Policy Briefing

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Summary

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

Background

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

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

There are numerous demands on the resources of Southern Palawan, which is rich in forestry, mineral, marine 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.

The forests of 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. After experiencing a decline in carbon stock in the period 2003-2010, the forests became a carbon sink in 2010-2014, helping mitigate the effects of climate change.

Water Supply and Crop Production

- The forests of Pulot watershed regulate 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%.

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.

Changes in Land Use and Competing Demands for Resources

- Annual rainfall in the Pulot watershed is somewhat lower than in other places where oil palm is grown under non-irrigated conditions (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.

Overview

Deforestation

- The deforestation rate 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 carbon stock in the period 2003-2010, Southern Palawan became a carbon sink in 2010-2014, thus helping mitigate the effects of climate change.

Water Supply To Crop Production

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

Coastal Extent and Condition

- There were dramatic declines in coral reef quality in the period 2001-2010.
- Areas with mangrove forests have declined, while seagrass-covered areas have remained the same.

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 a critical watershed

(iii) the coastal zone of Sofronio Española municipality.

Reduced and potentially reversed deforestation rate in Southern Palawan

From forest loss during the period 2003-2010, there was a small net gain for the period 2010-2014. This is attributed to the reduction of illegal

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

logging activities through the enforcement of forest protection laws and implementation of local and national forest management programs. However, further analysis and field verification are needed to fully confirm the results.

Forests 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 21 million ton C in 2003 to 15 million ton C in 2010 and increased again to 16 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.

Forests 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 water supply to the irrigation system. Change in forest cover affects 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.

The accounts show that if the forests upstream of the irrigation system would be lost, paddy production in the irrigation system would drop by 1,248 tons of paddy per year (around 20% of the current production in Pulot watershed) and economic loss would be an estimated 19.97 million pesos per year.

Contribution of ecosystem services to crop production

Resource rent is the value that could be forfeited if the ecosystems supplying services to crop production are lost. Derived values show that resource rent contributes about 50 percent to the gross value from production of major crops, except for oil palm which revenue potential is yet to be ascertained as many of the plants are relatively young and not fully productive yet. Change in land cover is seen as one of the causes of ecosystem degradation.

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

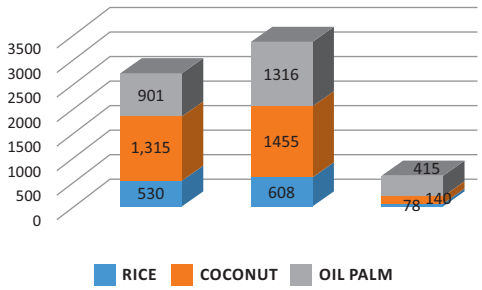

Figure 1. Increase in Area of Agricultural and Industrial Plantation, 2010 and 2014 (in hectares)

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.

The forests of Southern Palawan are an important carbon sink. They play an important role in mitigating the effects of global warming.

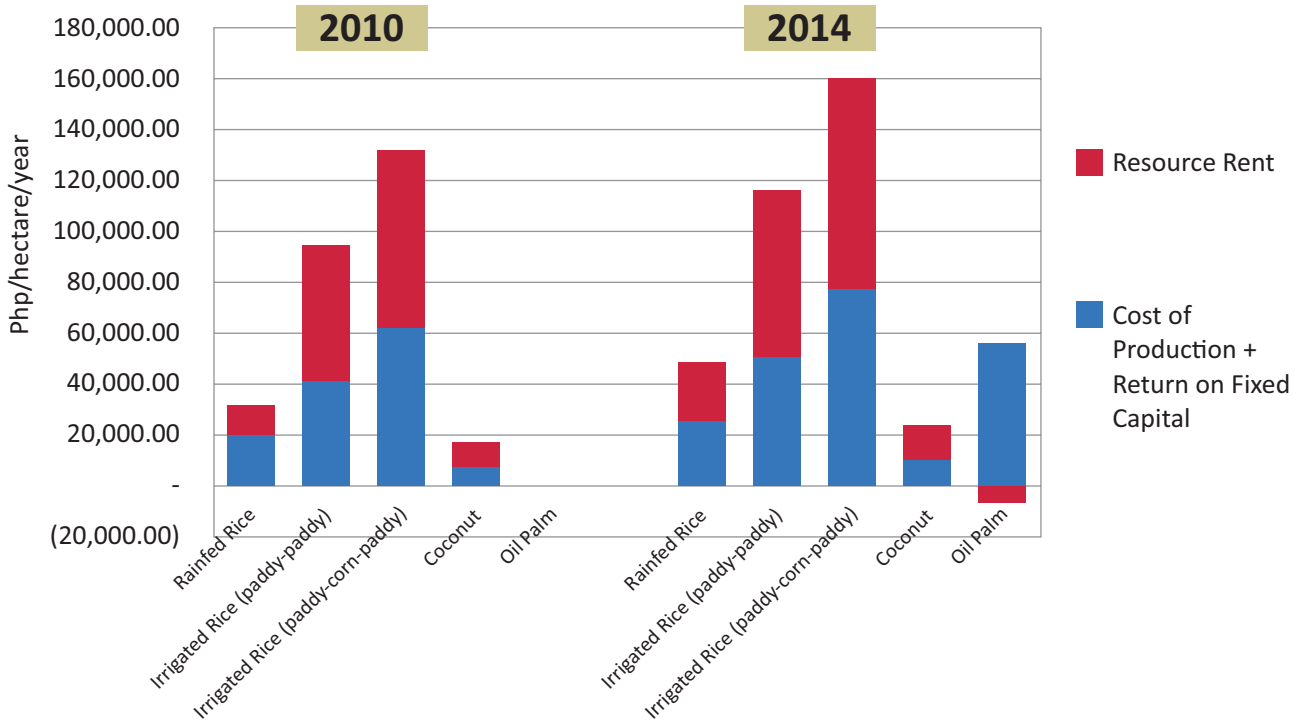

Figure 2. Value of Ecosystem Services Used in Production of Rice, Corn, Coconut and Palm Oil.

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.

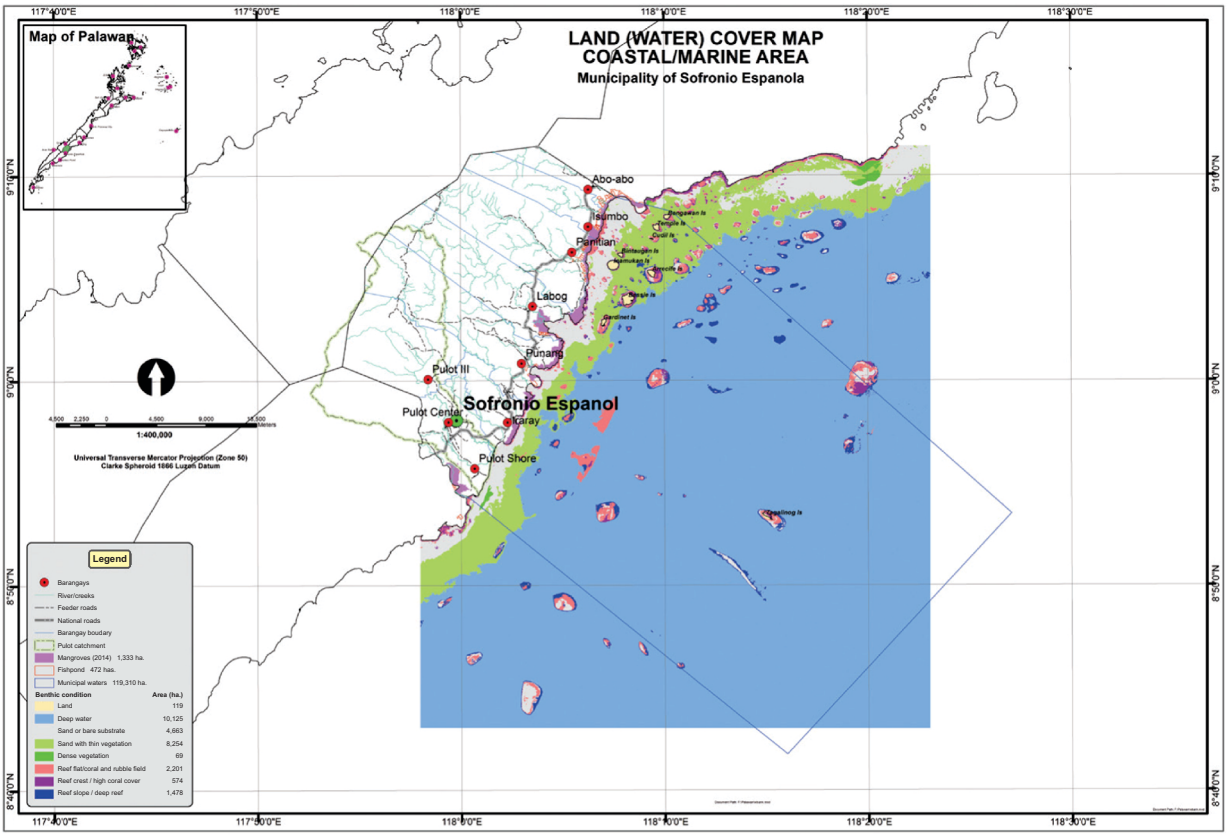

Figure 4. Coastal/Marine Ecosystem Extent Map, Sofronio Española, Southern Palawan, 2014

Summary & 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, mangroves that have occurred since 2000. There are important trade-offs to be considered when planning land and resource management.

Changes in land cover is seen as one of the causes of ecosystem degradation.

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 being one of the main rice producers in the country. 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 are already existing 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.

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