



Policy Briefing



Summary

This briefing contains findings of ecosystem accounts that use a "ridge-to-reef" approach to assess the upland, lowland, and coastal zones of Southern Palawan, Pulot Watershed and coastal areas of Sofronio Espanola.

Ecosystem Accounts Provide Inputs for Decision-Making and Policy Analysis in Southern Palawan

There are numerous demands on the natural resources of Southern Palawan, which is rich in forests, minerals, marine life and biodiversity. It is also home to a number of indigenous tribes and host to three protected areas.

The ecosystem accounting is useful in providing valuable information in the management and use of these resources, and as a guide for decision making, conflict resolution, and development planning.

Background

The development of the ecosystem accounts for Southern Palawan is a multi-agency task involving key national and international experts. The National Technical Working Group (TWG) is chaired by the Department of Environment and Natural Resources (DENR) Foreign Assisted Projects and Special Projects Service (FASPS) and vice-chaired by the Planning and Policy Service while the Local TWG based in Palawan is chaired by DENR Provincial Environment and Natural Resources Office (PENRO) and vice-chaired by the Palawan Council for Sustainable Development (PCSD).

Deforestation and Carbon Stock of Forests in Southern Palawan

Forests in Southern Palawan are important for biodiversity conservation, carbon sequestration and maintaining water flows to irrigated agriculture. Deforestation in Southern Palawan was reversed during the period 2010-2014. The recent increase may be attributed to multi-sectoral efforts to enforce forest protection laws and the implementation of local and national forest management programs.

After experiencing a decline in the period 2003-2010, carbon stock slightly increased in 2010-2014, helping mitigate the effects of climate change.

Coastal Extent and Condition

There were dramatic declines in coral reef quality in the period 2001-2010. This affects the capacity of the reefs to support fisheries, coastal protection and tourism.

Potential causes include damages due to sediment run-off and destructive fishing methods.

Deforestation and Water Supply for Crop Production

The forest of Pulot watershed regulates water flow, storing the water during heavy rainfall and gradually releasing it for irrigated agriculture during dry season. Deforestation has apparently reduced water availability for rice cropping. If the forest cover in Pulot watershed would be lost, rice production could decrease by another 20%.

Competing Demands for Water Resources

Oil palm plantations in Pulot watershed expanded rapidly since 2007 and is grown under non-irrigated conditions. However, annual rainfall in Pulot watershed is somewhat lower than in other places where oil palm is irrigated (rainfall in Palawan is generally within the range 1,700 to 1,900 mm per year). This will affect yields unless the plants are irrigated. However, irrigation of oil palm increases competition for water, which is also used to irrigate paddy.

Southern Palawan: Competing Demands on Natural Resources

Palawan is the largest island province of the Philippines. Palawan covers a total land area of 14,650 square kilometers. In 2010, the total population of the island was 771,667 (PSA, 2014). Palawan's economy is mainly supported by agriculture followed by mining, logging, fishing, natural gas exploration and tourism.

Southern Palawan is home to a number of indigenous tribes, has great potential for ecotourism and agriculture, and contains large protected areas including a significant share of the remaining forests of the Philippines. The protected areas harbor over 1,700 species of flowering plants, and about 41% of the more than 1,100 species of terrestrial vertebrates that are known in the Philippine archipelago are found in Palawan.

The variety of ecosystem services supplied and the need to address competing resource use claims make Southern Palawan an excellent case study area for testing the ecosystem accounting approach.

The Southern Palawan ecosystem account has been tested in different sites:

- (i) Southern Palawan
- (ii) Pulot watershed which is a critical watershed.
- (iii) the coastal zone of Sofronio Espanola municipality

Forest and Carbon Sequestration

Carbon sinks are natural systems such as vegetation and forests which absorb carbon dioxide produced by the burning of fossil fuels. Carbon sinks play an important role in mitigating the effect of global warming.

The total carbon stock contained in these forests declined from 15.6 million ton C in 2003 to 9.2 million ton C in 2010 and increased again to 9.4 million ton C in 2014. The decrease in the first period can be attributed to the decrease in the area (and volume) of closed forest due to conversion into other land uses. The increase in the period 2010 - 2014 is due to a modest recovery of the closed forests in Southern Palawan.

Forest and Water Supply

Forests act as buffer in storing and gradually releasing water to the streams and rivers throughout the year. Land conversion in the upland reduces this water retention capacity for sustaining supply to the irrigation system. Change in forest cover affects the sustained flow of water from the watershed.

Water is a main concern of farmers in Southern Palawan. There is a deficit in the Pulot Communal Irrigation System.

Contribution of Ecosystem Services to Crop Production

Resource rent is the supposed payment for the contribution of natural resources or ecosystems to economic production activities. Derived values show that resource rent contributes about 50 percent to the gross value of production of major crops, except for oil palm whose revenue potential is yet to be ascertained as many of the plants are relatively young and not fully productive yet.

The net expansion of agricultural and industrial plantation areas in Pulot watershed is shown below:

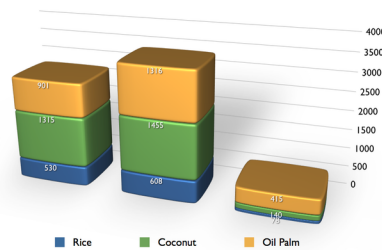


Figure 1. Increase in Area of Agricultural and Industrial Plantation, 2010 and 2014 (in hectares)

Pulot watershed contributes more than 20 percent of land devoted to oil palm plantation in Southern Palawan. Analysis of land cover change shows that portions of forest, shrubland, grassland, agricultural land and bare soil were converted to oil palm plantation. The watershed is not representative of Palawan at present, but it provides important insights in terms of potential future land use change on the island.

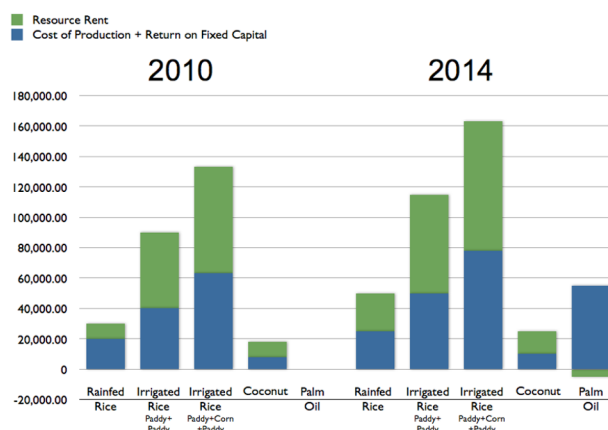


Figure 2. Value of Ecosystem Services Used in Production of Rice, Corn and Palm Oil

Southern Palawan is experiencing several competing demands on resources: increasing conversion of forest lands for plantation development and shifting cultivation, and intensive mineral extraction.

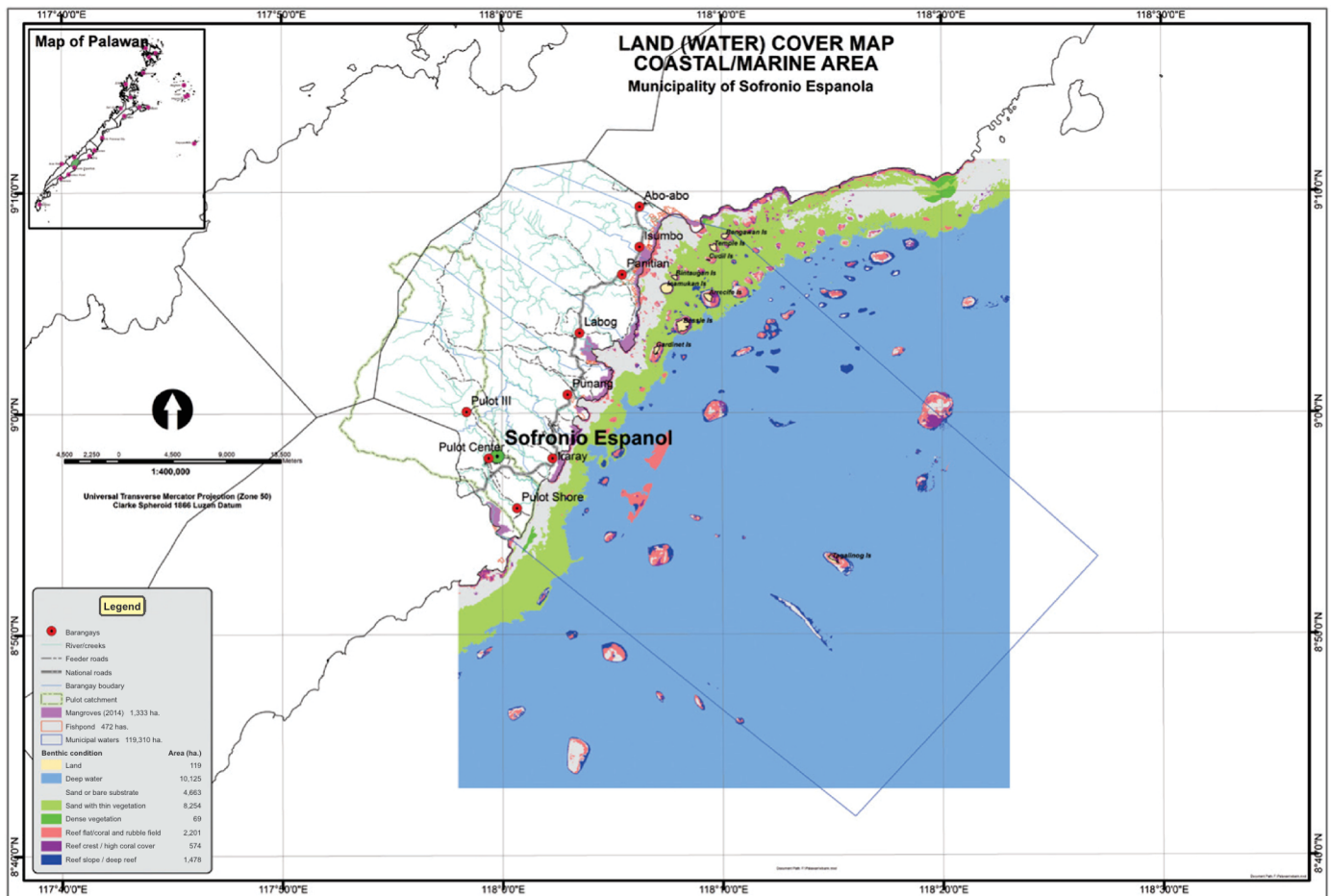


Figure 3. Coastal/Marine Ecosystem Extent Map, Sofronio Espanola, Southern Palawan, 2014

Mangrove Forests and Coral Reef Condition

Mangrove forests, seagrass beds and coastal reefs are key coastal ecosystems that serve as habitats for marine species and provide multiple ecosystem services such as the provision of food and a protective barrier against strong waves. These ecosystem services are in danger of being diminished due to the dramatic decline in the condition of these ecosystems.

The mangrove forests of Sofronio Española experienced a net loss in mangrove area of 684 hectares or about 38 percent of the original mangrove area of 1,776 hectares over a 10 year period (2001-2010). This major loss has a corresponding decline of over 60% in the overall volume of trees in the study area from 206,300 cubic meters in 2001 to only 69,310 cubic meters in 2010. The reduction was attributed to cuttings, conversion into fishponds and patches of clearings that were observed during the 2011 monitoring survey. It was noted that people in the municipality used the mangrove poles and piles in their fish pens, for construction purposes and other domestic uses.

The same condition decline was accounted for coral reefs. Ten sites out of 14 monitoring sites registered a reduction in coral cover with an overall average decline of 12 percent between the period 2001-2010. Also of significance is the absence of survey sites with a coral condition of Category 4 (Very Good rating) and Category 5 (Excellent rating) in 2010. Potential causes for the decline in coral cover include high sediment run-off and/or destructive fishing methods (e.g. cyanide or dynamite fishing). However, the time series in the accounts was not long enough to pinpoint the exact causes as well as the contribution or lack thereof of mining activities in the study area.

There has been a dramatic decline in the key coastal ecosystems: mangrove forests, and coastal reefs.

Summary and Recommendations

Manage Trade-offs Through an Ecosystem Accounting Approach

The ecosystem accounts show that ecosystem resources are under high pressure in the area, in spite of a relatively low population density in Southern Palawan. This is reflected in the dramatic declines in forest cover, coral reefs, seagrasses, and mangroves that have occurred since 2000. There are important trade-offs to be considered when planning land and resource management.

Such information provides better understanding of the contribution of ecosystems to economic activities and these can be useful input for land and resource use planning.

Safeguard the Remaining Forests

The accounts also show that it is paramount to safeguard the remaining forests of Palawan. They are essential for maintaining water supply for drinking water and rice production which is especially crucial to Palawan with rice being one of its major crops.

In addition, forests are an important carbon sink that absorb carbon dioxide released in the air, thereby helping mitigate the effects of global warming and climate change. The data shows that some of the open forest may have had the chance to recuperate to closed forest in the same period 2010-2014.

Continued strict enforcement of the ban on logging is an important prerequisite for recovery of the forests. However, the additional pressure on the forests that may arise from land conversion should also be a major watch point in current and future land use plans.

Coastal Ecosystem Conditions

The ecosystem condition account for the key coastal ecosystems shows the decline in the quality of these ecosystems. While a number of causes were gathered both from observations and anecdotal narratives of the local communities, empirical evidence is lacking to make direct attribution. Existing literature point to potential land-based causes of the degradation of coastal ecosystem conditions which already exist in the study area.

The coastal condition account also still needs to be linked with the ecosystem services. Given the importance of mangroves and seagrass for coastal protection and food source for marine life, there is an urgent need to consider how coastal ecosystems can be better protected.

References

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Facilitated by the World Bank, Wealth Accounting and the Valuation of Ecosystem Services is a global partnership that aims to promote sustainable development by ensuring that the national accounts used to measure and plan for economic growth include the value of natural resources.