Concept of Bioregional Management

There are three issues as the factors causing the disruption of the Segara Anakan Cilacap ecosystem, viewed from the affected area. Observing the DAS (water-shed management) having an influence on the downstream area (Segara Anakan), it can be described as follows:

(A). Upstream affected area; rain fall relatively high (>2,500 mm/year); land owner status is state (forest) and society; erosion sources; inhabitant relatively scarce and low education.

(B). Middle affected area; rain fall relatively low (<2,500 mm/year); land owner status dominated by society; erosion and pollution sources; inhabitant relatively dese and varied education;

(C). Downstream affected area; eustaries and sea tide; beach/coastel/sea area as sources of living; native and incoming inhabitant; low education level.

(D). Disturbance on mangrove ecosystem; sedimentation; deforestation for pond purpose, low fisheries potency; inhabitant looking for other professions (traditional becoming loss).

In view of the above description, in relation to the bioregional management there are three elements to be empowered, namely people, at the upstream, middle, downstream or Kampung Laut area); physical affected area element; and degraded ecosystem potential element.

In the bioregional management concept, in areas (A), (B), and (C) the emphasis is more on the restoration of the physical condition of the area, through green region development and people empowerment approach; as regards areas (C) and (D), the emphasis is more on the improvement of welfare quality through business improvement approach that is closely related to the development of the potential of the Segara Anakan ecosystem.

\[\text{LAGUNA SEGARA ANAKAN} \]


**) Marine Resources Team (Marine Science Centre University of Indonesia).
Physical Fact of Influence Area

The catchment area of Segara Anakan is ± 446,000 ha based on the result of 1993 landscape image analysis. The landscape region comprises water body 25,790 ha, settlement 106,300 ha, paddy field 26,700 ha, field/garden 220,200 ha, estate 41,750 ha forest greenery 25,260 ha. The field/garden land stretch measures 220,200 ha, and 98.2% (216,236.4 ha) has the status of being owned by the people that tend to be critical land, and the remainder of 1.8% (3,963.6 ha) belongs to the government (Forestry) and are logg-over area with taungya system on planting activities. Based on the result of research at the upstream area of the Citanduy watershad managemet Citanduy (1994), the prediction of actual erosion of critical land was recorded at 540 tons/ha/year. It appears that the upstream Citanduy cahtment is one of the sedimentation (soil protrusion) sources at the Segara Anakan Cilacap.

The burden of oil pollution seems to originate from the Donan river (site of oil refinery), that more or less affect the Segara Anakan biota ecosystem. Whereas the sources of pollution of the other cahtment areas originate from Nusakambangan and the Jeruklegi River carrying lime soil sedimentation, resulting from the mining of cement raw material, that gradually is carried by the flow and accumulated at the Pankel Village, by forming soil protrusions with limestone raw material.

Socio-economic Condition of Affected Area

The profession of the people at the affected area is 81.2% generally farming, and most, 67.4%, constitutes Poor Villages. At the upstream and middle areas there is more tendency to rely on the dry land production with hard crops like coconut (Cocos nucifera) and sengon (Parasenanthes falcataria), whilst the secondary crop species are dominated by tree yams (Manihot esculenta) crops, and at the wetlands with paddy cultivation failure is often experienced (Sidareja, Kawunganten) because this area is frequently flooded.

The use of timber produced by cultivation that is not balanced with replanting tends to cause the high rate of erosion danger, likewise with the domination of tree yam crop that tends to drain the mineral nutritional element of the soil excessively.

Design of Handling Action

Based on the above-mentioned description, several aspects of the issue and action efforts may be summarized as follows:

(1). The role of the Segara Anakan ecosystem function is disrupted as a result of loss of a portion of the vegetation cover at the affected areas (upstream, middle, and downstream) resulting form human activities, and constituting source of sedimentation (soil protrusions) at the Segara Anakan lagoon.

(2). Degradation of mangrove region constituting the habitat of sea waters biota, resulting from sedimentation, fresh water flooding, uncontrolled use of sea biota, oil and lime pollution, and marsh land grabbing for ponds.
(3). It is noted that there is indication of change of behavior of the Kampung Laut community, in connection with the environmental atmosphere, leading towards adaptation of life to change of profession from pure fisherman to farming business on soil protrusions.

(4). The concept of bioregional management is carried out through these approaches: (a) community empowerment; (b) affected area development; (c) mangrove region saving; and (d) development of potential of Segara Anakan waters.

**Strategy and Implementation**

The strategy in bioregional management, for the purpose of optimum saving, conservation, and use is implemented in the form of action plan including steps as follows:

(1). On the mangrove ecosystem, there is a need for basic assessment including stabilization of data base, site conformity zoning, and preparing restoration design model, to be subsequently realized in the form of “Mangrove Region Management Detailed Design” action plan.

(2). To ensure that the implementation of mangrove region restoration can accelerate the presence (intention) of the stakeholders, and can be evaluated or controlled, there is a need for action plan in the form of “Preparation of Guidelines” (Implementation of rehabilitation, Supervision of rehabilitation, and Design of allocation of stakeholder participation allocation);

(3). Development of mangrove region potential, realized in the form of “Fisherman Tourism Village Development” action plan, based on fisherman village settlement, home industry [terasi, cracker, and rowing and fishing education];

(4). Handling of the affected areas (upstream, middle, and downstream) requires land suitability and assessment of the species being developed, realized in the form of “Social Forestry Detailed Design” action plan.

(5). Empowerment of the Kampung Laut community, so that it will continue to be a community still having the profession as fisherman blending with the Segara Anakan waters atmosphere, the realized action plan is in the form of “technical training” as tourist guide, farming mina cultivation, home industry, and mangrove rehabilitation;

(6). On the soil protrusions, the realized action plan is in the form of “lowland tropical forest development design”, with development of the original tree species originating from Nusakambangan and Pengandaran.

**Handling Priority Order**

In the strategy determining the handling priorities, based on the vulnerability of each activity component (action plan), approach and synchronization between the GAP analysis and the GIS, it appears that this will be more effective and rational. Based on the scoring result of the approach, the handling priority order is as follows:
(1). Restoration of the affected upstream areas, particularly where the critical land plots;
(2). Restoration of mangrove region, based on the community orientation in the sense of focusing more on pond land plots, by applying a mangrove forest silviculture system;
(3). Development of Eco-Tourism (Desa Nelayan Kampung Laut), including the empowerment of the Kampung Laut fisherman community;
(4). Empowerment of soil protrusions, as low land tropical rainforest development system based on the local original vegetation.

Conclusion and Recommendation

(1). The change of behavior of the Kampung Laut Segara Anakan Cilacap community towards the role of the ecosystem function, based on the historical fact, is affected by the forms of policy issued in the control period.

(2). The affected area at the upstream area is one of the dominant factors causing the disruption of the Segara Anakan waters ecosystem, with the emergence of the soil protrusions.

(3). The islands populated by the Kampung Laut community are far from one another, the disruption of the mangrove area as source of livelihood, the hindered handling by the government for fulfillment of facilities and infrastructure (food, health, education, etc.) show the characteristics of the social values that are relatively low compared to the other land communities.

(4). Bioregional management covering the action plan instrument, strategy, and implementation as well as handling priority order basically constitute an effective and rational approach in the restoration of the Segara Anakan Cilacap ecosystem, for the purpose of saving, conservation, and use, on an integrated, sustainable basis.

References

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