

**YAP STATE DIVISION OF AGRICULTURE AND
FORESTRY 5-YEAR PLAN
2009 - 2014**



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Abbreviations

BTS	Brown Tree Snake
CMNI	Commonwealth of the Northern Marianas Islands
COM-FSM	College of Micronesia
CES	Compact Environment Sector
COP	Council of Pilung
COT	Council of Tamol
CPS	Compact Private Sector
DAF	Division of Agriculture & Forestry
DHS	Department of Health Services
DPS	Division of Public Safety
DR&D	Department of Resources & Development
ENSO	El Niño-Southern Oscillation
EPA	Environmental Protection Agency
FAO	Food and Agriculture Organization
FRM	Forest Resource Management
FSM	Federated States of Micronesia
FY	Fiscal Year
GEF	Global Environmental Facility
GIS	Geographic Information Systems
GGF	Global Greengrants Fund
GPS	Global Positioning System
IDPs	Individual Development Plans
IS	Invasive Species
IAS	Invasive Alien Species
ISSG	Invasive Species Specialist Group
IST	Invasive Species Taskforce
MC	Micronesia Challenge
MCC	Micronesia Challenge Coordinator
MCT	Micronesian Conservation Trust
MRMD	Marine Resources Management Division
NBSAP	National Biodiversity Strategic Action Plan
NEG	National Emergency Grant
NEMS	FSM Nationwide Environmental Management Strategy
NGO	Non-Governmental Organizations
NISC	U.S. National Invasive Species Council
PILN	Pacific Invasive Learning Network
PSIP	Public Sector Investment Program
RISC	Regional Invasive Species Council
S&P	State and Private
SAP	Strategic Action Plan
SDP	Strategic Development Plan
SPC	Secretariat of the Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Programme
SWOT	Strength, Weaknesses, Opportunities and Threats

Abbreviations

TA	Technical Assistance
TECAs	Terrestrial Effectively Conserved Areas
TOR	Terms of Reference
TNC	The Nature Conservancy
U&CF	Urban and Community Forestry
UNDP	United Nations Development Programme
USFS, IPIF	U.S. Forest Service, Institute of Pacific Islands Forestry
YapCAP	Yap Community Action Program
YBSAP	Yap Biodiversity Strategic Action Plan
YINEC	Yap Interagency Nutrition Education Council
YINS	Yap Institute of Natural Science
YIST	Yap Invasive Species Taskforce
YWA	Yap Women's Association

YAP STATE DIVISION OF AGRICULTURE AND FORESTRY 5-YEAR PLAN 2010 – 2014

1. BACKGROUND

1.1 Geography and Natural Resources

Yap State spans some 100,000 square miles of ocean. Its land area of about 50 square miles consists of some 134 islands and atolls, 22 of which are populated. The State has a population of approximately 12,000 people with roughly 60% living on the main islands and the remaining living on small neighboring islands and atolls. Lying at the western end of the FSM, Yap differs from Eastern Micronesia in a number of ways. Climatically, it lies in an area that generally experiences a monsoon climatic pattern with periods of drought. Geologically, mainland Yap is the oldest island in the FSM with some soils derived from continental rock and others from old volcanic activity with limited areas of coralline soils. The islands of mainland Yap are small and closely clustered resulting in condensed natural communities from ridge top to reefs. Neighboring atolls and islands are significantly smaller and therefore limited in soil resources. The majority of land on Yap is privately owned under a complex traditional tenure system and managed through a mix of traditional and modern technologies.

While the forests of mainland Yap are the most biodiverse in the FSM, they are also the most limited in area. Yap's forests are currently being degraded by activities such as bulldozing, unsustainable timber harvest, conversion to other uses and wildfires, resulting in land degradation, loss of biodiversity, and loss of the ecological services provided by forests and watersheds. These ecological services include clean water, fertile soil, habitat for biodiversity, reduction of erosion and siltation, the controlled release of nutrients and protection of marine habitats. On a more general level, forests and watersheds also buffer climate change and sea level rise. In developed countries where the values of the ecological services provided by natural communities have been studied, it has been found that the value of these ecological services far exceeds the gross national product of the country. In Yap, where the traditional system is so integrated with the islands' ecological system, the ecosystem services of natural communities are essential to the welfare of Yapese people.

1.2 The Mandates

Yap State's goals and objectives for Agriculture and Forestry in the First Yap State Economic and Social Summit (1996) are: "Yap's agriculture and forest resources will be used to provide food supplies, healthy livelihoods, and other resources to the people of the State and opportunities for cash and export income, while protecting the ecological integrity of Yap." Three major objectives under this goal are:

1. Food and nutritional security: increase production and consumption of local foods, emphasizing the most sustainable production systems utilizing both modern and traditional means and work closely with other agencies to educate the public on the value of local produce, food preparation, and healthy eating habits.

2. Increase cash income from use of agricultural resources, promote import substitution, and export.
3. Wise use and protection of Yap's natural environment: increase awareness and the means to protect the ecological integrity of Yap.

1.2.1 The FSM Strategic Development Plan Agriculture Sector

The 3rd FSM Economic Summit resulted in the preparation of the FSM Strategic Development Plan (SDP). The SDP established a mission statement for Agriculture and Forestry that is similar to the Yap State Summit mission, which states: "The agriculture sector, including forestry, shall provide: (i) food security, cash income, and healthy livelihoods; and (ii) opportunities for domestic and export markets, while promoting environmentally sustainable production within a stable and consistent policy framework". Four strategic goals were established under this mission, each having policies, outcomes, activities and outputs. The four strategic goals are:

1. A well resourced and properly focused agriculture sector operating within a stable and consistent policy framework.
2. Increased production of traditional farming systems for home nutritional and traditional needs and cash incomes.
3. Increased volumes of saleable surpluses to be marketed by the private sector into local and regional markets.
4. Promote environmentally sound and sustainable production.

1.2.2 The FSM Strategic Development Plan Environment Sector

The mission statement of the Environment Sector of the SDP overlaps with Goal 3 of the Yap State Summit and Goal 4 of the Agricultural Sector of the SDP in its first sentence: "Recognizing the critical importance of the FSM's natural environment to the health and prosperity of this and future generations of Micronesians, the Environment Sector shall support the protection of the Nation's Environment and achieve sustainable development of its natural resources". While the SDP Environment Sector plan does not indicate who is to implement it, a number of the outcomes, activities and outputs listed in the Environment Sector relate to the work of Agriculture and Forestry, and it is understood that the bulk of the work will be undertaken by State Forestry agencies. Activities included in this plan that are mandated by the SDP Environment Sector are referenced in this document.

1.2.3 Recent Developments Relating to Land Stewardship and Forestry

The FSM National Biodiversity Strategy and Action Plan (NBSAP 2002) and the Yap Biodiversity Strategy and Action Plan (YBSAP 2004) were developed in compliance with the FSM's responsibilities as signatory to the Convention on Biodiversity. Concurrent with and following the development of the NBSAP and YBSAP, The Nature Conservancy (TNC) developed a "Blueprint for Conservation in the FSM (TNC 2003). A series of meetings and plans relating to the FSM's environment have since occurred including: The Environment Sector of the FSM Strategic Development Plan (2004). Most recently, TNC followed up on their blueprint with the Micronesia Challenge, in which the nations of Micronesia have pledged to effectively manage 30% of near shore waters and 20% of land area. Associated with the environment movement within the FSM, a number of funding opportunities have become available. These include: U.S. Compact Environment Sector, Micronesia Conservation Trust

(MCT), Global Environmental Facility (GEF) Small Grants Program, European Union programs, and support anticipated as a result of the Micronesia Challenge.

Relevant to the work of Yap Forestry, is the recent report: “Tropical Forests of the United States; Applying USFS State and Private Forestry Programs”. This report links emerging U.S. National Themes to the work of the United States Forest Service (USFS) State and Private (S&P) Grants Program that supports most forestry efforts on Yap. Future projects undertaken with USFS S&P grants are to be related to these themes:

- I. Conserve working forest landscapes
- II. Protect forest resources from harm
- III. Enhance benefits associated with trees and forests
- IV. Protect communities from fire and other catastrophic events

The new USFS National Forester has also recognized the priority themes of climate change and Water and “Reconnecting People”, especially children, with nature.

During the drafting of this plan, a series national and state level workshops regarding the SDP Environment Sector were held resulting in several formats for submitting compact funding requests. Table 3, Section 6 is a result of these efforts. The budget shown for FY09 in this table was set by Mr. Konno (2008) and differs from the budget described on the SDP (see section 2.4).

1.3 Current Staffing & Organization

Figure 1 (below) depicts the current organization and staffing of DAF.

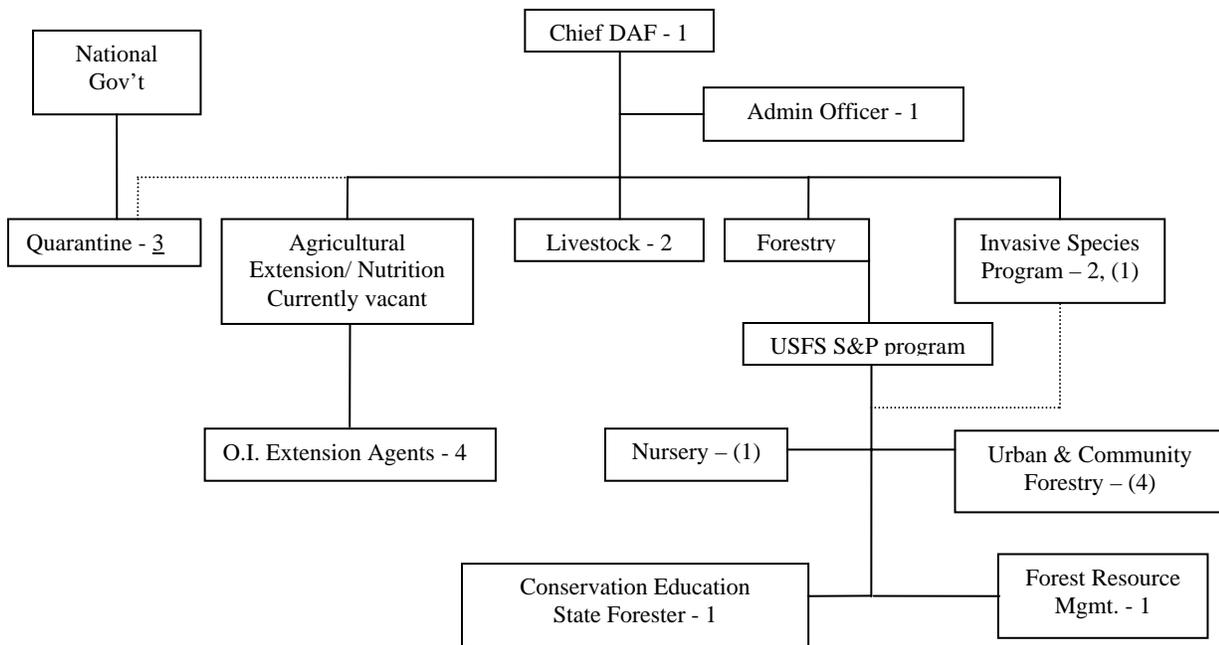


Fig 1. Current DAF Organizational Structure: Yap State Government personnel are indicated with plain numbers, FSM national government employees are indicated with underlined numbers, and staff supported by the USFS S&P program are indicated with numbers in parentheses.

1.4 Opportunities & Constraints

The opportunities before DAF are considerable: to greatly improve the health of Yap's people and the quality of Yap's environment. Further, DAF can help advance the new paradigm of an island people supporting themselves by the sustainable use and stewardship of natural resources to protect biodiversity and ecosystem services of natural communities.

Constraints to DAF's work include:

1. Small staff, big expectations - too small of a staff to meet current mandates and expectations (see Fig. 1)
2. A cumbersome fiscal and personnel system with both national and state levels
3. Visitors from outside programs requiring the use of DAF staff and resources making it difficult to achieve objectives of performance-based-budget
4. Outside programs requiring attendance of DAF staff, often using DAF budget, making it difficult to achieve objectives of performance-based-budget
5. Decreasing funding levels from the USFS S&P grant program, which is the main source of support for Yap's Forestry program

1.5 Organization of the DAF 5-Year Plan

Section 2 of this plan describes the organization needed to address the most relevant expectations of DAF consistent with the level of support recommended in the 3rd Economic Summit and detailed in the FSM Strategic Development Plan. It describes a vision and mission for DAF, a proposed organizational structure, and an approach to developing staff capacity. Section 2 then gives a description of the work of each section of the proposed DAF organization. The Forestry section has been less familiar and received less state funding than Agriculture, but is of increasing importance. Forestry related projects and activities called for under the YBSAP are described in Section 4.6.4.2. After the completion of the draft DAF 5-year plan, a series of workshops were held at FSM national and Yap State levels resulting in a number of formats for projects to be considered for funding under the Compact Environment Sector. The Yap State Division of Agriculture and forestry Five-Year Budget Plan (Table 3, Section 6) resulted from these efforts.

2. YAP STATE DIVISION OF AGRICULTURE AND FORESTRY STRATEGY AND ACTION PLAN

2.1 Vision

A healthy environment that provides for people's needs while maintaining ecological systems and Yap's biodiversity heritage. By the year 2014, Yap State will have an adequately staffed and supported land stewardship program working cooperatively with other relevant government and non-government organizations, individuals and communities to fulfill its mission. Individuals, families and local businesses will have access to local produce raised either by them or purchased from the private sector. By the year 2020, the people of Yap will have fewer health problems related to an unhealthy diet. At least 20% of native forests (mangroves included) will be under effective stewardship. By the year 2048, there will be enough timber and good soil to

meet each generations needs; streams will run clear, representatives of all natural communities will be present, intact and made up of native and non-invasive species. There will be at least 20% native upland forest, 15% healthy mangroves and swamp forest, 25% diverse and productive agroforest, 10% productive timberland rotated with crops and 5% native savanna¹.

2.2 Mission

To enable individuals, families, communities and the private sector to have the knowledge and skills needed to produce food in a sustainable manner, and appreciate its nutritional value; to protect critical areas of biodiversity and ecosystem services, and to promote economic welfare through the development of a farmer's cooperative.

2.3 Developing Capacity of DAF to meet this mission

Figure 2 outlines the baseline staff and organization needed to implement the mission described above. The capacity of DAF staff will be developed through on the job training programs such as an initial workshop to teach computer skills to those needing them, and a workshop on logical framework planning by a member of the DAF staff trained in this method. Individual Development Plans (IDPs) will be prepared to assist staff in developing skills needed to do their job well. Relevant skills of staff will be developed through distance learning opportunities, workshops, attendance at relevant conferences and links with visiting and contracted expertise. Assistance provided by DAF to visiting expertise and contracted services will be linked with staff development. Records of training and accomplishment of IDPs will be kept and used to guide and improve the staff development program.

Visits of representatives of outside programs will be integrated with the development of local capacity through the management of visiting expertise. Quite a number of outside agencies, each with their own vision, mission, and agenda, visit Yap each year. In a larger country, there would be more staff and budget to make use of the services and host these visitors. In Yap, they converge on a small staff. At the same time, the budgets of state agencies are performance-based so it is difficult to host, and make use of the services of the many outside agencies and still fulfill budgeted tasks. Strategies to accommodate and make use of the services of outside agencies without compromising the local program include:

1. Scheduling visits or meetings: Outside agencies will be requested to describe their program and the objectives of their visit in advance and to inform Yap DAF of impending visits at least three months in advance of their visit, and/or by August 1 of each year for the following fiscal year, so that DAF can determine if the objectives of the proposed visit or meeting are relevant to the state program and allocate time or staff to work with these agencies provided that all travel expenses are covered by the agencies hosting the meeting.
2. In cases where the outside agency has expertise relevant to local project(s) and needed by Yap, local staff will be programmed to work with the visitors.

¹ This vision encompasses the 5-year period of this plan, the timeline for the TNC Blueprint for Conservation in the FSM, the Micronesia Challenge, and the approximate time needed for forests to regenerate. The percentages are estimates based on modest improvements of the 1976 vegetation of Yap, the Micronesian challenge and estimates of appropriate area of timberland and native savanna.

3. For objectives that are of interest to DAF but not included in their plan of work under a performance-based budget, outside agencies will be asked to provide support for a local counterpart in order to accomplish the objectives of the outside agency and also contribute to capacity development in Yap.

2.4 Developing the capacity of communities, families and individuals to meet this vision: Municipal Plans

In order to achieve the vision of this plan, it will be necessary to turn environmental stewardship from the work of a small government agency into a community concern. Given the small size of Yap's Forestry staff, much of the work of this program is designed to develop the information base and capacity to assist communities with developing Municipal Natural Resource Stewardship Plans, as discussed in section 5.

2.4 Funding

Support for DAF has been decreasing since the Public Sector Investment Program (PSIP) program circa 1997 that resulted in a 40% reduction in agricultural staff (Fig.1). The SDP of 2004 calls for a 67% increase in funding for Agriculture and Forestry within four years (SDP 1.2.1.). The FY 2004-2005 DAF budget was \$165,000. A 67% increase in this budget would be \$110,550 for a total budget of \$275,550. The budget prepared by the Division of Agriculture and Forestry for 2009 is presented in Section 6.

2.5 The Organization of DAF

Figure 2 depicts the proposed organization of DAF. The discussion that follows describes the functions of the various sections and subsections of: 1) The Chief of DAF, 2) Sustainable Agriculture Production, 3) Nutrition, 4) Biosecurity, and 5) Forestry. Quarantine is a function of the FSM National Government that is housed at the DAF facility.

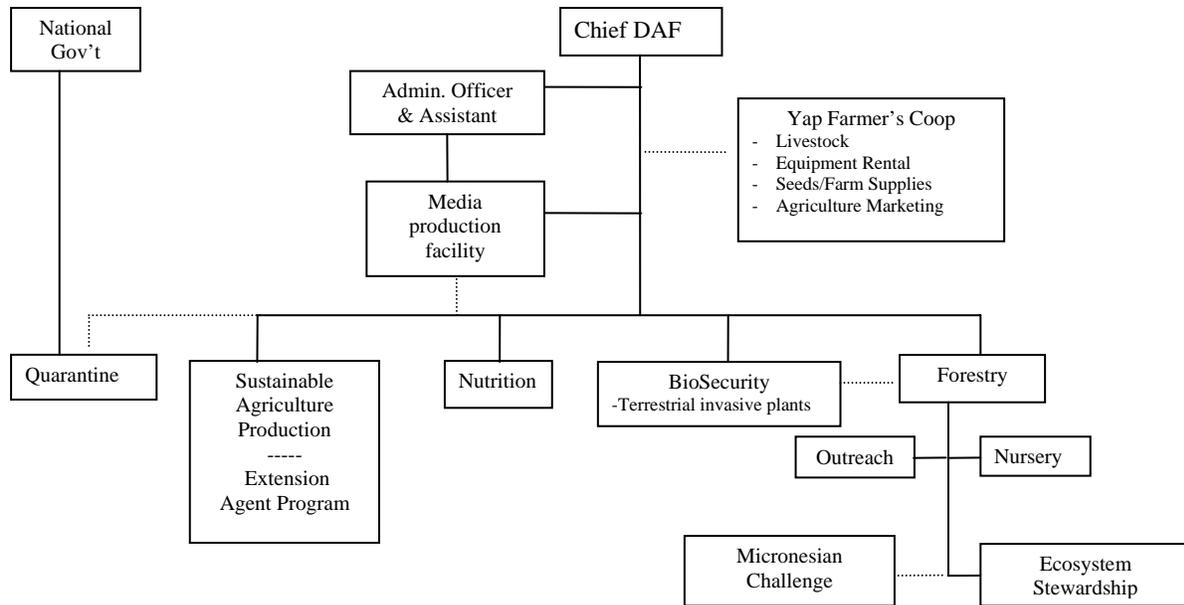


Fig 2. Proposed Organizational Structure

3. AGRICULTURE

3.1 Office of the Chief of Agriculture and Forestry

The Office of the Chief of DAF is assisted by an Administrative Officer and proposed assistant who also oversee the operations of a media production unit consisting of the central computer, records system, and printing and copying facilities. The Office of Chief of DAF is also linked with a developing Yap Farmer’s Cooperative and, when required, will enter into contracts for needed services as described below.

3.1.1 The Yap Farmer’s Organization and Cooperative

The SDP Strategic Goal 1 calls for “a well-resourced and properly focused agriculture sector operating within a stable and consistent policy framework”. In addition, the SDP Strategic Goal 3 calls for “increased volumes of saleable surpluses to be marketed by the private sector into local and regional markets”. The current subsistence nature of agricultural production on Yap makes it difficult to comply with these recommendations because of limited and sporadic surplus production in addition to the absence of commercial farmers. DAF is therefore in the process of sponsoring the development of a Farmers Cooperative. This Coop will link local growers interested in marketing excess production or going into commercial production with opportunities and services. Services will include access to high quality planting materials, livestock, equipment rental services, and workshops. The workshops will focus on methods for improving production, adding value to produce, marketing, and alternative sources of energy such as solar and biogas powered systems for rural farms. In addition, a farm store will be developed (SDP 3.1.5.).

Farmers will be linked with local markets, and if appropriate, outside markets. A consultant will be contracted to work with the Coop’s Board of Directors to develop administrative and

operational policy and to seek external sources of funding for the cooperatives operation. It is anticipated that once the Coop is able to operate independently, it will be privatized and livestock and nursery production will be taken over by the Coop or Private Sector.

At the current time, it is difficult to establish many agricultural policies. Once the Farmer's Cooperative is operational, it is anticipated that there will be a more steady supply of local produce available to support additional policies. In the interim, an initial policy that might be established would be the expenditure of government funds for food for government functions be limited to the purchase of locally grown produce.

3.1.2 Agricultural Survey

In order to address mandates of SDP 1.6.1-3, to evaluate progress and provide a basis for reporting to outside funding agencies, a proposal to conduct such a survey has been developed and submitted to the U.S. Department of Interior for consideration, and a similar request has been submitted to Food and Agriculture Organization (FAO). The objectives of the survey are to: 1) establish baseline agricultural data for Yap State, 2) determine the economic value and potential for the agricultural sector, and 3) use data to develop production and market strategies for local produce. Given the complexity of the traditional food production system and Yap's land tenure system, this survey will be challenging.

3.1.3 Cooperative Programs

Cooperative efforts will be needed to address issues that cannot be managed by DAF staff alone. A Memoranda of Understanding (MOU) will be developed with relevant agencies and groups to define roles and expectations of each party in cooperating to meet needs in at least the following areas:

- Quarantine (ongoing with National Government)
- Wildfires (with Public Safety)
- Fuel Reduction & Recycling of Biodegradable Wastes (with Public Works, EPA, Public Safety Fire Section)
- Touring visitors (with Public Safety Patrol Officers)
- Cooperative projects with College of Micronesia (COM)
- Joint projects with the Yap Interagency Nutrition Education Council (YINEC)

3.2 Agricultural Production

The agricultural production section of DAF will carry out a flexible program to assist local growers (SDP 2.1.1.). Given the substantial burden of sickness linked with poor diet (on individuals, families, communities) and Yap State performance and budget, this program will focus on the vast majority of small growers in Yap State. A core program will assist individuals and groups with best practices of traditional, modern, and organic agriculture, including nutritional value of local foods (SDP 4.1.1-2). Local producers wishing to go into commercial production will also be assisted through the Farmers Cooperative program. An initial focus of the agricultural production section of DAF will be on a survey of local varieties of food crops described below. The results of this survey will be incorporated into the core program. The core program will be enhanced by contracting traditional agricultural specialists, which correlates

with the SDP recommendation to privatize agricultural extension services. This also meets the objective of improving local agricultural production through best traditional practices and most adaptive and relevant modern agricultural technologies.

3.2.1 Genetic Resource Agrobiodiversity and Crop Development for Food Security and Economic Development

Yap State has a diverse “nature-integrated” traditional agricultural system incorporating much landscape architecture (Falanruw 1994, 1995). The infrastructure of this system is still etched in the landscape and villages, and practitioners continue to produce by traditional means. However, the number of traditional agricultural experts is dwindling. In cooperation with the Ecosystem Stewardship subsection of Forestry, agricultural production will carry out a project to inventory and propagate local varieties of food crops and enhance traditional agriculture and agroforestry systems.

The abundance of local varieties of food crops has been termed “agrobiodiversity”. This heritage is quite valuable. For example, it has been found that the Yapese “arai” banana is very high in Vitamin A. A previous nutritional survey found that over 30% of Yapese children suffer from Vitamin A deficiency; therefore the greater use of this local variety of banana could improve health and productivity of Yap’s population. Other local varieties are likely to be equally valuable, such as being high in certain nutrients, hardy, tasty, have good keeping qualities, resistance to disease and pests, etc. It is important to survey, evaluate and propagate this valuable heritage before it is lost. The documentation, protection, and development of local agrobiodiversity are recommended in the YBSAP, NBSAP and SDP Environment Sector 5.3.3. The project will include a survey of local varieties of crops and the establishment of local “genetic banks” of these crops. Initially, banana agrobiodiversity will be the priority project to be carried out in this program. Individual farmers will be selected to work with this program to maintain collections and propagate specific crops in order to maintain and use Yap’s valuable local varieties.

3.3 Nutrition Awareness Program

Diseases and health problems linked with a poor diet and unhealthy lifestyles are crippling Yap’s families and communities, which result in a significant burden of medical expense for Yap State. A large proportion of the population suffers from diabetes and a survey showed that 30% of Yap’s children suffer from Vitamin A deficiency. The promotion of healthy diets is of high priority for both social and economic reasons. Assistance with agricultural production will therefore be complemented by a Nutrition Awareness Program (SDP 2.2.1-4.) to be carried out in cooperation with YINEC.

The position of nutritionist has been vacant for some time and it appears that it will be necessary to contract an expatriate trained nutritionist to fill this position. Once this position is filled, a local trainee will be hired to serve as an understudy to assist the nutritionist with developing projects that are relevant to Yap while receiving on-the-job training. The work of the team will be reported and reviewed on a quarterly basis to assure that the appropriate technology transfer is occurring so that eventually the nutrition program will be headed by a local nutritionist.

The nutritionist team will work cooperatively with YINEC, the Yap Women's Association (YWA) and other relevant groups to impart information on the nutritional benefits of local foods and to develop improved methods of preparation and products. This work will take place in-house at the DAF food processing lab. Information on successful products will be shared with households and the private sector with potential commercialization taken over by the private sector. Initially, the Nutrition section will work with the Outer Island extension program described below. It is proposed that the main function of a nutritionist will be transferred to YINEC and Health Services with relevant elements of nutrition merged with the core agricultural production program.

3.3.1 Outer Island Extension Agents

In the past, DAF supported ten Outer Island Extension Agents. The reduction in staff associated with the Public Reform Program eliminated the position of supervisor of the Outer Island Extension Program; however, the agents were retained at the request of the Council of Tomol (COT), Outer Island Chiefs Council. Due to communication difficulties, this resulted in a period of limited supervision or oversight of these extension agents. Since, the number of Outer Island extension agents has decreased, to the current four agents. With current staffing limitations and the trend of Outer Islanders moving to mainland Yap, the Outer Island Extension Program will be amended to meet current conditions.

In keeping with the SDP mandate for privatizing extension services, an Extension Program Coordinator and two additional extension agents will be employed with the existing four agents. In order to develop a more flexible program, agents will be brought to mainland Yap to participate in nutrition workshops or training and gather appropriate planting material (in accordance with proper quarantine practices, such as not transporting soil). The information will then be shared with mainland and outer island communities.

The program will initially be coordinated by the DAF Genetic Resource Agrobiodiversity and Crop Development for Food Security and Economic Development Program. It is anticipated that the Outer Island Extension Program will be transferred to the Department of Education (DOE), which has resident programs and staff established in the outer islands with a need for agriculture teachers. DAF will then provide technical services to the Outer Island DOE agricultural teachers through the core agricultural production section as well as other sections of DAF.

3.4 Livestock

It is estimated that some 300 swine and 1,500 chickens were lost to Typhoon Sudal in April, 2004. In addition, greater self-reliance and import substitution for pork and poultry is needed. The DAF livestock subsection will build on a National Emergency Grant (NEG) project to replace this livestock and to maintain quality breeding stock. To this end, DAF will operate a piggery and poultry incubators to produce piglets and chicks that will be made available to local farmers, at cost, and coordinate the ordering of commercial feed. The livestock subsection will maintain a staff of two. In addition to stock production, two livestock workshops on animal husbandry and associated issues such as biogas energy sources will be held each year. Individual farmers wishing to improve livestock production and members of the private sector wishing to pursue commercial production will be assisted and directed to appropriate lending institutions or

grant programs. It is proposed that livestock production and feed sales will be privatized under the Yap Farmer's Cooperative.

4. FORESTRY

4.1 Background

There is no Yapese word for “forests” per se, or for “forestry”, yet the fertile soil, fruits, building materials, fibers, foods, animals, medicines and clear running water provided by forests are valued on Yap. In addition to the products mentioned above, contributions of forests are now understood to include amelioration of climate change and the corollary of sea level rise. The 20th century the concept of “forestry” has evolved from a focus on timber management to a focus on managing the ecological contributions of forests, and practicing good “land stewardship”. This is reflected in the expansion of Yap’s forestry program largely through the support of the U.S. Forest Service State and Private Forestry Grant Program and the Micronesia Challenge commitment to effectively conserve 20% of forest resources² by 2020.

While the forests of mainland Yap are the most biodiverse in the FSM, they are also the most limited in area. Yap’s forests are currently being degraded by activities such as bulldozing, unsustainable timber harvest, conversion to other uses and wildfires, resulting in land degradation, loss of biodiversity and loss of the ecological services provided by forests and watersheds. These ecological services include clean water, fertile soil, habitat for biodiversity, reduction of erosion and siltation, the controlled release of nutrients and protection of marine habitats. On a more general level, forests and watersheds also buffer climate change and sea level rise. In developed countries where the values of the ecological services provided by natural communities have been studied, it has been found that the value of these ecological services far exceeds the gross national product of the country. In Yap, where the traditional system is so integrated with the islands’ ecological system, the ecosystem services of natural communities are essential to the welfare of Yapese people.

4.2 Forestry Mandates

Yap State’s goals and objectives for Agriculture and Forestry in the First Yap State Economic and Social Summit (1996) are: “Yap’s agriculture and forest resources will be used to provide food supplies, healthy livelihoods, and other resources to the people of the State and opportunities for cash and export income, while protecting the ecological integrity of Yap.” The third major objectives under this goal, given below, are largely the work of Yap Forestry.

“3. Wise use and protection of Yap’s Natural Environment: increase awareness and the means to protect the ecological integrity of Yap.”

The SDP Agriculture sector states that: “The agriculture sector, including forestry, shall provide: food security, cash income and healthy livelihoods; and opportunities for domestic and export markets, while promoting environmentally sustainable production within a stable and consistent policy framework”. While the SDP Agriculture sector does not include activities for Forestry

² More recent iterations of the Micronesian Challenge indicate a representative sample of 20% of terrestrial natural resources.

per se, the SDP Environment sector includes a number of mandates in the area of forestry and activities listed in this plan are referenced to this section of the SDP.

4.3 Current Staffing of Forestry Section

Yap Forestry is located within the Division of Agriculture and Forestry and has the smallest government funded Forestry staff in Micronesia. Currently, this staff consists of one State Forester.

4.4 Opportunities and Constraints

In developed countries where the values of the ecological services provided by natural communities have been studied, it has been found that the value of these ecological services far exceeds the gross national product of the country. In Yap, where the traditional system is so integrated with the islands' ecological system, the ecosystem services of natural communities are essential to the welfare of Yapese people. The Forestry Section of DAF has a profound opportunity to protect the ecosystem context for healthy lives and sustainable development for the people of Yap. The challenge is to be able to access support for land stewardship, the real work of 21st century forestry.

General constraints facing DAF, including Forestry, are discussed Section 1.4. If Yap State Forestry is to assist the people of Yap in fulfilling the State's commitment under the Micronesian Challenge and other documents listed above, a broadening of the program and additional state support beyond the current one State Forester will be needed.

Most Forestry functions indicated in Figure 1 are supported with "soft money" obtained through the U.S. Forest Service Region 5 State and Private (S&P) Grants Program. Beginning in 2008, this funding will decrease by 15% each year leaving minimal funding by the end of this five-year plan. The pooled funds derived from these reductions will become available to U.S. States and island affiliates on a competitive basis for projects addressing U.S. National Themes (Section 1.2.3. above). The current level of staffing will put Yap State and the FSM at a competitive disadvantage compared with other states and jurisdictions of the United States that have higher levels of internal support and a longer history of natural resource management. If Yap and the FSM are not able to compete successfully for the competitive grants, the current USFS S&P grants program will fall below a level critical for a viable forestry program by the end of this plan period.

The current program of Yap Forestry is described below. It is followed by a proposed program designed to prevent the collapse of Yap's Forestry program, and to serve local needs while addressing mandates of the SDP, Micronesian Challenge and other documents listed in Section 2.10.2.

4.5 Biosecurity

The current invasive species program of DAF will be developed into the Biosecurity subsection due to the current level of interest in invasive species and the growing recognition of threats due to climate change and disasters such as typhoons and extensive wildfires associated with severe El Niño-Southern Oscillation (ENSO) related drought.

4.5.1 Invasive Species

Yap developed the first invasive species program in Micronesia with the support of the U.S. Forest Service S&P Urban and Community Forestry (U&CF) program, as a pilot project to work with a community to control one of the world's worst invasive species: *Imperata* grass (also known as lalang, cogon, or the "green desert"). Support for the program was subsequently provided by Yap Legislature and later through the USFS S&P Forest Health and Suppression Grant Programs. An Invasive Species Task Force was established by the SPC Plant Protection Officer for Micronesia. In addition, in 2006, Yap State hired an Invasive Species Coordinator to oversee the program and an Invasive Species Technician to meet SDP Env Sector Goal 7.4.1.

Global concern regarding the problem of invasive species has resulted in the formation of at least six networks, councils, regional organizations etc. funded to provide technical assistance on invasive species management in our area. A Regional Invasive Species Council (RISC) was formed by representatives of Guam, Palau, Yap and the CMNI and a representative from the U.S. National Invasive Species Council (NISC) has been detailed to assist RISC and TNC formed the Pacific Invasive Species Learning Network (PILN). The Yap State Invasive Species Coordinator will participate with these groups activities and workshops (when travel expenses are provided) to gain additional funding for Yap State.

Yap has since created the Yap Invasive Species Task Force (YIST) with technical support from SPC Plant Protection, the FSM National Quarantine Program, Land Grant COM-FSM, with technical and financial support from the USFS S&P program. The Yap State Invasive Species Program with YIST is currently focusing on the eradication of four of the 10 worst invasive species (SDP Env Goal 7(ii)), which include:

1. Cogon Grass or Pan nu Machbab (*Imperata cylindrica*)
2. Chain-of-Love or Sagaraw (*Antigonon leptopus*)
3. African Tulip (*Spathodea campanulata*)
4. Mile-A-Minute Vine or Makenya (*Mikania micrantha*)
5. "Paper Rose" (*Operculina ventricosa*)
6. Bronze-Leafed Clerodendrum or Februwari (*Clerodendrum quadriloculare*)
7. Pennesetum or "Cat's Tail" Grass (*Pennisetum polystachion*)
8. Merremia or Wachathngal (*Merremia peltata*)
9. Wedelia or Susuwan' (*Wedelia trilobata*)
10. Giant Sensitive Plant or Rachloy' ni Biech (*Mimosa invisa*)

These species (numbers 1 through 4 listed above) were chosen because they are relatively recent introductions of serious invasives to Yap that have not spread all over the island, thus making eradication or at least manageable control possible. There are other serious invasive species that should be addressed but the size of the program is limited by the "soft money" currently available from the USFS S&P. Thus far, the various invasive species networks have held meetings and workshops but not contributed financial support to Yap's invasive species program. In order to have a basis for tapping additional sources of funding, YIST recently completed a Strategic Action Plan (attached). Increased support would enable the expansion of Yap's program to control of other invasive pests and the broadening of the public awareness and participation effort.

4.5.2 Wildfires

During several severe ENSO related droughts of the past, approximately 22% of Yap's land area was burnt by wildfires. While such serious wildfire seasons do not occur often, they remain a serious threat to production, reforestation, and restoration efforts as they can destroy the result of years of work in one or two days. Fire vulnerability maps have been developed with assistance from the U.S. Forest Service Cooperative Fire Program. These maps will be updated annually through participation in the Yap State/Queen's University GPS/GIS project to map wildfires in order to develop contingency plans for wildfire prevention and suppression. Staff from Biosecurity will take part in training opportunities provided by the U.S. Forest Service Cooperative Fire Program and work cooperatively with Yap State Public Safety Fire Section and the DAF Conservation Education Program. While the Public Safety Fire Section will focus on fire suppression, the Biosecurity Section will work cooperatively with Public Works and other agencies on fuel reduction (the conversion of flammable wastes into mulch and compost) and with the Forestry Section to decrease the contiguous area of flammable vegetation. A Yap State Public Safety Fire Section 5-year Wildfire Plan has been developed with assistance from the U.S. Forest Service Cooperative Fire Program.

4.5.3 Adaptation to Climate Change and Disaster Response

The head of the Biosecurity Section will be the initial DAF point person for Climate Change and Disaster Response, with DAF assisting during times of emergency. It is anticipated that this subsection will need to be expanded in the future.

4.6 The Current Yap Forestry Program

The overall goals of Yap State Forestry are: to protect native forest types, restore ecological services of degraded areas and enhance watersheds while working with landscapes of the respective vegetation types. Given staffing and budget limitations, Yap State Forestry's strategy for making progress in land stewardship has been to turn "Forestry" from a small government agency into a community concern.

An efficient way to improve land stewardship on Yap would be to build on traditional land management using both traditional and modern best practices. The strategy would identify general trends in vegetation dynamics on Yap and areas where intervention could shift trends toward improved conditions.

4.6.1 The USFS State and Private Grant Program

Though small, Yap Forestry has an ongoing program of public awareness, technical assistance, and small grant programs for communities and land owners. These are supported by the following U.S. Forest Service, State and Private (USFS S&P) grant programs: Urban and Community and Forestry (U&CF), Forest Resource Management (FRM), Cooperative Forest Health and Suppression; Nursery, Reforestation, and Genetic Resources; and Conservation Education.

The largest of the above programs, **U&CF**, uses a community-based approach focusing on community lands through education, projects, and demonstrations. The **FRM** program gathers needed information, supports demonstration projects and provides technical assistance to land

owners. Projects have included savanna reforestation, timber tree planting, replanting of native and indigenous trees, more sustainable traditional technologies (such as using built trellises instead of sacrificed trees for yam production and traditional banana production), land conservation, and community beautification projects.

The **Reforestation, Nursery, and Genetic Resources** program supports other forestry programs through two large nurseries that can accommodate more than 10,000 tree seedlings at any given time. The Forestry nursery has recently been upgraded to include a misting chamber and tissue culture facility for the propagation of sensitive species and fruit trees. The **Cooperative Fire Protection** program assists the Department of Public Safety Fire Section with fire prevention and suppression training and also provides Incident Command System training for the state. Yap Forestry assists the Yap Public Safety Fire Program with wildfire education and mapping areas burnt by wildfires. A Second Yap State 5-Year Wildfire Plan was recently completed. The **Conservation Education Program** provides community and school outreach to promote forestry conservation and safeguarding the environment.

4.6.2 The Annual Cycle of Eco-events

All Forestry staff contributes to an “*Annual Cycle of Eco-events*” that includes:

- February/March: Yap Day displays and recognition of community groups for environmental and forestry efforts
- April 22nd: Earth Day Observance
- May-June: Natural resource assessments as part of the Yap State/Queen’s University GIS program
- June 1st: Tree Planting Day and Environment Week concluding with June 5th FSM Environment Day
- June-August: Yap State Summer Youth Program & Peace corps Volunteers “Save our Summer” (SOS) camps
- October-November: Community involvement with invasive species control (generally coincides with flowering season of *Mikania* & *Chromalaema*)
- October-May: School visitation program, including forests and wildfire education

4.6.3 Miscellaneous Programs and Projects

After Typhoon Sudal, Yap Forestry helped to develop a 3.2 million dollar program under the National Emergency Grant (NEG) program to rehabilitate taro patches and agroforests along with other projects added by other agencies. In addition, DAF, in partnership with Yap Women’s Association (YWA), with assistance from the United Nations, Red Cross and Salvation Army, carried out a “Sudal Victory Gardens” project to assist with recovery after Typhoon Sudal.

4.6.4 Proposed Program

To prevent the collapse of Yap’s Forestry Program, fill the modern role of Forestry as sustainable land stewardship, address the mandates of the Yap State Summit, NBSAP, YBSAP, TNC Blueprint, SDP Environment Sector, Micronesian Challenge, and their predecessor, the FSM Nationwide Environmental Management Strategy (NEMS, 1993), the section that follows describes the staffing and organizational structure for Yap Forestry to transition from almost complete dependence on USFS S&P grants to a Yap State program that is positioned to

undertake needed projects utilizing funding from a variety of sources. To offset the losses of staff due to declining funding from the USFS S&P program, four additional Yap State Forestry positions are proposed: Assistant State Forester, Land Stewardship Coordinator (LSC), Yap State Forestry Nurseryman, and Micronesia Challenge Terrestrial Coordinator. Figure 2 describes the proposed organization of Yap State Forestry and the section that follows describes the work of the 3 Forestry subsections: 1) Forestry Operations, 2) Land Stewardship, and 3) The Micronesian Challenge.

4.6.4.1 Forestry Operations

Many of the current activities carried out by Yap Forestry would be conducted by the Operations subsection of Forestry. These would include the U&CF program, Yap State programs such as savanna restoration, timber lots, beautification, Tree Planting Day and Conservation Education. This subsection would be staffed by the current Yap State Forester, and an Assistant State Forester who would be trained in the administration of the USFS S&P programs and assist with the following projects:

- Urban and Community and Forestry (U&CF)
- Conservation Education: Visit at least 10 schools per year to increase youth awareness of Forest Conservation (SDP Env. 6.2.1.)
- Wildfire Prevention Awareness
- Reforestation, Nursery, and Genetic Resources: Operate Yap State Forestry nursery, producing at least 10,000 seedlings per year
- Annual Cycle of Eco-Events (with other subsections of Forestry)
- Wildlife surveys (with LSC)

4.6.4.2 Yap Island Stewardship Program

This new subsection of Forestry is necessary to address the original Yap State Summit goal of promoting environmentally sound and sustainable production, and address mandates outlined in the documents listed above. It is also critical in fostering sustainable livelihoods for Yapese by providing for the good stewardship of natural communities, which supply valuable ecosystem services. In developed countries where the values of the ecological services provided by natural communities have been studied, it has been found that the value of these ecological services far exceeds the gross national product of the country. In Yap, where the traditional system is so integrated with the islands' ecological system, the ecosystem services of natural communities are essential to the welfare of Yapese people.

The Land Stewardship section would add considerable depth to Yap's Forestry program, especially with regard to current issues of ecosystem management, watershed stewardship, adaptation to climate change, carbon credits, etc. It would also serve to integrate traditional land stewardship with these new slants on land management and the concept of Forestry in the 21st century. The subsection would be headed by a Land Stewardship Coordinator (LSC) who would address sustainable stewardship of Yap's terrestrial ecosystem including mangroves, with a focus on: watershed stewardship, restoration of ecosystem services of natural communities, native forest and mangrove management plans and programs, fire ecology, and agroforestry. The Land Stewardship Coordinator would coordinate the DAF research program including the definition of research needs and cooperative efforts with outside research agencies. The LSC would provide

technical guidance for the work of the entire DAF Division including the Micronesian Challenge subsection that would focus on protecting 20% of Yap's natural land habitats. Projects and programs that will be carried out under the Ecosystem stewardship subsection of DAF include the USFS FRM program and the projects listed below. These projects are grouped under relevant objectives of the YBSAP. References to outputs called for in the SDP Environment Sector are also given. In addition, most of these activities have also been listed in the FSM NEMS, the NBSAP, the TNC Blueprint, and the Micronesian Challenge. Section 6 describes projects from this set to be undertaken using Compact Environment Sector funding between fiscal year 2009 and 2013. Described below are projects grouped by relevant sections of the YBSAP (with reference to goals of the FSM SDP):

- ◇ YBSAP 2 - Secure and enhance traditional knowledge (secure and build on what we know):
 - Develop program to restore native forests and agroforests using traditional and modern best practices (SDP 1.5.4., 3.5.3.)
 - Add “traditional land management” layer to GIS system
 - Evaluate traditional ways of managing erosion and sedimentation
 - Develop taxonomic and local names database

- ◇ YBSAP 3 - Inventory and Monitoring (Counting our blessings and identifying problems):
 - Survey of forest birds and fruit bats (SDP5.5.4.)
 - Determine what native and endemic species are in peril (5.6.1.)
 - Determine keystone species, natural communities and ecosystem processes and their linkage and their current condition, and develop a monitoring plan (5.6.2.)
 - Conduct biodiversity surveys of areas of special biodiversity significance and proposed forest reserves (5.1.2.)
 - Conduct watershed assessments (2.10.1)
 - Produce field manual on trees of Yap
 - Develop mangrove monitoring program
 - Arrange for updating of Yap Vegetation Survey (SDP 1.4.4., 5.5.3.), incorporate results into Yap State GIS system and compare with vegetation map based on 1976 aerial photos to determine trends in vegetation change
 - Arrange for Land Capability assessment to determine highest use of lands (SDP 1.2.1., 1.4.2., 1.4.3., 1.4.4.)
 - Arrange for determination of sustainable timber harvest (SDP 5.3.2.)
 - Incorporate results of USFS Forest Inventory Assessment (FIA) survey into Yap GIS system
 - Develop program to restore native forests and agroforests using traditional and modern best practices (also included above) (SDP 1.5.4., 3.5.3.)

- ◇ YBSAP 6 - Environmental awareness, research and capacity building:
 - Provide background for Municipal Plans (1/5/1/. 1/5/2/, 1.9.1., 1.10.1., 5.2.4)
 - Develop Intern Program (9.6.1.)
 - Develop materials for Conservation Education program with schools and communities (6.2.1.)
 - Define research needs and manage research efforts (9.1.4.)

- Develop annual “State of the Terrestrial Environment” report (6.2.4.)
- ◇ YBSAP 7 - Developing stewardship programs and ecologically sustainable industries (making a living without killing Yap) by developing:
- Trails program
 - Watershed management plans (2.10.1.)
 - A determination of sustainable timber harvest and timber management plan (SDP 5.3.2.)
 - Sustainable indicators program (SDP 1.2.4.)
 - Ecotourism development (5.3.7.)
 - Forest Management Plan (3.5.1., 3.5.2.)
 - Mangrove Management Plan (3.5.1., 3.5.4.)
 - Mangrove restoration project
 - Community watershed stewardship projects

5. MUNICIPAL PLANS

In order to achieve the vision of this plan, it will be necessary to turn environmental stewardship from the work of a small government agency into a community concern. Given the small size of Yap’s Forestry staff, much of the work of this program is designed to develop the information base and capacity to assist communities with developing Municipal Natural Resource Stewardship Plans. Table 3. summarizes a linked sequence of work envisioned with support for this plan. Most of the activities, especially those included within the “Wa’ab Land and Wildlife Conservation: program (described in this plan as the Yap Island Stewardship Program), and the Forestry Operations Program address both goals of the Environment SDP, NBSAP, and YBSAP, and also to develop the data base and capacity to work with individuals, families and communities to care for natural resources using both traditional and modern best management practices. By the end of this 5-year period, the Division will be able to work with Yap’s Municipalities to develop Municipal Plans. These plans will include GIS natural resource maps (provided in partnership with Yap’s Division of Land Resources), and data on these resources so that communities can develop plans for the best use of their heritage of natural resources.

6. THE MICRONESIAN CHALLENGE

The Micronesia Challenge is an agreement of the Heads of States of Micronesia to “effectively conserve at least 30% of the near-shore marine and 20% of the forest resources across Micronesia by 2020”.

In order to meet Yap State’s commitments to the TNC Micronesian Challenge and to be able to tap funding envisioned from this strategy, a Micronesia Challenge subsection will be added to the Forestry program. The Micronesia Challenge Coordinator (MCC) shall be contracted with funding available from Micronesia Challenge sources. Initial work to be carried out by the MCC will be the development of protocols for areas to be considered as “Terrestrial Effectively Conserved Areas” (TECAs). The MCC will also work with individual land and coastal area owners and communities to identify TECAs and to develop programs for their management and incorporation into the envisioned Protected Areas Network of the FSM and Micronesia.

The Micronesia Challenge Coordinator will work to determine what would constitute “20% of forest resources” in Yap. While the declaration of the Micronesian Challenge refers to “forest resources”, the Micronesian Challenge Action Planning Meeting held December 4 through 7, 2006 refers to “terrestrial resources” and “the effective conservation of at least 20% of its total land area”. Another iteration calls for effective management of a representative sample of terrestrial natural habitats. It leaves the determination of whether mangroves are to be considered marine or terrestrial up to states. As Yap does not have 20% native upland forest, mangroves would have to be considered as terrestrial forests if Yap is to meet its commitment to the Micronesian Challenge. The MCC would develop guidelines for selection, establishment and effective management of terrestrial protected areas (SDP 5.1.1., 5.3.7), the designation of Watershed Forest Reserves (SDP 5.1.5), and the designation of terrestrial effectively conserved areas, TECAs (SDP 5.1.4., 5.2.4.)

7. ANNUAL CALENDAR OF DAF EVENTS

Table 2. Annual calendar of DAF events

ACTIVITY	J	F	M	A	M	J	J	A	S	O	N	D
Annual meeting to review programs and develop budget at least two months before budget call								X				
Quarterly reports to Director R&D and Legislature			X			X			X			X
Annual Review												X
Preparation of S&P proposals	X	X	X	X								X
Semi-annual S&P reports				X			X					
PMAS reports									X			
Pacific Island Committee Meeting		X			-							
Yap Day displays and recognition of community groups for environmental and forestry efforts			X									
Earth Day Observance				X								
Natural resource assessments as part of the Yap State/Queen's University Program					X	X						
June 1 st Tree Planting Day, June 1 st followed by Environment Week and ending with FSM Environment Day June 5 ³						X						
Summer Youth Program						X	X	X				

³ Environment week is a cooperative event involving Yap Forestry, Yap EPA and other government and environment groups.

ACTIVITY	J	F	M	A	M	J	J	A	S	O	N	D
Community involvement with invasive species control (coincides with flowering season of Mikania)										X	X	
School visitation program, including forests and wildfire education	X	X	X	X	X					X	X	X

8. FIVE-YEAR BUDGET PLAN

The following table depicts annual linked objectives of DAF projects from FY09 to FY13. It is an ambitious plan as would be required if the Division is to meet the expectations of FSM SDP Agricultural and Environment Sectors and also addresses objectives of the NEMS (1993), NBSAP, YBSAP, TNC blueprint and the Micronesian Challenge. Accordingly Table 3 is referenced to these mandates. This table was developed in conjunction with project-based proposals for funding under the SDP Compact Environment and Private Sectors. The budget for FY09 was mandated at a workshop on “The Environment Sector” (Konno 2008). The two planning processes involved a number of iterations of formats and the renaming of projects. As indicated in parentheses in Table 6, the “Waab Land & Wildlife Conservation project would be carried out under the Yap Island Stewardship Program (Section 4.6.4.2), and the “Forestry Development and Conservation Program” would be carried out by the Forest Operations Program (Section 4.6.4.1). Successful completion of a number of projects would require support from additional sources and cooperative efforts with outside technical agencies such as NASA and the U.S. Forest Service Institute of Pacific Islands Forestry. In addition, the ability of DAF to complete projects assumes that staff will not unduly be diverted to projects generated by outside agencies, workshops, and visitors. Given unpredictable funding, adaptations to the scope and sequencing of this plan may be necessary.

Table 3. Proposed 5-year DAF budget and activities plan

. YAP STATE DIVISION OF AGRICULTURE & FORESTRY FIVE-YEAR BUDGET PLAN						
ENVIRONMENT SECTOR PROGRAMS	ANNUAL OBJECTIVES:					Outcomes - Goals Referenced: Env SDP, NBSAP, YBSAP, MC, YIST
	FY 09	FY 10	FY 11	FY 12	FY 13	
Wa'ab Land & Wildlife Conservation	Conduct biological surveys using remote imagery (aerial survey)	- Update Yap vegetation map based on remote imagery - Conduct ground-truthing of vegetation map	- Determine trends in vegetation (since 1976) using Yap vegetation map - Incorporate results of USFS forest inventory assessment survey into Yap GIS system	Arrange for land capability assessment to determine highest/best use of land	- Develop forest management plan - Provide background for municipal/community plans using updated vegetation maps	Communities and resource owners will be provided with the information to effectively manage their resources (SG 4, 5, 6, 8, 9)
	Survey of areas of biological significance (precedence on selected uninhabited islands**)	Survey two (2) unsurveyed areas of biological significance (precedence on selected uninhabited islands**) in support of the Micronesian Challenge (MC)	- Surveys of areas of biological significance in support of the Micronesian Challenge - Survey of forest birds & fruit bats**	-Determine what native and endemic species are in peril (threatened or endangered)** -Develop report on uninhabited islands as refuges for species in peril**	-Develop management plan for species in peril** -Provide input for the development of uninhabited outer island serial world heritage site**	Developed data and a report on uninhabited islands, areas of biological significance, and endemic species throughout Yap State as refuges for species in peril (SG 1, 5, 9)
	-Develop a mangrove monitoring and restoration plan -Conduct assessment of carbon pools**	Implement mangrove monitoring and restoration efforts	Continue mangrove monitoring and restoration efforts	Develop mangrove management plan	Work with stakeholders and communities to implement mangrove management plan	-Sustainable management of mangroves - a keystone habitat (SG 1,5) -Completed assessment of carbon pools (SG 1)
	Seek funding to conduct a watershed assessment**/**	Conduct watershed assessment**/**	Incorporate traditional land management layer into Yap GIS system	Evaluate traditional ways of managing erosion & sedimentation	Incorporate results into the Awareness/Education Program	Developed a community watershed planning framework assessment (SG 5)
	Establish intern training program in collaboration with US Forest Service	Hire a Micronesia Challenge Terrestrial Coordinator to develop MC criteria for Yap State and secure funding	Micronesia Challenge Terrestrial Coordinator (MCTC) will identify one potential protected area in Yap	MCTC will carry out the planning to create one (1) protected area in Yap	MCTC will establish one (1) protected area in Yap	Micronesia Challenge Terrestrial Coordinator has developed MC criteria for Yap State, secured funding, and established one protected area in Yap (SG 1,5,9)
	-Develop Awareness/Education Program by providing relevant materials* -Create prototype brochure for one trail	-Incorporate results of FY09 projects into awareness/educational materials** -Provide input to YVB and HPO regarding trails brochure and program	Incorporate results of FY10 projects into awareness/educational materials**	-Incorporate results of FY11 projects into awareness/educational materials** -Produce field manual on trees of Yap	Incorporate results of FY 12 projects into awareness/educational materials**	Provide locally relevant educational materials to the Forestry Development and Conservation Program. Also to provide technical assistance and capacity building for ecotourism development (SG 6, 8)
Budget*	\$33,500++	\$71,734	\$78,908	\$86,799	\$95,479	

. YAP STATE DIVISION OF AGRICULTURE & FORESTRY FIVE-YEAR BUDGET PLAN

ENVIRONMENT SECTOR PROGRAMS	ANNUAL OBJECTIVES:					Outcomes - Goals Referenced: Env SDP, NBSAP, YBSAP, MC, YIST
	FY 09	FY 10	FY 11	FY 12	FY 13	
Forestry Development & Conservation	-Conduct outreach and education program by visiting 10 schools in Yap Proper -Coordinate with DOE on fieldtrip ship to visit outer island schools**	-Conduct outreach and education program by visiting 12 schools in Yap Proper -Coordinate with DOE on fieldtrip ship to visit outer island schools**	-Conduct outreach and education program by visiting 14 schools in Yap Proper -Coordinate with DOE on fieldtrip ship to visit outer island schools**	-Conduct outreach and education program by visiting 16 schools in Yap Proper -Coordinate with DOE on fieldtrip ship to visit outer island schools**	-Conduct outreach and education program by visiting 18 schools in Yap Proper -Coordinate with DOE on fieldtrip ship to visit outer island schools**	Provided outreach and education program to communities by visiting 70 schools in Yap Proper and outer island schools (pending funding) (SG 6)
	Participate in annual cycle of eco-events: Yap Day, Earth day, Summer Youth Program, and Tree Planting Day	Participate in annual cycle of eco-events: Yap Day, Earth day, Summer Youth Program, and Tree Planting Day	Participate in annual cycle of eco-events: Yap Day, Earth day, Summer Youth Program, and Tree Planting Day	Participate in annual cycle of eco-events: Yap Day, Earth day, Summer Youth Program, and Tree Planting Day	Participate in annual cycle of eco-events: Yap Day, Earth day, Summer Youth Program, and Tree Planting Day	Promoted and encouraged communities to initiate and carry-out event activities through involvement in annual eco-events (SG 3,5,6)
	Conduct 10 community meetings to provide technical assistance regarding tree planting and rehabilitation projects (listed below)	Conduct 12 community meetings to provide technical assistance regarding tree planting and rehabilitation projects (listed below)	Conduct 14 community meetings to provide technical assistance regarding tree planting and rehabilitation projects (listed below)	Conduct 16 community meetings to provide technical assistance regarding tree planting and rehabilitation projects (listed below)	Conduct 18 community meetings to provide technical assistance regarding tree planting and rehabilitation projects (listed below)	Approximately 150 projects will have been established throughout Yap State by promoting tree planting projects at 70 community meetings to groups and individuals (SG 6)
	Assist with 20 tree planting and rehabilitation projects: -Timber plantation -Savanna reforestation -Beautification projects -Coastal erosion projects -Mangrove rehabilitation -Tree Planting Day	Assist with 25 tree planting and rehabilitation projects: -Timber plantation -Savanna reforestation -Beautification projects -Coastal erosion projects -Mangrove rehabilitation -Tree Planting Day	Assist with 30 tree planting and rehabilitation projects: -Timber plantation -Savanna reforestation -Beautification projects -Coastal erosion projects -Mangrove rehabilitation -Tree Planting Day	Assist with 35 tree planting and rehabilitation projects: -Timber plantation -Savanna reforestation -Beautification projects -Coastal erosion projects -Mangrove rehabilitation -Tree Planting Day	Assist with 40 tree planting and rehabilitation projects: -Timber plantation -Savanna reforestation -Beautification projects -Coastal erosion projects -Mangrove rehabilitation -Tree Planting Day	Provided technical assistance and materials to assist with 150 tree planting restoration and rehabilitation projects throughout Yap State (SG 2,3,5,6))
	Propagate 5,000 high quality tree seedlings	Propagate 6,000 high quality tree seedlings	Propagate 6,000 high quality tree seedlings	Propagate 6,000 high quality tree seedlings	Propagate 7,000 high quality tree seedlings	Generated 30,000 high quality tree seedlings to be distributed to communities and at annual eco-events (SG 3,5,6)
	Maintenance of two forestry nurseries – replace all benches and install fence**	Maintenance of two forestry nurseries – install water irrigation system** -Hire nursery assistant**	Maintenance of two forestry nurseries – replace plastic nursery roofing**	Maintenance of two forestry nurseries – make installations and repairs as necessary**	Maintenance of two forestry nurseries – make installations and repairs as necessary**	Renovated and efficiently run nursery facility that will provide a quality environment for seedling propagation and other nursery functions (SG 9)
Budget*	\$8,170++	\$31,243	\$34,367	\$37,803	\$41,583	

. YAP STATE DIVISION OF AGRICULTURE & FORESTRY FIVE-YEAR BUDGET PLAN

ENVIRONMENT SECTOR PROGRAMS	ANNUAL OBJECTIVES:					Outcomes - Goals Referenced: Env SDP, NBSAP, YBSAP, MC, YIST
	FY 09	FY 10	FY 11	FY 12	FY 13	
Invasive Species Program	<i>Imperata Eradication:</i> 1) Monitor 60 acres of impetrate previously treated for regrown 2) Initiate M.O.P up operation program to reduce rhizome & seed banks 3) Treat 4 acres of regrown 4) Revegetate treated areas on Savanna to prevent regrowth and erosion	<i>Imperata Eradication:</i> 1) Monitor 60 acres of impetrate previously treated for regrown 2) Continue the M.O.P up operation program to reduce rhizome & seed banks 3) Treat 2 acres of regrown 4) Revegetate treated areas on Savanna to prevent regrowth and erosion	<i>Imperata Eradication:</i> 1) Monitor 60 acres of impetrate previously treated for regrown 2) Continue the M.O.P up operation program to reduce rhizome & seed banks 3) Treat 1 acre of regrown 4) Revegetate treated areas on Savanna to prevent regrowth and erosion	Outside consultant such as The Secretariat of the Pacific Community (SPC) and/or US Forestry Service (USFS) will be invited to confirm complete eradication	A third party such as The Micronesian Regional Invasive Species Council (RISC) will be invited to declared complete eradication of Imperata	Complete eradication of Imperata, one of the worst weed in the world (SG 7)
	<i>Chain-of-Love Control:</i> 1) Identify infested sites 2) Treated 500 plants	<i>Chain-of-Love Control:</i> 1) Initiate M.O.P up operation program to reduce seed banks 2) Treat 400 plants	<i>Chain-of-Love Control:</i> 1) Continue M.O.P up operation program to reduce seed banks 2) Treat 300 plants	<i>Chain-of-Love Control:</i> 1) Continue M.O.P up operation program to reduce seed banks 2) Treat 200 plants	Outside consultant such as SPC and/or USFS will be invited to confirm complete eradication – declaration will be done by RISC in FY14	Confirmation of complete eradication of <i>Chain-of-Love</i> (SG 7)
	<i>African Tulip Control:</i> Identify infested sites Treated 400 plants	<i>African Tulip Control:</i> Initiate M.O.P up operation program to reduce seed banks Treat 300 plants	<i>African Tulip Control:</i> Continue M.O.P up operation program to reduce seed banks Treat 200 plants	<i>African Tulip Control:</i> Continue M.O.P up operation program to reduce seed banks Treat 100 plants	Outside consultant such as SPC and/or USFS will be invited to confirm complete eradication – declaration will be done by RISC in FY14	Confirmation of complete eradication of African Tulip (SG 7)
	Development of Yap Invasive Species Taskforce (YIST) Strategic Action Plan and request plan to be approved by Governor	Seek funding for and implement activities outlined in the YIST SAP Conduct public awareness of the YIST SAP	Seek funding for and implement activities outlined in the YIST SAP Conduct public awareness of the YIST SAP	Seek funding for and implement activities outlined in the YIST SAP Conduct public awareness of the YIST SAP	Seek funding for and implement activities outlined in the YIST SAP Conduct public awareness of the YIST SAP	A complete Yap Invasive Plan of both terrestrial and aquatic invasive species including control programs for two additional species that will be implemented as a continuous effort to control invasive species (SG 7)
	GPS/GIS database yearly update of terrestrial treated invasive plants	GPS/GIS database yearly update of terrestrial treated invasive plants	GPS/GIS database yearly update of terrestrial treated invasive plants	GPS/GIS database yearly update of terrestrial treated invasive plants	GPS/GIS database yearly update of terrestrial treated invasive plants	Developed a yearly updated database that records progress and efforts spent on each species (SG 7)
	Budget*	\$26,611++	\$56,400	\$62,040	\$68,244	\$75,069

. YAP STATE DIVISION OF AGRICULTURE & FORESTRY FIVE-YEAR BUDGET PLAN

ENVIRONMENT SECTOR PROGRAMS	ANNUAL OBJECTIVES:					Outcomes - Goals Referenced: Env SDP, NBSAP, YBSAP, MC, YIST
	FY 09	FY 10	FY 11	FY 12	FY 13	
Genetic Resource Agro – biodiversity for Food Security and Economic Development	Identify and prioritize four genetic resource varieties for propagation and reproduction	Identify and prioritize five genetic resource varieties for propagation and reproduction	Identify and prioritize six genetic resource varieties for propagation and reproduction	Identify and prioritize seven genetic resource varieties for propagation and reproduction	Identify and prioritize eight genetic resource varieties for propagation and reproduction	Identified 30 genetic resources known to be high in nutritional value, endemic, or near extinction (SG 2,3,4)
	Establish genetic resource survey database (Purchase computer and camera to conduct and manage survey data**)	Update genetic resource survey database with additional varieties**	Update genetic resource survey database with additional varieties**	Update genetic resource survey database with additional varieties**	Update genetic resource survey database with additional varieties**	Genetic resources survey data is developed and entered into a database (SG 2,3,4)
	Reorganize Agricultural Extension Program**	Transfer to Education Sector/Hire an Extension Program Coordinator	See Agriculture Technology Transfer	See Agriculture Technology Transfer	See Agriculture Technology Transfer	Establish and effective Extension Agent Program that will be able to better serve all of Yap State (SG 2,3,4)
	Create Public Awareness Program pertaining to genetic resource varieties and food security	Develop Public Awareness Program pertaining to genetic resource varieties and food security – produce posters and brochures	Implement Public Awareness Program – work with Extension Agents to distribute informational materials	Implement Public Awareness Program – work with Extension Agents to distribute informational materials	Implement Public Awareness Program – work with Extension Agents to distribute informational materials	Provide genetic resource informational materials to Yap communities (SG 2,3,4)
	Survey potential sites and land owners to manage genetic resource banks**	Establish seed banks of the first four additional genetic resource varieties**	Identify and establish seed banks of the five additional genetic resource varieties**	Identify and establish seed banks of the six additional genetic resource varieties**	Identify and establish seed banks of the seven additional genetic resource varieties**	Established a total of 22 genetic resource banks of the varieties produced (SG 2,3,4)
	Develop a system for genetic resource variety distribution in Yap Proper and the neighboring islands**	Implement genetic resource variety distribution system when funding becomes available**	Distribute genetic resource varieties and planting materials propagated in the seed banks from FY10**	Distribute genetic resource varieties and planting materials propagated in the seed banks from FY11**	Distribute genetic resource varieties and planting materials propagated in the seed banks from FY12**	Distributed a total of 15 genetic resource varieties plus planting materials propagated locally in the seed banks to all villages and atolls in Yap State (SG 2,3,4)
Budget*	\$24,855++	\$51,369	\$56,506	\$62,157	\$68,373	

**YAP STATE DIVISION OF AGRICULTURE & FORESTRY
FIVE-YEAR PLAN**

PRIVATE SECTOR PROJECTS	ANNUAL OBJECTIVES:					
	FY 09	FY 10	FY 11	FY 12	FY 13	Outcomes (SDP Ag Goals Referenced)
Yap Farmers Organization/ Cooperation	Recruitment and repatriation of a consultant by the end of the fiscal year to develop a marketing strategy	- Complete one (1) Market Strategy Plan - Submit two (2) proposals to support the Plan	Implement a market strategy to diversify, develop, and have a reliable source of local produce and export locally grown produce	Using the market strategy 5 crop varieties will be regularly sold in the local market of which one variety will be exported	An additional 5 crop varieties will be sold in local markets of which two varieties will be exported	Using the market strategy the number of produce sold in local markets and exported off island will increase three-fold with the addition of 10 locally produced crop varieties (SG 1,2,3)
	Develop workshop materials for farm management and marketing	Conduct two (2) workshops on farm management and marketing	Conduct two (2) workshops on farm management and marketing	Conduct two (2) workshops on farm management and marketing	Conduct two (2) workshops on farm management and marketing	Provided informational workshops to local farmers on farm management and marketing (SG 1,2,3)
	Develop strategies for DAF functions (livestock program, farming supplies, equipment rental, seedlings, etc.) to be privatized under the Co-op/Org	The DAF Livestock program will be transitioned to and managed by the Coop	Most income generating activities managed by DAF will be transferred to the Co-op/Org	Discuss existing and potential services or products that can be managed by the Co-op/Org	Implement existing and newly developed services or products that will be managed by the Co-op/Org	Manage all activities concerning products and marketing in creating and shaping policies important to the agriculture sector (SG 1,2,3)
	Research and develop plan to produce and develop noni with farmers	Initiate ten (10) community meetings to coordinate the production and marketing of noni	Initiate ten (10) community meetings to coordinate the production and marketing of noni	Initiate ten (10) community meetings to coordinate the production and marketing of noni	Initiate ten (10) community meetings to coordinate the production and marketing of noni	Initiate ten (10) community meetings to coordinate the production and marketing of noni
	The Co-op and DAF seek funding for building renovation, necessary supplies, equipment, and start-up costs***	Start building renovation and order equipment if funding becomes available**	Complete building renovation, receive equipment and supplies**	Conduct agriculture functions and responsibilities from new facility	Co-op will become less dependent on DAF funding and generate own revenue	Co-op is able to be fully operational without receiving financial support from DAF and is a functional facility independent from DAF (SG 1,2,3)
Budget*	\$39,863++	\$63,601	\$69,961	\$76,921	\$84,613	

**YAP STATE DIVISION OF AGRICULTURE & FORESTRY
FIVE-YEAR PLAN**

PRIVATE SECTOR PROJECTS	ANNUAL OBJECTIVES:					
	FY 09	FY 10	FY 11	FY 12	FY 13	Outcomes (SDP Ag Goals Referenced)
Livestock	Conduct two workshops on swine management	Conduct two workshops on swine management	Conduct two workshops on swine management	Conduct two workshops on swine management	Conduct two workshops on swine management	Conduct a total of 10 workshops on swine management (SG 2,3)
	Start two small piggery projects for local market (1 boar and 4 sows)	Start three small piggery projects for local market (1 boar and 5 sows)	Start five small piggery projects for local market (1 boar and 6 sows)	Start five small piggery projects for local market (1 boar and 7 sows)	Start five small piggery projects for local market (2 boar and 8 sows)	Livestock program and piggery projects will merge with Yap Farmers Co-op (SG 2,3)
	Distribute 60 piglets to local farmers from breeding stock	Distribute 70 piglets to local farmers from breeding stock	Distribute 80 piglets to local farmers from breeding stock	Distribute 90 piglets to local farmers from breeding stock	Distribute 100 piglets to local farmers from breeding stock	Distributed approximately 400 piglets to local farmers from breeding stock (SG 2,3)
	Arrange import substitution with local markets	Sell approx. 12,800 lbs of pork product to the local market	Sell approx. 24,000 lbs of pork product to the local market	Sell approx. 48,000 lbs of pork product to the local market	Sell approx. 56,000 lbs of pork product to the local market	Sold approximately 140,800 lbs of pork product to the local market generating approx. \$281,600 in local revenue (SG 2,3)
Budget*	\$20,255++	Merge with YFO	Merge with YFO	Merge with YFO	Merge with YFO	

**YAP STATE DIVISION OF AGRICULTURE & FORESTRY
FIVE-YEAR PLAN**

EDUCATION SECTOR PROJECTS	ANNUAL OBJECTIVES:					
	FY 09	FY 10	FY 11	FY 12	FY 13	Outcomes (SDP Goals Referenced)
Agriculture Technology Transfer (Extension Program)	See Agro Project	Extension Coordinator will make four (4) trips annually to the neighboring island on the state fieldtrip ship to provide DAF extension services	Extension Coordinator will make four (4) trips annually to the neighboring island on the state fieldtrip ship to provide DAF extension services	Extension Coordinator will make four (4) trips annually to the neighboring island on the state fieldtrip ship to provide DAF extension services	Extension Coordinator will make four (4) trips annually to the neighboring island on the state fieldtrip ship to provide DAF extension services	DAF current projects and trainings conducted in the neighboring islands are continually monitored and assisted by the Extension Coordinator
	See Agro Project	Maintain seed bank crop varieties	Maintain seed bank crop varieties	Maintain seed bank crop varieties	Maintain seed banks crop varieties	Maintained seed bank crop varieties
	See Agro Project	Distribute seedlings to the ten (10) municipalities in Yap and neighboring islands	Distribute seedlings to the ten (10) municipalities in Yap and neighboring islands	Distribute seedlings to the ten (10) municipalities in Yap and neighboring islands	Distribute seedlings to the ten (10) municipalities in Yap and neighboring islands	Distribution of seedlings to the ten (10) municipalities in Yap and neighboring islands
	See Agro Project	Conduct composting workshops	Conduct agriculture technology workshops	Conduct agriculture technology workshops	Conduct agriculture technology workshops	Conducted agriculture technology workshops
	See Agro Project	Assist with two (2) agriculture fairs (March & October)	Assist with two (2) agriculture fairs (March & October)	Assist with two (2) agriculture fairs (March & October)	Assist with two (2) agriculture fairs (March & October)	Assisted with annual agriculture fairs
	See Agro Project	Establish one (1) local and/or rare crop with a high market value	Establish one (1) local and/or rare crop with a high market value	Establish one (1) local and/or rare crop with a high market value	Establish one (1) local and/or rare crop with a high market value	Established four (4) local and/or rare crops with a high market value
Budget*	\$39,863++	\$56,425	\$62,068	\$68,275	\$75,103	

**YAP STATE DIVISION OF AGRICULTURE & FORESTRY
FIVE-YEAR PLAN**

HEALTH (OR EDUCATION) SECTOR PROJECTS	ANNUAL OBJECTIVES:					Outcomes (SDP Goals Referenced)
	FY 09	FY 10	FY 11	FY 12	FY 13	
Nutrition Awareness Program	Organize and manage two agriculture fairs (March & October)	Organize and manage two agriculture fairs	Bi-yearly agriculture fairs (10) will have been presented to the public promoting locally grown foods (SG 2)			
	Develop lesson plan for nutrition workshops	Perform two community nutrition workshops	Develop and perform three community nutrition workshops	Develop and perform four community nutrition workshops	Develop and perform five community nutrition workshops	Developed a nutrition workshop curriculum best suited for Yap and presented at 14 workshops (SG 2)
	Conduct 5 food preparation and cooking demonstrations to Yap community members	Conduct 6 food preparation and cooking demonstrations to Yap community members	Conduct 7 food preparation and cooking demonstrations to Yap community members	Conduct 8 food preparation and cooking demonstrations to Yap community members	Conduct 9 food preparation and cooking demonstrations to Yap community members	Community members will acquire new recipes and safer cooking methods through the 35 cooking demonstrations (SG 2)
	Develop and complete recipe booklets in 3 languages (Yapese, Ulithian, English)	Print and distribute 100 recipe booklets to Yap proper and the neighboring islands	Print and distribute 150 recipe booklets to Yap proper and the neighboring islands	Print and distribute 200 recipe booklets to Yap proper and the neighboring islands	Print and distribute 250 recipe booklets to Yap proper and the neighboring islands	Produced and circulate 700 multi-language recipe booklets to Yap proper and the neighboring islands (SG 2)
	Design posters and brochures promoting local foods**	Print and distribute 50 posters and 50 brochures promoting local foods	Print and distribute 100 posters and 100 brochures promoting local foods	Print and distribute 150 posters and 150 brochures promoting local foods	Print and distribute 200 posters and 200 brochures promoting local foods	Created and distributed 500 posters and 500 brochures promoting local, nutritious foods to Yap proper and the neighboring islands (SG 2)
Budget*	\$34,811++	\$54,171	\$59,588	\$65,546	\$72,100	

*The FY11 – FY13 budget reflects a 10% annual inflation increase based on FY10 budget projections.

**Requires additional funding.

***Will be carried-out in cooperation with outside agencies pending funding and staff availability.

+The ability of Yap DAF to complete these projects assumes that staff will not be unduly averted to assist with outside generated projects, workshops, and visitors.

++FY09 Budget was mandated during the 2008 Environment Sector Workshop by Joe Konno. FY10 – FY13 budgets reflect actual funding requirements to carry-out annual activities listed above.

7. REFERENCES

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8. APPENDICES

8.1 YIST SAP

8.2 Yap Five Year Wildfire Plan