UNIVERSITY OF PUERTO RICO
MAYAGÜEZ CAMPUS
COLLEGE OF AGRICULTURAL SCIENCES
AGRICULTURAL EXPERIMENT STATION

FY 2005-2006 PLAN OF WORK UPDATE

Planning Option: This two year Plan of Work Update is prepared for our Institution's individual functions.

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Overview

The University of Puerto Rico's Agricultural Experiment Station (AES) conducts basic and applied research to promote an economically viable agricultural sector and to stimulate rural development in Puerto Rico and in the region. Research also promotes the conservation and enhancement of natural resources and the environment, supports established and newly developed industries that process agricultural raw materials, and provides technical assistance to farmers and private and public institutions. The Agricultural Experiment Station coordinates its academic activities with the teaching and extension faculty of the College of Agricultural Sciences (CAS) in an ongoing effort to implement the strategic plan that defines our programmatic goals. AES scientists also participate in several advisory boards of the Puerto Rico Department of Agriculture (PRDA), providing technical expertise for public policy decisions made by the PRDA. To advance regional goals, the AES participates in both multistate research and Special Grants from USDA-CSREES that target agriculture in the Caribbean Basin of the United States.

The Agricultural Experiment Station has administrative offices and carries out research activities at two main centers: Río Piedras, in the northern San Juan metropolitan area, and Mayagüez, in the west coast of the island, where the CAS Campus is located. In addition, the AES has six substations comprising more than 2,000 acres of land distributed in the different geographical and ecological zones of Puerto Rico. This wide distribution allows for the evaluation of crop and animal production systems adapted to the conditions of different ecological zones.

Five principal goals, consonant with both federal and local priorities, drive our research program:

1. To develop technology for achieving sustainable agricultural production systems that are socioeconomically viable and competitive.
2. To develop technology for processing traditional and new agricultural products and for achieving a safe food and fiber system.
3. To provide direct services and technical expertise to farmers, agroindustries, and public agencies that lack specialized personnel or research facilities present at AES-UPR.
4. To develop agricultural technology compatible with the preservation and enhancement of our natural resources and environment.
5. To provide the socioeconomic research needed to formulate alternatives that can potentially improve economic opportunities and the quality of life in rural areas.

Research efforts at the AES are concentrated on goals one and four of the national goals, whereas other goals are covered by the Agricultural Extension Service of the CAS. The AES recently began an internal and external evaluation process to identify other critical intermediate and short term issues that should be targeted by our research program, and to incorporate stakeholders input on these issues and on the setting of research priorities. Our research program is still organized following commodity lines, but there are now ten

commodities[1], instead of the original eleven. Since FY 2002 the sugarcane commodity group was eliminated, given the practical disappearance of sugar plantings in Puerto Rico and the retirement of researchers with expertise in that commodity. Moreover, the Environment and Natural Resources commodity area (the only one not associated to a particular crop/livestock research program) is now being reorganized along five broad areas of research (soil management, water quality, invasive species, sustainable agriculture and food systems, and tropical biodiversity) to better meet the needs identified by both scientists and different stakeholder audiences. Further changes in the organization of current commodity research are expected to occur during the next two years, as this evaluation process continues to unfold.

Information on critical issues related to our planned programs under each national goal has been derived from three types of meetings that have been held in the last year in different locations of Puerto Rico. First, through a series of periodic meetings with researchers acting as commodity leaders, a thorough re-evaluation of our research program is being conducted. Emphasis has been given to assessing means to incorporate and document stakeholders' input into the setting of research priorities, and to assess ways in which our research results can be translated into initiatives of impact for our different audiences. Second, we have continued to celebrate an annual meeting with researchers, extensionists, faculty, farmers and other public interested in the work performed under each commodity area, focusing again on the sharing of results and on requesting further input for determining the commodity's research needs and priorities. Third, several commodity leaders have organized thematic workshops, seminars, or field days in which research results on particular topics have been shared and alternative views on the subject--including further research and extension needs, or public policy determinations--have been discussed. The feedback received in all of these activities has been incorporated into the revised statement of issues prepared under each goal for this Plan of Work (POW) update.

Executive Summary

Year 2005

Nat l Goal	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5
FTE TOTAL	**87.5**	**1.6**		**109.0**	**1.8**
Scientist	49.8	1.5		26.8	1.7
Professional	9.3			58	0
Technical	28.4	0.1		24.2	0.1
Fiscal ($)	**6,288,971**	**113,073**		**4,256,315**	**111,583**

Formula funds should amount this year to 51.3% of the total financial resources available.

[1] Current commodity groups are: dairy, coffee, plantains and bananas, vegetable crops, fruit crops, ornamentals, meat production, roots and tubers, basic grains and environment and natural resources.

Year 2006

Nat l Goal	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5
FTE TOTAL	**87.5**	**1.6**		**109.0**	**1.8**
Scientist	49.8	1.5		26.8	1.7
Professional	9.3			58	0
Technical	28.4	0.1		24.2	.1
Fiscal ($)	**6,569,338.0**	**115,788**		**4,434,340**	**116,046**

Formula funds should amount this year to 51.3% of the total financial resources available.

Goal 1: An agricultural system that is highly competitive in the global economy

Increasing economically viable and sustainable agricultural production remains our principal long-term goal. Through an ongoing evaluation process, other critical issues have been identified such as the assessment of which types of crop/livestock operations, production practices, and farm organizations are more suitable for the large-scale utilization of coastal lands; and assessing the viability of alternative crops/livestock and farm enterprises for the diversification of small scale individual farms. Additional emphasis will be provided in our research program to emerging plant and animal protection issues, postharvest/market quality of crops and livestock products, and on lowering the costs of production of several commodities. We will continue to address the issues identified above by a combination of strategies involving the evaluation of new plant germplasm, the development of integrated pest management practices, the development of economically viable livestock management practices and animal health practices, the development of new and value added products, and the evaluation of other inputs management practices (fertilization, irrigation, labor). Approximately 58% of total formula funds and other CSREES funding will be allocated for FY 2005 and FY 2006 under this goal. A total of 49.8 scientist/FTEs (62%) will be devoted to this goal during these years.

Goal 2: A safe and secure food and fiber system

Sustaining the environmental land base, providing the necessary research to devise adequate animal and plant protection measures, and addressing in an integrated manner food production, marketing and consumption issues are critical concerns that future research must approach in order to sustain and increase the production capacity and safety of the local food system. The AES does not currently have the human and fiscal resources to cover all aspects of this critical research agenda, but modest steps are been taken to gradually strengthen our research capacity in the areas of post-harvest storage and processing, marketing, and plant and animal health. Approximately 1% of total formula funds and other CSREES funding will be allocated for FY 2005 and FY 2006 under this goal. A total of 1.5 scientist/FTEs (2%) will be devoted to this goal during these years.

Goal 3: A healthy, well-nourished population

The AES is not currently performing, and does not intend to perform in the near future, any research specifically targeted to meet this goal's concerns, which are primarily addressed by the educational programs of the Agricultural Extension Service. No fiscal or human resources will therefore be devoted to this goal during the next two fiscal years.

Goal 4: Greater harmony between agriculture and the environment

The principal objective of the Natural Resources and Environment commodity area has been since its inception to develop and support the scientific research carried out in the CAS on the interface of agriculture, natural resources and the environment. As a result of an ongoing internal and external evaluation process of the research priorities in the areas grouped under this commodity, its future research program will be focused on the identified critical issues related to soil management, water quality, invasive species, sustainable agriculture and food systems, tropical biodiversity, and environmentally viable urban and suburban agricultural activities. Approximately 40% of the total formula funds and other CSREES funding will be allocated for FY 2005 and FY 2006 under this goal. A total of 26.8 scientist/FTEs (34%) will be devoted to this goal during these years.

Goal 5: Enhanced economic opportunity and quality of life for Americans

High unemployment rates and chronic poverty are long term critical issues affecting Puerto Rico´s population, particularly in non-metropolitan areas. The AES research program under this goal, although modest in scientific and fiscal resources, is directed toward providing the socioeconomic research needed to formulate alternatives that can potentially enhance the economic well-being and quality of life in rural localities. Studies of labor market dynamics, of the prospective impact in rural areas of welfare reform, of alternative marketing channels for farm products, and of community organization in support of local farming alternatives are core priorities that will continue to be addressed by our program. Approximately 1% of the total formula funds and other CSREES funding will be allocated for FY 2005 and FY 2006 under this goal. A total of 1.7 scientist/FTEs (2%) will be devoted to this goal during these years.

A. PLANNED PROGRAMS

GOAL 1: AN AGRICULTURAL SYSTEM THAT IS HIGHLY COMPETITIVE IN THE GLOBAL ECONOMY

Statement of Issue(s)

Agriculture is of strategic importance to Puerto Rico both in terms of its present and its potential contribution to the economy. Although it is the smallest of the primary economic sectors, its broader economic impact is significant given the high multiplier

effect of its activities. Puerto Rico has a large food import bill, much of which could be competitively produced locally, if appropriate technology and marketing strategies were devised, disseminated among farmers and processors, and emerging problems researched to formulate viable solutions. Moreover, through its research and extension programs, the island's land grant system could also make a significant contribution towards stabilizing and expanding our current agricultural exports.

Increasing economically viable and sustainable agricultural production remains, therefore, our principal long-term goal. Other critical long-term issues that have been identified through our ongoing evaluation process are the following:

1. To assess crop/livestock operations, production practices, and farm organizations that are more suitable for the large-scale utilization of coastal lands, formerly under sugar cultivation and gradually acquired by the government due to their paramount importance for sustaining agricultural and natural resources of the island.
2. To assess the viability of alternative crops/livestock and farm enterprises for the diversification of small scale individual farms, particularly in the central mountainous region of the island.

Critical intermediate and short term issues for which we plan to continue or expand our current efforts are the following:

1. Emerging plant and animal protection issues – continue with current efforts to protect plants and animals for sustained productivity, with additional short term emphasis on strengthening our animal protection and plant pathology research program.

2. Postharvest quality of crops, market quality of livestock products, and creation of new and value added agricultural products to make our commodities more competitive and open new market niches.

3. Lower the costs of production of commodities such as grains and roots and tubers, whose situation in the last 10 years has been particularly undermined by the competition of cheaper imports from other Caribbean and Latin American countries.

Performance Goal(s)

1. To further agricultural production and competitiveness.
2. To produce and provide pertinent agricultural knowledge to growers and other interested individuals or groups.

Output indicators:

-New germplasm is evaluated.
-New integrated pest and weed management practices are developed.
-New fertilization and irrigation practices are developed.
-New feeding and health management practices are developed.

-Publications are prepared and submitted to journals

Outcome indicators:

-Resistance to certain pests and diseases is increased.
-Crop production and management is improved.
-Livestock production and management is improved.
-Local crop production is increased.
-New varieties are introduced

Key Program Component(s)

Each commodity group has identified their research priorities for the next couple of years. Some key components of their research program associated to this goal are:

-Reduce the costs of production of pigeon peas and other grains focusing on improved cultural practices and on breeding for resistance to the pigeon pea podfly.

-Develop varieties for green-shelled bean production.

-Develop integrated management practices for *yautía (Xanthosoma saggittifolium)*--an important root crop whose production has been declining in the island--including disease control, irrigation, planting systems, fertilization, seed preparation and post harvest practices, and the development of new value added products.

-Develop integrated pest and disease management practices for horticultural crops, plantains and bananas, and new value added products for farinaceous crops.

-Improve the production efficiency of dairy operations by evaluating new feeding and reproductive management systems, and by improving the quality of grasses through the introduction of new species and management practices.

-Improve the marketing of local meats by identifying farm and market factors affecting the quality of meat (bovine, goat, fowl, rabbit) in Puerto Rico, and consumer perceptions on the quality of local meats.

-Evaluate different scion-rootstocks combinations of citrus germplasm for tolerance to the principal diseases affecting citrus production, and new horticultural germplasm with suitable characteristics for local and export markets.

-Develop new mediums of cultivation from local organic wastes to substitute the use of peatmoss in ornamental plants.

Internal and External Linkages

The AES coordinates its research activities with the teaching and extension faculty of the CAS. Both faculty and extension specialists have been leaders of research projects

under this goal, while AES staff also collaborates in the educational activities related to faculty/extension projects, teaching, or program initiatives. This collaboration is expected to increase in the future, as a result of changes being implemented at the Departmental level in the CAS to promote further integration between its three branches.

AES scientists and commodity leaders are also in close contact with United States Department of Agriculture (USDA) personnel based in Puerto Rico (mostly at the Tropical Agriculture Research Station at Mayagüez and Isabela), and collaborative research projects contributing to this goal are currently under way. Close links are also maintained with the PRDA, facilitated during the last three years by the Director of the CAS Planning and Development office which has served as liaison officer. Several projects are underway addressing special research priorities of the PRDA. Under a recent collaborative agreement, the PRDA has assigned funds for the improvement of facilities in the CAS experimental dairy farms, while the AES is conducting a special project on the adaptability and potential of kenaf (*Hibiscus cannabinus*) as an alternative crop for large scale production in the island. Cooperative projects or collaborations have also been established with the local Department of Natural Resources, the federal Natural Resources and Conservation Service, and the US Forestry Service.

Linkages have also been made by AES individual scientists with recently organized "production nuclei"--a commodity-based producers association—to better identify their research needs, receive feedback on our current research program, and share the results of ongoing projects. In addition, the AES maintains good working relationships with long-standing local farmers groups (Farmers Association, Farmers Federation), professional scientists and agronomists associations, and private agribusiness companies with particular interest in our research outcomes.

Regional collaboration, with Florida and the Virgin Islands, in research projects targeting the competitivity of Caribbean Basin agriculture is also an important part of our research efforts under this goal and is expected to continue or increase in the next two years under Special Grants from USDA-CSREES. In addition, the AES participates in multistate research targeting national or regional priorities that coincide with Puerto Rico's particular basic or applied needs.

Target Audiences

Extension specialists and agents, individual farmers and growers, production nuclei and other farmers associations participants, agronomists and other agricultural professionals working in public and private agencies, scientists, faculty, and graduate and undergraduate students.

Program Duration

This is a two year update of our former five year program but most of the critical issues identified require a long term commitment of more than five years.

Allocated Resources

Fiscal Year	Hatch Funds	State Funds	Other Federal Funds
2005	**2,334,298**	**3,692,474**	**262,199**
2006	**2,334,298**	**3,972,841**	**262,199**

FTE

Year	Scientist	Professional	Technical
2005	**49.8**	**9.3**	**28.4**
2006	**49.8**	**9.3**	**28.4**

GOAL 2: A SAFE AND SECURE FOOD AND FIBER SYSTEM

Statement of Issue(s)

The current food system of Puerto Rico can be characterized by several traits: the increasing marginalization of its agricultural production, the dependence on food imports to satisfy most of its population needs, the importance of federal food and nutrition assistance programs to sustain the island's food consumption, and the distribution of food supplies through a few, increasingly larger and concentrated supermarket chains. Food security, understood as the ability of local people to access a diverse food supply, unfortunately disappeared from public policy deliberations after the 1974 implementation of the Food Stamp Program and other nutritional subsidies, and concerns about the overall safety of the island's food system were relegated to a secondary position in the research and education agenda of the CAS.

Given the increasingly common realities of international embargos, climate changes, bioterrorism, and wars, the assumption that the global food system can indefinitely provide a reliable and affordable supply of food and fiber products has recently come again into question. Sustaining the environmental land base, providing the necessary research to devise adequate animal and plant protection measures, and addressing in an integrated manner food production, marketing and consumption issues, are critical concerns that must be approached, to sustain and increase the production capacity and safety of the local food system. The AES does not currently have the human and fiscal resources to cover all aspects of this critical research agenda, but modest steps are being taken to gradually strengthen our research capacity in the areas of post-harvest storage and processing, marketing, and plant and animal health.

Performance Goal(s):

1. To maintain a safe and secure fiber system that is compatible with local food preferences and idiosyncrasies.
2. To improve the quality and marketability of local agricultural and livestock products.

Output indicators:

-A research program for the detection and control of new farm animal diseases is devised.

-New technologies for the preservation of local food products are developed.

Outcome indicators:

-New animal disease control and management programs are implemented.

-Market availability and consumer acceptability of selected agricultural products (either raw or processed) are increased.

-Publications are prepared and submitted to journals.

Key Program Component(s)

Each commodity group has identified their research priorities for the next couple of years. Some key components of their research program associated to this goal are:

-Conduct food system profiles of selected localities to provide a more systematic knowledge of how communities can generate, support and benefit from more localized food systems.

-Conduct research on the transformation of food retailing and wholesaling, emerging farmers markets, and other food/agricultural marketing channels, and their consequences for local agriculture.

-Determine the prevalence of Johne's disease in local dairy herds and devise control and management programs for the disease.

-Research the applicability of modified atmosphere packaging (MAP) for the marketing of fresh pigeon peas and other crops.

-Conduct research on critical areas related to post-harvest management of crops.

Internal and External Linkages

Food system profiles of selected communities are conducted in collaboration with the local Agricultural Extension Service agents and Home Economists, and education activities based on these projects results are usually held in a central facility of the locality. Local governmental and non-governmental organizations active in the

community usually participate in the discussion of projects goals and in the dissemination of results. Scientists working in projects under this goal have also collaborated with the PRDA officials in charge of organizing new itinerant farmers markets linked to the WIC's Farmers Markets Nutrition Program.

While at present, food safety issues are mostly covered by the staff of the Agricultural Extension Service and other CAS personnel. Researchers in the Departments of Animal Industry and Agricultural Engineering and in the Food Science and Technology Program also collaborate in these endeavors. An increase in joint projects/collaborations is expected to occur in the near future as new researchers with expertise in these areas are recruited. Also collaborations with CAS faculty in the area of post-harvest management research are expected to continue.

In the area of animal health, the AES is partnering with USDA-APHIS personnel to effectively implement a detection, control and management program for Johne's disease and other diseases affecting cattle in Puerto Rico. Local Department of Agriculture staff will also collaborate in these efforts through their Veterinary State Diagnostic Laboratory.

Target Audiences

Extension specialists, agents and home economists, individual farmers, growers, and managers of dairy operations, local community governmental and non-governmental organizations, farmers' markets organizers and participants, agronomists and other agricultural professionals working in public and private agencies, scientists, faculty, and graduate and undergraduate students.

Program Duration

This is a two-year update of our former five year program but some of the critical issues identified require the strengthening of our research capacity in new areas and therefore a long term commitment of more than five years.

Allocated Resources

Fiscal Year	Hatch Funds	State Funds	Other Federal Funds
2005	**26,374**	**86,699**	**0**
2006	**26,374**	**89,414**	**0**

FTE

Year	Scientist	Professional	Technical
2005	**1.5**	**0**	**0.1**
2006	**1.5**	**0**	**0.1**

GOAL 3: A HEALTHY, WELL NOURISHED POPULATION

Statement of Issue(s)

The AES is not currently performing, and does not intend to perform in the near future, any research specifically targeted to meet this goal's concerns, which are primarily addressed by the educational programs of the Agricultural Extension Service. Nevertheless, the studies conducted under the former Food Technology Laboratory of the AES on the nutritional composition of many local food crops still provide part of the basic information used in the nutritional education programs of the Extension Service.

GOAL 4: GREATER HARMONY BETWEEN AGRICULTURE AND THE ENVIRONMENT

Statement of Issue(s)

The principal objective of the Natural Resources and Environment commodity area has been since its inception to develop and support the scientific research carried out in the CAS on the interface of agriculture, natural resources and the environment. During the original five year period covered by this plan of work this goal has been addressed through research on the following priorities: (1) Developing technologies for the management of soil erosion, (2) Developing technologies for the management of organic residues, (3) Developing integrated management systems for different crops, and (4) Establishing pollution biological indexes. Within these priorities emphasis was given to water pollution control, integrated pest management, and sustainable agriculture.

As a result of an ongoing internal and external evaluation process of the research priorities in the areas grouped under this commodity, its future research program will be focused on the following critical issues:

(1) Research on watershed management to examine the different sources of pollution, emphasizing on the development of detection techniques and management strategies.
(2) Broaden the scope of research on soil erosion management to include the examination of the movement of contaminants and loss of soil nutrients, with an emphasis on evaluating management practices and strategies.
(3) Expand current research on invasive species of plants and insects to examine the biology, distribution, ecology, and risk assessment of introduction of the invasive species, emphasizing on management techniques and strategies.
(4) Expand interdisciplinary research on sustainable agriculture to examine how integrated agricultural production systems can contribute to the environmental and socioeconomic sustainability of the island, emphasizing on the development of alternative agricultural production systems and their problems.

(5) Continue with the current research program on tropical biodiversity and the registry of the plant and insect fauna of Puerto Rico, emphasizing on the development of databases and biological indexes.
(6) Develop a research program geared towards agricultural activities held in peripheral urban and suburban areas – the small size of the island and accelerating urbanization rate in the last 10 years requires that more emphasis be given to research related to urban forestry, urban horticulture, ornamentals, and pesticide management in restricted areas, among other topics.

Performance goals

1. To develop watershed pollution detection techniques and management strategies.
2. To devise alternative management practices and strategies for the control of soil erosion.
3. To increase local knowledge of invasive species of plants and insects, and develop management techniques and strategies in case of their prospective introduction.
4. To increase local knowledge of alternative agricultural production systems and their problems.
5. To develop databases and biological indexes on the plant and insect fauna of Puerto Rico.
6. To increase local knowledge on economically and environmentally viable urban and suburban agricultural activities.

Output indicators:

-New watershed pollution detection techniques and management practices are developed.
-New germplasm and management alternatives for eroded soils are recommended.
-The biology, distribution, economic impact and ecology of selected invasive species are studied and documented.
-Research and education needs of alternative agricultural producers are determined.
-Establishment of plant and insect fauna databases.
-Information is compiled on management practices adopted by commercial turf and greenbelt managers, landscape managers, golf courses and sod producers.
-Publications are prepared and submitted to journals.

Outcome indicators:

-Increased adoption of watershed pollution management practices.
-Non-point pollution from agricultural sources decreases.
-Soil erosion decreases.
-Protocols for the management of invasive species once introduced are developed.
-Increase in the number of alternative sustainable producers in the island.

-Improved management of turf and greenbelts in urban environments is accomplished in an economically and environmentally friendly manner.

Key Program Component(s)

Some key components of the Natural Resources and Environment commodity's research program associated to this goal are:

-Continued assessment of watershed approaches to non-point source pollution management, and well and interstitial water protection.
-Studies of soil conditioners to enhance the performance of adapted germplasm, nutrient availability of different types of compost materials, and nutrient movement and uptake in tropical soils.
-Management of soil compaction in intensively grazed pastures.
-Determine the economic impact of technical barriers to trade related to invasive species.
-Devise sustainable agricultural practices for the management of plant-parasitic nematodes and other pests.
-Evaluate environmentally friendly crop processing technologies.
-Devise best management practices for the establishment of urban turf and greenbelts focusing on varietals selection, irrigation practices, wastewater management, and proper fertilization and pesticide use.

Internal and External Linkages

Research conducted under this goal is directly linked to the mission of several local and federal agencies which actively support the work performed in the CAS and collaborate in the diffusion and implementation of results. Close links exist with the federal Natural Resources Conservation Service, the Environmental Quality Board, the local Department of Natural Resources, the administration of the Jobos Bay Natural Reserve, and the US Forest Service. Several members of the CAS faculty are leaders of projects in this commodity group, while Agricultural Extension Service personnel also collaborate in specific research components and in the diffusion of results. Another program collaborator is the University of Puerto Rico Institute of Water, an internal partner which allocates additional financial resources in support of research objectives associated to water quality improvement.

Target Audiences

Extension specialists and agents, personnel of environmental regulatory agencies, individual farmers and growers, alternative sustainable/organic producers, coffee processors, urban horticulturists, commercial turf and greenbelt managers, golf courses managers and sod producers, agronomists and other agricultural professionals working in public and private agencies, scientists, faculty, and graduate and undergraduate students.

Program Duration

This is a two-year update of our former five year program but most of the critical issues identified require a long term commitment of more than five years.

Allocated Resources

Fiscal Year	Hatch Funds	State Funds	Other Federal Funds
2005	**1,428,130**	**2,543,512**	**284,673**
2006	**1,428,130**	**2,721,537**	**284,673**

FTE

Year	Scientist	Professional	Technical
2005	**26.8**	**58.0**	**24.2**
2006	**26.8**	**58.0**	**24.2**

GOAL 5: ENHANCED ECONOMIC OPPORTUNITY AND QUALITY OF LIFE FOR AMERICANS

Statement of Issue(s)

High unemployment rates and chronic poverty are long term critical issues affecting Puerto Rico´s population, particularly in rural areas. Changes in the global economy since the mid-1970s, with the concomitant restructuring of major local economic sectors, have exacerbated these adverse conditions. Official statistics confirm that nutritional subsidies and welfare payments are highly important for the livelihood strategies of more than half of the island's families. While the contribution of agriculture to the Gross Domestic Product is stagnant or declining, due to its high multiplier effect the continued viability of farming is critical for maintaining and improving the quality of life in the island, particularly in the central mountainous region where alternative employment opportunities do not abound.

The AES research program under this goal, although modest in scientific and fiscal resources, is directed toward providing the socioeconomic research needed to formulate alternatives that can potentially enhance the economic well-being and quality of life in rural areas. Studies of labor market dynamics, of the prospective impact in rural areas of welfare reform, of alternative marketing channels for farm products, and of community organization in support of local farming alternatives are core priorities that will continue to be addressed by our program. Moreover, the collaboration of our institution's social scientists in the process of collecting stakeholder input for the research program of the different commodity groups is expected to increase in the near future.

Performance goals

1. To enhance the employment opportunities of the rural labor force.
2. To provide the socioeconomic research needed to devise new economic development alternatives for rural areas.
3. To collaborate with local food system stakeholders in the identification of high priority information needs.

Output indicators:

-Local dimensions of community food systems are assessed.
-New marketing and distribution alternatives for regional production are recommended.
-The spatial mismatch between the demand and offer of jobs in rural areas is explored.
-Challenges faced by Temporary Assistance to Needy Families (TANF) recipients in their transition to salaried employment are documented.

Outcome indicators:

-Policy recommendations related to the economic well being and quality of life in rural areas are published and distributed among pertinent government representatives.
- New employment opportunities are created in targeted rural areas.
-The number of civic organizations dealing with the socioeconomic problems of rural communities or providing socio-cultural alternatives for these areas increases.
-New marketing alternatives for farmers are opened in the targeted region.
-Recommendations for educational programs tailored the characteristics of TANF program recipients are suggested.

Key Program Components

-Surveys of agricultural laborers, farmers and unemployed laborers in the coffee region of the island to assess the characteristics of the region's labor force and the nature of employers labor demand.
-Personal interviews and case studies of beneficiaries of TANF are performed to identify their characteristics and challenges faced as they move from dependency to self sufficiency.
-Rural participatory approaches to the study of communities involved in projects supporting local agriculture are implemented to assess ways of expanding community participation in the solution of their problems.

Internal and External Linkages

Research under this goal is conducted in collaboration with the local Department of Labor and Human Resources Job Readiness Program and its Agricultural Laborers Division. The Agricultural Extension Service of the targeted municipalities is also an active participant in the planning and execution stages of these studies and this collaboration is expected to continue in the policy recommendation stage. Linkages also exist with government associated community organizers and non-governmental civic organizations in targeted communities of the central region. These partners serve both as a sounding board for discussing the progress of local projects and as an audience for sharing the outcomes of the research conducted.

Target Audiences

Government officials in agencies dealing with economic development policies, labor training and employment, agriculture, family, and social services, farmers, agricultural laborers, extension agents and specialists, social scientists, graduate and undergraduate students, and community stakeholders in rural areas particularly in the central region of Puerto Rico.

Program Duration

This is a two-year update of our former five year program and while the issues identified require a longer commitment, the program will be revised more thoroughly for our next five year plan.

Allocated Resources

Fiscal Year	Hatch Funds	State Funds	Other Federal Funds
2005	**27,309**	**84,274**	**0**
2006	**27,309**	**88,737**	**0**

FTE

Year	Scientist	Professional	Technical
2005	**1.7**	**0**	**0.1**
2006	**1.7**	**0**	**0.1**

B. STAKEHOLDER INPUT PROCESS

The AES recently began an internal and external evaluation process of current priorities to identify other critical issues that should be targeted by our research program, and to incorporate stakeholders input on these issues and on the setting of research priorities. Three types of meetings have been held during last year in different locations of Puerto Rico to accomplish these goals.

First, through a series of periodic meetings with researchers acting as commodity leaders, a thorough re-evaluation of our research program is being conducted. Emphasis has been given to assessing means to incorporate and document stakeholders' input into the setting of research priorities, and to assess ways in which projects results can be translated into initiatives of impact for our different audiences. This process will culminate by the end of May 2004 in a two day meeting, where commodity leaders are expected to report on the outcomes of their analysis, including on how the input of stakeholders was collected and considered into the setting of priorities.

Second, we have continued to celebrate an annual meeting with all the researchers, extension faculty, farmers and other public interested in the work performed under each commodity area. In these meetings the progress of currently active projects is discussed, preliminary results are shared and further input is sought for updating the commodity's research needs and priorities. The meeting is usually celebrated in the Research Center or Substation closest to where the main nucleus of the commodity producers are located, and coordinated with the Agricultural Extension Service commodity specialist and agricultural agents of the region. Both the commodity leader and the extension personnel identify and invite interested stakeholders from producers associations, individual farmers, faculty and students, government officials and community organizations with an interest in the commodity's work. The input received in these meetings from all the stakeholders present is summarized, evaluated and presented in a concluding meeting of commodity leaders and research administrators, where final decisions are taken.

Third, several commodity leaders and directors of integrated academic departments have organized thematic workshops, seminars, or field days in which research results on particular topics have been shared and alternative views on the subject--including further research and extension needs, or public policy determinations--have been discussed. The feedback received in all of these activities has been incorporated into the revised statement of issues prepared under each goal for this POW update.

C. PROGRAM REVIEW PROCESS

There have been no significant changes in our Program Review Processes since our Five-Year POW was submitted. This update is therefore including the same description previously presented, with minor revisions.

Every AES proposal or request for extension, formula funded or otherwise, goes through a thorough merit review process following the *Administrative Manual for the Hatch* (*Experiment Station*) *Act as Amended* (see section C.3, page 7, Projects Supported with Regional Research Funds). The review committee is made up of AES Assistant Dean for Research, the concerned Department Chair[2] and the concerned commodity Leader or Leaders, or, in the case of these last two, their representatives. Each individual evaluates and rates the various proposals before they are submitted to the proper authority for approval. If any of the members of the review committee are collaborating in the proposal being submitted, they do not participate in the evaluation process, but send the proposal to a qualified scientist, in some instances to external reviewers.

More specifically, the scientific peer review process of proposals according to the source of funding is the following:

a) Matching Commonwealth Research Funds:

Proposals are submitted to the Assistant Dean for Research with the pre-approval of the respective Department Head and Commodity Leader. The Assistant Dean for Research discusses and evaluates the proposals in a meeting with the 10 commodity leaders. Once the proposal goes through this process and is accepted, the project is included in the AES research program.

b) Formula Hatch Research Funds:

Proposals are submitted to the Assistant Dean for Research with the preliminary endorsement of the respective Department Head and Commodity Leader. The Assistant Dean for Research sends the proposal again to the corresponding department head, commodity leader and external reviewers—if needed--for their written comments on the scientific merit of the proposed research and compliance with the AES strategic plan. Proposals and their reviewers' input are discussed, evaluated, and a final decision is reached in a subsequent meeting of the Assistant Dean for Research with the ten commodity leaders and seven departments' heads. These proposals are then sent to the USDA-CSREES Office of the Administrator, where the respective specialist reviews them. Once the proposals are approved in Washington, the new or revised projects are included in the AES research program.

[2] The College of Agricultural Sciences is made up of seven Integrated Departments: Animal Industry, Horticulture, Crop Protection, Agronomy and Soils, Agricultural Economics and Rural Sociology, Agricultural Engineering and Agricultural Education.

c) Special Grant Research Funds:

Pre-proposals are submitted to the Assistant Dean for Research with the pre-approval of the respective Department Head and Commodity Leader. The Assistant Dean for Research sends the pre-proposal to a scientific review committee composed by members of the scientific staff within and outside the College of Agriculture. These scientific review members make written comments and decide on the scientific merit of the proposed research and if it complies with the AES strategic plan. Eight scientists compose this committee. Once the pre-proposal is accepted, the principal investigator is notified and asked to write up a full proposal. The Assistant Dean for Research sends the proposal again to the scientific review committee. They review the full proposal and again make written comments. These proposals are then sent to the program manager. The program manager send them out for external review using a mailing list similar to the one managed by the NRI program. A panel of 4 to 5 reviewers rank each proposal and make written comment on the scientific merit, scientific preparation of the principal investigator, and the potential success and impact of the research. This information is then gathered, distributed, and discussed among the technical committee members of the special grant fund at an annual spring meeting in Washington. This committee is composed of representatives of the universities of Florida, Puerto Rico, and the US Virgin Islands (Dean and Director, Associate Dean and/or Assistant Dean for Research), CSREES staff, and USDA-ARS representative. This group and the Program Manager decide which proposals will be accepted for funding and included in each of the participating universities research program.