style="list-style-type: none"> <li>Tabulação: Estatísticas básicas</li> </ul>	Danilo Abdula
11:00–12:45	<ul style="list-style-type: none"> <li>Gráficos</li> </ul>	Danilo Abdula
13:00–15:30	<ul style="list-style-type: none"> <li>Exercícios individuais</li> </ul>	Danilo Abdula
<b>REGRESSÃO LINEAR</b>		
15/04/2008 8:30–12:45	<ul style="list-style-type: none"> <li>Regressão linear simples: formas funcionais e interpretação dos resultados</li> </ul>	Mlay
13:00–15:30	<ul style="list-style-type: none"> <li>Regressão linear múltipla: variáveis categóricas independentes</li> </ul>	Mlay/Pitoto
16/04/2008 8:30–12:50	<ul style="list-style-type: none"> <li>Tempo livre</li> </ul>	
13:00–15:30	<ul style="list-style-type: none"> <li>Exercícios individuais</li> </ul>	Mlay/Pitoto
17/04/2008 8:30–12:50	<ul style="list-style-type: none"> <li>Regressão com variável categórica dependente</li> </ul>	Mlay
13:00–15:30	<ul style="list-style-type: none"> <li>Exercícios individuais</li> </ul>	Mlay/Pitoto
18/04/2008	<ul style="list-style-type: none"> <li>Teste final</li> </ul>	Mazuze, Pitoto, Ellen, Mlay
21/04/2008 8:30–9:30	<ul style="list-style-type: none"> <li>Resultados do teste final</li> </ul>	Mazuze, Pitoto, Ellen, Mlay
9:45–11:00	<ul style="list-style-type: none"> <li>Considerações finais e encerramento</li> </ul>	DG do IIAM, DFDTT

## **Appendix 2: Descriptive Rural Income Analysis: Summary**

In spite of impressive reductions in poverty from 1996 to 2002, the majority of Mozambique's population remained below the poverty line in 2002/03 (51.5% in urban areas, 55.3% in rural; MPF et al, 2004). TIA 2005 provides the most recent data available on rural household income and asset levels. As many researchers will likely use this new TIA income data, the first objective of this paper is to provide background information on the methods used to construct TIA 2005 income and the TIA 2002-2005 panel income file. The second objective of this paper is to evaluate changes in rural household income and assets as reported by TIA 2002 and TIA 2005 to see if the upward trends in household welfare found from 1996 to 2002 (in both IAF and TIA data) have continued and are observed in TIA from 2002 to 2005. The third objective of this paper is use information about the structure of income, household asset levels, and household access to technology and public goods in 2002 and 2005 in order to investigate the prospects for continued rural economic growth.

### *Human capital: Education*

TIA05 shows that the highest schooling grade achieved is still very low among heads in 2005 (average of 2.0 years), and only 43% of heads are literate. However, heads' education levels should improve over time, as information on literacy by age shows that young adults age 15-24 are much more likely to be literate than adults just 10 years older, as about 75% of males and 50% of females age 15-24 are literate.

School attendance rates have continued to improve, and the gender gap has decreased considerably. IAF found that child school current attendance of children 12-17 in rural areas was 51.5% for boys and 33.2% for girls in 1996/97. TIA05 finds average attendance rates for children age 12-17 in rural areas are 72.9% for boys and 61.8%.

The TIA data show that average school advancement ratio of all boys and girls age 10-14 increased from 2002 to 2005, which suggests that rural household investment in child schooling improved over this time period (although as noted above, household demand for schooling is but one of various factors which influence schooling outcomes). While this is good news, the results also demonstrate that there is still much room for improvement: the fact that the average advancement ratio is 0.46 for boys and 0.42 for girls indicates that the majority of children are not starting school on time (at age 7), nor advancing one grade per year.

Consistent with findings from many other developing countries, the TIA education data show that children from wealthier households in rural Mozambique are more likely to attend school, have higher completed grade levels on average, and have higher school advancement.

### *Human capital: Health*

Consistent with findings from the only seroprevalence data in Mozambique (antenatal clinic data), which indicate rising HIV/AIDS prevalence in many areas of the country in recent years, the TIA data show that both the incidence of PA illness cases and PA death due to illness are increasing from 2002 to 2005. Nearly 10% of households reported either the death of a PA adult due to illness, or a chronically-ill PA adult member, during the 12 months prior to the TIA 2005 interview.

DHS surveys show that the number of rural Mozambican households with latrines increased from 26% in 1997 to 36% in 2003. TIA data show that 38% of rural households had a latrine in 2002, and that this number increased to 41% in 2005. As one might expect, households in the highest income quintile are much more likely to have a latrine (61%) than those in the lowest quintile (31%).

#### *Physical capital*

Consistent with the positive trends seen from 1996 to 2002/03 in IAF, DHS, and TIA, the TIA panel data demonstrate that, on average, rural households in Mozambique have continued to increase their asset holdings from 2002 to 2005, notably in land access and ownership of goods such as bicycles, radios, and have improved the durability of their houses. However, we find that tropical livestock units per adult equivalent (TLU/AE) fell from 2002 to 2005, which is most likely due to significant losses of chickens in various parts of the country in 2005 due to the spread of Newcastle disease. This is confirmed by TIA data which records losses of chickens due to illness.

#### *Access to public goods*

All public goods (road density, price information, extension, farmer association) are positively associated with income – the direction of causality is beyond the scope of bivariate analysis. TIA data show that coverage of price information appears to be increasing, as the percentage of households which received price information (via radio, newspaper, NGO, farmer association) increased from 34% in 2002 to 40% in 2005. TIA panel analysis shows that 13 percent of households received extension in 2002, and 14.8 percent in 2005. The TIA panel data show that 26% of households received an extension visit in either or both years, while 74% did not receive an agent in either year. The percent of rural Mozambican households with a member in a farmer association nearly doubled from 2002 to 2005, but is still quite low at 6.4% of households in 2005 (and much of this may be from Maputo province, though there were large increases in Gaza and Niassa).

#### *Use of improved inputs – fertilizer, animal traction, irrigation*

TIA panel data showed some increases in input use from 1996 to 2002 (Boughton et al, 2006), but there has been no improvement since then. Some analysts believe that much of the growth in agricultural production and crop income in rural Mozambique since 1994 has primarily come from agricultural extensification (increasing area cultivated) and very little from intensification (increased productivity via higher levels of inputs and/or shifting area into higher-return cash crops) (World Bank, 2007). Given the continued low levels of fertilizer and animal traction use (both of which help to improve crop yields and maintain soil fertility), it seems doubtful if continued area expansion by manual cultivation will continue to generate growth in crop income over time, without some increase in the adoption of improved inputs and/or increased production of higher-value crops.

#### *Household income 2002 – 2005*

Comparing mean and median household incomes over time, we see that the mean of total net household income per adult equivalent (AE) of panel households rose 15% from 2002 to 2005, but median income/AE fell -1%. The distribution of income became wider in 2005, as the poorest households in 2005 are considerably poorer than the poorest households in 2002, while the wealthiest households in 2005 are considerably wealthier than the wealthiest households in 2002.

However, the sample mean increased over time because the increases at the top of the distribution were larger than the declines at the bottom of the distribution. The reason for this appears to be as follows: worse rainfall conditions in 2005 reduced crop income in 2005, which had a large effect on most rural households given that crop income is their principal source of total household income. By contrast, households in the top income quintile enjoyed increases in both crop and non-farm income/AE from 2002 to 2005, and thus their incomes increased. When we follow panel households over time, we see that there is rather dramatic relative mobility of households from 2002 to 2005 across quintiles of income/AE computed for each year.

#### *Structure of income*

Structural change is typically understood to involve the shift over time from an economy in which farm production employs most people, to an economy in which non-farm goods and services plays a bigger and bigger role in the economy. This implies a movement away from an economy dominated by subsistence agricultural production (where most if not all of household economic activity is focused on the production of food and consumer goods for home consumption), and towards a more specialized, market-driven economy (where the household produces less and less food and consumer goods/services for its own consumption, and instead concentrates its labor, land, and other assets on production of a fewer number goods which are sold in markets, including the sale of household labor to other farms, businesses, etc).

Evidence of structural change would imply increased shares of higher-return farm and non-farm activities. Among farm activities, this would be evidenced by increased participation and/or productivity in cash cropping and livestock production. Among non-farm activities, structural change would imply increased participation and/or productivity in higher-return activities such as production and trading of farm inputs such as fertilizer, farm equipment, etc; marketing of crop/livestock products, adding value to food and livestock products through processing, production/trading of consumer goods such as clothing, housing, etc.

#### *Participation and shares of farm income components*

Analysis to evaluate the structure of income does not provide evidence of movements towards greater reliance on markets. The majority of rural households remain subsistence or semi-subsistence farm households. Evaluating the possibility of increased participation and/or returns in higher-return farm and non-farm activities demonstrates that there is little evidence from 2005 of any structural change toward higher-value farm activities. In fact, participation in higher-value farm activities declined somewhat since 2002, as only a third (31.7%) have sold some high-value crops (field cash crops, tree crops, horticulture) in 2005, and 26% have sales of livestock products (live animals, meat, eggs/milk). Average shares for these activities remained very low, given both low participation rates and the predominance of food crops in total income.

There is evidence of great variation in returns to farm activities: even though the wealthier households depend less on farm income than the poorer households, median income/AE from farm income for the top quintile (3,981 contos/AE) is about nearly 14 times higher than that earned by the bottom quintile (286 contos/AE).

#### *Participation and shares of non-farm income components*

The percentage of households with any non-farm income activity varied considerably from north to south, ranging from 41.9% of households in Niassa to 73% in Maputo Province. The

most prevalent non-farm activity in the north and center was family-operated small-medium enterprise (SME), while that in the south is receipt of remittances (pensions are also included, but this entails few cases).

While this general spatial pattern held for 2005, there were rather large increases in household participation in non-farm activity participation from 2002 to 2005 in the north, in Sofala, and in Gaza. It is encouraging to note that much of this increase appears to be due to increased participation in higher-return activities, not activities with lower returns such as unskilled nonfarm wage labor and SME natural resource extraction. Nampula, which suffered some of the largest crop losses in 2005, is the only province with a sizeable increase in SME natural resource activities, which might be a response to drought.

Income distribution remains highly skewed: the top income quintile earns median non-farm income/AE which is 53 times higher than that of the lowest quintile. Even with our relatively disaggregated component categories, there is still a large range of income from within a given component across households with that component. For example, even if we look at a 'higher-returns' activity such as SME other-high, we see that the median income/AE from this activity is 2,433 contos/AE for the top quintile, 291 for the middle quintile, and only 83 contos/AE for the bottom quintile.

These vast differentials in non-farm returns, and the high correlation between non-farm shares and returns and total household income, are consistent with what Reardon (1997) found in reviewing non-farm shares from household survey data across sub-Saharan Africa. He found that while non-farm income activities are correlated with higher incomes, there are often substantial barriers to entry in many of the higher-return niches. The implication of this non-farm literature for the TIA results is that observing an increase in nonfarm shares in and of themselves does not imply that such households are enjoying higher incomes, as some non-farm opportunities are pursued by households which are 'pushed' by desperation or vulnerability into such activities, rather than being 'pulled' by the lure of higher-returns per labor hour expended (Barrett et al, 2001).

### **Appendix 3: Abstract of Cunguara Master's Thesis**

#### **PATHWAYS OUT OF POVERTY IN RURAL MOZAMBIQUE**

By

Benedito Armando Cunguara

#### **ABSTRACT**

This research addresses three questions: (i) how have the incidence of poverty and the distribution of income changed? (ii) what factors are associated with rural household income change? and (iii) what factors are associated with moving out of or into poverty in the short-run? The analysis presented is based on a nationally representative two period panel data set from Mozambique, covering the years 2001/2 and 2004/5. We cannot unambiguously argue that poverty headcount in 2005 (a year of more widespread drought) was higher than poverty headcount in 2002, but the poverty gap and squared poverty gap measures were both higher in the second period.

Poverty has spatial, demographic, and asset holding dimensions. The diversification of off-farm income sources is strongly associated with increases in household income, and thus poverty reduction. For agricultural activities, especially crop production, reduction in vulnerability to drought is important for poverty reduction. Access to price information is positively correlated with income and poverty reduction in all areas, and the cultivation of tobacco is also significant in reducing poverty in the central part of the country. The impact on poverty of growing tobacco or cotton in the north was not significant, however. We also found that increases in landholding size can reduce poverty in rural Mozambique but will require additional inputs such as labor, fertilizers, and animal traction.

## **Appendix 4: Cumulative Research and Outreach Related Outputs**



# Strengthening Mozambique's Capacity for Agricultural Policy Analysis, Productivity, Growth and Poverty Reduction

## Projecto de Apoio ao Fortalecimento da Capacidade em Análise de Políticas, Produtividade Agrícola, Crescimento Económico e Redução da Pobreza em Moçambique



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### Project Overview

MSU has worked with the Ministry of Agriculture (MINAG) in Mozambique since 1991 to increase MINAG's capacity to formulate and implement facilitative agricultural sector policies, strategies, and institutional reforms. Since 2004, assistance has also been provided to the National Agricultural Research Institute (IIAM). The twin goals of the current project are to expand the availability of appropriate crop, livestock and natural-resource management technologies for smallholder farmers, and to accelerate the uptake of those technologies by strengthening policy institutions and market information services. The project seeks to achieve this goal through formal and on-the-job training in the identification of priority policy issues, collection and timely analysis of relevant information, and prompt dissemination of actionable results to managers and policy makers.

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- [Prior Project Fact Sheet](#): summarizes project approach and output up to Sept 2004.
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- [Contact Information](#): in-country personnel, U.S. based backstop and collaborative institutions.
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- [Tornar a investigação agrária relevante e produtiva](#). Gilead Mlay. Apresentação feita aos investigadores do IIAM, Centro Zonal Noroeste, Lichinga, 10 de Julho de 2008.
- [Fortalecimento da Capacidade Moçambicana para Aumento da Produtividade, Segurança Alimentar e Redução da Pobreza](#). G. Mlay, C. Donovan, R. Pitoro, F. Mazuze, D. Boughton. Uma apresentação no workshop sobre "Reforçando Parcerias e Receptividade da Investigação para Segurança Alimentar e Crescimento Agrário em Moçambique". Hotel VIP, Maputo, 4 de Junho de 2008.
- [Análise de Rendimento e Dinâmica da Pobreza nas Zonas Rurais de Moçambique 2002-2005](#). Raul Pitoro and Gilead Mlay (Centro do Estudos Sócio-Económicos/IIAM/MSU). Presented to the Working Group on the Revision of the Strategic Plan for the Agricultural Sector, January 31, 2008, Maputo.
- [Food Security in Mozambique](#). A Presentation on food security issues and future directions by the IIAM/Minag/MSU team at USAID for the US Government Accountability Office (GAO). Review Team. November 14, 2007. USAID offices, Maputo, Mozambique.
- [Avaliação dos Benefícios Económicos do Algodão Bt em Moçambique: Implicações para os Camponeses e Companhias Algodoeiras. Proposta de Pesquisa](#). Raul Pitoro. Presentation at the National Cotton Sector Meetings held by the National Cotton Institute (IAM) with private sector stakeholders, Nampula, 8 November 2007.
- [Inventário de Tecnologias Agrárias em Moçambique](#). Raul Pitoro. Presentation at the Workshop on the Transfer of Agricultural Technology in Mozambique, held 6-7 March 2007, Nampula.
- [Strengthening Mozambican Capacity for Agricultural Productivity Growth, Policy Analysis, and Poverty Reduction](#). Gilead Mlay. A Presentation to the SAKSS-SA Regional Workshop in Johannesburg, October 4th 2006.
- [Resultados do Exercício de "Priority Setting" de Namaacha, 29 Maio – 01 Junho, 2006](#). Raul Pitoro. Apresentado num encontro de PROAGRRII, IIAM, Maputo, Mozambique, 20 de Junho, 2006.
- [Debriefing on IIAM/MSU Collaboration with AGORA/HINARI Portuguese Training](#), Maputo, Jan 24-26, 2006 (Note file size = 1.6 mb)
- [List of Participants in AGORA/HINARI Trainer of Trainer Workshop](#), Maputo, Jan 24-26, 2006.
- [Insights from the Analysis of Rural Household Income in Mozambique](#). A Presentation on work by the IIAM/Minag/MSU team at the EC Delegation. December 5, 2005. EC Delegation, 2820 Julius Neyere, Maputo, Mozambique.

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- [Inquérito da Janela 2008: Resultados do Inquérito](#). Equipe do SIMA. Apresentação numa Sessão do Governo Provincial de Nampula. Cidade de Nampula, Agosto de 2008.
- A evolução do desempenho das pequenas e médias explorações e o bem-estar dos agregados familiares rurais, 2002-2005. Disseminação dos resultados do TIA. G. Mlay com apoio de D. Mather, B. Cunguara, D. Abdula, C. Donovan, E. Payongayong, D. Boughton. Apresentações nas Províncias aos autoridades provinciais e as Direcções Provinciais de Agricultura nas províncias de [Cabo Delgado](#), [Gaza](#), [Maputo](#), [Nampula](#), e [Niassa](#), Julho 2008.
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  - [Strengthening Mozambican Capacity for Agricultural Productivity Growth, Food Security and Poverty Reduction. MSU- FOOD SECURITY III/MZ PROJECT](#). Gilead Mlay. A Presentation to the PROAGRI GROUP. Swedish Embassy, Maputo. October 11, 2007.
  - [Impacts of Prime-age Adult Mortality in Mozambique: Gender Matters](#). C. Donovan and D. Mather. Poster presented at USAID for the Rural Incomes Exhibit, Maputo, Mozambique, October 15, 2007.
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  - [Adult Illness and Death in Mozambique: Prevalence and Strategies for Rural Households Dealing with Adversity](#). (English)
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  - [Dinâmica do Sector Agrário em Moçambique](#). O Papel da Agricultura Comercial Familiar na Redução da

Pobreza. (English translation-Agricultural Sector Trends: The Role of Commercial Smallholders in Poverty Reduction.) MADER seminar. Maputo. March 19, 2003 .

- [Qual o Papel da Agricultura Familiar Comercial no Desenvolvimento Rural e Reducao da Pobreza em Mocambique?](#) Presentation by Vice Minister of Agriculture and Rural Development Joao Carrilho to the Mozambican Association of Science and Technology. Maputo, October 2002. Rui Benfica and David Tschirley of MSU assisted in preparation.
- [Property Rights for Poverty Reduction: Mozambique's Land Law.](#) Presentation by Minister of Agriculture and Rural Development Helder Muteia at the World Summit on Sustainable Development. Johannesburg, September 2002. Duncan Boughton, MSU In-Country Representative in Mozambique, assisted in preparation.
- [Desenvolvimento do Sector Agrario em Mocambique: Constrangimentos, Estrategias e Prioridades.](#) Presentation by Minister of Agriculture and Rural Development Helder Muteia at the USAID/Mozambique seminar on its five year country strategy development. Maputo, October 2001. Jan Low and Duncan Boughton assisted in preparation.





## Reprint Series - Theses

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- Benfica, Rui M.S. [An Analysis of Income Poverty Effects in Cash Cropping Economies in Rural Mozambique: Blending Econometric and Economy-Wide Models](#). PhD Dissertation. 2006. (1 MB)\*
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- Pitoro, Raul Oscar. [Assessing The Potential Economic Benefits of Transgenic Cotton in Mozambique](#). M.Sc. Thesis. 2004. (590 KB)\*
- Mole, Paulo. [An Economic Analysis of Smallholder Cashew Development Opportunities and Linkages to Food Security in Mozambique's Northern Province of Nampula. \(Note: 1 megabyte download\)](#). Ph.D. Dissertation. June 2000. (970 KB)\*
- Benfica, Rui. [An Analysis of the Contribution of Micro- and Small Enterprises to Rural Household Income in Central and Northern Mozambique](#). M.Sc. Thesis. March 1998. (765 KB)
- Marrule, Higinio. [Land-Poor in a "Land-Abundant" Setting: Unraveling a Paradox in Mozambique](#). M.Sc. Thesis. March 1998. (730 KB)\*
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- Donovan, Cynthia. The Effects of Monetized Yellow Maize Food Aid on Local Maize Prices in Mozambique. Ph.D. Dissertation. February 1996. \*
  - [Chapters 1-5](#) (Note: 4.4 megabyte download)
  - [Chapters 6-8 and annex](#) (Note: 5.1 megabyte download)
- Dengo, Maria Nita. Household Expenditure Behavior and Consumption Growth Linkages in Rural Nampula Province, Mozambique. M.Sc. Thesis. December 1992. PN ABS 943.\*

\* by MSU graduate students supported by the project





# Professional Publications

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## 2007

- Boughton, Duncan, Mather, D., Barrett, C.B., Benfica, R., Abdula, D., Tschirley, D. and Cunguara, B. [Market Participation by Rural Households in a Low-Income Country: An Asset-Based Approach Applied to Mozambique](#). *Faith and Economics* Vol 50, Fall 2007: 64-101.
- Mather, David, and Cynthia Donovan. 2007. The Impacts of Prime-age Adult Mortality on Rural Household Income, Assets, and Poverty in Mozambique. Report for World Bank/Mozambique.
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## 2005

- Benfica, Rui M.S., David Tschirley and Duncan Boughton. 2005. [Interlinked Transactions in Cash Cropping Economies: The Determinants of Farmer Participation in the Zambezi River Valley in Mozambique](#). Accepted as a contributed paper for the 26th International Association of Agricultural Economics Meeting, Brisbane, August 2006.
- Boughton, Duncan, David Mather, David L Tschirley, Thomas Walker, and Ellen Payongayong. 2005. Pro-Poor Rural Economic Growth for Post-Civil War Recovery: Myth or Reality in Mozambique? Accepted as a poster paper for the 26th International Association of Agricultural Economics Meeting, Brisbane, August 2006.
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- Jayne, T. S., Marcela Villarreal, Prabhu Pingali and Günter Hemrich. [HIV/AIDS and the Agricultural Sector: Implications for Policy in Eastern and Southern Africa](#). *Electronic Journal of Agricultural and Development Economics*. Vol. 2, No. 2, 2005, pp. 158-181.
- Mather, D., C. Donovan, T.S. Jayne, and M. Weber. 2005. [Using Empirical Information in the Era of HIV/AIDS to Inform Mitigation and Rural Development Strategies: Selected Results from African Country Studies](#). *American Journal of Agricultural Economics*, Vol. 87:5 (1289-1297).

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- Jayne, T.S. T. Yamano, M. Weber, D. Tschirley, R. Benfica, A. Chapoto, and B. Zulu. 2003. [Smallholder Income and Land Distribution in Africa: Implications for Poverty Reduction Strategies](#). *Food Policy*, Vol. 28(3): 253-275. [Science Direct Summary](#).

## 2001

- Tschirley, D., R. Benfica, 2001. Smallholder Agriculture, Wage Labor and Rural Poverty Alleviation in Land-Abundant Areas of Africa: Evidence From Mozambique. *The Journal of Modern African Studies*, Vol. 39:2 (333-358).

## 1996

- Jayne, T.S., L. Rubey, F. Lupi, D. Tschirley, M. Weber, 1996. Estimating Consumer Response to Food Market Reform Using Stated Preference Data: Evidence from Eastern and Southern Africa. *American Journal of Agricultural Economics*, Vol. 78:3 (820-824).



# Survey Instruments and Data Documentation

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## Introduction

Since 1991, FSP has carried-out or assisted in a large number of household surveys in Mozambique. These surveys have ranged from geographically focused studies designed to address specific policy issues, to assistance to Ministry of Agriculture and Rural Development in its National Agricultural Survey. Below are brief descriptions of each survey, links to downloadable questionnaires, and links to Research Reports which provide methodological background or research results from the surveys. Many of the downloadable questionnaires are "synthetic questionnaires". These are based on the original, but are redesigned to reflect the final structure of the SPSS/Windows data files. If the questionnaire is an original, and not a synthetic version, that is indicated in parentheses.

## 2005 National Agricultural Household Survey (TIA05)

- Village/Community Questionnaire ([English](#), Portuguese)
- Small and Medium Farms: Panel Households ([English](#), Portuguese)
- Small and Medium Farms: New Households ([English](#), [Portuguese](#))

## 2003 National Agricultural Household Survey (TIA03)

- Village/Community Questionnaire ([English](#), [Portuguese](#))
- Small and Medium Farms - with Field Measurements ([English](#), [Portuguese](#))
- [Pequenas E Médias Explorações - Sem Medição](#)
- [Grandes Explorações](#)

## 2002 National Agricultural Household Survey (TIA02)

During 2002 the project is working intensively in support of MADER's national agricultural household survey, referred to as TIA02. Field work is scheduled to be launched in July 2002 and completed during October. A total of over 4,000 households will be interviewed. Final questionnaires are now available.

- [Household Questionnaire](#)
- [Community Questionnaire](#)

## Agricultural Market Information System (SIMA)

Since 1991, MSU has assisted MADER in implementing an Agricultural Market Information System (SIMA). This system produces weekly (Quente-Quente) and monthly (Boletim Mensal) bulletins with domestic prices of 25 products in 27 producer, wholesale, and retail markets throughout the country. The bulletins also include regional and international prices of selected commodities, and market commentary.

- [Questionnaires](#)
- [SIMA Web site](#) - Full set of SIMA and SIMA Provincial (SIMAP) Publications and presentations.

## 2000/01 Cotton Monitoring Surveys

In October 2000, Mozambique embarked on a phased liberalization of its cotton sector, and the Ministry of Agriculture and Rural Development's Policy Analysis Department was charged with monitoring this process and recommending follow-on reforms. As part of the monitoring process, FSP assisted the Policy Analysis Department in conducting a survey of cotton growers in Nampula province during December, 2000.

Questionnaires



- [Household Level](#): this questionnaire is based in the income proxy methodology developed from the 1998 Income Survey, and will allow the calculation of estimates for each household of income from 10 different sources. (original in Portuguese)
- [Grower Level](#): this questionnaire focuses on the cotton growing practices and experience of the grower. (original in Portuguese)

## 1998 Income Survey

In 1998, FSP worked with USAID-funded NGOs to conduct a survey of households in NGO target areas. The stratified cluster sample design covered 490 households, each of whom was visited twice during the year. The primary purpose of the survey was to develop income proxy models for use by NGOs in impact monitoring.

### Questionnaires

- [Round 1](#) (June 1998; original in Portuguese)
- [Round 2](#) (November 1998; original in Portuguese)

Research Reports: See [#38](#) for more detail on research methods, and for the income proxy models developed on the basis of these data.

## 1996 National Agricultural Survey (TIA96)

FSP assisted MADER in carrying out this national rural household survey. The stratified cluster sample design covered 3,851 households in all 10 provinces of the country. FSP added a microenterprise module to this survey, covering all sampled households in the provinces of Nampula, Zambezia, Manica, and Sofala.

### Questionnaires

- [Main Questionnaire](#)
- MSE Module
  - [Rural, Part I](#) (translated original)
  - [Rural, Part II](#) (translated original)
  - [Rural, Closed Enterprises](#) (translated original)
  - [Urban](#) (translated original)

### Reports

- [Lessons Learned](#)
- Documentation and selected results: [text of the report](#), and [statistical tables](#).

## Small-Holder Cash Cropping, Food Cropping and Food Security in Northern Mozambique

This survey was carried out over five rounds in 1994 and 1995. It focused on three "Joint Venture Companies" operating cotton outgrower schemes with smallholders in Nampula and Cabo Delgado provinces in northern Mozambique. The objective of the research was to examine the effects of alternative technological packages and institutional arrangements for cotton on smallholder incomes and food security. The stratified cluster sample covered 472 households, with modules on agricultural production, field level agricultural activities (including labor hiring), off-farm wage and microenterprise activities, expenditure, and 24-hour recall food consumption.

### Questionnaires

- [Agriculture, Demography, Employment and Expenditure](#)
- [Household Level Questions](#)
- [24-hour Recall Consumption](#)
- [Maize Milling Module](#)
- [Land Conflict Module](#) (done in collaboration with Land Tenure Center, U. of Wisconsin)

Research Reports: See [#21](#) for details on research methods; [#25](#) for selected research results.

## Socio-economic Survey of the Smallholder Sector in Three Districts of

## Nampula Province, 1991

This survey covered 343 households in the districts of Ribaué, Monapo and Angoche, Nampula province. It examined the food security strategies that households had adopted under the extremely difficult circumstances created by civil war and degradation of infrastructure.

- [Original Questionnaire](#)
- Related Research Reports: See Research Reports [3](#) and [3P](#) (Portuguese) for more detail on research design. For research results, see Research Reports [4](#), [4P](#), [5](#), [5P](#), and [6](#)