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1.0 INTRODUCTION

In the context of protected area system, livelihood/enterprise development is considered as a critical ingredient in the sustainable management of forest and coastal resources. It focuses both on the creation of employment opportunities resulting to increase in household and community income and protection of the environment. It can be used as an impetus to sustain interest of the communities in environmental protection.

Transforming livelihood practices into sustainable community enterprises, however, is a great challenge and identifying enterprises that are not dependent on forest resources is doubly difficult. Great care is therefore needed in the selection of sustainable enterprises including how to develop them towards viability.

This volume attempts to assess the livelihood issues of communities that are within the bounds of the protected area, defines livelihood approaches and strategies, discusses the livelihood framework plans including proposed programs and projects as well as organizational mechanism to implement alternative livelihood activities. Mechanics on how to select sustainable enterprises is also discussed including sample pre-feasibility studies on certain forest resources and products found to be feasible for future community investment.

A proposed IGP/livelihood model community (Pastolan Village) is also discussed including the mechanisms on how this will be approached and undertaken.

1.1 Livelihood Issues

Livelihood issues for both upland and coastal communities revolve around the lack of opportunities available to residents to make a decent living. In the uplands, the continued extraction of forest resources due to increasing household needs and population pressure led to continuing degradation of the environment. This was shown in the gradual encroachment of communities to protected areas like the Roosevelt Park, BNP, and even the SBFZ. The extreme case of slowly poisoning forest trees to give way to the plantation of fruit trees like mangoes, cashew, star apple, citrus, etc. is undertaken by a few families in higher portions of Sitio Minanga, Mabayo, Morong. Their purpose is to earn some cash income from these fruit trees. Despite the long period before trees bear fruit, they take the risks in investing their hard-earned cash and efforts.

In the coastal communities, the degradation of coastal resources is largely due to overfishing and the use of illegal fishing methods, i.e., cyanide fishing, trawling and others which had killed small fishes and destroyed their breeding grounds. This resulted in the decrease in fish catch among municipal fishermen during the past ten years.

Unfortunately, deep-sea fishing is limited only to fishermen who could afford bigger investments.

There is also the need for more support from government in terms of technology, (i.e., production, research and development, processing, etc.) marketing, and credit support

The lack of other infrastructure, including roads and irrigation facilities, also mattered to lowland and upland residents.

The lack of employment skills among many residents also limited their access to high earning jobs even at the SBMA. For instance, the Pastolan residents who are nearest to SBPZ are hired only as maintenance crews, grass cutters, security guards, and other seasonal and contractual jobs.

Overall effect of this situation is the poverty condition in both the upland and lowland communities. Unless something is done about it, encroachment of communities to nearby buffer and protected areas will continue, endangering the remaining forest and coastal resources.

2.0 THE PLANNING AREA: UPLAND, LOWLAND, AND COASTAL COMMUNITIES

Livelihood planning will be focused on three areas: upland, lowland, and coastal communities. It will also consider the geographical areas where they are located. For the PAMP, these communities are located in various sub-zones, either within the buffer or protected areas. In developing the strategies, therefore, a review of the area characterization and issues will be made including livelihood issues identified earlier in previous consultation workshops.

2.1 Upland/Lowland

Various communities which are considered uplands and partly lowlands fall under different sub-zones:

2.1.1 Terrestial Sub-Zones 2

Area Coverage

This is the area located to the north of the proposed protected area (watershed boundary) extending up to the main highway. This area includes the Pastolan area settlement and related land use activities such as reforestation, agro-forestry, agricultural and others. It also includes part of the Roosevelt National Park and a substantial portion of the Olongapo Watershed Area.

Affected communities include Barangays Tipo, Hermosa, Pastolan Village, part of poaches within the Roosevelt National Park.

Issues

The area is characterized by mixed activities (economic/multiple use) partly undertaken by the Pastolan community, an indigenous community with current ancestral claim. Primary issues include tenurial rights, encroachment, poaching and fires, low productivity, poorly managed agriculture and others. The proximity of the intensive land use of the Free Port Zone and Olongapo City present the danger of expanded land use and unauthorized settlements. Poorly placed economic activities will also possibly contaminate surface streams and rivers polluting the Subic Bay marine environment.

2.1.2 Terrestial Sub-Zone 3 (Multiple use, Rural Settlement, Economic)

Coverage area

This area is located to the east of protected area that includes either part or all of Barangays Tipo, Sacrifice Valley, and Mabiga. It is characterized in part by open woodland and brushlands with extensive frontal areas, mixed agricultural activities including pasture leases (north of sub-zone) and extensive areas of remnant forests to the south and towards higher terrain associated with the Bataan National Park proposed extension. There also exists a low density rural settlement. While this sub-zone lies outside the Subic Bay Management area, it may however include a part of the proposed Tama-Bacong River watershed area.

Issues

Due to human settlement, the ecological and biological values in this buffer zone are threatened and will continue to be at risk until protected. It is also important to preserve remaining forests in support of protected area.

There are signs of population growth and potential expansion of land use activities. Significant numbers of community residents depend on forest resources for their livelihood.

2.1.3 Terrestial Sub-Zone 5 (Economic zone)

Area Coverage

This is the area lying west of Bataan National Park. An upland portion has land uses which include small settlements and associated forest agriculture with substantial clearing.

Issues

There is a great threat from expanded land development due to population pressure including threat of degradation and erosion.

2.1.4 Opportunities/Strengths

Despite some issues related to the economic activities of communities, which pose grave threat to nearby watershed and national parks, opportunities do exist; these are the following:

- The nearness of the communities to the SBMA presents a range of possible employment and livelihood sources. This will mean the possible employment of residents in factories and offices inside SBMA and potential markets for their products.

- There are also on-going economic activities that could be strengthened (in terms of production and technology) such as manufacturing, livestock and swine raising, trading including labor and service oriented types of projects (Olongapo and Subic).

- Another opportunity for these communities is their nearness to centers and markets of SBMA, Subic and Olongapo City, etc.

- Regeneration activities being undertaken by upland communities such as fruit trees plantation, cash crops production, agro-forestry activities, etc., bring continuing source of livelihood for communities and residents.

- Tourism potential is great in areas such as the Pastolan Village where indigenous tribe (Aeta) settled. There are also employment opportunities because of its nearness to the SBMA site.

2.1.5 Livelihood Strategies

Upland

- Enhance regenerative livelihood approaches and activities of communities, specifically fruit trees plantations, agro-forestry activities including reforestation and cash crops production, orchards, etc.

  The fruit trees plantation and orchards provide permanent vegetative cover for the open grasslands and existing patches of tree stands as well as continuing source of income for residents.

  Agro-forestry activities provide cash income sources from cash crops and livestock production. Selection of high value crops is preferred with potentials for processing activities (Barangay Tipo/Pastolan Village).

- As regenerative approaches are being strengthened, limit extraction to plantation areas developed by communities and in some areas where limited extraction is allowed by government (buho extraction, honey gathering, hunting, fishing, etc.)

- Promote high value crops with potentials for processing and value added.

This thrust will minimize overextraction of forest resources as these activities could provide adequate employment for the residents. An example of this is the potential of tiger grass production both in Pastolan Village and Barangay Tipo.

- Enhance use of technologies to increase production

  This should address issues on low productivity. The introduction of technology that will systematize and increase production yield could provide opportunities for community residents to increase yield from their fruit trees plantation, e.g., mango, jackfruit, etc. Pests and diseases should also be controlled to increase yield of existing fruit stands.

- Establish distribution and marketing centers for products in strategic areas in SBMA, Subic, and Olongapo.

Lowland Communities

- Generation of land-based enterprises to decrease dependence on forest resources and consequently, minimize further encroachment to protected areas. Land-based enterprises may involve light manufacturing, processing, trading and service oriented activities of residents. The strategic location of Barangay Tipo, very near the highway going to Olongapo and Subic, provides entrepreneurial activities for residents catering to the needs of passersby.

  Tourists and local visitors are big market for goods. A range of services could be offered, from labor construction, table waiting, laundry services, and others.

- Strengthening of livelihood skills of residents

  Current livelihood skills of residents barely match the existing employment and economic opportunities in the SBMA and other areas. For instance, the Pastolan residents due to lack of formal schooling and skills are limited only to maintenance jobs on a seasonal basis as ground crews, grass cutters, laborers, etc. The more lucrative positions are taken by outsiders.

  Livelihood skills development should consider the needs of the locators and industries within SMBA, Olongapo, Subic, and vicinity.

  Non-formal education for adults and out-of-school youths could be initiated and which may gradually be picked-up by other formal institutions like TESDA, TLRC and other national agencies.

- Developing entrepreneurial traits, values and skills

  Self-employment is the most logical option for residents in view of their lack of competitiveness in the formal sector. There are entrepreneurial activities undertaken by the residents. These could be further strengthened by enhancing of attitudinal and entrepreneurial values including systematization of production systems and processes.

  Exposure of residents to successful upland livelihood projects could also provide them insights as to how they could further improve their livelihood activities.

Lowland/Upland Communities

- Intensify IEC activities specifically promoting the value of buffer zones as well as environmental laws and rules.

  The identification of appropriate medium in carrying out crucial messages on environmental protection and management including sustainable development is a must. Varied media including radio, print, flyers, community meetings, community theatres, advocacy campaigns are some of the possible activities that could be implemented.

  The use of one-on-one or the interpersonal approach had also been used by internationally funded projects with the hiring of community organizers (CO-workers) acting as catalyzer, advocate, organizer, resource mobilizer, trainor and consultant. Constant communication and feedback will contribute to faster behavioral change of communities.

  The interpersonal approach also brings about more involvement and participation of communities ensuring deeper commitment to projects.

- Improve educational opportunities/access for residents to gain quality employment

  There is a need to strengthen the educational support by the government to these communities. This should include the establishment of full elementary education program in the uplands (i.e., Pastolan Village elementary education is up to grade 4 only). Children tend not to attend school because of inaccessibility of school facilities. Some families do not have enough income to send their children to school outside of their community considering the cost of food and transportation.

  Scholarships could be provided to deserving students at the high school and college levels such as the one provided by the Felicito C. Payumo Scholarship Foundation.

This way, more youths could access better opportunities for employment in the near future.

- Strengthen non-formal educational activities

  The DECS and NGOs could work-out together appropriate non-formal and vocational skills for women and out-of-school youths toward developing skills or type of economic activities that will cater to tourist and visitors needs such as service oriented activities (tourist guides, maintenance, beauty parlors, barbershops, therapy/massage, laundry, food services, etc.)

  The main objective is to professionalize such services.

2.2 Coastal Communities

The activities of coastal communities have greatly affected beach areas (buffer zones) and greater threats of expanded economic and land-based activities including fishing, coastal development/resort development and others. Communities of Subic including Calapandayan, Wawandue, Matain, Camachile, Kalaklan and Calapacuan depend on fishery resources of Triboa, Ilanin and Binanga Bays (SBMA) and Silangin and Cawag residents at Nagsaza Bay including the Grande Islands. At the other side, Mabayo, Minanga, and Timac residents depend on fishing activities for their livelihood.

In terms of specific sub-zones, the following are potential for the threats of expanded fishing and recreational activities:

2.2.1 Terrestial sub-zone 3

This area extends from west of Bataan National Park to Port Binanga Bay, and also part of the municipality of Morong. Part of this area is characterized by small settlements (fishing village, coastal area including fish ponds). There is anticipated pressure from various types of land use development, which may include coastal tourism development to take advantage of the high quality of beaches in Port Binanga Bay, and development activity such as the proposed Bataan Technology Park and road development access to Subic.

Issues

The threat of uncontrolled coastal development is foreseen.

2.2.2 Marine sub-zone 1

The area is generally west and south of Grande Island to Biniptican and Port Binanga. It is more oceanic with deep waters, fishery quality, and higher biological values.

Issues

It is vulnerable to distinctive fishing practices and potent demand for mariculture and aquaculture farm sites that are highly detrimental to protected values.

2.2.3 Marine sub-zone 2

The area which is north of Marine Sub-zone 1 (Grande Island) up to and including Olongapo Bay and the harbor/marine areas of Subic Free Port Zone are not included in the protected area. It is characterized by diminishing water quality and biological values. It is also characterized by higher marine-based activities and adjacent coastal land use activities.

Issues

There is a higher degree of human use activity than in Sub-Zone 1, particularly along the Redondo Peninsula coastline, including navigational disturbances. It is also prone to pollution from increased use of water sports and loss of fish nursery areas.

2.2.4 Coastal Communities Livelihood Issues

The overall situation of the coastal and marine resources is not encouraging. Fishermen are quite pessimistic of their plight as they perceived continuing decline in fishery and other marine resources.

Although there may be other livelihood options for fishermen, the fishery situation need serious thought and concern. Some of the issues that have to be addressed are the following;

- *Decreasing fish/marine resource supply*

  The decrease in fishery resources is caused by the increase in the (a) number of fishermen after the Mt. Pinatubo eruption, (b) damage to local reefs due to dynamite use and continuing illegal fishing methods such as cyanide, powerlite etc. As a result, the fishing grounds are now farther from shore, taking more days to catch fish with a corresponding increase in production cost. The increase in production cost reduces the income of fishermen from every fishing trip. This has contributed to the increase in poverty among fishermen.

- *Inadequate fishing gears and equipments*

  In order to increase income, fishermen now have to seek more distant fishing grounds where various fishes still abound. Current fishing equipment and gear of fishermen however are inadequate and do not match the requirements of deep-sea fishing. Thus, they have to make do with the traditional municipal fishing grounds.

- *Financing Constraints*

  The lack of credit facilities accessible to fishermen hindered them from upgrading their fishing equipment and gear. The usurious interest rates (10% to 20% per month) from informal lenders aggravated their financial difficulties. Only organized groups such as cooperatives (Calapandayan Cooperative) were able to finance their production cost.

- *Non-Enforcement of marine regulations/laws*

  Illegal fishing activities are still practiced by fishermen within the municipal waters using cyanide, trawls, etc. Despite efforts of FARM-C and the Coast Guards, illegal activities are still pursued. There is also perceived a lack of political will among concerned agencies to enforce existing laws.

- *Increasing poverty*

  Overall there is increasing poverty among fishermen due to the fast declining catch. This translates to households' inability to meet their basic needs such as food, health, education and shelter. The low level of education also forced them to hold on to odd jobs, which are seasonal or contractual.

2.2.5 Opportunities

Despite some issues that are encountered by fishermen and coastal communities, there are opportunities that can be tapped which their upland counterparts do not have.

- They are nearer to Poblacion and the centers of trading. This may provide other sources of employment such as buy and sell activities, food processing and other service-oriented activities.

- There are community-based organization initiatives such as the FARM-Cs, Calapandayan Cooperative, Grameen Banking, etc. that showed success in managing

their various operations on credit, production, marketing, technology access, networking and others.

These successes could be replicated in other areas.

- There are also joint efforts between government and concerned agencies (Coast Guard) and communities through the FARM-Cs in enforcing the laws under the Bantay Dagat Program in some coastal areas.

- There is increasing awareness among some fishermen on the need to protect and manage fishery resources in a sustainable manner.

2.2.6 Coastal Livelihood Strategies

- The identification of non-destructive livelihood should be focused on one that does not further deplete resources but would rehabilitate and conserve coastal and marine resources. This should include the following;

  - Eco-tourism such as boat riding, sailing and controlled camping activities, recreational fishing etc.,
  - Community-based resort management putting emphasis on natural beauty and with less emphasis on land development and building construction. The use of minimum facilities such as nipa huts utilizing excess buho and bamboo resources could be explored with SBMA. The less structures are built in coastal and beach areas the better.

    The management of these activities could be through associations, cooperatives or joint venture between barangay council and their constituents and LGUs.

- Generation of employment opportunities either through formal and informal sectors.

  In the formal employment sector, appropriate vocational and technical skills should be developed among the youths to access employment opportunities in industry, agencies, and other business entities.

  Self-employment opportunities could also be developed among the marginalized and out-of-school youth. Entrepreneurial values and skills should be simultaneously strengthened. Type of livelihood activities should include service-oriented types such as beauty parlors, food/restaurants, tourist guides, welding, vulcanizing, and repair shops, air condition and refrigeration repairs, etc. These activities respond to growing demands on such services due to population growth, tourism potentials and industrial

growth in the coastal communities of Olongapo and Subic including Subic Free Port Zone.

3.0 THE LIVELIHOOD FRAMEWORK PLAN

In the light of the above issues, design of Livelihood Framework Plan will be integrated and holistic to meet needs of target upland and coastal residents. The development of strategies will also consider the factors that contribute to the success or failure of planned livelihood/enterprises.

The Framework Plan will provide the direction and approaches to be made in providing livelihood assistance. It consists of the following: (1) livelihood concepts and approaches, (2) goal, (3) specific objectives, (4) methodology, and (5) sub-components; (a) human resource/capability building and organization development, (b) market development, (c) project financing, (d) social services and community development, (e) monitoring and evaluation, establishment of database and management information system (MIS).

3.1 Livelihood Concepts and Approaches

Livelihood assistance will be packaged in various forms depending upon target goals and objectives. Considering the current status of affected upland and coastal communities of the SFPZ, intervention will be focused on the following:

3.1.1 For Subsistence

At the household level, livelihood activities need not generate cash income but may generate resources that will meet daily food requirements of the family plus minimum amount to pay for services for household needs. For instance, they could barter their produce for other goods that are not readily available without having to pay in cash or to pay in kind for services. Other livelihood activities such as poultry and livestock raising meet other household needs aside from earning some needed cash.

3.1.2 For Major Income Source or Supplemental Income

Another objective of livelihood assistance is to generate cash income either as a major source to meet household basic needs (food, education, shelter, health and recreation) or to partially meet the same needs. In agricultural production for instance, volume of production will be increased to meet demand for certain products thus generate possibly substantial cash income. Employment opportunities will also have to be developed as an alternative source of cash income from either the informal or formal sector.

3.1.3 For Replacement of Existing Livelihood Activities

In protected areas, the goal is to replace a destructive livelihood activity (example, destructive fishing methods) with another activity that will be less extractive and destructive. Displaced households or resource users will have to be prepared to turn to other viable sources of environment friendly livelihood.

For purposes of the PAMP, the generation of livelihood activities should consider the integrated need of households for resource use, cash income and alternative sources of livelihood. Current monthly average household income of P4,750, that is way below the poverty threshold for Region III (P12,000+) need to be increased.

The ultimate goal of livelihood programs should therefore focus on reducing poverty and increasing the level of household income to enable them to access basic necessities and opportunities toward quality life. Livelihood options, under the PAMP, will be based on sustainable development. Extraction will only be allowed in sustainable/multiple use zones and limited economic activities in special and protected zones.

In designing livelihood intervention, the following approaches may be considered:

- *Integrated and Holistic Approach*

  Livelihood assistance should be provided in an integrated approach. Various issues including livelihood support to financing, marketing, production and technology and capability building should be addressed simultaneously. If assistance is provided on a fragmented and piecemeal basis, livelihood initiatives will most likely fail.

- *Capacity Building and Skills Development*

  Capability building should include the enhancement of appropriate values, vocational and technical skills including updated knowledge on agro-forestry, agricultural enterprises, processing, marketing, etc.

- *Progressive and Ladderized Approach*

  Livelihood goal and objectives could be divided into short, medium, and long-range objectives.

  The short-range objectives could be focused on limited extraction from existing forest resources and individually owned plantations. Processing activities will be undertaken. Various fruits such as mangoes, jackfruit, pineapple, etc. could be

processed as dried fruits, candies, jams, pickles, and others. Forest products could be processed into household and novelty items (buho, rattan, bikol etc).

The medium-range target may include processing forest products for bigger industrial use. Buho may be processed as panel boards, walls, parquet, etc.

The long-term goal will include the regeneration of forest areas to include agro-forestry, reforestation and tree planting activities.

The idea behind this approach is to achieve greater success potential by "starting where the residents are" in terms of practice and skills.

- *Balance of Population and Resources*

  Population pressure has aggravated the use of forest and coastal resources which resulted in serious degradation. Balance of economic resources and population should be maintained so that utilization will not exceed the capacity of existing ecosystems and minimize encroachment of population on protected areas.

- *Community Empowerment Through Education*

  Communities have to be provided access to higher education to enable them to seek and compete for better employment opportunities. Unless the current low level of education (elementary education) is improved, people will continue to depend on odd jobs such as those of contractual and seasonal in nature. Their dependence on already degraded forest and coastal resources will further increase.

  Greater access to employment outside of their communities will contribute to the outmigration of some residents seeking greener pastures. The upgrading of the educational infrastructure support specifically in the upland communities is therefore crucial. Consideration should be given to students who have the potential for higher education through the provision of scholarships.

- *Consideration of Absorptive Capacity of Communities in Introducing Livelihood Projects*

  There is a need to assess the absorptive capacity of residents to engage in bigger and different ventures. It would be best to start with their existing and indigenous practices.

Attitudinal and value orientation should also be considered in introducing changes to current practices. Overall, residents should be prepared to meet new challenges posed by new livelihood activities.

- *Participatory Approach*

  Community involvement and participation in the planning and development of the livelihood projects is a must. This is to ensure that their needs and issues including their suggestions will be included in the process. This will also lead to greater sense of ownership of the projects. Participation also enhances their skills in handling future livelihood development activities.

3.2 Goals

3.2.1 Goal

To provide sustainable livelihood activities that will generate adequate resources for basic necessities (food, shelter, education, health and recreation).

3.2.2 Specific Goals

- To strengthen and expand on-going livelihood activities that are regenerative and rehabilitative of natural resources

- To enhance participation of resident in the generation, development and management of their livelihood including activities that will allow for the appropriate conservation and sustainable development of forests and coastal areas.

- To strengthen the capability (attitude, knowledge, and skills) in managing their livelihood/enterprises in a sustainable manner as well as in seeking for alternative employment outside their communities (SBMA and other areas)

- To establish livelihood support program including infrastructure, credit and loan assistance, production technology, market development (product development and design, product utilization, packaging, distribution, etc.,) and capability building and organization development.

- To strengthen social services from government and NGOs to include health, water supply, family planning, and population and other services.

- To promote awareness of the resident on the importance of resource conservation and sustainable development.

3.3 Methodology

- Identifying marginalized households in the upland/lowlands who will be the focus of and priority targets for assistance

- Profiling of specific marginalized households including their current economic activities

- Consultation and planning workshops to include (1) needs assessment; (2) environmental scanning, (3) pre-feasibility studies, (4) project feasibility studies and others.

- Identifying type of business/projects the residents will be engaged in

- Identification of possible financing requirements either through individual/group financing or from outside resources

- Link with concerned agencies and groups for production/technology, product development and design, financial and marketing support including social services

- Provide continuing technical assistance during monitoring and evaluation activities to identify implementation issues and to resolve the same quickly.

3.4 Sub-Components

3.4.1 Sub-Component 1: Human Resource/Capability Building and Organization Development

The most critical asset in any livelihood activity is the human capital. It refers to the traits that include attitude, values, knowledge, and skills of individual residents necessary in making their enterprises viable and profitable. It is also the same capital that will enable them to assume more responsible actions specifically in promoting regenerative and less destructive types of activities.

It is therefore necessary to strengthen current positive traits and values and change those that are negative.

Strategies

- Strengthen values on the following areas:

- values on the protection and management of resources (flora and fauna), forest, rivers including sustainable development
- values on "responsibility" and "ownership" of projects that are to be implemented
- values on self-reliance, innovation and creativity

- Strengthen capability and skills on the following areas:

  - leadership
  - project/business management (production, financial, marketing)
  - coordination and networking
  - problem solving/decision-making
  - resource mobilization

- Strengthen existing cooperatives/associations or establish new ones depending on the need of residents/communities that will be responsible in managing/assisting community-based livelihood projects and other related activities

- Strengthen skills in agricultural production, agro-forestry, mixed plantations, food processing, etc.

Activities

- Conduct of IEC and advocacy campaigns for the communities that happen to be within or near buffer zones and PAs.

- Conduct of various workshops and seminars for affected communities in:

  - self-awareness and value development
  - entrepreneurship development
  - project/business management including planning, organizing, coordination, supervision, monitoring and evaluation
  - production technology, i.e. agro-forestry, nursery management, livelihood, food processing, manufacturing, etc.
  - networking and resource mobilization
  - organization development techniques and strategies
  - project feasibility study preparation

3.4.2 Sub-Component 2: Market Development

This focuses on the range of processes from research and development (R & D), product identification, product design and development, packaging and distribution.

Strategies

- Inventory of raw materials such as fruit trees, orchard and cash crops currently cultivated by households (including those awarded with CBFM) and other tenurial rights[1].

- Conduct of research utilization of forest products, which have potential for use as ornaments, or an accessory of a primary finished product (i.e., bayto, bical, buho, etc.)

- Link with other agencies that have the capability in designing and processing innovative product lines from locally available materials:

    - Forest products – rattan, buho, bayto, bikal, etc.
    - Herbal products – banaba, makahiya, sambong, roots of cogon, etc.
    - Grasses – cogon, talahib
    - Fruit trees – mangoes, cashew, jack fruit, star apple, sampalok, etc.
    - Wild banana (amukao) and other varieties including root crops

- Establish a marketing network enabling upland producers to collectively market their products either raw or processed, which is preferred due to value added.

Activities

- Actual counting of the quantity of fruit trees, bananas, and other farm crops

- Link with various agencies for product development and processing such as the Forest Product Research and Development Institute (FPRDI), UPLB College of Forestry and Natural Resources (product utilization research and training), ERB for forest production research and technology, Design Center Philippines, etc.

- Design mechanism for the marketing network to be established including product lines, distribution centers, promotions, and incentives.

3.4.3 Sub-Component 3: Project Financing

This focuses on the mechanism for financing the projects to include possible sources, procedures in financing potential projects including requirements.

Strategies

- Promote savings mobilization among potential partners to enhance "ownership" and involvement in the project

[1] Inventory of forest products, wines and grasses are available (Dalmacio 2000)

- Organize residents into associations or cooperatives who will invest on capital shares as members

- Mobilization of external resources including local banks and national agencies in financing part of their project, i.e., rural banks, DBP, Land Bank, DTI, etc.

Activities

- Conduct of seminars and workshops on the value of savings and the organization of cooperatives/associations

- Encourage/initiate savings activities among individuals and groups

- Organize residents into associations/cooperatives or tap existing organizations

- Tap financial institutions as a source of financing for community livelihood projects

3.4.4 Sub-Component 4: Social Services/Community Development

This entails the strengthening of social services support to upland/coastal communities in terms of health, nutrition, family planning and population management, potable water supply and others. With these services in place, social costs for marginalized households will decrease accruing bigger income from their livelihood activities.

Strategies

- Establish households into associations/groups to tap national agencies and NGOs for social services support

- Identify vulnerable households who need priority support

- Engage in preventive and reproductive health practices to decrease cases of morbidity and illnesses, "health makes wealth"

- Tap and mobilize internal and external resources including volunteer efforts to undertake community development projects.

Activities

- Conduct of seminars/workshops on health, nutrition, and family plan/population management

- Organize groups to tap support from various sectors

- Enlist the assistance of volunteers to undertake awareness campaigns, solicitation of household support for social services/program

3.4.5 Sub-Component 6: Monitoring and Evaluation/Establishment of Data Base and Management Information System

This component entails the establishment of monitoring, evaluation and feedback mechanism to continuously improve livelihood planning and intervention activities.

Strategies

- Establishment of monitoring and evaluation system for all types of livelihood projects within the protected areas and buffer zones

- Provision of technical assistance and feedback during monitoring and evaluation visits
- Establish database and management information system for more effective livelihood planning and intervention

Activities

- Set up monitoring and evaluation framework and mechanisms as well as indicators for performance

- Conduct monitoring and follow-up visits to on-going livelihood assisted projects

- Conduct periodic evaluation reviews to access impact of project on communities

- Set up MIS for more effective planning and networking purposes

4.0 PROGRAMS AND PROJECTS

The following programs and projects are intended to address livelihood issues and needs of both upland/lowland and coastal communities in consonance with the Livelihood Framework as well as identified livelihood strategies.

4.1 UPLAND/LOWLAND/COASTAL COMMUNITIES

4.1.1 Integrated Livelihood Assistance Program

The KAP is a comprehensive and holistic livelihood assistance to upland/lowland/coastal marginalized communities. Its goal is to decrease poverty incidence in those areas.

Specific objectives

To increase livelihood opportunities for the residents that is anchored on sustainability.

- To strengthen existing IGP and livelihood activities of affected residents in the area through appropriate production and processing technologies.
- To increase income of residents.
- To provide support services that are necessary in enhancing the viability of on-going livelihood projects.
- To strengthen coordination and linkages among affected communities with LGUs, NGOs and agencies concerned.

4.1.2 Sub-Projects

Sub-Project 1. Improved Production Through Utilization of Appropriate Technologies

Objective

This project specifically aims to increase production yield in specific livelihood activities such as (1) agricultural/cash crops production, (2) agro-forestry, (3) livestock/poultry raising, (4) Bee culture, honey production processing, and other income generating projects.

Description

This project involves the utilization of environment-friendly technologies to improve production.

It focuses on the conduct of the following activities;

(a) Identification of production and technology-related needs and issues experienced by affected communities.

(b) Establishment of linkages and referral system with appropriate technology centers (DOST, PCARRD, DA-NAFC, Mango Information Network (MIN) etc.) to facilitate assistance including dissemination of information materials.

(c) Reproduction of technology materials (i.e. Mango production/Management Pest and Diseases, etc. for distribution to interested residents.

(d) Conduct of appropriate technology trainings on various livelihood activities from agriculture/cash crops to fruit trees production.

(e) On site visit to areas where appropriate technology utilization are being undertaken for possible replication.

(f) Conduct of follow-up and monitoring visits to groups that will be provided assistance to assess results and further needed assistance.

Responsible Groups : LES* Ecology Center, LGUs, Project participants/beneficiaries
*LES – proposed Livelihood and Enterprise Section

Resource Agencies : DOST, PCARRD, DA-NAFC, DAR, MIN (Mango Information Network)

Project Time Frame : 3 years/continuing follow-up with resource agencies

Project Budget : Php 3 million

Beneficiaries : upland families, women and youth

Project Impact/Benefits :

- Enhanced non-extractive livelihood activities
- Increased production yield
- Increased Income
- Improved access to basic needs (food, clothing, education, health, shelter, etc.)
- Participation of women in economic activities and consequently, increased contribution to household income and decision making.

Sub-Project 2. Product Processing, Product Design and Development

Objectives/Purpose

This project intends to strengthen existing processing activities of various raw materials such food/fruits processing, forest products processing (buho, bamboo, rattan, tiger grass) and herbal processing (i.e. banana leaves, cogon roots, etc.)

Description

This involves the use of appropriate technology to improve product design and development, processing as well as packaging of finished products. This project is proposed to generate added value to raw materials available in the uplands.

Specifically, the following activities will be undertaken;

- Establishment of linkages with resource groups and agencies for assistance in technology for food and forest products processing including product design and development (i.e. TLRC, DOST, LIVE COR, DA-NAFC, PCARRD, Design Center Philippines, etc.)

- Conduct of workshops and other related activities to strengthen skills of livelihood participants in processing their products.

- Reproduction of simple materials and easy guide on some food processing procedures for jams, jellies, fruit candies and dried fruits, which could be used by households.

- Establishment of quality control and standards for processed products through the help of technical consultants and resource groups.

Responsible Groups	:	LES* Ecology Center, LGUs, concerned agencies; DOST, etc.
Resource Groups	:	DOST, TLRC, DA-NAFC, Design Center Phil., PCARRD.
Project Time Frame	:	3 years/continuing activity
Project Budget		Php 3 million

:

Project Beneficiaries/ Participants : Households/Individuals included in livelihood production/processing activities

Project Benefits/Impacts

:

- Value added to raw materials
- Improved quality of processing/finished product
- Increased potential demand for products
- Increased income among participants
- Improved quality of life among participants

Sub-Project 3. Expanding Marketing Network

Objective/Purpose

To expand and improve marketing distribution and outlets for both local and export markets.

Description

This sub-project focuses on the expansion and improvement of current distribution mechanism of affected communities. This entails the identification of centers and outlets that will ensure available markets for their produce and finished products.

This entails the conduct of the following activities;

- Monitoring and establishment of data on the quantity of goods and products produced by upland/lowland residents and current outlets.

- Conduct of feasibility study for organizing association/cooperative for marketing agricultural products/forest products.

- Conduct of feasibility study for identifying areas where processed foods and fruits will be marketed. The concept of "Pasalubong Centers" could be explored where varied processed products will be displayed/sold. Hotels, restaurants, beach resorts,

public markets, roadside (highway going to Manila/Subic) SBMA Duty Free Shops could be some of the potential sites.

- Exploration of export market potential of novelty items, Christmas decors, fixtures, furnitures and others.

- Promotion of exhibits/trade fairs inside SBMA/and other sites.

Responsible Groups : LES* Ecology Center, LGUs, Agencies DTI, DA-NAFC

Resource Groups : CITEM and other Trade Exhibition Groups, TLRC, etc.

Project Time Frame : 5 years and continuing support

Project Budget : Php 5 million

Project Beneficiaries : households/individuals engaged in livelihood activities

Project Benefits/Impacts :

- Increased number of distribution centers and outlets for raw materials/finish products
- Increased income among households
- Improved opportunities/access to basic amenities and quality life

Sub-Project 4: Livelihood Credit Financing

Objective/Purpose

To provide credit/loan assistance to current livelihood groups/individuals and start-up capital for new comers.

Description

Livelihood credit assistance is a crucial input in assisting groups or individuals who need to start a new enterprise or expand an existing one. This includes the micro, small and medium enterprises. Support will primarily focus on production assistance.

The following activities will be conducted:

- Establishment of mechanism, policies and procedures in the provision of credit and loan assistance to participating individuals or groups.
- Establishment of referral system with institutions such as LANDBANK, DBP and other government agencies which provide financing to enterprises (i.e. Live Corp, TLRC, Rural Banks, etc.
- Promotion of savings activities of interested groups/cooperatives which would serve as their equity or counterpart to proposed projects and eventually to finance their own activities.

Responsible Groups : LES* Ecology Center, LGUs, Agencies DTI, DA-NAFC

Resource Groups : LAND BANK, DBP, Rural Banks, Cooperatives, NGOs, etc.

Project Time Frame : 5 years and until such time when groups are sustainably linked with financing institution or partly financing their own

Project Budget : 20M (may be sourced from various sectors and groups including LGUs, et.)

Project Beneficiaries : households/individuals engaged in livelihood activities

Project Benefits/Impacts :

- availability of credit/loan assistance for upland/lowland groups
- increased capacity to engage in livelihood activities

- increased income
- increased access to opportunities and basic activities

Sub-Project 5: Vocational/Technical Training Project

Objective/Purpose

- To enhance technical skills of unemployed/underemployed youths and individuals who are qualified.

- To provide opportunities for individual/youths to compete for employment in the formal sector or for self-employment.

Description

Many upland/coastal residents near the SBMA and within the buffer and protected areas have not been able to access job opportunities due to their low level of educational attainment and technical skills. Pastolan residents for instance, remained to be maintenance crews or as laborers and grass cutters at SBMA.

Vocational/Technical Training will provide youths the opportunity to seek technical jobs with higher compensation.

Graduates could be further trained toward self-employment to cater to needs of the SMBA and the local industries. i.e. Entrepreneurship, Business Management, etc.

The following activities will be undertaken;

- Assessment of the needs and job requirements of industries within SBMA and nearby Subic and Olongapo.

- Development of technical and vocational training programs that will be responsive to the needs of industries within and outside SMBA.

- Tapping of resources of government agencies including private institutions in the provision of such training programs. i.e. TESDA, DSWD, DTI, TLRC.

- Development of a mechanism whereby potential students could "Study Now and Pay Later" so that funds could be shared with other students.

- Establishment of a trust fund for this undertaking and which could be sourced from LGUs and civic organizations.

- Organization of students after graduation for follow-up activities such as (a) job placement, (b) support assistance for self-employed graduates to establish their own business and (c) for repayment purposes.

Responsible Groups	:	LES* Ecology Center, LGUs, concerned agencies (TESDA, etc.)
Resource Groups	:	DTI, TLRC, MERALCO Foundation, and other local technical Colleges
Project Time Frame	:	5 years
Project Budget	:	Php 5 Million
Project Participants/ Beneficiaries	:	households, women, out-of-school youth, unemployed adult
Project Benefits/Impacts	:	

  - improved technical skills among target groups
  - increased employment opportunities
  - increased income and economic opportunities

Sub Project 6: Educational Scholarship Program

Objective/Purpose:

To give opportunity for high school students to pursue college education.

Description

This could be provided to deserving students who have achieved high grades in high school. This will provide students with better opportunities after college graduation to seek greener pastures elsewhere and consequently, balance population growth in the uplands/lowland communities.

Activities

- Promote a "Study Now, Pay Later" scheme for deserving and academically qualified students.
- Establish a package that will be appropriate for the needs of the student including tuition fees, books and/or living allowances and possible counterpart from the student's family.
- Tap civic organization (Jaycees, Rotary, Scholarship foundations, etc.) to provide grants for the program.
- LGUs and other agencies could be mobilized for other support and assistance in setting up the program.
- Establish a trust fund with initial funding that may be sourced from civic organizations, foundations, individuals, and LGUs.

Responsible Groups : LES* Ecology Center, LGUs, NGOs, concerned agencies (DECS) Commission on Higher Education

Resource Groups : DSWD, Jaycees, Rotary Clubs

Project Time Frame : Five years and continuing

Project Budget : Php 5 Million

Project Beneficiaries/ Participants : High school students graduating with high grades.

Project Benefits/Impacts :

- Improve capacity/opportunity for students towards higher education.
- Increase employment opportunities in the formal sector.

- Enhance capacity to compete for quality and more secure jobs.

Sub-Project 7: Capability Enhancement and Organizational Development

Objective/Purpose

To strengthen personal efficacy, project management and organizational skills of residents toward greater production efficiency.

Description

There is a need to enhance appropriate attitude, values, knowledge and skills of residents to ensure viability and sustainability of their projects. There is also a need to strengthen existing organizations or to establish new ones. Further intervention will focus on Entrepreneurship Development, Project/Business Management, Bookkeeping and Recording, Financial Management, including Organizational Development (OD) techniques.

The following activities will be undertaken;

- Conduct training needs assessment of groups that are being assisted.
- Design training program and modules including appropriate training materials.
- Coordinate with possible resource agencies, which could be tapped as facilitators or resource persons.
- Conduct exposure visits to organizations/cooperatives that are operational and successful.
- Conduct follow-up and monitoring visits to assess impact of training activities.

Responsible Groups : LES* Ecology Center/LGUs

Resource Groups : NGOs/POs, DSWD, DTI, TLRC and other Foundations

Project Time Frame : 3 years and continuing

Project Budget	:	Php 3 Million
Project Beneficiaries/ Participants	:	participants of livelihood activities/leaders of associations/cooperatives
Project Benefits/Impacts	:	

- Improved individual and group capacity to manage business/IGP activities
- Enhanced productivity including quality standards
- Increased viability and sustainability of projects.

Sub-Project 8. Social Development Program

Objective/Purpose

- To strengthen existing social services and other support services to upland/lowland communities.

- To generate support from within and outside their communities to improve social and health status.

Description

This project focuses on providing appropriate social services to communities that are within or outside the buffer zone including those within the protected area. This includes the provision of health and sanitation, population and FP programs, water supply, day care and other services that will improve quality of life of affected communities.

The following activities will be conducted;

- Identification of priorities and needs of communities through the help of a social development staff.

- Tap appropriate agencies for the provision of such services.

- Organize groups to serve as volunteers for various social projects and to deal with NGOs/POs.

Responsible Groups	:	LES* Ecology Center, LGUs, NGOs/POs, concerned agencies
Resource Groups	:	DSWD, DPWH, DOH, NGOs/POs
Project Time Frame	:	continuing activity
Project Budget	:	Php 5 million
Project Beneficiaries/ Participants	:	household residents/communities
Project Benefits/Impacts	:	

- Improved social and health status
- Enhanced productivity and economic opportunities of communities (i.e. road construction/water supply, etc.
- Enhanced quality of life of residents.

Sub-Project 9. Establishment of Livelihood Management Information System/Monitoring and Evaluation System

Objective/Purpose

- To provide appropriate information and data base for strategic planning and management decision-making.
- To develop effective technical intervention strategies to individuals/group engaged in IGP/livelihood projects.
- To assess progress, milestones including efficiency and effectivity of project assistance and intervention.

- To evaluate benefits and impact of assistance to livelihood participants and their communities.

Description

This project focuses on the establishment of a data base system for livelihood projects, which will be used to ensure that assistance will be appropriate and effective. Relevant information and indicators will be drawn as basis in monitoring progress and evaluation activities.

The following activities will be conducted;

- Set-up monitoring and evaluation framework and mechanisms as well as indicators for performance.
- Development of appropriate program/software to be used in data processing and retrieval.
- Conduct monitoring and follow-up visits to on-going livelihood assisted projects.
- Conduct periodic evaluation reviews to assess impact of project on participants and their communities.
- Create an MIS/monitoring evaluation group to monitor programs and status of livelihood projects.

Responsible Groups : LES* Ecology Center, LGUs

Project Time Frame : 1 year, but monitoring and evaluation will be continuous

Project Budget : Php 1 million

Project Beneficiaries : Project Staff/Livelihood Participants

Project Benefits/Impacts :

- Improved assistance to project participants through appropriate intervention and support.
- Timely feedback on progress, program status, issues, needs and problems of livelihood participants.
- More viable and sustainable livelihood enterprises among participants.

5.0 ACTION PLAN FOR THE DEVELOPMENT OF AN IGP/LIVELIHOOD MODEL COMMUNITY

This section will focus on the development of an IGP model community. Specifically, it will discuss the mechanism and strategies to be used to operationalize the development of the IGP model.

5.1 The IGP/Livelihood Model Community

For purposes of the PAMP, the selection of the proposed IGP model community included several factors. These were based on significant influences impacting on the protected area and economic opportunities that may be explored owing to strategic location being adjacent to the Subic Bay Freeport Zone (SBFZ).

Based on the above premise, the Pastolan Village, an indigenous Aeta community nearest the SBFZ and within the protected area was selected as the model community. Its selection was based on the following:

- Geographical significance to protected area

The Pastolan Village is one of the sitios of Barangay Tipo. In terms of geographic distance, it is the indigenous Aeta community nearest the SBFZ. Based on IPRA Law, the Pastolan area covers almost 3,000 hectares part of which include the current SFPZ site. The proposed management zones include some portion as buffer zone used as multiple use/economic zones and some portion of which is the protected area.

- Indigenous Practices with regards to Forest/Environmental Protection and Management

Despite the influence of outside people as a result of intermarriages, the Pastolan Aetas still maintain indigenous practices that promote non-destructive cultural practices in forest extraction, hunting, honey gathering, jungle training, eco-tourism activities. The community has had previous experience in working with the US Naval Forces in jungle training.

- Readiness/Social Preparation of the Community

The Social Development Division of the Ecology Center of the SBMA has been providing development assistance to the community residents in partnership with the World Bank. Technical assistance, capability building and some livelihood skills training were provided.

Most significant experience is that the Pastolan Aetas have been involved in the identification of their needs and problems and were also part in crafting the Indigenous

Peoples Development Plan (IPDP). Their involvement was made possible through continuing consultation and dialogues as well as the attendance of their representatives in strategic planning workshop to validate the plan.

Leaders are also involved and are part of the group who are now advocating for the implementation of the NCIP Act which will provide the legal basis on their occupancy of ancestral lands.

- The Existence of an Indigenous Peoples Development Plan (IPDP)

An Indigenous People Development Plan was prepared to enhance the capacity of Pastolan Aetas to respond to economic development and growth in the Freeport Zone. The plan was jointly prepared by the SBMA and some Aeta representatives and was confirmed by the community residents through consultations and in a 3-day community development and strategic planning workshop.

The plan aimed to achieve the following;

- secure legal and formalized land tenure.
- implement community development activities which will support and strengthen the economic and social status of the Pastolan Aetas and their access and control over their natural resources, and improve the productivity of their agricultural land and their management of the forest in a sustainable manner.
- provide the residents with skills to develop sustainable livelihood which will improve their standard of living.
- empower the Pastolan Aetas develop their capabilities to facilitate their participation in linking with government agencies to secure services for their community and to determine the direction of their future.
- implement community organization and social integration activities that will enhance community identification and cohesiveness.

The IPDP provides the direction and basis for the future development of the Pastolan community. Planned projects and activities have since been implemented in 1999 utilizing the plan as the framework. This included social services, training and planning for livelihood projects.

- Presence of organized community structures

Organized structures/associations operate in the community which currently plan and implement projects. The Samahan ng Mga Katutubong Aeta sa Pastolan Village (SKAP) is an umbrella organization of some sectoral groups, which include the (a) Samahang Kababaihan ng Pastolan para sa Kaunlaran, (b) Samahang Kabataan, (c) Samahan ng mga Forest Ranger sa Pastolan.

The Pastolan Village Multipurpose Cooperative has been recently organized to cater to the credit and other production needs of members.

These structures provide an appropriate mechanism through which livelihood activities could be channeled.

- Existence of IGP/Livelihood Projects

Although most of the residents of Pastolan are employed as seasonal/contractual workers at the SBMA as caretakers, grass cutters, laborers, tourist guides at the Pamulaklakin Stream Resort, etc. some are currently engaged in other agricultural production activities either for home consumption or for commercial purposes.

There are other livelihood activities that are currently implemented by sectoral groups. These projects are the following; (a) Communal Fish Pond Project (World Bank–BFAR) was developed from a natural spring which produces tilapia, (b) Communal Tree Farm Project which include growing mangoes, coffee, bananas, peppers, langka, kasoy, etc. on a 3-hectare farm, (c) Fish Pond Project (youth group) by placing net (fish cage) in the river and others.

There are also projects that are in the planning stage such as the (a) Ginger Project among women, (b) Reforestation Project, and (c) Bantay Kalikasan Project which was supposed to guard and protect the forest and environment.

Some micro entrepreneurs are also engaged in trading, buy, and sell (i.e. sari-sari stores, etc.)

These range of economic activities could be a spring board toward the development of new ones or the strengthening of existing economic activities. Their experience in these activities will be valuable in managing other projects.

- Strategic Location: Economic opportunities through its proximity to SBMA

Current livelihood activities and employment status show that the Pastolan residents have not maximized the opportunities available at the SBMA. They lacked the educational and technical skills to compete for more quality jobs that command higher wages. They also lacked agricultural and other skills to improve agricultural production. With appropriate project assistance and technical intervention, the Aetas and other Pastolan residents could improve their access to employment at SBMA and other places including agricultural productivity.

5.2 Overall Approach

In consonance with the goal of environmental protection and economic sustainability, the development of the IGP model community will consider the following principles;

- participatory approach to the planning and implementation of IGP/enterprises with maximum involvement of Pastolan Aetas and other residents together with other stakeholders.

- sustain and improve current non-destructive livelihood activities.

- development of IGPs/enterprise and capability of residents will result in the development of the community's self-reliance.

5.3 Objectives

5.3.1 Short Term objective

- To enhance existing/current livelihood activities with short gestation period and increase return on investment.

- To develop new ones based on availability of raw materials/resources including the marketability of finished products.

5.3.2 Long Term objective

- To develop enterprises that will be profitable, viable and sustainable with focus on

    - minimum extraction
    - developing new products with value added
    - expanding market locally and exporting

- To increase formal employment in the SBMA and other agencies, specifically those offering higher compensation/wages.

5.4 Strategies and Activities

5.4.1 Strategy 1. Assess current economic activities

Assess current economic activities including employment and livelihood activities vis-à-vis vocational/livelihood skills.

Output objective:

Compendium of data and information as input in developing direction and strategies for IGP/livelihood and skills development.

Activities

- Conduct interviews with employable groups (labor force) to assess the type of livelihood activities they are currently undertaking.
- Determine wages, labor cost, or fees for current economic activities.
- Identify issues/problems in these jobs, whether as employee or self-employed.
- Assess participation in IGPs/livelihood activities by gender and by age group.
- Assess current livelihood skills of residents vis-à-vis needs of SBMA or for self-employed activities in agricultural/manufacturing activities.
- Review socioeconomic profile of the community to determine current socioeconomic situation.
- Prioritize groups to be assisted i.e. women, out of school youths, Cooperatives, etc.

5.4.2 Strategy 2. Review of development plan

Review of development plan of the Ecology Center (Social Development Division) and Hermosa and other agencies on livelihood and economic projects and future plan for assistance.

Output objective:

Data input on identifying roles and responsibilities of key stakeholders by Ecology Center and LGUs.

Activities

- Assessment of the status of current assistance/future plans to assist the community in livelihood or other programs.
- Assess the LGU's (Hermosa) current assistance and future plan to assist the Pastolan community.
- Discuss issues and problems in current/future efforts to assist the community.

5.4.3 Strategy 3. Conduct environmental scanning

Conduct environmental scanning to determine availability of resources and raw materials to be developed and managed including preparation of investment studies. (Reference: Development of Sustainable Enterprises by Dr. Antonio Carandang)

Output objective:

Compensation of projects that are assessed to be feasible and viable to implement.

Activities

- Orient concerned residents in the conduct of the activity to enhance their involvement and participation in the entire process (i.e. women, men, youths, organization members, etc.)

- Conduct workshops identifying potentials and opportunities in using available raw materials and resources in the area/or developing resources for future extraction.

- Prepare project feasibility studies for identified IGP/livelihood enterprise to assess profitability and viability.

5.4.4 Strategy 4. Formulation of a Livelihood Development Plan for the Pastolan Community.

Output objective:

Framework, mechanism and procedures including possible IGP/livelihood activities that will be implemented as well as resources to be used.

Activities

- Conduct consultation workshops of key stakeholders, residents, LGUs, industry representatives SBMA, other government agencies, NGOs, etc. to discuss opportunities, needs and issues that should be considered in the development of a livelihood plan.

- Come up with short- and long-term objectives in the development of such plan including strategies and activities to be undertaken, priorities, target beneficiaries and others.

- Solicit suggestions and recommendation from residents in the development of specific livelihood activities depending on their interest, capacity as well as existing resources in the area.

- Dedicate appropriate resources and logistics in the implementation of the Livelihood Development Plan.

5.4.5 Strategy 5. Establish tie-up and working arrangement with industries/locators

Establish tie-up and working arrangement with industries/locators within and outside SBFZ for employment of technical graduates.

Output objectives:

Define alternative livelihood sources through employment with SBFZ and other institutions and agencies.

Activities

- Coordinate with key representatives of industries/locators within and outside SBFZ regarding manpower needs and recruitment plans.
- Assess manpower requirement needs of industries and locators including job competency skills required.
- Review their short- and long-term manpower requirements and needs.
- Work out various schemes in absorbing graduates such as developing with industries an apprenticeship program to provide opportunity for trainees to be immersed and later absorbed by factories/companies.
- Explore with LGUs possible incentives which could be provided to industries/locators that prioritize local hires or residents from surrounding communities of SFPZ.

5.4.6 Strategy 6. Establish coordination mechanisms

Establish coordination mechanisms between Ecology Center[1], LES[2] and other agencies, institutions, NGOs in the implementation of the Livelihood Development Plan.

Output objective:

Delineate roles and responsibilities as well as define resources to be tapped and mobilized.

[1]SDD-Ecology Center – to act as the interim group to oversee the planning and implementation of the IGP/livelihood model community.

[2]LES – proposed new section at the SDD-Ecology Center

Activities

- Create a livelihood committee in the Pastolan Village, under the KAP to follow-up and monitor implementation of planned and on-going livelihood projects.

- Set-up working arrangement between SDD-Ecology Center[1] and LES[2] and the Pastolan livelihood committee including other concerned agencies and institutions and NGOs specifying commitment, agenda and dates of meetings.

- Identify areas for working arrangement that includes all aspects of livelihood development from planning, implementation to evaluation of projects/enterprises including specific areas of assistance covering technology, processing, product design and marketing of finished-products.

5.4.7 Strategy 7. Establish a capability and skills enhancement program

Establish a capability and skills enhancement program to respond to needs of self-employed groups as well as those seeking employment within SBFZ.

Output objective:

Enhanced capacity of participants and residents in managing their enterprises as well as broader employment opportunities.

Activities

- Identify training needs of livelihood participants depending on the identified IGP projects as well as job requirements of some SBMA employment opportunities (technology and processing, present design, entrepreneurship training, project management, financial management, bookkeeping and record keeping, etc.)

- Develop training curriculum and capability development plan including schedule of activities and corresponding budget.

- Set-up referral system and tap resources, such as resource persons, consultants and facilitators from resource agencies.

- Identify participants for various training programs to be conducted.

- Monitor and evaluate results of training activities and define further training needs.

5.4.8 Strategy 8. Establish marketing linkages and network to expand outlets for products

Output Objectives:

Ready market/distribution centers for finished products.

Activity

- Identify market/outlets for available finished products.
- Define incentives and promotions to increase demand and expand distribution centers.
- Tie-up with trade exhibits/market counters as well as local markets, supermarkets, SBMA tourism, etc.

6.0 PROPOSED INSTITUTIONAL ARRANGEMENTS

6.1 Proposed Interim Structure

- The Social Development Division of the Ecology Center will be responsible for establishing the IGP/Livelihood Model Community with the assistance of IGP/livelihood consultants who will be hired for the purpose.

- The SDD will be further assisted by partner agencies including DENR, DA, DAR, LAND BANK, Rural Banks and other stakeholders, Jaycees, Rotary clubs, NGOs and others. They will be mobilized and tapped for various activities - from planning to implementation of IGP activities involving financial and technical expertise.

- The SDD will be responsible for the entire process of IGP development until such time that a proposed Livelihood and Enterprise Section (LES) will be approved and made operational by SBMA.

- Consultants will be hired to assist SDD to initially set-up IGP/livelihood projects including technology development, processing and drawing strategies for marketing of finished products.

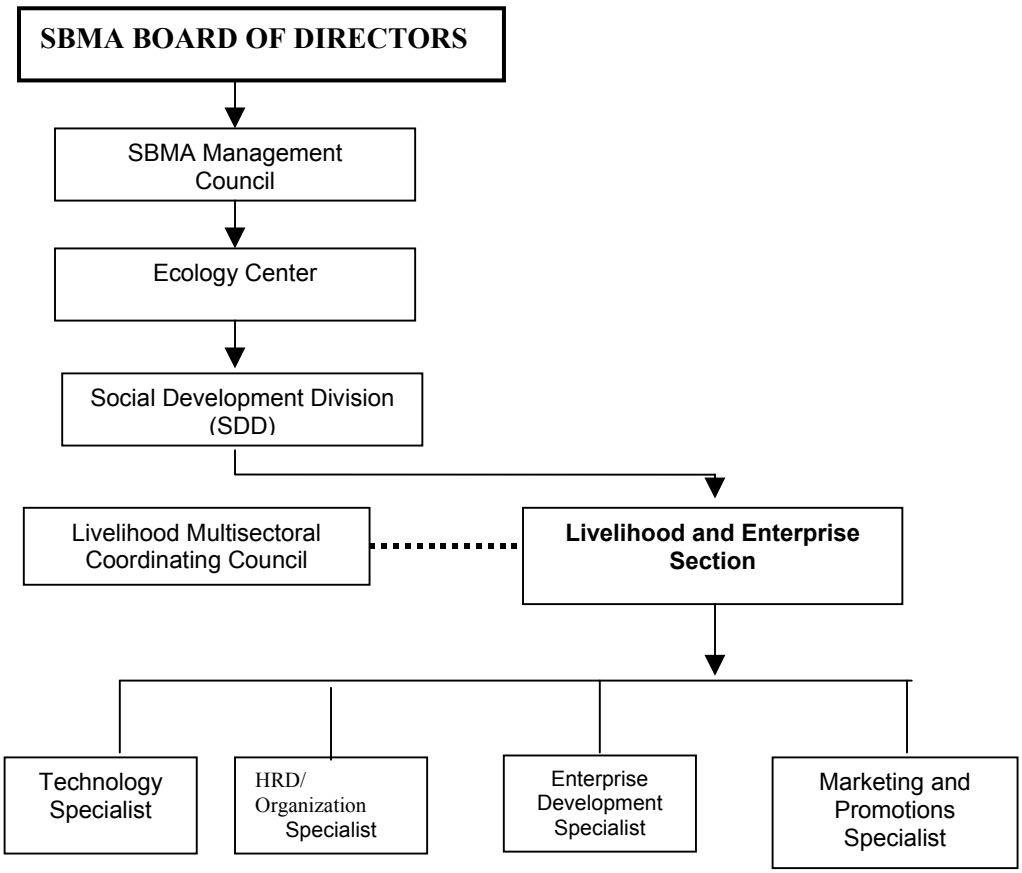
6.2 Proposed Organizational Mechanism

Current livelihood assistance is undertaken by the Social Development Division of the Ecology Center. There is limited support being provided to communities with regards to livelihood projects. This is due to limited staff and resources available for identified livelihood projects and activities, thus livelihood assistance is not comprehensive and provided on a case-to-case basis.

6.2.1 The Livelihood And Enterprise Section (LES)

It is proposed that Livelihood and Enterprise Section will be established within the Social Development Division of the Ecology Center. This section will provide comprehensive assistance to livelihood participants and communities in the designated protected areas and buffer zones within the PMAP. It will also facilitate the flow of assistance and support to ensure viability and sustainability of livelihood projects.

Figure 1. Livelihood and Enterprise Section (LES)



The LES is responsible for managing various program and support assistance to be provided to livelihood participants and their communities. Specifically, it will have the following functions;

- Provides direction in the over-all planning of program intervention and support to livelihood participants and communities.

- Coordinates with various LGUs, agencies, institutions, foundations, civic organizations, POs and residents in the planning, implementation, monitoring and evaluation of assisted livelihood projects.

- Provides technical support and intervention in technology dissemination and utilization, market and product development and organizational support to beneficiaries to ensure the viability and sustainability of livelihood projects.

- Conducts monitoring and evaluation activities to assess status and performance of projects including provision of timely technical intervention to respond to beneficiaries needs.

- Ensure the availability of funds to finance proposed livelihood projects and other intervention activities.

6.2.2 The Livelihood Multi-Sectoral Coordinating Council

This body will provide the over-all support to the LES in the provision of assistance to communities.

Composition

- Concerned LGUs
- National Agencies
- Representatives: SBMA Locators
- NGOs/POs
- Civic Organizations: Jaycees/Rotary, etc.
- Chamber of Commerce
- Ecology Center

Functions:

- Provides direction and policy framework for livelihood assistance to communities within the protected and buffer areas.

- Identifies possible resources and partner agencies to fully provide support to approved livelihood projects.

6.2.3 Livelihood Multi-sectoral Technical Advisory Group

Composition

- LES specialists
- NGO/PO representatives
- Representative SBMA Locators
- Concerned LGU representatives: MPDO
- Representative: Civic Organizations

Functions:

- Provides inputs and advice to center specialists in different aspects of livelihood assistance, i.e. technology, marketing, financing, organizational support, etc.

- Assists team of specialists review proposed livelihood projects including monitoring and evaluation activities.

- Assists center specialists tap and mobilize resources to support on-going and approved projects.

6.2.4 Section Staff

- ***Enterprise Development Specialist***

Functions:

- Responsible in identifying viable and feasible IGP/livelihood projects
- Assist the communities in the preparation of a project feasibility study and business plan
- Provide technical assistance and follow-up in seeing to it that enterprises are viable and profitable
- Continuously review and identify alternative livelihood projects for possible implementation of interested communities.
- Supervises the work of the team of specialists in providing assistance to livelihood participants and groups.
- Coordinates with key officers and majors partner agencies and institutions, foundations, etc. in the implementation of key program assistance.
- Represents the center in meetings, conferences, and other activities critical to the delivery of program assistance to target participants and communities.
- Prepares reports to the Governing Council and update the council on the status and progress of assistance to livelihood participants including current problems and issues.

- ***HRD/Organization Specialist***

Functions

- Conducts training needs assessment, designs training and capability training programs and coordinates implementation of the said programs.
- Taps and invites resource persons and facilitators including consultants that will help participating organizations and cooperatives.
- Evaluates the results of training programs conducted for livelihood participants.
- Provides follow-up visits and technical assistance to cooperatives/associations and individual participants.
- Encourage individuals and groups to save and organize into cooperatives towards self-sufficiency and self-reliance.

- ***Technology Specialist***

Functions

- Identifies groups and individuals to provide technology inputs in production, processing of raw materials into finished products as well as packaging for distribution.
- Identifies technology needs of prospective on-going livelihood participants or livelihood communities.
- Reproduces reader-friendly technology materials for the use of livelihood participants in various aspects of their business.
- Taps and mobilizes resources for technology support to on-going livelihood and approved livelihood projects.

- ***Marketing Specialist***

Functions:

- Identifies needs and problems of livelihood participants in marketing their products either in raw or finished forms.
- Prepares market feasibility study to determine appropriate geographical network and institutional linkages.
- Develops mechanism and support for the distribution of goods and finished products including promotion, incentives, etc.
- Coordinates with appropriate agencies and institutions in organizing market encounters, products exhibits inside and outside SBMA.

- ***Information/MIS Specialist***

Functions:

- Establishes the database and management information system for the livelihood Section.

- Identifies information needs as well as relevant data to be used in planning, strategizing and managing livelihood assistance for livelihood participants.

- Designs appropriate software program for data processing and retrieval.

- Prepares reports for the use of the specialists and director in managing the livelihood assistance program.

- ***Monitoring And Evaluation Specialist***

Functions:

- Prepares monitoring and evaluation mechanism and framework to assess progress, efficiency, and effectivity of program intervention assistance.
- Conducts monitoring and follow-up activities to livelihood projects and assess status and progress including needs and problems.
- Provides on-site information and as appropriate or refer needs and issues to other specialists depending upon the problem at hand.
- Conducts periodic evaluation reviews to assess efficiency, effectivity and impact of intervention to participants and communities.
- Assesses effectivity of some strategies developed and implemented by livelihood groups.

- ***Social Development Specialist***

Functions:

- Ensures the delivery of social services and other support provided to participants and their communities.
- Organizes groups/associations to identify, plan and implement social projects that are crucial to the daily existence of communities. i.e. potable water supply, health and sanitation, family planning/reproductive health, population management, etc.
- Trains groups how to tap and mobilize resources within and outside their communities toward self-reliance

PHASES IN THE DEVELOPMENT OF SUSTAINABLE LIVELIHOOD PROJECTS

The development and management of livelihood projects consists of six (6) distinct stages; namely: examination of livelihood environment, screening and prioritization, business planning stage, resource mobilization stage and implementation and monitoring and evaluation (Figure 2).

1. Examination of livelihood environment

This activity involves careful study of the project site conditions. Information may come from both primary as well as secondary sources. Within the project environment, existing and potential livelihood activities are identified. Along with this is a rapid assessment of the socio-cultural situations, local market situation, and potential industry profile in the area. With adequate reconnaissance and proper consultations with the communities as well as those who are knowledgeable about the available resources, livelihood activities with enterprise potential are validated and listed. Listing involves identification of potential projects/enterprises the community wants to pursue based on their observations or previous knowledge of what are promising livelihood options or potential businesses in their area.

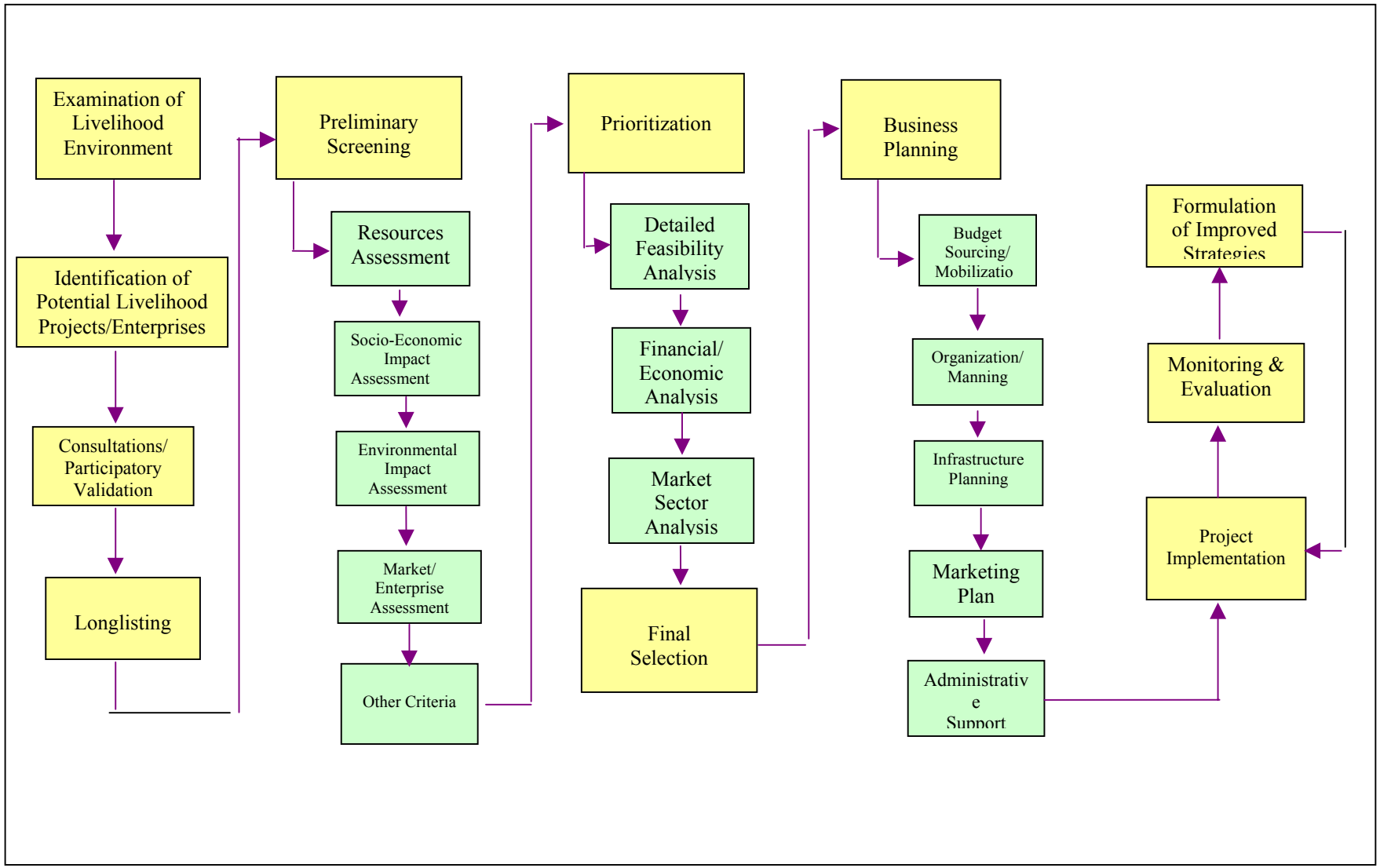
2. Preliminary Screening

The next stage is a series of processes, which will lead to the screening of options following some general criteria for selection. Each option in the list is subjected to different measures of acceptability or sustainability. A scoring system is devised for short-listing and further evaluation of alternative options. Among the major defining processes for screening are as follows: resource assessment, environmental assessment, socioeconomic impact assessment and assessment of enterprise or market potential.

Below are some of the pointers/criteria to remember when selecting livelihood projects or enterprises appropriate to the community as well as the tools involved to facilitate shortlisting. The tools were designed to guide the communities in selecting better options. Below are tools necessary for screening:

a. **Resources assessment -** Some enterprises may require raw materials either from the protected area or from identified market sources. Others may require skilled manpower if the community intends to offer services as its product. Most importantly, other resources like money, land, managerial skills, etc., are needed to operate a livelihood project or business enterprise.

Figure 2 Framework for Livelihood Project/Enterprise Development



In all these requirements, there must be a steady supply of resources available for sustained operations. Below is a scoring tool for resource assessment which may be adopted to help select priority projects:

CRITERIA	INDICATOR	SCORE
1. Quantity/ Availablity	Long Term (10 yrs & up) Medium Term (3 – 9 yrs) Short Term (< 3 yrs)	3 2 1
2. Quality	High Medium Low	3 2 1
3. Accessibility	High Medium Low	3 2 1
4. Renewability	High Potential Medium Potential Low Potential	3 2 1
5. Dispersion	Concentrated in patches Mediumly dispersed Highly dispersed in the area	3 2 1
	Total Score:	

b. Ecological/Environmental compatibility assessment - The implementation of the chosen project must not negatively affect the natural/ecological functions of the site and immediate ecological systems. On the other hand, the option must be able to draw the attention of the community from highly exploitative or destructive resource use (e.g., timber poaching, mangrove conversion, etc.), to more environment enhancing activities. The project activities must not pose environmental risks both in the short term and in the future (e.g., fish poisoning, accumulation and deposition of toxic wastes) which may be caused by the siting and establishment of the project, its actual operations, processing, storage and transport of products. Below is a scoring tool for assessing environmental compatibility:

CRITERIA	INDICATOR	SCORE
1. Negative impacts to biodiversity/ wildlife in the area	Low/Insignificant Medium High	3 2 1
2. Negative impacts to soil	Low/Insignificant Medium High	3 2 1
P3. Potential accumulation/ mismanagement of processing wastes/toxic residuals	Low/Insignificant Medium High	3 2 1
4. Improvement in the productivity of the ecosystem	Significant Moderate Low	3 2 1
5. Compatibility with the protected area concepts/goals and objectives	High Medium Low	3 2 1
	Total Score:	

c. Socio-Economic Impacts - The project must benefit the greater majority of the target communities and must have positive impacts to economically depressed areas. Must consider the economy of scale, encourage efficient use of natural and other community resources, encourage high value-added processing, must encourage use of idle or unproductive resources and transform them in to productive ones.

CRITERIA	INDICATOR	SCORE
1. Equity/ Distribution of Benefits	Wide Distribution Moderate Distribution Limited Distribution	3 2 1
2. Contribution to HH Income	High Medium Low	3 2 1
3. Fit with traditional knowledge & culture	High Medium Low	3 2 1
4. Potential for	High	3

CRITERIA	INDICATOR	SCORE
employment creation	Medium Low	2 1
5. Gender impact	Both Men & Women Mostly Women Mostly Men	3 2 1

Total Score:

d. **Market viability** - The option must have viable market, available market infrastructures, presence of receptive alternative market or product outlets, the competitive prices, existing structures for providing support services access to market information, improved packaging and product distribution system, value added processing technology, etc.

CRITERIA	INDICATOR	SCORE
1. Marketability of products	Highly Saleable Medium Low	3 2 1
2. Presence of competition	High (quantity & quality) Medium Low	3 2 1
3. Constraints to business, barriers to entry (laws, regulations, lack of information, etc.)	High Medium Low	3 2 1
4. Potential margins for profit	High Medium Low	3 2 1
5. Processing technology, locations	Manual/Dispersed Cluster of locations Sophisticated/Centralized	3 2 1

Total Score:

There are other criteria that are helpful in qualitatively assessing the merits of different enterprise options. Among the other criteria in screening of project options are:

- **sustainability over the long term** - the project can be sustained profitably over the long term and can be replicated within the community and similar areas, must encourage a shift from resource destructive utilization systems to environmentally enhancing ones.

- **technological** - there is appropriate technology affordable to the community or its members; there is available and acceptable technology in the management of wastes and residuals.

- **Social –** the livelihood option is acceptable in the targeted communities and will not create community problems or conflicts at present or future times in terms of resources access and utilization. It must be gender sensitive and fits existing cultures and social structures.

- **Legal -** the option must be compatible with local and national policies, laws, rules and regulations regarding access and disposition of natural resources and actual operations of the project. There must be safeguards against too much replication that will create oversupply or proliferation of inferior products that will affect serious and good producing ones.

- **Institutional -** availability of assisting institutions for the creation of positive linkages and provision of future support services needed for expansion or diversification.

3. Prioritization/Shortlisting/Selection

3.1 Project feasibility analysis

The financial viability of the proposed enterprises is gauged based on their impacts (benefits and costs) on the communities and other stakeholders. Each distinct/specific livelihood project has individual costs and revenue schedules at prevailing market prices. Project proponents need to project accurately the cost and revenue streams of the proposed projects within a relevant planning horizon. The computations of the financial indicators can easily be done by a knowledgeable person using a computer. The financial viability of proposed project is often gauged using common financial feasibility indicators among which are: the Return on Investment (ROI), Net Present Value (NPV), Benefit Cost Ratio (BCR) and Internal Rate of Return (IRR).

ROI is simply the ratio between net return for a year over fixed investment. Net return for the year is the difference between annual revenue less annual variable cost. Fixed investment refers to long term inputs (e.g., buildings, vehicles, equipment, etc.) that may be used for production of goods and services over a long period of time.

$$ROI = \frac{\text{Annual net return}}{\text{Fixed investment}}$$

The NPV, also called the net present worth, is perhaps the most widely used financial indicator in project analysis. It is considered as the most straightforward measure of discounted cash flow of project worth. It determines the present worth

of incremental benefits of the project. A project is viable if the NPV is positive given an assumed discount rate. It is computed using the following formula:

$$NPV = \sum_{t=0}^{n} \frac{B_t}{(1+i)^t} - \sum_{t=0}^{n} \frac{C_t}{(1+i)^t}$$

Where: t = Year when transaction occurred
B_t = Total benefits received at year t
C_t = Total costs incurred at year t
i = Discount rate
n = Planning period

The BCR is the ratio between the present worth of benefit streams and the present worth of cost streams. A project is feasible if the BCR value is greater than 1.

$$BCR = \frac{\sum_{t=0}^{n} \frac{B_t}{(1+i)^t}}{\sum_{t=0}^{n} \frac{C_t}{(1+i)^t}}$$

On the other hand, the IRR refers to the rate of return on capital outstanding per period while it is invested in a project. It is the maximum rate of return that a project could provide for the resources used in its implementation. Furthermore, this is the discount rate (value of t) that makes the net present value of incremental net benefit streams, or discounted incremental cash flow, equal to zero, as shown below:

$$\sum_{t=0}^{n} \frac{B_t}{(1+i)^t} - \sum_{t=0}^{n} \frac{C_t}{(1+i)^t} = 0$$

Sensitivity analysis - Assumptions in project plans are usually subject to uncertainties. This is a result of future changes in subproject conditions, which we cannot predict with certainty at present. One way of treating uncertainties is to conduct sensitivity analysis. Sensitivity analysis is a process of determining the effects or future impacts of minor and to some extent major changes in some project assumptions in its viability. These are reflected in the resulting values of financial indicators as adjustments are inputted in the calculations. Among common changes used in sensitivity analysis are as follows: decrease in future

prices of products, increase in real costs of inputs, decrease in yield of products due to some calamities or faulty projections, and other negative changes that would put the project's viability into doubt. Conducting sensitivity analysis is a way of knowing if the project would still be viable if such uncertainties do occur in the future.

3.2 Market subsector analysis

A subsector is the network of firms or actors that supply raw materials transform them and distribute goods to a particular consumer market, including the conditions on which these actors operate. Subsector analysis offers a framework for rapid evaluation of subsector dynamics where the community can determine up to what stage of production system they have to go. Or at what stage of production spectrum they still have the comparative advantage or competitive edge. This also entails examination of inter-industry relationships.

3.3 Selection of the enterprise/s - Potential profitable enterprise/s or projects are chosen by the community.

3.4 Determination of type and size of operations - Considering the selected livelihood project or business enterprise, it is important to study the nature of business organization applicable to community conditions. Among them are as follows:

Type of business - Some businesses are better managed by individuals or individual households. These businesses are called individual or single proprietorships and are usually small-scale in operation. They are run by a single owner who also acts as general manager of the business. Most of the business decisions emanate from him.

Other businesses may need cooperation among partners. These businesses involve co-ownership by two or few partners who bring into the business their capital or management expertise or both. Some big businesses are created by several individuals or entities who own stocks or a percentage of the whole business. These are called corporations. Ownership is determined by shareholdings that are transferable to the public. A corporation may be managed differently from its owners.

A type of business maybe owned by a group of individuals through a cooperative who are bound by a common goal and whose memberships are voluntary. Management of their affairs is entrusted on the Board of Directors elected by the General Assembly or Membership. Management of the business is undertaken by a unit in the cooperative managed by a full-time or part-time staff or in some cases done by the officers of the co-op themselves.

Levels of Capitalization - Different livelihood projects or enterprises may profitably operate using different levels of capitalization. Some can operate better using small capitals spread over a few years. These individual enterprises can be run by 1 to 10 individuals. These are called *micro-enterprises*. Others may require medium capitalization and needs at least 10 to 100 employees to operate. These are called *small to medium enterprises (SMEs)*. Work differentiation begins to be useful in these types of enterprise. *Large enterprises* require large capitalization. Work patterns of employees in these types of business establishments are highly differentiated.

5. Business Planning

For purposes of this paper, business planning starts when the profitability of the business is already ascertained in the feasibility study. Thus, the assumption is that the enterprise is already identified and determined to be feasible. The assumptions made in the business plan are just actualization of premises made in the feasibility study. As such, we treat the business plan as the blueprint of the operational aspects of the enterprise. This involves planning of detailed activities of the business. Among the activities involved in business planning are as follows:

a. Budget sourcing and mobilization plan– This activity involves securing of funds and allocating budget for business operations. Funds may come internally from the community members or obtained from outside sources. In case of the latter, effective and aggressive fund leveraging techniques are necessary. As long as the funds budgeted for the enterprise is assured, the community can implement the business plan according to schedule.

b. Organizing and manning schedules - Involves planning the creation of an organization best suited to the enterprise. Plans to hire manpower and management team to man the business operations are finalized. This also involves capacitation and training of the enterprise team and providing adequate opportunities for personnel growth and development.

c. Infrastructure and enterprise facilities planning – This involves planning and setting up of physical structures needed in the enterprise and procurement of facilities and raw materials.

d. Market planning - involves organization of marketing team, laying out of distribution channels and linkages to market, purchase plan for vehicles and distribution facilities and other post-marketing activities.

e. Creation of administrative support systems - It is important to pre-conceive a realistic and proactive administrative support system to harmonize actual business operations. Among the things to consider in this concern are the office policies, procedures and protocols, accounting systems, information management systems,

auditing procedures, and overall financial management system. Some peripheral plans are also needed such as developing procedures for technology upgrade, contingency plan for market uncertainties, profit enhancing strategies like production expansion and diversification, raw material base development, product development and research and many other small but important concerns some of which may be discovered only during actual operations.

6. Implementation of the business plan

A realistic plan can be implemented according to schedule. If everything is alright, the business can proceed as planned.

7. Monitoring and evaluation

A conscious effort to regularly monitor and evaluate actual operations is a must for all businesses. Through this activity, much can be learned and mistakes can be properly and timely addressed. Every member of the business organization from the top management to the lowest of laborers is a rich source of information for operations evaluation. Improved operations strategies are timely formulated through effective feedback mechanisms. Through this, business losses can be prevented and profitability can be tremendously enhanced. Operating a business is a continuous learning process and business owners must be aware that right information would always lead to improved business operations.

SAMPLE OF LIVELIHOOD PROJECTS[1]

1. AGRICULTURAL/CASH CROPS PRODUCTION

Current activities in flat and gently sloping areas are cash crops and agricultural production. These agricultural crops include the following;

- tomatoes, ampalaya, sitao, okra, eggplant, etc.
- root crops such as ube, sweet potatoes, etc.

Aside from using them for food for daily subsistence, these are good sources of cash income for upland families.

Strategies

- Improve production yield of these activities to maximize use of effort and costs.
- Use of good seeds to increase production.
- Promote organically grown vegetables for health reasons and a come-on for marketing.
- Assistance should be provided by appropriate government agencies to achieve production efficiency, (DA, DAR, etc.) Agricultural technicians could help improve production strategies.

2. PINEAPPLE PRODUCTION

Pineapple is one of the cash crops that are grown in many parts of Zambales and Bataan. Most of the uplands in Subic, specifically resettlement areas, and many parts in Bataan produce this cash crop.

This could be grown in relatively hilly and gently sloping areas.

This crop provides much needed income for upland families.

[1] other livelihood projects could be conceptualized depending on the type of available raw materials in the upland areas.

Strategies

1. Improve production technologies to increase yield.

2. Identify other growers in the area, determine volume of production, and supply gaps in the local market.

3. Organize communities engaged in pineapple production to access support from government in terms of credit, production technology, and marketing from local traders/wholesaler.

3. FOOD/FRUIT PROCESSING

The strength of the uplands and hilly portions of Zambales and Bataan areas are its abundance in fruit trees that are being planted continuously by residents in many areas. Fruit trees such as mango, cashew, jackfruit, star apples, avocado and others are now in various stages of growth and many of them are already fruit-bearing. There is an abundance of supply during harvest season, driving market prices to dip, affecting net income of growers.

One of the strategies to balance this situation is to process these fruits to add value to their raw form. Mangoes, jackfruit, pineapples could be processed into juices, jams or jelly. They could also be processed into candies.

Cashew kernels could also be processed and its main fruit could also be made into candies. On the other hand, its juice could be processed into wine or vinegar.

Strategies

- Establish plan on how to encourage women to get involved in this undertaking from the planning to the implementation stage of the project.

- Identify areas where fruits abound during harvest season including the type of fruits that are harvested.

- Develop information on the volume of harvest from each of these areas and determine the volume of fruits that would be feasible to process.

- Access food processing technologies from agencies and technology centers.

- Develop mechanism on how to individually undertake processing activities but collectively market finished products.

- Design attractive packaging of finished products, i.e., mango jam, mango jelly, mango dried fruits, candies, etc.

4. SEEDLING NURSERY

An increased interest of residents in planting fruit trees due to their economic potential as well as the profitability of cash crops production make this livelihood activity viable.

The seedling nursery may sprout these: (a) fruit trees seedlings (b) forest trees and (c) production of vegetable seeds. Demand for the seedlings of fruit trees such as mango, jack fruit, citrus fruits, cashew coffee and other fruit trees are high. There is also the demand for forest seedlings such as mahogany, narra, and other reforestation trees. Good seeds for cash crops production is also in demand either for home consumption or for cash income.

Strategies

- Identify community groups that may be interested in this undertaking.

- Plan with the group the necessary steps in establishing this project, from the conduct of a feasibility study to actual implementation plan.

- Identify areas in available sites or communities that may be ideal for seedling production.

- Provision of appropriate technology. For instance, nursery management should be taught to prospective groups.

- Link with possible market outlets and establish distribution network with agencies (DENR, DA, DAR, etc.) and other interested individuals/groups who will be interested to buy either on retail or wholesale basis.

5. BEE CULTURE/HONEY PRODUCTION

Aetas and other upland residents reach distant places in the forests to collect honey either for home consumption or cash income. This project will improve environmental conditions through the establishment of vegetation such as trees, shrubs or flowers that will become hosts for bees. This will be a good project for out-of-school youths or women in relatively hilly or upland portion.

Strategies

- Identify groups that will be interested in this undertaking. Information meetings will be conducted to discuss benefits, costs, as well as advantages.

- Provide technology and skills for participants to prepare them on how to manage the project. Assistance should include the selection of the specie of honeybee that should not destroy or in anyway harm existing native species.

- Production could be done by individual households; marketing however could be done collectively.

6. LIVESTOCK PRODUCTION/POULTRY RAISING

Livestock production is an important economic activity that can be used for home consumption or income generation. There is a range of sub-projects that could be developed:

Carabao Raising

Carabaos provide variety of uses in upland communities. As a work animal, it is used for plowing rice fields, tilling lands or for hauling forest/agricultural products. For instance, carabaos are used for hauling buho from forest site to roadside, etc. Carabaos are rented at P250/day for hauling activities.

Cattle Raising/Fattening

Cattle is usually raised for meat and dairy purposes. There is the abundance of resources and land where feed materials like napier grass could be grown in relatively sloping or gently rolling areas.

Goat Raising

Demand for goat's meat is increasing. Proper care however should be made in ensuring that pasture area should be enclosed or properly protected as goats are known to be destructive to cash crops and other vegetation.

Quail Raising

Quail eggs are used for the preparation of certain menu in restaurants and eateries. Quails reproduce rapidly and are easy to manage. They may be used for home consumption or for income generation.

Native Chicken Productiion

Demand for native chicken meat has been increasing due to growing consciousness of people on the advantages of organically grown chicken. It commands higher price compared to the 45-day chicken. Women and youth could be engaged in this economic activity either for home consumption or for income generating.

Strategies

- Promote the concept of self-sufficiency and self-reliance in homes and communities. These projects could be significant in ensuring that households meet their requirements for food or cash income. The goal is for communities to produce and generate income so that they would be able to access opportunities for education, health, housing and other social needs.

- Provide technology that will enhance production of identified livestock/poultry projects.

- While production could be done by individual households, marketing could be undertaken collectively. Develop a marketing mechanism that will ensure sustainable outlets and network; i.e. super markets, public markets, hotels and restaurants, etc.

- Capability enhancement should be provided groups that will be interested in the project. Project management and entrepreneurship as well as financial management should be included in the training programs to be conducted.

- Conduct project feasibility of all the identified projects.

7. BAMBOO PRODUCTION/PROCESSING

Bamboo could be both a reforestation or an income generating activity in hilly and denuded upland portions. It has many uses such as materials for housing, furnitures and fixtures, etc. It is naturally growing in most of the uplands in Zambales and Bataan. It cold be grown both for home and commercial purposes. Compared to the forest trees, bamboo matures faster and are ready for harvest within 5-7 years. Once it is planted, it multiplies by itself. Proper maintenance is needed to benefit most from it.

Currently, they are processed into wood panels, furnitures and fixtures, floor parquet, ceilings, ballusters, etc.

Strategies

- Promote bamboo as a reforestation material in appropriate places such as in hilly areas, ridges, creeks and denuded hilly areas.

- Conduct awareness campaign of the uses, benefits and advantages of producing bamboo and its economic use.

- Link with current industries or groups that are into processing bamboo and where technology could be replicated or used.

- Provide incentives to individuals or groups who are interested in growing bamboo on a commercial scale.

- Establish mechanism whereby bamboo will be marketed either as semi-processed or complete finished product with value added.

8. BANANA PRODUCTION

Wild bananas (amukao) grow in hilly and upland areas in Subic and Bataan. Their blossoms are harvested and transported to local markets and Metro Manila.

Similarly, 'latondan' and 'saba' varieties are also planted by many residents. Bananas once planted continue to propagate with minimum maintenance and weeding activities on their surroundings.

The latondan variety commands a good price in the local market and the 'saba variety' could be processed into chips and used for baking cakes and others.

Either for home consumption or income generating purposes, the banana is an important resource for residents.

Strategies

- Improve maintenance and care of wild banana (amukao) to increase production.

- Promote bananas as both a homelot/backyard resource.

- Improve marketing strategies/outlets for bananas to increase farm gate prices.

- Promote processing of bananas (saba variety) to finish products, i.e. banana chips to command better prices.

9. TIGER GRASS PRODUCTION

Tiger grass is naturally growing in many parts of Subic and Bataan. Once they are planted, they continue to grow with proper maintenance and care. It is usually processed into brooms (walis tambo) and sold to local markets including Pampanga and Metro Manila. Tiger grass is also processed by some residents as christmas décor and novelty items and are currently exported.

Tiger grass production has big potential as a source for cash income for households.

Strategies

- Promote the production of tiger grass in suitable places such as areas which are gently rolling and hilly areas.
- Ensure proper maintenance and care including appropriate production technology which should be taught to residents.
- Develop other uses and design of novelty items that are currently produced for local and export market.
- Establish appropriate market linkages and expand outlets such as the export market.

10. FOREST PRODUCTS/BUHO PROCESSING

Forest products such as rattan and bayto are currently processed into baskets, furniture and other handicraft items by Aetas and other households. Bayto is used as handle for brooms (walis tamboo) and accessory of other products.

On the other hand, buho is currently used as housing materials as well as processed into lamps (sulo) and other novelty items for export. Although current uses are valuable, it is worthwhile to design other uses or finished products.

Strategies

- Organize current producers of rattan and buho products into associations/cooperatives to address their needs.
- Identify other product lines, improve product design to increase value added to finish products being sold in the market.
- Link with government/business industries i.e. DTI, Design Center Philippines, FRDI, etc. to improve design of current products.
- Improve/Expand market outlets and distribution centers to increase sales volume.

COASTAL PROJECTS

1. COMMUNITY-BASED RESORT PROJECT

This is a good source of revenue for LGUs and their residents.

Community resort could be established by residents and LGUs/barangay council. Simple structures such as those which provide shade and eating places for visitors and swimmers are promoted. This is to highlight the appreciation of natural beauty of the surroundings and the beaches. Construction of permanent and concrete facilities at beach fronts is discouraged.

Strategies

- Residents together with LGUs develop an appropriate plan to develop a coastal area considering environmental concerns and issues.
- Promote the use of simple structures and indigenous materials (buho, bamboo, cogon) for the construction of shades and eating places.
- Residents could also bring their goods and produce at the site to earn some cash income.
- Promote these areas as IEC areas where volunteer residents could be involved in the process of information dissemination activities.

2. DEEP-SEA FISHING PROJECT

Deep sea fishing is an alternative to municipal fishing which is now unprofitable due to depleted fishery resources. Though deep sea fishing investment is costlier, return on investment is high.

Strategies

- Organize municipal fishermen into associations or cooperatives to be able to confront current issues and needs as well as to develop other sources of livelihood activities.
- Study experiences of local deep sea fishermen in terms of production, income and issues that might be relevant to potential deep sea fishing ventures.
- Improve access to credit among fishermen to improve fish production, activities, i.e. purchase of boat, motor/engine, fuel, food requirement, etc.
- Strengthen assistance from LGUs, BFAR and other concerned agencies to municipal fishermen in terms of credit, production and marketing.

3. ECO-TOURISM/BOAT RIDES

LGUs and communities could also initiate eco-tourism activities in scenic spots along Subic Bay and Redondo area. Boat rides could be promoted as an alternative by catering to both local and foreign tourists. Local fishermen could be involved in this undertaking and could also be used as tour guides.

Strategies

- Establish an eco-tourism plan, which should entail the participation of both LGU and coastal communities.
- Establish linkages with local tourism office/SBMA for potential tourists arrivals including other requirements.

- Provision of orientation and capability-building skills for would be tourist guides including promotional strategies.

- Partnership between LGUs and communities should be forged including the definition of roles and responsibilities as well as incentives and remuneration of involved parties.

SELECTED PREFEASIBILITY STUDIES

Prefeasibilty studies were conducted in the establishment of agroforest farms and buho plantations. A financial analysis was conducted to determine the financial viability of proposed economic components, using common financial feasibility indicators among which are: the Net Present Value (NPV), Benefit Cost Ratio (BCR) and Internal Rate of Return (IRR).

1. Feasibility of Agroforestry and Buho Plantations

Plantation establishment costs are certainly high, especially in the first three years. The direct costs, including project management costs, which constitute at least 15% of the direct costs, are as follows:

a. P18,772 per hectare of mango plantations (Table 1)

b. P 15,480 per hectare of jackfruit and cashew (Table 2)

c. P28,068 per hectare for buho plantation (Table 3)

Initial analysis of financial feasibility of agroforestry plantation establishment in grasslands showed some promising indicators. At an average planning period of 25 years, jackfruit posted an 80.6 % internal rate of return (IRR) with a net present value (NPV 12%) Php 618,141 (Table 5). Mango posted an internal rate of return equivalent to 40.6 %. The mango NPV at 12% interest rate is Php 202,628 per hectare while cashew posted a 54.2 % IRR and Php 195,172 NPV at 12 % interest rate. On the other hand, buho plantation obtained an IRR of 25.3 % while the NPV at 12% i was Php 37,816..

2. Sensitivity analysis - Based on the sensitivity analysis conducted, it was found that the profitability of the four major plantation species considered in this study is not adversely affected by small negative changes in plantation costs and benefits. Given a 10 % increase in plantation establishment costs without increase in corresponding benefits, the feasibility indicators posted minimum decrease in values. For example, from a 80.6 % IRR for jackfruit at base case, the resulting IRR for 10 % increase in cost is 77.8 % (Table 6). A 10 % decrease in revenue without change in cost would give an IRR of 77.5 % for the same species (Table 7). Considering a combination of both changes occurring, the resulting IRR for jackfruit plantation, is 74.8 % (Table 8).

Table 1 Cost Standard for Agroforestry (Mango, 10 x 10 m)

COMPONENT/ACTIVITY	UNIT OF MEASURE	GOAL/ HA	MATERIAL COSTS			LABOR COSTS			TOTAL COSTS / HA(P)	COST PER SDLG(P)
			INPUTS Required	UNIT COST	COST/ ha (P)	Mandays Required	Cost/ Manday	COST/ Ha (P)		
A. OPERATIONAL COST		100					200.0			
1. NURSERY OPERATIONS										
Procurement of Grafted Mango Seedlings		100	seedlings	80.0	8,000.0				8,000.0	80.00
Maintenance of seedlings *	sdlg	100				0.3	200.0	66.7	66.7	0.67
Fertilizer application (10 gm/p. bag)	Kg	1.00	fert.	8.5	8.5	0.3	200.0	50.0	58.5	0.59
Tools					-			-	-	-
S U B T O T A L					**8.5**	**0.6**	**200.0**	**116.7**	**8,125.2**	**81.25**
PERCENTAGE					**0.1**			**1.4**		
2. PLANTATION ESTABLISHMENT										
Spot brushing for mango (1 m radius, 50/md)	spots	100				2.0	200.0	400.0	400.0	
Staking (500 spots/md)	stake	100				0.2	200.0	40.0	40.0	0.40
Hole Digging for Mango (50 spots/md)	spots	100				2.0	200.0	400.0	400.0	4.00
Seedling transport/hauling (50sdlg/md)	sdlg.	100				2.0	200.0	400.0	400.0	4.00
Planting (50 sdlg/md)	sdlg.	100				2.0	200.0	400.0	400.0	4.00
Tools & materials					200.0				200.0	2.00
S U B T O T A L					**200.0**	**6.2**	**200.0**	**1,240.0**	**1,440.0**	**14.40**
PERCENTAGE					**13.9**			**86.1**		
3. PLANTATION MAINTENANCE & PROTECTION (3 yrs)										
Ringweeding/spot cultivation (1 m radius)	spots									
Year 1 (2 passes, 80 spots/md)	spots	100				2.5	200.0	500.0	500.0	5.00
Year 2 (4 passes, 100 spots/md)	spots	100				4.0	200.0	800.0	800.0	8.00
Year 3 (4 passes, 100spots/md)	spots	100				4.0	200.0	800.0	800.0	8.00
Replanting, 20% (including sdlg transport)	spots	20	sdlgs	81.3	1,625.0	1.2	200.0	248.0	1,873.0	93.65
Fertilizer Application										
Year 2 (2 passes, 120g)	spots	100	fertilizer	8.5	204.0	0.3	200.0	50.0	254.0	2.54
Year 3 (2 passes, 120g)	spots	100	fertilizer	8.5	204.0	0.3	200.0	50.0	254.0	2.54
Patrol work	ha	1				1.3	200.0	266.0	266.0	2.66
Tools					15.0				15.0	0.15
S U B T O T A L					**2,048.0**	**13.6**	**200.0**	**2,714.0**	**4,762.0**	**47.62**
PERCENTAGE					**43.0**			**57.0**		
4. INFRASTRUCTURE										
Nursery facilities (1 nursery/400 ha)**					250.0	1.0	200.0	200.0	450.0	4.50
Graded trail (1m-wide, 50m/ha)	meter	50								

COMPONENT/ACTIVITY	UNIT OF MEASURE	GOAL/ HA	MATERIAL COSTS			LABOR COSTS			TOTAL COSTS / HA(P)	COST PER SDLG(P)
			INPUTS Required	UNIT COST	COST/ ha (P)	Mandays Required	Cost/ Manday	COST/ Ha (P)		
						0.3	200.0	66.7	66.7	0.67
Footpath (1m-wide, 50m/ha)	meter	50				0.3	200.0	66.7	66.7	0.67
Fireline const'n (10 m width, 120m/md)	sq.m.	500				4.2	200.0	833.3	833.3	8.33
Fireline maintenance (200 sq m/md)	sq.m.	500				2.5	200.0	500.0	500.0	5.00
Bunkhouse (1 unit/200 ha)					350.0	0.6	200.0	110.0	460.0	4.60
Lookout tower (1unit/200ha)					50.0	0.1	200.0	20.0	70.0	0.70
S U B T O T A L					**400.0**	**7.3**	**200.0**	**1,596.7**	**1,996.7**	**19.97**
PERCENTAGE					**20.0**			**80.0**		
TOTAL OPERATIONAL COST					**2,656.5**	**27.7**	**200.0**	**5,667.3**	**16,323.9**	**163.24**
PERCENTAGE					**16.3**			**34.7**		
B. PROJECT MANAGEMENT COST (PMC)(15% of TOC)										
a. First Year (40% of PMC)									979.4	9.79
b. Second Year (30% of PMC)									734.6	7.35
c. Third Year (30% of PMC)									734.6	7.35
SUB TOTAL									**2,448.6**	**24.49**
GRAND TOTAL									**18,772.4**	**187.72**

Notes:

* - Maintenance includes cultivation, weeding, fertilization, hardening, grading under project supervision, and other activities in the nursery.

** - Estimated nursery establishment cost is P100,000.0

- Spacing for mango is 10 x 10 m

Table 2 Cost Standard for Agroforestry (Pure fruit trees, e.g. jackfruit, and cashew, 6 x 6 m spacing)

COMPONENT/ACTIVITY	UNIT OF MEASURE	GOAL/ HA	MATERIAL COSTS			LABOR COSTS			TOTAL COSTS / HA(P)	COST PER SDLG(P)
			INPUTS Required	UNIT COST	COST/ ha (P)	Mandays Required	Cost/ Manday	COST/ ha (P)		
A. OPERATIONAL COST		278					200.00			
1. NURSERY OPERATIONS										
Procurement/handling of certified seeds	seed	333	seeds	0.50	166.67	0.50	200.00	100.00	266.67	0.96
Nursery bed preparation	sq.m.	8				1.00	200.00	200.00	200.00	0.72
Sowing of seed	seeds	333				0.14	200.00	27.27	27.27	0.10
Gathering & preparation of soil	cu.m.	0.52				0.52	200.00	104.88	104.88	0.38
Potting of seedlings	pots	333	p. bags	0.15	50.00	1.34	200.00	268.82	318.82	1.15
Prepn of potbeds & pot arrangements	pots	333				0.04	200.00	8.83	8.83	0.03
Maintenance of seedlings	sdlg	333				2.40	200.00	480.03	480.03	1.73
Fertilizer application (5 gm/p. bag)	kg	1.67	fert.	8.50	14.17	0.25	200.00	50.00	64.17	0.23
Tools					25.00			-	25.00	0.09
SUB TOTAL					**255.83**	**6.20**	**200.00**	**1,239.82**	**1,495.66**	**5.38**
PERCENTAGE					**17.11**			**82.89**		
2. PLANTATION ESTABLISHMENT										
Brushing (strip 2m-wide, 300 sq m/md)	sq.m.	556				1.85	200.00	370.37	370.37	1.33
Staking (500 spots/md)	stake	278				0.56	200.00	111.11	111.11	0.40
Hole Digging (150 spots/md)	hole	278				1.85	200.00	370.37	370.37	1.33
Seedling transport/hauling (240sdlg/md)	sdlg.	306				1.27	200.00	254.63	254.63	0.92
Planting (150 sdlg/md)	sdlg.	278				1.85	200.00	370.37	370.37	1.33
Tools & materials					200.00				200.00	0.72
SUB TOTAL					**200.00**	**7.38**	**200.00**	**1,476.85**	**1,676.85**	**6.04**
PERCENTAGE					**11.93**			**88.07**		
3. PLANTATION MAINTENANCE & PROTECTION (3 yrs)										
Ringweeding/spot cultivation (1 m radius)	spots									
Year 1 (3 passes, 80 spots/md)	spots	278				10.42	200.00	2,083.33	2,083.33	7.50
Year 2 (4 passes, 100 spots/md)	spots	278				11.11	200.00	2,222.22	2,222.22	8.00
Year 3 (4 passes, 120 spots/md)	spots	278				9.26	200.00	1,851.85	1,851.85	6.67
Replanting, 20% (including sdlg transport)	spots	56	sdlgs	6.04	335.37	1.48	200.00	295.37	630.74	11.35
Fertilizer Application										

Year 1 (2 passes, 100 g/spot)	spots	278	fertilizer	8.50	472.22	0.69	200.00	138.89	611.11	2.20
Year 2 (2 passes, 100 g/spot)	spots	278	fertilizer	8.50	472.22	0.69	200.00	138.89	611.11	2.20
Patrol work	ha	1				1.33	200.00	266.00	266.00	0.96
Tools					15.00				15.00	0.05
S U B T O T A L					**1,294.81**	**34.98**	**200.00**	**6,996.56**	**8,291.37**	**29.85**
PERCENTAGE					**15.62**			**84.38**		
4. INFRASTRUCTURE										
Nursery facilities (1 nursery/400 ha)**					250.00	1.00	200.00	200.00	450.00	1.62
Graded trail (1m-wide, 50m/ha)	meter	50				0.33	200.00	66.67	66.67	0.24
Footpath (1m-wide, 50m/ha)	meter	50				0.33	200.00	66.67	66.67	0.24
Fireline const'n (10 m width, 120m/md)	sq.m.	500				4.17	200.00	833.33	833.33	3.00
Fireline maintenance (200 sq m/md)	sq.m.	500				2.50	200.00	500.00	500.00	1.80
Bunkhouse (1 unit/200 ha)					350.00	0.55	200.00	110.00	460.00	1.66
Lookout tower (1unit/200ha)					50.00	0.10	200.00	20.00	70.00	0.25
S U B T O T A L					**400.00**	**7.33**	**200.00**	**1,596.67**	**1,996.67**	**7.19**
PERCENTAGE					**20.03**			**79.97**		
TOTAL OPERATIONAL COST					**2,150.65**	**55.90**	**200.00**	**11,309.90**	**13,460.55**	**48.46**
PERCENTAGE					**15.98**			**84.02**		
B. PROJECT MANAGEMENT COST (PMC)(15% of TOC)										
a. First Year (40% of PMC)									807.63	2.91
b. Second Year (30% of PMC)									605.72	2.18
c. Third Year (30% of PMC)									605.72	2.18
SUB TOTAL									**2,019.08**	**7.27**
GRAND TOTAL									**15,479.63**	**55.73**

Notes
:

** - Estimated nursery establishment cost is P100,000.0

Table 3 Cost Standard for Buho (5 x 5 m spacing)

COMPONENT/ACTIVITY	UNIT OF MEASURE	GOAL/ HA	MATERIAL COSTS			LABOR COSTS			TOTAL COSTS / HA(P)	COST PER SDLG(P)
			INPUTS Required	UNIT COST	COST/ ha (P)	Mandays Required	Cost/ Manday	COST/ ha (P)		
A. OPERATIONAL COST		400					200.00			
1. NURSERY OPERATIONS										
Gathering of Suckers (50/md)	cuttings	480	culms	2.50	1,200.00	9.60	200.00	1,920.00	3,120.00	7.80
Gathering & preparation of soil	cu.m.	2.44				4.88	200.00	976.00	976.00	2.44
Potting of soil (200/md)	pots	480	p. bags	0.15	72.00	2.40	200.00	480.00	552.00	1.38
Potting of suckers (150/md)	pots	480				3.20	200.00	640.00	640.00	1.60
Maintenance of planting materials	sdlg	480				3.46	200.00	691.24	691.24	1.73
Fertilizer application (10 gm/p. bag)	kg	4.80	fert.	8.50	40.80	0.25	200.00	50.00	90.80	0.23
Tools					25.00			-	25.00	0.06
S U B T O T A L					**1,337.80**	**23.79**	**200.00**	**3,567.93**	**6,095.04**	**15.24**
PERCENTAGE					**21.95**			**58.54**		
2. PLANTATION ESTABLISHMENT										
Brushing (strip 2m-wide, 300 sq m/md)	sq.m.	800				2.67	200.00	533.33	533.33	1.33
Staking (400 spots/md)	stake	400				1.00	200.00	200.00	200.00	0.50
Hole Digging (100 spots/md)	hole	400				4.00	200.00	800.00	800.00	2.00
Cuttings transport/hauling (30 cttg/md)	cuttings	440				14.67	200.00	2,933.33	2,933.33	7.33
Planting (60 sdlg/md)	sdlg.	400				6.67	200.00	1,333.33	1,333.33	3.33
Tools & materials					200.00				200.00	0.50
S U B T O T A L					**200.00**	**29.00**	**200.00**	**5,800.00**	**6,000.00**	**15.00**
PERCENTAGE					**3.33**			**96.67**		
3. PLANTATION MAINTENANCE & PROTECTION (3 yrs)										
Ringweeding/spot cultivation (1 m radius)	spots									
Year 1 (3 passes, 100 spots/md)	spots	400				12.00	200.00	2,400.00	2,400.00	6.00
Year 2 (4 passes, 100 spots/md)	spots	400				16.00	200.00	3,200.00	3,200.00	8.00
Year 3 (4 passes, 100 spots/md)	spots	400				16.00	200.00	3,200.00	3,200.00	8.00
Replanting (including sdlg transport)	spots	40				2.13	200.00	426.67	426.67	10.67
Fertilizer Application										
Year 1 (1 pass), 60 gm/spot	spots	400	24.00	8.50	204.00	1.00	200.00	200.00	404.00	1.01
Year 2 (1 pass) 60 gm/spot	spots	400	24.00	8.50	204.00	1.00	200.00	200.00	404.00	1.01
Patrol work	ha	1				1.33	200.00	266.00	266.00	0.67
Tools					15.00				15.00	0.04
S U B T O T A L					**423.00**	**49.46**	**200.00**	**9,892.67**	**10,315.67**	**25.79**
PERCENTAGE					**4.10**			**95.90**		
4. INFRASTRUCTURE										
Nursery facilities (1 nursery/200 ha)**					500.00	1.00	200.00	200.00	700.00	1.75

Graded trail (1m-wide, 50m/ha)	meter	50				0.33	200.00	66.67	66.67	0.17
Footpath (1m-wide, 50m/ha)	meter	50				0.33	200.00	66.67	66.67	0.17
Fireline const'n (10 m width, 120m/md)	sq.m.	500				4.17	200.00	833.33	833.33	2.08
Fireline maintenance (200 sq m/md)	sq.m.	500				2.50	200.00	500.00	500.00	1.25
Bunkhouse (1 unit/200 ha)					350.00	0.55	200.00	110.00	460.00	1.15
Lookout tower (1unit/200ha)					50.00	0.10	200.00	20.00	70.00	0.18
S U B T O T A L					**400.00**	**7.33**	**200.00**	**1,596.67**	**1,996.67**	**4.99**
PERCENTAGE					**20.03**			**79.97**		
TOTAL OPERATIONAL COST					**2,360.80**	**109.58**	**200.00**	**20,857.27**	**24,407.38**	**61.02**
PERCENTAGE					**9.67**			**85.45**		
B. PROJECT MANAGEMENT COST (PMC)(15% of TOC)										
a. First Year (40% of PMC)									1,464.44	3.66
b. Second Year (30% of PMC)									1,098.33	2.75
c. Third Year (30% of PMC)									1,098.33	2.75
SUB TOTAL									**3,661.11**	**9.15**
GRAND TOTAL									**28,068.48**	**70.17**

Notes:

* - Maintenance includes cultivation, weeding, fertilization, hardening, grading and other activities in the nursery.

** - Estimated nursery establishment cost is P100,000.0

Table 4 Yield of Fruit Trees and Buho

Year	Mango 10 x 10 (kg/tree)	Jackfruit 6 x 6 (kg/tree)	Cashew 6 x 6 (beans-kg/tree)	Buho 5 x 5 (pole/ha)
1	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0
4	0.0	0.0	1.0	2000.0
5	0.0	5.0	3.0	4000.0
6	5.0	20.0	7.0	6000.0
7	10.0	40.0	10.0	6000.0
8	20.0	60.0	12.0	6000.0
9	40.0	70.0	14.0	6000.0
10	60.0	70.0	16.0	6000.0
11	80.0	70.0	18.0	6000.0
12	80.0	70.0	20.0	6000.0
13	80.0	70.0	20.0	6000.0
14	80.0	70.0	20.0	6000.0
15	80.0	70.0	20.0	6000.0
16	80.0	70.0	20.0	6000.0
17	80.0	70.0	20.0	6000.0
18	80.0	70.0	20.0	6000.0
19	80.0	70.0	20.0	6000.0
20	80.0	70.0	20.0	6000.0
21	80.0	70.0	20.0	6000.0
22	80.0	70.0	20.0	6000.0
23	80.0	70.0	20.0	6000.0
24	80.0	70.0	20.0	6000.0
25	80.0	70.0	20.0	6000.0
Stumpage Price	10.0	9.0	18.0	2.5

Table 5 Financial Analysis of Selected Crops

Agroforestry: Jack fruit			
			Net
Year	Cost	Revenue	Incremental Benefits
1	8,671	-	(8,671)
2	4,158	-	(4,158)
3	2,650	-	(2,650)
4	2,000	-	(2,000)
5	2,000	12,510	10,510
6	2,000	50,040	48,040
7	2,000	100,080	98,080
8	2,000	150,120	148,120
9	2,000	175,140	173,140
10	2,000	175,140	173,140
11	2,000	175,140	173,140
12	2,000	175,140	173,140
13	2,000	175,140	173,140
14	2,000	175,140	173,140
15	2,000	175,140	173,140
16	2,000	175,140	173,140
17	2,000	175,140	173,140

Agroforestry: Mango			
			Net
Year	Cost	Revenue	Incremental Benefits
1	15,003	-	(15,003)
2	1,892	-	(1,892)
3	1,877	-	(1,877)
4	1,000	-	(1,000)
5	1,000	-	(1,000)
6	1,000	5,000	4,000
7	1,000	10,000	9,000
8	1,000	20,000	19,000
9	1,000	40,000	39,000
10	1,000	60,000	59,000
11	1,000	80,000	79,000
12	1,000	80,000	79,000
13	1,000	80,000	79,000
14	1,000	80,000	79,000
15	1,000	80,000	79,000
16	1,000	80,000	79,000
17	1,000	80,000	79,000

Agroforestry: Cashew			
			Net
Year	Cost	Revenue	Incremental Benefits
1	8,671	-	(8,671)
2	4,158	-	(4,158)
3	2,650	-	(2,650)
4	2,000	3,186	1,186
5	2,000	9,558	7,558
6	2,000	22,302	20,302
7	2,000	31,860	29,860
8	2,000	38,232	36,232
9	2,000	44,604	42,604
10	2,000	50,976	48,976
11	2,000	57,348	55,348
12	2,000	63,720	61,720
13	2,000	63,720	61,720
14	2,000	63,720	61,720
15	2,000	63,720	61,720
16	2,000	63,720	61,720
17	2,000	63,720	61,720

Bamboo/Buho			
			Net
Year	Cost	Revenue	Incremental Benefits
1	18,449	-	(18,449)
2	4,791	-	(4,791)
3	4,829	-	(4,829)
4	2,000	5,000	3,000
5	2,000	10,000	8,000
6	2,000	15,000	13,000
7	2,000	15,000	13,000
8	2,000	15,000	13,000
9	2,000	15,000	13,000
10	2,000	15,000	13,000
11	2,000	15,000	13,000
12	2,000	15,000	13,000
13	2,000	15,000	13,000
14	2,000	15,000	13,000
15	2,000	15,000	13,000
16	2,000	15,000	13,000
17	2,000	15,000	13,000

Agroforestry: Jack fruit			
18	2,000	175,140	173,140
19	2,000	175,140	173,140
20	2,000	175,140	173,140
21	2,000	175,140	173,140
22	2,000	175,140	173,140
23	2,000	175,140	173,140
24	2,000	175,140	173,140
25	2,000	175,140	173,140
IRR =			80.6%
NPV 10% =			786,305.8
NPV 12% =			618,141.3
NPV 14% =			491,493.0

Agroforestry: Mango			
18	1,000	80,000	79,000
19	1,000	80,000	79,000
20	1,000	80,000	79,000
21	1,000	80,000	79,000
22	1,000	80,000	79,000
23	1,000	80,000	79,000
24	1,000	80,000	79,000
25	1,000	80,000	79,000
IRR =			40.6%
NPV 10% =			268,775.0
NPV 12% =			202,628.9
NPV 14% =			153,880.5

Agroforestry: Cashew			
18	2,000	63,720	61,720
19	2,000	63,720	61,720
20	2,000	63,720	61,720
21	2,000	63,720	61,720
22	2,000	63,720	61,720
23	2,000	63,720	61,720
24	2,000	63,720	61,720
25	2,000	63,720	61,720
IRR =			54.2%
NPV 10% =			251,587.2
NPV 12% =			195,172.5
NPV 14% =			152,979.5

Bamboo/Buho			
18	2,000	15,000	13,000
19	2,000	15,000	13,000
20	2,000	15,000	13,000
21	2,000	15,000	13,000
22	2,000	15,000	13,000
23	2,000	15,000	13,000
24	2,000	15,000	13,000
25	2,000	15,000	13,000
IRR =			25.3%
NPV 10% =			51,378.7
NPV 12% =			37,816.2
NPV 14% =			27,520.3

Table 6 Sensitivity Analysis – 10% Increase in Cost

Agroforestry: Jack fruit			
			Net
Year	Cost	Revenue	Incremental
			Benefits
1	9,538	-	(9,538)
2	4,574	-	(4,574)
3	2,915	-	(2,915)
4	2,200	-	(2,200)
5	2,200	12,510	10,310
6	2,200	50,040	47,840
7	2,200	100,080	97,880
8	2,200	150,120	147,920
9	2,200	175,140	172,940
10	2,200	175,140	172,940
11	2,200	175,140	172,940
12	2,200	175,140	172,940
13	2,200	175,140	172,940
14	2,200	175,140	172,940
15	2,200	175,140	172,940
16	2,200	175,140	172,940
17		175,140	172,940

Agroforestry: Mango			
			Net
Year	Cost	Revenue	Incremental
			Benefits
1	16,503	-	(16,503)
2	2,081	-	(2,081)
3	2,065	-	(2,065)
4	1,100	-	(1,100)
5	1,100	-	(1,100)
6	1,100	-	(1,100)
7	1,100	5,000	3,900
8	1,100	10,000	8,900
9	1,100	20,000	18,900
10	1,100	40,000	38,900
11	1,100	60,000	58,900
12	1,100	80,000	78,900
13	1,100	80,000	78,900
14	1,100	80,000	78,900
15	1,100	80,000	78,900
16	1,100	80,000	78,900
17		80,000	

Agroforestry: Cashew			
			Net
Year	Cost	Revenue	Incremental
			Benefits
1	9,538	-	(9,538)
2	4,574	-	(4,574)
3	2,915	-	(2,915)
4	2,200	-	(2,200)
5	2,200	3,186	986
6	2,200	9,558	7,358
7	2,200	22,302	20,102
8	2,200	31,860	29,660
9	2,200	38,232	36,032
10	2,200	44,604	42,404
11	2,200	50,976	48,776
12	2,200	57,348	55,148
13	2,200	63,720	61,520
14	2,200	63,720	61,520
15	2,200	63,720	61,520
16	2,200	63,720	61,520
17		63,720	

Bamboo/Buho			
			Net
Year	Cost	Revenue	Incremental
			Benefits
1	20,294	-	(20,294)
2	5,270	-	(5,270)
3	5,312	-	(5,312)
4	2,200	-	(2,200)
5	2,200	5,000	2,800
6	2,200	10,000	7,800
7	2,200	15,000	12,800
8	2,200	15,000	12,800
9	2,200	15,000	12,800
10	2,200	15,000	12,800
11	2,200	15,000	12,800
12	2,200	15,000	12,800
13	2,200	15,000	12,800
14	2,200	15,000	12,800
15	2,200	15,000	12,800
16	2,200	15,000	12,800
17		15,000	12,800

dd

	2,200		

	1,100		78,900

	2,200		61,520

	2,200		

Agroforestry: Jack fruit			
18	2,200	175,140	172,940
19	2,200	175,140	172,940
20	2,200	175,140	172,940
21	2,200	175,140	172,940
22	2,200	175,140	172,940
23	2,200	175,140	172,940
24	2,200	175,140	172,940
25	2,200	175,140	172,940
IRR =			77.8%
NPV 12% =			615,759

Agroforestry: Mango			
18	1,100	80,000	78,900
19	1,100	80,000	78,900
20	1,100	80,000	78,900
21	1,100	80,000	78,900
22	1,100	80,000	78,900
23	1,100	80,000	78,900
24	1,100	80,000	78,900
25	1,100	80,000	78,900
IRR =			34.9%
NPV 12% =			172,226

Agroforestry: Cashew			
18	2,200	63,720	61,520
19	2,200	63,720	61,520
20	2,200	63,720	61,520
21	2,200	63,720	61,520
22	2,200	63,720	61,520
23	2,200	63,720	61,520
24	2,200	63,720	61,520
25	2,200	63,720	61,520
IRR =			43.3%
NPV 12% =			165,979

Bamboo/Buho			
18	2,200	15,000	12,800
19	2,200	15,000	12,800
20	2,200	15,000	12,800
21	2,200	15,000	12,800
22	2,200	15,000	12,800
23	2,200	15,000	12,800
24	2,200	15,000	12,800
25	2,200	15,000	12,800
IRR =			19.9%
NPV 12% =			25,807

Table 7 Sensitive Analysis = 10% Decrease in Revenues

Agroforestry: Jack fruit			
Year	Cost	Revenue	Net Incremental Benefits
1	8,671	-	(8,671)
2	4,158	-	(4,158)
3	2,650	-	(2,650)
4	2,000	-	(2,000)
5	2,000	11,259	9,259
6	2,000	45,036	43,036
7	2,000	90,072	88,072
8	2,000	135,108	133,108
9	2,000	157,626	155,626
10	2,000	157,626	155,626
11	2,000	157,626	155,626
12	2,000	157,626	155,626
13	2,000	157,626	155,626
14	2,000	157,626	155,626
15	2,000	157,626	155,626
16	2,000	157,626	155,626
17	2,000	157,626	155,626

Agroforestry: Mango			
Year	Cost	Revenue	Net Incremental Benefits
1	15,003	-	(15,003)
2	1,892	-	(1,892)
3	1,877	-	(1,877)
4	1,000	-	(1,000)
5	1,000	-	(1,000)
6	1,000	4,500	3,500
7	1,000	9,000	8,000
8	1,000	18,000	17,000
9	1,000	36,000	35,000
10	1,000	54,000	53,000
11	1,000	72,000	71,000
12	1,000	72,000	71,000
13	1,000	72,000	71,000
14	1,000	72,000	71,000
15	1,000	72,000	71,000
16	1,000	72,000	71,000
17	1,000	72,000	71,000

Agroforestry: Cashew			
Year	Cost	Revenue	Net Incremental Benefits
1	8,671	-	(8,671)
2	4,158	-	(4,158)
3	2,650	-	(2,650)
4	2,000	2,867	867
5	2,000	8,602	6,602
6	2,000	20,072	18,072
7	2,000	28,674	26,674
8	2,000	34,409	32,409
9	2,000	40,144	38,144
10	2,000	45,878	43,878
11	2,000	51,613	49,613
12	2,000	57,348	55,348
13	2,000	57,348	55,348
14	2,000	57,348	55,348
15	2,000	57,348	55,348
16	2,000	57,348	55,348
17	2,000	57,348	55,348

Bamboo/Buho			
Year	Cost	Revenue	Net Incremental Benefits
1	18,449	-	(18,449)
2	4,791	-	(4,791)
3	4,829	-	(4,829)
4	2,000	4,500	2,500
5	2,000	9,000	7,000
6	2,000	13,500	11,500
7	2,000	13,500	11,500
8	2,000	13,500	11,500
9	2,000	13,500	11,500
10	2,000	13,500	11,500
11	2,000	13,500	11,500
12	2,000	13,500	11,500
13	2,000	13,500	11,500
14	2,000	13,500	11,500
15	2,000	13,500	11,500
16	2,000	13,500	11,500
17	2,000	13,500	11,500

Agroforestry: Jack fruit			
18	2,000	157,626	155,626
19	2,000	157,626	155,626
20	2,000	157,626	155,626
21	2,000	157,626	155,626
22	2,000	157,626	155,626
23	2,000	157,626	155,626
24	2,000	157,626	155,626
25	2,000	157,626	155,626
IRR =			77.5%
NPV 12% =			553,945

Agroforestry: Mango			
18	1,000	72,000	71,000
19	1,000	72,000	71,000
20	1,000	72,000	71,000
21	1,000	72,000	71,000
22	1,000	72,000	71,000
23	1,000	72,000	71,000
24	1,000	72,000	71,000
25	1,000	72,000	71,000
IRR =			39.1%
NPV 12% =			180,198

Agroforestry: Cashew			
18	2,000	57,348	55,348
19	2,000	57,348	55,348
20	2,000	57,348	55,348
21	2,000	57,348	55,348
22	2,000	57,348	55,348
23	2,000	57,348	55,348
24	2,000	57,348	55,348
25	2,000	57,348	55,348
IRR =			51.6%
NPV 12% =			173,273

Bamboo/Buho			
18	2,000	13,500	11,500
19	2,000	13,500	11,500
20	2,000	13,500	11,500
21	2,000	13,500	11,500
22	2,000	13,500	11,500
23	2,000	13,500	11,500
24	2,000	13,500	11,500
25	2,000	13,500	11,500
IRR =			23.2%
NPV 12% =			30,573.5

Table 8 Sensitivity Analysis – Both Changes

Agroforestry: Jack fruit			
Year	Cost	Revenue	Net Incremental Benefits
1	9,538	-	(9,538)
2	4,574	-	(4,574)
3	2,915	-	(2,915)
4	2,200	-	(2,200)
5	2,200	11,259	9,059
6	2,200	45,036	42,836
7	2,200	90,072	87,872
8	2,200	135,108	132,908
9	2,200	157,626	155,426
10	2,200	157,626	155,426
11	2,200	157,626	155,426
12	2,200	157,626	155,426
13	2,200	157,626	155,426
14	2,200	157,626	155,426
15	2,200	157,626	155,426
16	2,200	157,626	155,426
17	2,200	157,626	155,426

Agroforestry: Mango			
Year	Cost	Revenue	Net Incremental Benefits
1	16,503	-	(16,503)
2	2,081	-	(2,081)
3	2,065	-	(2,065)
4	1,100	-	(1,100)
5	1,100	-	(1,100)
6	1,100	4,500	3,400
7	1,100	9,000	7,900
8	1,100	18,000	16,900
9	1,100	36,000	34,900
10	1,100	54,000	52,900
11	1,100	72,000	70,900
12	1,100	72,000	70,900
13	1,100	72,000	70,900
14	1,100	72,000	70,900
15	1,100	72,000	70,900
16	1,100	72,000	70,900
17	1,100	72,000	70,900

Agroforestry: Cashew			
Year	Cost	Revenue	Net Incremental Benefits
1	9,538	-	(9,538)
2	4,574	-	(4,574)
3	2,915	-	(2,915)
4	2,200	2,867	667
5	2,200	8,602	6,402
6	2,200	20,072	17,872
7	2,200	28,674	26,474
8	2,200	34,409	32,209
9	2,200	40,144	37,944
10	2,200	45,878	43,678
11	2,200	51,613	49,413
12	2,200	57,348	55,148
13	2,200	57,348	55,148
14	2,200	57,348	55,148
15	2,200	57,348	55,148
16	2,200	57,348	55,148
17	2,200	57,348	55,148

Bamboo/Buho			
Year	Cost	Revenue	Net Incremental Benefits
1	20,294	-	(20,294)
2	5,270	-	(5,270)
3	5,312	-	(5,312)
4	2,200	4,500	2,300
5	2,200	9,000	6,800
6	2,200	13,500	11,300
7	2,200	13,500	11,300
8	2,200	13,500	11,300
9	2,200	13,500	11,300
10	2,200	13,500	11,300
11	2,200	13,500	11,300
12	2,200	13,500	11,300
13	2,200	13,500	11,300
14	2,200	13,500	11,300
15	2,200	13,500	11,300
16	2,200	13,500	11,300
17	2,200	13,500	11,300

Agroforestry: Jack fruit			
18	2,200	157,626	155,426
19	2,200	157,626	155,426
20	2,200	157,626	155,426
21	2,200	157,626	155,426
22	2,200	157,626	155,426
23	2,200	157,626	155,426
24	2,200	157,626	155,426
25	2,200	157,626	155,426
IRR =			74.8%
NPV $_{12\%}$ =			551,562

Agroforestry: Mango			
18	1,100	72,000	70,900
19	1,100	72,000	70,900
20	1,100	72,000	70,900
21	1,100	72,000	70,900
22	1,100	72,000	70,900
23	1,100	72,000	70,900
24	1,100	72,000	70,900
25	1,100	72,000	70,900
IRR =			37.7%
NPV $_{12\%}$ =			178,030

Agroforestry: Cashew			
18	2,200	57,348	55,148
19	2,200	57,348	55,148
20	2,200	57,348	55,148
21	2,200	57,348	55,148
22	2,200	57,348	55,148
23	2,200	57,348	55,148
24	2,200	57,348	55,148
25	2,200	57,348	55,148
IRR =			49.3%
NPV $_{12\%}$ =			170,890

Bamboo/Buho			
18	2,200	13,500	11,300
19	2,200	13,500	11,300
20	2,200	13,500	11,300
21	2,200	13,500	11,300
22	2,200	13,500	11,300
23	2,200	13,500	11,300
24	2,200	13,500	11,300
25	2,200	13,500	11,300
IRR =			21.4%
NPV $_{12\%}$ =			27,112.4