

## **Biodiversity Conservation and Sustainable Development in Mindanao Protected Areas, Philippines**

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**Abstract** - The paper examines the Protected Area Management Systems (PAMS) on Biodiversity Conservation and Sustainable Development (BCSD) of 28 protected areas (PAs) in Mindanao, Philippines, focusing on the contexts, inputs, processes and outcomes. Of the nineteen variables, eight were found to be significantly correlated to BCSD of the PAs. Path analysis was used to determine direct, indirect and net effects of the variables to BCSD. The study concluded that placement of optimal PA staffing and resource management implementation are both crucial in achieving BCSD. It necessitates critical and positive collaboration with Protected Area Management Board (PAMB), resource generation contributing to the operation of the PA and community participation in management. The longer the PA under protection, the better is its contribution to BCSD. Policy recommendations were formulated in the areas of institutional,

economic, technical, community participation and PAMB operations.

**Keywords** - biodiversity conservation, sustainable development, protected areas, path analysis

## INTRODUCTION

The rich biodiversity resources of the Philippines showed that it is one of the 17 mega diversity countries which collectively claim within their borders more than 2/3 of the earth's biological resources and is home to a major portion of the planet's cultural diversity. Diverse biological resources provide regulating services that include carbon sequestration and climate regulation, waste decomposition and detoxification, nutrient dispersal and recycling, invasion resistance, erosion regulation, and natural hazard protection (FPE, 2008). All these point to the need for proper biological resources management considering that the rich biodiversity resources are confronted with serious issues threatening their sustainability. Contributing to this are the rapid biodiversity loss, lack of political will and social concern for PA conservation. In response to these issues and in fulfilment of its obligation as one of the contracting parties to the convention of biological diversity, the government passed several national legislations that have formulation impact on biodiversity.

One of these laws is the Republic Act 7586, also known as the National Integrated Protected Area Systems (NIPAS) Law of 1992. The law is considered as the most important legislation in maintaining biodiversity as it provides for the establishment and management of the NIPAS. NIPAS law is landmark legislation that recognizes the importance of integrated PA system as a powerful mechanism for the conservation of the country's biodiversity. Republic Act 7586, mandated for the creation of PAMB; standardized planning process for the formulation of the management plan; NIPAS site administration through the protected superintendent office, establishment of a trust fund; institutionalization of the community support and participation and provide the process for a site designation through congressional action. To date, there are 107 designated PAs in the country of which 28 are in the island of Mindanao (PAWB, 2007). The management of

these PAs is governed by the provisions and management systems mandated under the NIPAS Law. It is for this reason that we are interested to study and analyze the PAMS presently used. We would like to determine if the PAMS has significant relation to biodiversity conservation (BC) and sustainable development (SD), the two main goals of the NIPAS law.

## OBJECTIVES OF THE STUDY

The study aimed to: (1) identify the significant variables that contribute to the biodiversity conservation and sustainable development in the Mindanao protected areas; (2) analyze the effects of the significant management systems variables to the index of biodiversity conservation and sustainable development; and (3) determine the constraining and facilitating factors and conditions contributing to the functionality status of the protected area.

## MATERIALS AND METHODS

Following the Context-Input-Process-Output (CIPO) model (patterned from the CIPP model of Stufflebeam (1983), variables were grouped according to *context*, *inputs*, *processes* and *outputs* variables. The significant factors were identified by the categorization of the 25 variables into context variables (variables 1-5), input variables (variables 6-10), and process variables (variables 11-19). The output variables (variables 20-25) are represented by the index of BCSD. Each variable was examined against the index of BCSD to find out which of the variables have a significant effect to the index of BCSD of the PAs. Table 1 shows the variables of the study.

Exploratory statistical analysis was used specifically the Principal Components Analysis (PCA), Analysis of Variance (ANOVA) and Regression Analysis. Path analysis was also used to determine the relationship among significant variables. The research locale includes the 28 PAs in the island of Mindanao, Philippines covering regions 9,10,11,12 and 13. The subject PAs are as follows:

*Region 9* - Buug Natural Biotic Area, Siocon Resource Reserve, Jose Rizal Memorial Protected Landscape, Mt. Timolan Protected

Landscape, Aliguay Island Protected Landscape and Seascape, Dumanquillas Protected Landscape and Seascape, Great & Little Sta. Cruz Islands Protected Landscape and Seascape, Selinog Island Protected Landscape and Seascape, and Murcielagos Island Protected Landscape and Seascape

*Region 10* - Mt. Kitanglad Range Natural Park, Mt. Kalatungan Range Natural Park, Mt. Malindang Range Natural Park, Mt. Timpoong-Hibok-Hibok Natural Monument, Mt. Balatukan Range Natural Park, Mt. Inayawan Range Natural Park, Baliango Protected Landscape and Seascape, and Initao-Libertad Protected Landscape and Seascape

*Region 11*- Mt. Apo Natural Park, Baganga Protected Landscape, Mainit Hotspring Protected Landscape, Mt. Hamiguitan Range Wildlife Sanctuary, Mati Protected Landscape, Mabini Protected Landscape and Seascape, and Pugada Bay Protected Landscape

*Region 12* - Mt. Matutum Protected Landscape and Sarangani Bay Protected Landscape

*Region 13*- Agusan Marsh Wildlife Sanctuary and Siargao Protected Landscape and Seascape

Table 1. Variables of the study.

Variables
$x_1$ , type of PA
$x_2$ , status of PA
$x_3$ , category of PA
$x_4$ , status of site specific PA law of a PA
$x_5$ , years a PA included in the NIPAS
$x_6$ , status of PAMB
$x_7$ , status of PA staff
$x_8$ , status of boundary demarcation
$x_9$ , status of GPMS-based PA management plan
$x_{10}$ , status of resource management implementation
$x_{11}$ , average number your PAMB/PAMB Execom meets in a year
$x_{12}$ , average number of PAMB resolutions passed in a year

$x_{13'}$	status of your PAMB in terms of training to fulfill their functions and management objectives of the PA
$x_{14'}$	status of community in terms of capacity development to ensure their participation in PA management
$x_{15'}$	status of the local community input in PA management decision
$x_{16'}$	status of biodiversity monitoring system implementation
$x_{17'}$	status of information education and communication campaign
$x_{18'}$	status of PA community based forest protection
$x_{19'}$	status of SAPA
$x_{20'}$	current accomplishment in restoration and rehabilitation of degraded habitat
$x_{21'}$	status of resource mobilization and generation to secure PA budget
$x_{22'}$	status of protection and law enforcement
$x_{23'}$	status of PA economic benefits to the local community
$x_{24'}$	status of mechanisms for community empowerment (tenure instrument)
$x_{25'}$	status of fee system

A researcher-made questionnaire was formulated based on the variables of the study. The instrument was content validated by experts and tried-out in Region 7. Results showed a reliability coefficient of 0.795. The functionality of the PAs was based on the computed BCSD indices. The BCSD indices of the PAs were categorized as follows:

Range of BSCD Indices	Qualitative Description
Above 5.66	Above Average Functional
3.40 – 5.66	Average Functional
Below 3.40	Below Average Functional

## RESULTS AND DISCUSSION

Results of the ANOVA of the significant variables against the BCSD index show 8 significant variables. It shows those years of *protection under the NIPAS* correlates significantly with BCSD. Longer protection periods necessarily translate to better biodiversity conservation. This

being the case, older protected areas under the NIPAS should, in theory, have better inputs and processes towards BCSD. In fact, tabular values also show that of the input variables, 2 registered significant effect on BCSD, namely, *status of PA staff* and *status of resource management implementation*. Sufficiency of PA staff, in terms of both numbers and quality, has significant implications on program implementation, as well as on resource management which ultimately affect on the overall BCSD performance of a PA.

The process variables listed five (5) factors with significant effect to BCSD, namely average number of PAMB/PAMB-EXECOM meets in a year, average number of PAMB resolutions passed in year, status of community in terms of capacity development to ensure their participation in PA management, status of PA community based forest protection and status of SAPA/MOA.

In summary, the factors significantly associated with BCSD are:

Context Variables: years a PA is included in the NIPAS

Input Variables: status of PA staff ( $x_7$ ) and status of resource management implementation

Process Variables: average number of PAMB/PAMB Execom meets in a year, average number of PAMB resolutions passed in a year, status of community in terms of capacity development to ensure their participation in PA management, status of PA community based forest protection, and status of SAPA/MOA

## Effects of the Significant Factors to Biodiversity Conservation and Sustainable Development

Fig. 1 shows the input and output path diagram of the relationship of significant variables from the context, input and process to the output variables. It further shows that the number of years of PA included in the NIPAS has direct and indirect effects on the index of BCSD. The number of years a PA included in the NIPAS affects the status of the PA staff and the status of resource management implementation. The context and input variables in turn affects the average number of PAMB/PAMB Execom meets in a year, average number of PAMB resolutions passed in a year, status of community in terms of capacity development to ensure their participation in PA

management, status of PA community based forest protection and status of SAPA which in turn affects the index of BCSD. The results of the analysis are summarized in Table 1. Tabular values show that the important input factors, namely status of PA staff and the status of resource management jointly and directly explain roughly 40% of the variations in the BCSD indices of the PAs. Both variables are directly equi-influential on the BCSD indices. But when confounded by the process variables, the net effect of the variables is dampened to only 11.50%.

The implication is that although the direct effects of appropriate PA staffing and resource management on the BCSD index of a PA are quite large (roughly, 40%), these effects become less pronounced when taken in the context of the other operant process variables. For example, appropriate PA staffing size need not necessarily translate to better BCSD when the staffs do not perform well in terms of providing secretariat support to the PAMB. The smaller PA staff size who can multi-task and who efficiently handles secretariat matters might over produce better BCSD indices. This observation is parallel with the study of Alcala (1998), when he cited the important role of support institutions to the success of Apo and Sumilon islands.

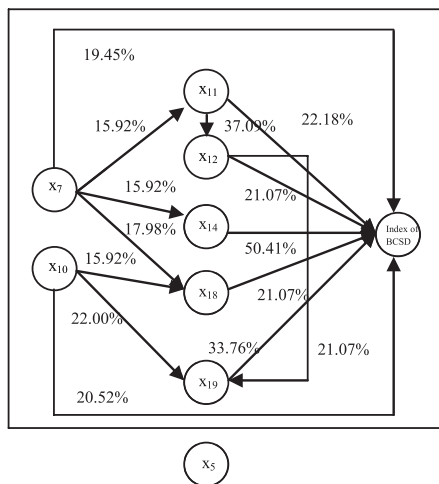


Fig. 1. Output Path Diagram showing Significant Factors to Index of BCSD Correlations

Legend:

$x_5$  = Years a PA is included in the NIPAS

$x_7$  = Status of PA Staff

$x_{10}$  = Status of Resource Management Implementation

$x_{11}$  = Average number of PAMB/PAMB Execom meets in a year

$x_{12}$  = Average number of PAMB resolutions passed in a year

$x_{14}$  = Status of Community in terms of capacity development to ensure their participation in PA management

$x_{18}$  = Status of Protected Area Community Based Forest Protection

$x_{19}$  = Status of SAPA/MOA

Index of BCSD = Output Variables (Variables 20-25)

In the neoclassical labor-capital theory (James, 2007), the relationship between production and labor/capital is generally direct. What was found here is a variant of this classical theory in the sense that a “dampening” effect is deduced from the interaction of the labor/capital with the input variables on the BCSD (output) indices. That is, both labor and capital relate to production in some dampened fashion when coursed through a peculiar systems process, such as those found in the systems of PAs.

The *process* variables, not surprisingly, provided the most influence on the BCSD of the PAs their proximity to the output measure. Of the process variables enumerated, the *status of communities in terms of capacity development to ensure their participation in PA management* is the most influential factor in determining the BCSD or hearth of the PAs (50.41%). In fact, leaving the community empowered and responsible for the management of the PA is the surest way to ensure long term sustainability. This finding is similar with the study of Russ and Alcala (1996), in the classical model of successful marine PAs. The study cited that one of the major contributing factors for a successful marine protected management is community empowerment. This is demonstrated when communities realized the long term value of no take zone within the PAs.

Although it is certainly desirable to empower the communities to take active management roles in the PAs, the subprocess of conducting PAMB meetings (22.18%) and formulating PAMB resolutions (21.07%)

facilitate the attainment of community empowerment. In turn, these subprocesses correlate with the input factors of PA staffing and resource management. An understanding of the dynamics of these processes (and the interaction of the variables thereof) has an important application in the management of protected areas. For instance, knowing that by empowering the local communities to take charge of protecting their environmental resources, one can be assured of a sustainable BC. This observation is parallel with the findings of Catibog-Sinha and Heaney (2006) where they cited that community managed renewable resources can be self-replenishing or renewable and thus sustainably used indefinitely. It generates countless indirect human benefits, which are often intangible and thus difficult to quantify.

PA staffing in terms of both size and qualifications, is an important policy area that has to be looked into considering the magnitude of community organizing, strengthening and empowering need to be done. Hontiveros (1999) emphasized on the need to bring into the programme lot of peoples skills, such as how to handle communities, resolve conflicts and calculate in them the values for protecting the environment.

The same path analysis was performed to ascertain the direct, indirect and net effects of the 6 *output* variables separately in BC and SD respectively. There are 3 Biodiversity Conservation (BC) variables identified, these are *current accomplishment in restoration and rehabilitation of degraded habitat*, *status of resource mobilization and generation to secure PA budget* and *status of protection and law enforcement*. These were then translated into a BC index using PCA. Similarly, for SD variables, these are *status of PA economic benefits to the local community*, *status of mechanisms for community empowerment (tenure instrument)* and *status of fee system*.

Table 1. Summary of the Direct, Indirect and Net Effects  
of Significant Factors on BCSD

Factor	Direct Effects	Indirect Effects	Net Effects
1. Input			
1.1. Status of PA Staff	19.45%	17.70%	1.8%
1.2. Status of Resource Management Implementation	20.52%	10.80%	9.7%
Subtotal	39.97%	28.50%	11.50%
1. Process			
2.1 Average number of PAMB Meetings in a year	22.18%	10.40%	22.18%
2.2 Average Number of PAMB Resolutions passed in a year	21.07%	7.09%	13.98%
2.3 Status of Community in terms of Capacity Development to ensure their participation in PA Management	50.41%	-	50.41%
2.4 Status of PA Community Based Forest Protection			
2.5 Status of SAPA/MOA	21.07%	-	21.07%
	33.76%		
Subtotal	148.49%	17.09%	131.40%
Grand Mean Effects	26.92%	6.51%	18.77%

Again a path analysis was performed but this time the interest is to ascertain the effects of the significant factors to BC and SD respectively. Important input factors to BC are the *status of PA staff* and the *status of resource management*. The 2 variables contributed barely 20% of the differences in the BC indices of the PAs, with status of PA staff contributing more than half against the resource management implementation. These results indicate that for BC, both the quantity

and quality of PA staffing are very critical, and rightfully so, because BC activities require organizing and legwork. The negative net effect (-4.80%) of resource management implementation signifies that human intervention in the restoration of degraded habitat (for example) cause disturbance to the indices BC. Moreover, inappropriate intervention does not necessarily contribute to the positive effect on the index of BC. The effect to the indices of BC is aggravated when confounded by the process variables; the net effect is dampened to -4.60% which implies that the direct effects of appropriate PA staffing and resource management on the BC index of a PA becomes a negative effect when taken in the *context* of the other operant process variables. This can be explained that the lean status of PA staffing when interfaced with greater responsibility and authority, such as in organizing a management board meeting and formulation of PAMB resolution, could result to disarray and confusion among key players, hence do not contribute to better BC. Again, the study of Hontiveros (2009), support this finding that staff skills plays a key role in PA management.

The *process* variables, as expected, exerted the most effect on the BC of the PAs because of their proximity to the output determinants. That is, except for the *average number of PAMB meeting* (-4.02%) and *resolution passed in a year* (4.61%) when taken into the operant process variables. Results tend to indicate that more PAMB meetings led to poorer BC output because resources intended for direct BC activities may be devoted to supporting the meetings or when these meetings may actually not led directly with BC concerns.

This study finds that having PAMB meeting is not a guarantee to contribute to BC when this will not result to the passage of PAMB resolution and put into action. Narvadez and Acosta (2002) mentioned that on working without and within NIPAS focusing on the Mt. Isarog experience, the conservation of the park's biodiversity has not been given much attention by the PAMB. Instead, environmentally critical projects were given the legal permits to operate inside PAs since they got approval from the management board. This condition strained partnership arrangement between the non government organization and people's organization of the PA. This is when they felt and observed that they are only being used and not genuinely given due recognition and treatment as a real partner.

Of the *process variables* correlated to BC, the *status of PA community based forest protection* is the most influential factor in determining the BC or the center of the PA (53.30%). *Community based forest protection* is the most valuable way of protecting our remaining forest resources considering their proximity to the area and their cultural survival depend largely on forest. Community volunteers need not do foot patrolling; instead do their day-to-day economic activities as they are residents of the PA.

The third path analysis performed after the determination of BC is for the interest of ascertaining the effects of the significant factors to SD. Results show that essential input factors, namely *status of PA staff* and the *status of resource management* cooperatively contributed 35% of the difference in the SD indices of the PAs, though looking at the individual value of the input factors, *status of PA staffing* has a negative effect of -0.60%. The influence to the index of SD is reduced when confounded by the process variables; the net effect of the variables is lessened to 19.84%. This implies that, although the direct effects of *resource management and status of PA staff* on SD index of a protected area is larger (35%), these effects become less distinct when taken in the context of other operant process variables. The negative net effect of *status of PA staff* to the index of SD indicates the need to empower the community and the PAMB. This is so in order for them to make a decision and play an active role in achieving the index of SD, instead of the PA staff doing for and in their behalf.

Moreover, PA staffs come and go unlike the local community and the other PA stakeholders who look at long term coexistence with the PA. In the area of resource management implementation to meet management needs, this will translate to better SD. This can also improve the quality of life and used sustainably by the local community. Resource access can be opened to traditional use on shared benefits. This is in lieu of local community's commitment to sustainably manage natural resources within their territories, which in turn can produce better SD indices.

The *process variables* set into view better effect on the SD of the protected areas because of their propinquity to the output indices. While they are all equally important to the indices of SD, PAMB action in a meeting (31.10%) has greater influence in determining the SD.

Provided that this is translated into action by the community based forest protection volunteers (26%). Even as it is undoubtedly enviable for PAMB functions to take active management roles in the protected areas, the subprocess of community participation in PA management (21.60%) and formulating PAMB resolutions (17.107%) facilitate the attainment of a functional PAMB. In turn, these subprocesses correlate with the input factors of PA staffing and resource management.

The Mt. Kitanglad experience in the operation of PAMB reached an agreement among PAMB members, the Local Chief Executives (Municipal/City Mayors) attend PAMB meeting if the Chair who is also the Regional Executive Director of DENR, attends the meeting as well. In this case the Chair, who has one of the primary functions on PA management, should find ways to attend every meeting. As a result, actions are carried out expeditiously including the allocation of resources to implement their approved plan in the amount of 3.5M pesos annually from the LGUs. Moreover, PAMB undergoes organizational diagnosis workshop and conduct informal activities. One activity is the annual "Aldaw ta Kitanglad" celebration which is already on its 15<sup>th</sup> year this CY 2011. The PAMB also go through 14 educational tours to both local and foreign countries with financial support from institutions with project in the PA (AusAid, Cefor, German Ministry of Education, ICRAF among others),(Mt. Kitanglad Manual of PAMB Operation, 1995).

*Constraining and facilitating factors and conditions contributing to the functionality status of the protected area*

Considering the functionality of the PAs there are 6 PAs which are *above average functional* in terms of their BCSD indices. Facilitating conditions making it *above average functional*, under the significant input variables includes the following: a) Institutionalization of the PA - Set aside as a permanent protected area through an act of congress and/or the president through a Presidential Proclamation. Such action provides for institutional mechanisms and management framework of the PA; b) presence of staff; and c) initial implementation of species, ecological processes and cultural values.

Logically, the presence of staff can facilitate the needed coordination and collaboration among partners, formulate work program, update management board for policy formulation and monitor progress on the ground. This will result to better resource management implementation among others.

For significant *process* variables as shown, the following are the facilitating conditions: the management board meets at least once in every quarter and able to passed at least 6 decisions and/or resolutions annually; implemented community training program and community volunteers providing support for the protection of the area; and generates income.

The PAMB action is crucial in making the PAMS work, being the local policy making body of the PA. The board by virtue of the provision of the NIPAS law is given the authority to decide matters relating to planning, budget, sustainable resource management and protection.

According to the result of this study, their crucial role can be carried out when PAMB at least conducts meeting once in every 3 months and be able to resolve and pass 6 resolutions annually. PAMB's decision is translated into resolution which shall guide staff action and address issues confronted on the ground.

Another crucial role of the PAMB is the passage of policies that generate revenues and standardize allowable cultural sensitive activities. This policy rewards volunteers and communities for services rendered for the park. In addition, another facilitating condition is the critical role of community in the informed decision making process in PAM. In the case of this study, very functional PAs trained their communities. They are actively engaged in forest protection program. Likewise, they all have protection volunteers and federated organized peoples association. These volunteers and people's organization serve as an extension to the PA staff and complement information, decision and action needed.

PAs likewise generate income which is made available to finance approved work plan. Their income include fees for water and land users, visitors entry and communication structures, considering the height advantage of all terrestrial PAs that are conducive for telecommunication facilities. The bottom line for a very functional PA

under the process variables is the operation of the PAMB. It should be able to provide policies and the overall direction. The community participates in the decision making process and protection work and generates income.

Results further indicate the *average functional* and *below average functional* PAs. As the constraining condition under the *context* variables: *not institutionalized following the processes provided under the NIPAS law; no assigned staff; and no implementation of resource management program.* PAs that are not institutionalized following the NIPAS law have difficulty in securing separate annual budget from the government and other support institutions. Instead, they are dependent with the DENR allocations which form part of the limited operational expense allocated to the CENRO and/or PENRO. Often times, priority is given to anti-illegal logging campaign, reforestation and administrative functions which do not necessarily support the PAMS. Likewise, prior proclamation of national parks do not include management framework for BCSD principles. Hence, they have limited capacity to respond to current issues such as in the area of culture, political and socio-economic among others.

As a consequence and due to budgetary constraints, no full time staff is assigned to work for the PA. The staff assigned has also other functions either in the CENRO and/or PENRO offices of the DENR. In some cases, 3 PAs are handled by one PA superintendent. This condition will certainly limit coordination among partners to ensure that PAMS are effectively implemented on the ground. Often, management issues are left behind without any action. For the significant *process* variables, the following are the constraining conditions: *PAMB meets at least once and passed 1 resolution every year; no and/or low community skills training to increase their capacity to participate in management; community volunteers do not cover the whole area and/or no volunteers to assist in the protection of the area; and proper pricing and valuation of resource use not implemented.*

PAs do not maximize the great potential for the multi-sectoral participation in PA management. This is because the PAMB meets once in a year. The board fails to exercise their basic mandate of acting on the resource management planning, resource protection, approved budget and institute mechanism for pay systems. These are manifested through the passage of 1 resolution per year.

The very important role of the community was not engaged making the PA a free access to various interest groups. This is similar to the untenured timberland areas under the management of the DENR. The desired feedback and participation from the community is not extensive in the absence of consolidating mechanism for community issues, such as the federation of people's organization and the like. As a result, PAMS cannot reach the remotest part of the PA.

## CONCLUSIONS

The neoclassical labor-capital theory states that there is a direct and deterministic relationship between labor and capital with production. This study however, showed that this need not be the case when labor and capital are inputted to a process. Thus,

1. Labor and capital relate with a production measure (e.g. BCSD) in a damped-effect fashion. That is, when labor and capital are inputted to a peculiar systems process, their net effects to the production can be reduced significantly. When applied to PA systems, there is a need to determine the optimal staff and optimal level of resource management. For instance, a small PA need not need to have the same staff requirement with the big PA. Moreover, the same size of PA need not also mean size of PA staff requirement because of the different condition of the community and political intervention. It is quite possible that 2 PAs of the same size will not have the same size of optimal staffing, because, the conditions of these communities can be very different. As a policy, the theory necessitates that the agency conducts preliminary survey and assessment of the community and political condition to ascertain the optimal number of staffing required.
2. The success or failure of PA in BCSD hinge primarily on resource management implementation and functional PA Office (both in terms of quality and quantity of staff). They tend to produce processes that pave the way for successful PA, the critical one in order of importance are community participation, resources generation and functional PAMB(membership).
3. The attainment of PA in BC should primarily consider the

functionality of the PASu Office both in quantity and quality. The latter predisposed the achievement of critical tasks and processes that led to the success of the PA. The essential factors are the role of the community, resource mobilization and functional PAMB.

4. The achievement of PA in SD should highly consider resource management implementation. This will overlay stages of procedures towards a successful PA management. Primordial to this is functional PAMB, community participation and resource generation.
5. The influence to the BCSD of the PA, significantly consider the capacity of the PA staff to influence PA system and actors, to produce measures that will pave the way for a greater contribution to the factors of BCSD. Crucial to this influence is the community, resources and the PAMB.

## RECOMMENDATIONS

The following are the recommended policies to support the functionality of the Mindanao PAs:

### *Institutional Aspects*

Assess the PA and its community to determine the optimal number of staffing, and review current sectoral priority budget particularly under item forest protection in order to allocate resources (budget and personnel) to PA when it is already designated as such, instead of under the Forest Management Services.

### *Economic Aspects*

Institutionalize payment for environmental services to all PAs in order to plow back revenue to the upland community and make payment tools easy to implement in the field, and establish environmental natural resources or accounting valuation system (such as for water, climatic influence and others) and integrate in the equation for economic development planning.

### *Technical Aspects*

The DENR to prioritize PA staff capacity development training on public speaking and negotiations skills; parliamentary procedures and technical writing; and environmental natural resources or accounting valuation system.

### *Community Participation*

Make mandatory for all PAs to: organize and make functional community volunteers involving all Sitios and Barangays who have administrative jurisdiction over the park; organize federation of people's organization and the council of elders if applicable and ensure their participation in PAM, and allocate resources and support to people's organization and members of the Indigenous Peoples representatives to the PAMB particularly the consultation/reporting process.

### *PAMB Operation*

Provide greater motivation and incentive to active participation of the Local Chief Executives in the PAMB, instead of representatives; initiate informal activities among PAMB members; conduct field exposure and travel to successful PAs; make local chief executive chair most of the PAMB subcommittee, and enact PAMB resolutions as a goal of PAMB meeting.

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