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Public-private partnership as a responsive culture for green management in Bangladesh: A study of natural resources management at Lawachhara national park.

Mohammad Nashir Uddin ^a, Mohammad Hamiduzzaman ^{a*}

^a Assistant Professor, Department of Public Administration, Shahjalal University of Science and Technology, Sylhet-3114, Bangladesh, PABX: 880-821-713491, 714479, Fax: 880-821-715257

* Corresponding author : khoka08@yahoo.com

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Abstract

The study essentially aims to assess the public-private partnership (PPP) as a thriving strategy in natural resources maintenance that largely is dependent on stakeholders' participation forest biodiversity and green management. In an age of climate change and global warming, as a threat due to unavoidable consequences of human activities, natural resource management is now one of the prime concerns around the developed and developing countries in terms of creating responsible attitudes towards green maintenance. Governments have, by and large, agreed on sustainable employment and conservation of forests in several international forums during the last three decades. In fact, the public sector has already proved its inefficiency and ineffective mode to protect natural resources due to lack of skills, human and material resources, and rampant corruption which have encouraged the government to introduce the strategy of PPP. The study was conducted at Lawachhara national park through a sample survey by employing stratified sampling as well as some other tools of data collection incorporating both quantitative and qualitative approaches. It is evident in the study that most of the respondents commonly believe PPP may change the existing ineffective and inefficient mode of natural resources management. Another important finding included that challenges are not possible to overcome unless the active participation of the stakeholders is possible to ensure.

Keywords

Public-private partnership
Green management
Responsive culture
Natural resources maintenance

Introduction

Maintenance and conservation of forest biodiversity and green resources is one of the foremost contemporary challenges in a changing global environment. Almost three billion hectares, half of the original forest coverage worldwide, has already been disappeared; much of it has been ruined during the last three decades. Every year about 16 million hectares of green areas are being destroyed.

Existence of forests is highly important for conserving biodiversity because around 50 to 90 percent of all terrestrial species are living in the forests world-wide (Ahsan, 2009). Scores of these species are threatened, mainly because of habitat loss. Forest biodiversity is also being threatened by unsustainable industrial logging, energy plant development, mining, building new infrastructure, conversion

of forest areas to cultivable agricultural land, excessive vegetation removal, and firewood collection etc. Important underlying causes behind these threats lie in illegal logging and poverty of the surrounding population (Khan, 2008). In 1992, 'the Forest Principles' were adopted in Rio by the concerned leaderships of the world to protect and maintain bio-diversification for future generations in upcoming centuries. Since then governments from both developed and developing countries have agreed on sustainable use of forests resources and create an authoritative structure to build awareness among people throughout the world, among others the various conventions on Biological Diversity are being observed and the United Nations Forum on Forests (UNFF) is being working in different remote areas. Nonetheless, international negotiations for an international legally binding forest treaty have failed due to fundamental differences in visions regarding conservation of forests and forest resources. In other words, countries without large areas of forests want to conserve the world's forests, and countries with large forests want to keep the right to decide by them to use their green areas in their own fashion. In recent past, it has been quite evident to notice some fundamental changes in the global institutional framework governing the use of natural resources. Although the development of public institutional arrangements continues, new political spaces for global forest governance have emerged. Characteristic of these arrangements is the engagement of private actors in authoritative decision-making, which was previously the prerogative of sovereign states.

Thus, public-private partnership (PPP) has become widely accepted and popular in public sector green management likewise in different sectors and areas. The period of 1990s has experienced the establishment of the PPP as a key tool of public policy process across the world as an outcome of New Public Management (NPM) thought (Osborne, 2007). NPM has shifted the spotlight of management from public service to service delivery and since 1980s been emphasizing on privatization, market mechanism, contestability in the delivery of public goods and services, deregulation, and reinvention of the role of government. At the center of that NPM was a cut-back of public sector expenditure, a delegation of responsibilities to the private sector and fostering voluntary engagement of private sector aiming at providing public goods (Mitchel, 1991). The principles of NPM encouraged the establishment of Public Private Partnerships (PPPs) as a new management tool. Now it (PPP) has become a favorite tool for providing services, to the developing society and conservation of natural resources as well in both developed and developing countries. At the most general level, Public-Private Partnership (PPPs) is generally recognized as the long term cooperative institutional arrangements between public and private sectors to achieve various purposes. Hence, there is a wide range of PPPs with diverse features involved in different activities. Natural resource preservation is highly influenced by decisions of the management throughout the history of natural resource management around the globe. Since the birth of the country Bangladesh, different management decisions have played the key role both on the forests and the forest-dependent people; the Forest Policy of 1994 was a dire necessity to reformulate. Forestry development projects in different sector such as Forestry Sector Project (FSP) have been implemented with a major policy

shift in favor of a participatory management of the country's forests and protected areas. Local people and communities participated in developing, protecting and managing forests/plantations in lieu of their rights granted as per participatory benefit sharing agreements (PBSAs) signed between user groups (of participants) and land owning agencies such as the department of Forest (DoF) in case of forest land. The Nishorgo Support Project (NSP) of DoF aims at protecting and conserving the forests and biodiversity of the country's protected areas (PAs) by building a gainful partnership between DoF and principal stakeholders based on mutual trust, and shared roles and responsibilities for biodiversity conservation and sustainable usage. International organizations, acting as governance agents of states, along with powerful transnational entrepreneurs, are also the chief political drivers of public-private cooperation. Both the theoretical and empirical analysis reveal that public-private institutions do not simply cope up to fill all or even the most urgent governance gaps; instead they tend to focus on areas of cooperation where the interests of powerful state and transnational actors intersect. NSP is, indeed, based on a certain normative framework of conserving the forests and ensuring better livelihood of the forest dwellers. The application of co-management approach for the forest conservation in Bangladesh has witnessed incorporation of the Ministry of Environment and Forest (MoEF) and its subservient Department of Forest of Bangladesh (DoF), certain private and transnational organizations, and the local communities in the project. In addition, the project NSP has been funded by the United States Assistance for International Development (USAID), which implements development programs in conformity with US foreign policy. It works in Kamalgang upazila of Maulvibazar district to conserve the Lawachara National Park (LNP) and support local people.

Since PPP is the working arrangement based on mutual understanding between a public sector and any organization or individuals outside of the public sector, the co-management approach which is now in operation under NSP can be defined as PPP initiatives. It is expected, for the last few decades, from the Government of Bangladesh (GoB) is to protect all the natural resources and maintenance of greens of the country. Regarding the issue, the authority has already launched PPP in the field of biodiversity conservation since the last decade in the country where DoF and Nishorgo collaboratively are initiating the conserving activities involving the surrounding inhabitants especially of the national parks. NSP as a pilot project was started on 2003 and ended on 2008. NSP has started its second phase after it has got a new name of Nishorgo Network. It is commonly believed that this project does not successfully perform its role and cannot bring expected changes to the real scenario. The DoF and Nishorgo argued that the NSP is performing well in conservation activities with efficiency and effectiveness. Unfortunately, due to inadequate support from government and local people, it is now under threat. Though a lot of research works have been conducted in Bangladesh on natural resources. Those works failed to provide a good guidance to take dynamic policies to promote authoritative structure. It follows the drawbacks of the previous studies and will afford significant recommendations based on the platform. The outcome of this study may, hopefully, be useful for policy makers for their future policy issues in reshaping the existing thoughts in green management. In an

age of climate change and global warming, bio-diversity conservation and green management are scorching issues too. Apart from this, no significant study focused on the core villagers. Therefore, it is indispensable to justify whether PPP as a management strategy is useful for maintaining bio-diversity by bringing about a tripartite (government, private sector, and stakeholders) in a developing country like Bangladesh.

The main objective of the study is to review the existing PPP programs for natural resource management and chalk out the challenges for responsive administrative culture. Therefore, the study specifies:

- a) To justify the basis of on-going projects for green maintenance and distribution of functions and responsibilities between public (government) and private sector;
- b) To explain formal and informal actors and factors affecting initiation and performance of such projects and level of involvement of stakeholders of the specific region;
- c) To assess the success or failure of the project by comparing achievement with pre-project outcome; and
- d) To suggest future policy agenda to develop and nurture PPP in line with effective and responsive administrative culture in green management.

Background of the study

Conservation of natural resources is highly motivated by the government decisions throughout the times past of resource management around the earth. In Bangladesh, since the birth of the country, different policies and regulations taken by the successive governments have been playing key role in protection and conservation of green resources and the forest-dependent people as well. But successive failures of the governments due to inefficiency and corruption, co-management approach has been taken place to regulate the functioning of the management system to forestry development in Bangladesh broadly reveal the principles of Public-Private Partnership (PPP). Participatory forestry projects, supported by donors and local NGOs, have taken to implement in Bangladesh on a large scale during 1980s. Forest Department (FD) of Bangladesh has initiated a community forestry project with the financial support from Asian Development Bank (ADB). In addition, forestry improvement projects, such as Forestry Sector Project (FSP), have been implemented after a major policy shift in favor of participatory administration of the country's forests and protected areas. Local people and communities participated in developing, protecting and managing forests/plantations in lieu of their rights granted as per participatory benefit sharing agreements (PBSAs) signed between user groups (of participants) and land owning agencies (such as FD in case of forest land).

Nishorgo project has some specific components for conserving the unique biodiversity of the protected areas. It broadly aims to reduce the dependence of the forest dwellers on the forest on the one hand, and arrange sustainable alternative means for livelihood for them, on the other. Promotions of eco-tourism and non-timber wood production are among the major constituents, which are being implemented in the protected areas (IRG, 2006: 16). The Study area

located in West Vanugach Reserve Forest at Komolganj Upazila of Moulavibazar District which covers the area of one thousand and twelve hounded hectares. This national forest reservation project was formed according to the Wildlife (Preservation) (Amendment) Act of 1974. It lies between the Dholai River on the east, the Manu River on the north, and the road from Moulavibazar to Srimangal on the west. Though this park is surrounded by 18 villages of which two, Lawachara and Magurchara are located in the park. It also bordered by cultivated lands and six tea estates that provide a suitable ecosystem services to human and non-human inhabitants. A number of ethnic communities resides within the park and largely depend on it for their livelihood. According to the NSP site reports- about sixty five percent of the local people are poor or very poor – and earn their livelihoods as day laborers and fuel wood collectors. Of the reminder, five percent are rich and thirty percent are middle class. In contrast, among the tribal people, nearly ninety seven percent are poor or very poor, with the highest concentrations of poor found in Lawachara Punji (ninety eight percent), Magurchara punji (ninety six percent), Dolubari Punji (ninety five percent), and followed by Baghmara (fifty eight percent) (NSP, 2004). The main professions of the local people are betel leaf cultivation, lemon and pineapple cultivation, agriculture, fuel wood collection, and different types of day based wage labor. There are different NGOs named BRAC, Association for Social Advancement (ASA), Grmeen bank, Bangladesh Rural Development Board (BRDB) are engaged in providing micro-credit to empower local women. NSP facilitates a total number of 53 forest user groups in 16 villages surrounding LNP through shared responsibility with development partners and NGOs. There are twenty one male forest user groups and rests of them are convened by local female which are playing an imperative role to reduce direct dependency on forest resources.

Participatory forestry projects, supported by donors, have been implemented in Bangladesh on a large scale since 1981 when a community forestry project was taken up by Forest Department (FD) with the financial support from Asian Development Bank (ADB). Sectoral forestry development projects such as Forestry Sector Project (FSP) have been implemented with a major policy shift in favor of a participatory management of the country's forests and protected areas. Local people and communities participated in developing, protecting and managing forests/plantations in lieu of their rights granted as per participatory benefit sharing agreements (PBSAs) signed between user groups (of participants) and land owning agencies (such as FD in case of forest land). The Nishorgo Support Project (NSP) of FD aims to protect and conserve the forests and biodiversity of the country's protected areas (PAs) by building gainful partnerships between FD and main stakeholders based on mutual trust and shared roles and responsibilities for biodiversity conservation and sustainable use.

Review of relevant literature

PPP implies working arrangements based on a mutual pledge between civil sector organizations with any organization outside of the public sector on basis of a co-management approach which is now in procedure under Nishorgo project as it includes both state machineries and non-state organizations for the preservation of

biodiversity and tropical forest. PPP is essential because it offers resources, information, and skills unavailable for making governance of the public institutions effective.

There are different definitions for PPPs viewed from different angles which include 'as a way of managing and governing organizations, as an institutional arrangement for financial relationship, as a development strategy, and also as a language game.' The review of different definitions indicates that there is no precise agreed definition of PPP. However, there are common features across the different approaches as well as distinctive features. Several gaps have been identified related to issues of governance, management and policy design of PPPs (Khanom, 2009).

Public-private partnerships have been implemented throughout the world since the 1970s with mixed results mainly due to the lack of long run commitments from governments and other parties involved, lack of scientific understanding regarding clear short term and long-term potential biophysical and socio-economic, policy and legal consequences, and lack of trust between the partners. It presents a Regional Irrigation Business Partnership (RIBP) model, which is capable of efficiently utilizing research output and government policies for sustainable public-private irrigation planning and investment as well as emphasizes on the principle that sharing risks, rewards, and responsibilities coupled with sufficient investment incentives motivating actors in management to generate better outcomes for the environment (Khan & Mustaq, 2009).

The project under this study is the first of its kind in Bangladesh based on public private partnerships strategy and involving local stakeholders as beneficiaries for natural resources management. The key goal of social forestry is to involve the poor beneficiaries and then it is possible to measure the degree of attainment of this goal by collecting socioeconomic data before and after project implementation the degree of inclusion of the poor in social forestry using ex-post data. Longitudinal analysis is approximated through the use of 'slow change' socioeconomic variables and through logistic regression (Sunderlin, 1997).

The conservation of biodiversity requires a significant commitment by governments, industry sectors and the wider community to encourage cultural change across community and industry sectors which ensures a long-term balance between sustainable land management and biodiversity conservation. At the regional level viable biodiversity conservation requires a range of management strategies that may include the establishment of statutory protected areas, a range of off-park conservation management measures and achievable guidelines for ecologically sustainable land management at the landscape scale. Monitoring the performance of protected areas in achieving biodiversity conservation requires a commitment by government to facilitate involvement and participation of the wider community. In this regard, four Australian case studies discussed how public private conservation partnerships are integrating sustainable land management and biodiversity conservation at the regional level (Thackway, 1999).

Operationalization of key concepts

PPP as a strategy

Although the nature of partnership is often viewed differently, the key distinguishing features of public-private partnerships is the transfer of risk between partners especially in development projects. The appropriate allocation of risk is the big question to answer, but always necessary to the success of the partnership. PPP maintains the relationship among government agencies and private or nonprofit contractors that should be formed when dealing with services or products of highest complexity. In comparison to traditional contractor- customer relationships, they require radical changes in the roles played by all partners. Accordingly, in this study PPP is defined as a management strategy between DoF and NSP for efficient green maintenance at Lawachhara national park.

Green management

One of the major current global environmental challenges is the conservation of biodiversity and green resources. Deforestation and forest degradation is continuous despite international and national governmental agreements on forest conservation and afforestation. In recent years private regulation in the international forest governance system has increased. Partnerships between governments, business, NGOs and/or civil society have been developed. This focuses on natural resource management mechanism and initiatives that attempts to conserve the green bio-diversity of the forest and ensure the stakeholders' interests as well.

Data and materials

The nature of the study is of a scientific evaluation of project mainly by using the sample survey method along with an exploratory-descriptive design. Inductive method and theoretical approach were simultaneously used to get empirical findings which resulted from collected data. In addition, methodological triangulation of mixed method was deployed (survey with qualitative and quantitative analysis). The study was conducted on a project which contains the quality aspect of the research side by side, quantitative measurement of the data. It examined the challenges of PPP to boost up responsive culture at forest preservation and spontaneous attachment of people's with the project.

The study has applied a stratified sampling method to 4 core villages (locally termed as *Punji*) named *Langurpur* (18 respondents); *Dolubari* (10 respondents); *Lawachhara* (13 respondents); and *Magurchhara* (15 respondents). Then, a purposive sampling method was employed in the study to get information from ultimate sample units in the specific villages. A self-administered semi-structured questionnaire (including both open and close ended questions) was used to collect empirical data from 56 respondents: one from each family. Depending on the nature and objectives of the study and availability of resources, the study has also collected data through most common methods of data collection techniques: community mapping, transect walks, household interviews, focus group discussion, informal discussion, and personal observation. The data was processed through editing to improve their quality and coding to convert them to the numerical

form representing attribute of variables. For the sake of quantitative analysis, upgraded Statistical Programme for Social Science (SPSS) software used to get appropriate combination of data.

This study has formed a conceptual framework on the basis of the reviewing the relevant literature with defined objectives. The following variables have considered in analyzing data.

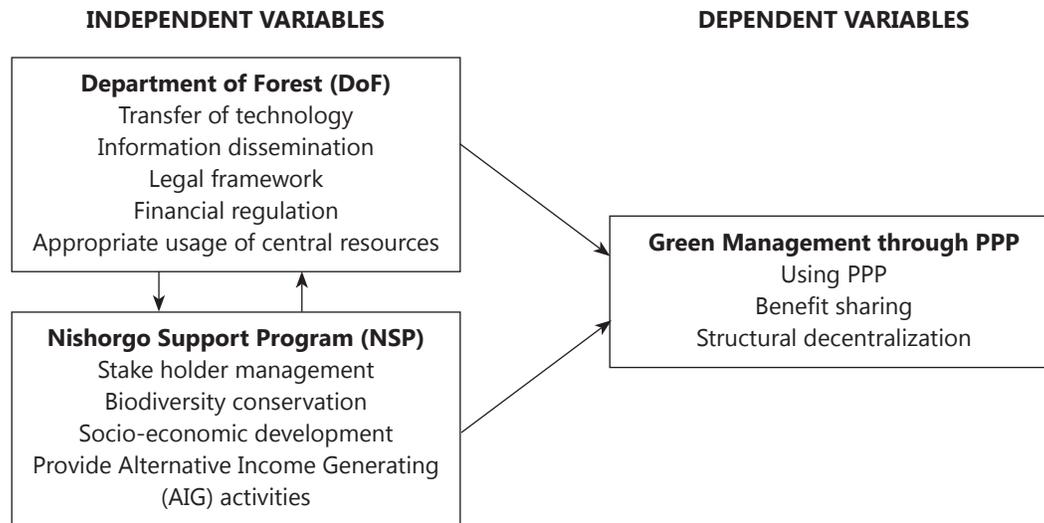


Figure 1. Conceptual framework of the study.

Findings and discussion

Qualitative analysis

Formation of protected area (PA)

This means that every PA has a management plan that guides and controls the management of PA resources, the conservation of biodiversity, the uses of area and the development of Park facilities. This management plan provides development programs with framework activities and guidelines for sustainably managing the Lawachara National Park and its interface landscape. The study found that PPP can make sure adequate protection to the Park for the preservation of its ingredient biodiversity. Main activities carried out to achieve this objective include updating forest cover and interface landscape maps; demarcation of park boundaries and management zones; effective protection through control of illegal felling, forest fires and poaching; forest grazing; and stopping encroachment of the park lands. All the peripheral boundaries of the notified park area were identified, surveyed and marked on the ground to engage the people living there; support has been provided by DoF staff by gainfully associating local stakeholders and NGOs on a co-management principle basis. Forest villagers are particularly helpful in forest protection efforts through joint patrol and intelligence sharing.

Conflict resolution mechanism

A conflict resolution mechanism has been established as part of co-management council/committee because park level conflicts arises due to forest extraction, forest land encroachment, forest land disputes, forest offences, forest grazing and local level politics. In case of organized smuggling an effective checking of tree felling and poaching require concerted efforts from DoF by using modern

equipments, arms and ammunition (guns, revolvers, etc.), and transport facilities to combat organized smugglers and poachers. This also requires setting up special protection force by augmenting the presence of DoF field staff, if necessary backed by Border Guard Bangladesh (BGB) staff. Communication network has been strengthened by installing a radio communication network and by mobilizing more walky-talkies, mobile telephones and vehicles.

Ensuring ecological succession for wildlife conservation

This project implements program introduced to maintain ecological succession in constituent forests by providing effective protection against biotic interference; to develop natural forests and plantations as good habitat favoring wildlife; to conserve the forest resources including the constituent biodiversity; and to establish appropriate co-management methods and practices through stakeholders' consultation and active participation. The long-term management aim of maintaining the maximum possible area under forest cover along with its constituent biodiversity in the best possible condition achieved by zoning the park area and surrounding landscape such that: i) the areas of highest conservation value (forests and/or old plantations) are protected, regenerated and managed towards natural forest composition and structure, particularly in the core zone; and ii) the areas used to provide benefits to local people through sustainable use of forests are defined, and high impact activity areas, mainly as interface landscape zone.

Zoning and sub-zoning for effective habitat management

The core zone has the highest conservation value followed by interface landscape zones which of course are important for biotic

life; these two broad zones are further subdivided into specific sub-zones. All of the total notified area of the park is designated as the core zone, which is sub-divided into 5 sub-zones:

- **Ecosystem sub-zone**

All the well-stocked areas are covered under this sub-zone, where main management objective is to protect and maintain remaining vegetation in good stocking and encourage natural regeneration to gradually bring back natural forests. More than half (57%) of the notified park has been designated as ecosystem management sub-zone covering existing forests/plantations areas with good biodiversity value. Subsidiary silvi-cultural operations are carried out whenever necessary to encourage natural regeneration.

- **Habitat management sub-zone**

This sub-zone is subject to management/manipulation of habitat for key wildlife species through selective management interventions. Habitat improvement works include rehabilitation of degraded areas, enrichment planting of fruit bearing species and palatable grasses, replacement of exotics by gradual canopy opening, maintenance of glades and water holes, soil/water conservation in identified micro-watersheds and eradication of weeds.

- **Sustainable use sub-zone**

Nearly one-quarter of the notified park area is designated as sustainable use sub-zone comprising forests/plantations which can sustainably be used by local people by entering into participatory conservation and benefits sharing agreements. Short and long rotation plantations including those raised under FSP as buffer plantations is managed under benefit sharing agreements. However, these plantations are not clear-felled but instead are managed under selection felling (mainly of exotic species) so that the area can be naturally regenerated to ultimately include over the period in core zone as mixed forests. The traditional use of assigned forests for betel leaf cultivation by forest villagers of Magurchara and Lawachara included in this zone.

- **Village use sub-zone**

The habitations and cultivations with respect to Forest Villages (Magurchara and Lawachara) are included in village use sub-zone. All of the six Tea Estates (Fulbari, Khaichara, Jakchara, Gilachara, Noorjahan and Bharaura) surrounding the Park is typically very important part of the interface landscape zone of Lawachara Park. Some parts of these Tea Estates have so far not been brought under tea cultivation, and have over the period developed as unmanaged secondary vegetation. They provide additional wildlife and plant habitat as a transition.

- **Intensive use sub-zone**

Livelihood programs are taken for landscape development and establish proper linkages with appropriate livelihoods programs and other projects/initiatives that will reduce biotic pressure on forests. Up-scaling of skills are taken up for generating value additions through capacity building of local stakeholders. LDF is used to provide finance for the members of co-management groups and committees, and their federations are encouraged to set up microenterprises,

particularly forests-based, to generate value additions locally. Though several programs have undertaken, maximum respondents (around 84 percent) were partially benefited from the programs due their limited involvement. The benefits from eco-tourism are also ploughed back locally for the development of local communities and the park. Networking with relevant NGOs acting in the landscape zones is established for rendering rural development services to local stakeholders.

Benefit sharing

Different fringe benefits have been initiated to support the park administration during the plan implementation period. Built facilities have been developed at Park HQ including the existing Lawachara Beat Office and BFRI facilities; rest stop/picnic area near Janakichara Nursery; Guard Bhagmara Camp near eastern Park boundary; and Chautali Beat Office. At each location, the design standards for both renovations and new construction are based on sound environmental considerations. Most of respondents (around 81 percent) agreed that the collective program was appropriate for facilitating themselves.

Conservation research activities

Another important program is providing tools/mechanisms for a better understanding of the park and its functions in sustainably managing forests and biodiversity. Keeping in view the funds scarcity for conservation research, appropriate collaboration and networking with relevant Bangladeshi research organizations are maintained. Conservation research includes diverse types of flora and fauna, status of endangered species, wildlife behavior, socioeconomic issues, silvi-cultural aspects, applied biological research, ecological issues, human-animal conflicts, impact of anthropogenic pressures on natural systems, etc. The results/findings of research studies adequately disseminated for their proper utilization by DoF field staff. Research dissemination and usage methods are standardized and circulated among DoF staff. Useful research outputs include in annual development plans of DoF for their field implementation.

Conservation training programs

Cross-country exchange visits and training are also arranged to learn from relevant experiences from similar projects being implemented in different Asian countries under PPP program. A working group is being supported under NSP for preparing and disseminating co-management best practices and lessons learned. Potential organizations for establishing and maintaining professional contacts include FAO (Bangkok office), RECOFTC (Bangkok), ICIMOD (Kathmandu), WII (Dehra Dun), CIFOR (Bogor), etc. There are great necessities of imparting conservation training to the DoF field staff responsible for managing Lawachara Park. Presently they do not have any specialized capacity for imparting PA management training, although adequate forestry training infrastructure has been developed under different donor funded projects. Of many forestry subjects only one paper relates to wildlife management being taught to cadre officers at Forest Academy, Chittagong. Other subordinate DoF staffs do not receive any significant training on PA management, although wildlife management is one of the many taught subjects. There is lack of faculty, particularly conservation at ecosystem and landscape levels by involving stakeholders. Some forest officers have

undergone overseas training on wildlife and PA management but are presently working outside WNCC, thereby underutilizing their expertise. An exhaustive conservation training plan, covering both in-country and overseas training, has been developed under NSP and implemented over the project period.

Quantitative analysis

Around three-fourths (about 79%) of the participating respondents belong to male (Table 1); of them almost all people are between 25 to 45 years old (Table 2). This is because these ranges of people are able to participate in the work involved within the project area. Regarding the occupational engagement, around one-third of the respondents (32%) were engaged in betel leaf cultivation; and next to that who were engaged in lemon and fruits cultivation; all of the women respondents (21%) are homemakers, while others were engaged in fisheries (about 11%), livestock rearing, handloom, poultry, and banana cultivation (Table 3).

Table 1. Gender of the respondents

Types of respondents	Number of respondents	Percentage	Cumulative percentage
Female	12	21.4	21.4
Male	44	78.6	100.0
Total	56	100.0	

Source: Field data

Table 2. Age distribution of the respondents

Age of respondents	Number of respondents	Percentage	Cumulative percentage
25 <age ≤ 35	6	10.7	10.7
35 <age ≤ 45	12	21.4	32.1
age > 45	38	67.9	100.0
Total	56	100.0	

Source: Field data

Table 3. Types of the respondents according to occupational status

Occupational status of the respondents	Number of respondents	Percentage	Cumulative percentage
Betel leaf cultivation	18	32.1	32.1
Lemon & Fruits cultivation	15	26.8	58.9
Hand loom	1	1.8	60.7
Fisheries	6	10.7	71.4
Poultry	1	1.8	73.2
Livestock rearing	2	3.6	76.8
Banana cultivation	1	1.8	78.6
Homemakers	12	21.4	100.0
Total	56	100.0	

Source: Field data

The educational background shows that most of the respondents (66%) were completely illiterate while almost all (97%) rarely completed primary level. After they have participated in the project, the corresponding illiteracy level noticeably declined to 14% (Table 4 & 5).

Table 4. Educational status before participation in the project

Year of schooling of the respondents	Number of respondents	Percentage	Cumulative percentage
0≤	37	66.1	66.1
5	17	30.3	96.4
10	1	1.8	98.2
15≥	1	1.8	100.0
Total	56	100.0	

Source: Field data

Table 5. Educational status after participation in the project

Year of schooling of the respondents	Number of respondents	Percentage	Cumulative percentage
0≤	8	14.3	14.3
5	45	80.3	94.6
10	2	3.6	98.2
15≥	1	1.8	100.0
Total	56	100.0	

Source: Field data

Similarly, in case of income level before participation in the project, around 66% belonged to the income group ranging from BDT 35,000 and 55,000 and the highest income level was BDT 120,000 (around 2%). After participation, the minimum income level rose to BDT 45,000 and corresponding figure from BDT 45,000 to 55,000 decreased to 19% which means after project intervention around 81% people went up to BDT 55,000 above and the highest income level rose from BDT 120,000 to 140,000; whereas those 66% people could enter into income ranging from BDT 45,000 to BDT 65,000 (Table 6 & 7).

Table 6. Income before participation in the project

Income level of the respondents (BDT)	Number of respondents	Percentage	Cumulative percentage
≤35000 to 45000	15	26.8	26.8
45000 to 55000	22	39.3	66.1
55000 to 65000	6	10.7	76.8
65000 to 75000	6	10.7	87.5
80000 to 12000	6	10.7	98.2
120000≥	1	1.8	100
Total	56	100.0	

Source: Field data

Table 7. Income after participation in the project

Income level of the respondents (BDT)	Number of respondents	Percentage	Cumulative percentage
≤45000 to 55000	24	42.8	42.8
55000 to 65000	13	23.2	66.0
65000 to 75000	13	23.2	89.2
75000 to 85000	1	1.8	91.0
85000 to 95000	2	3.6	94.6
95000 to 140000	2	3.6	98.2
140000≥	1	1.8	100
Total	56	100.0	

Source: Field data

In this regard, a significant portion of the respondents believe that their living standard had been changing due to the programs initiated in green preservation.

Almost all respondents somehow depended on NSP AIG project of who around 16% were fully dependent. But most of the respondents believed that the success rate of the project activities is very high (about 81% agreed). Therefore, it can be said that if the rest of the people (around 84%) could be incorporated into the project coverage, the rate of fruitfulness of the project could have been enormous (Table 8 & 9).

Table 8. Extent of dependency on the NSP AIG projects

Pattern of dependency of respondents	Number of respondents	Percentage	Cumulative percentage
Fully	9	16.1	16.1
Partially	47	83.9	100
Total	56	100.0	

Source: Field data

Table 9. Success of DoF-NSP synergic efforts on LNP

Response of respondents	Number of respondents	Percentage	Cumulative percentage
No	11	19.6	19.6
Yes	45	80.4	100
Total	56	100	

Source: Field data

One of the important aspects of the project was that it involved itself in the areas the local people were engaged in to earn their living. Around 18% contribution was in each sector of livestock rearing, fisheries and nursery along with patrol group (about 21%); others involved horticulture (about 9%), handloom and CMC (7% each), and poultry (around 2%) (Table 10).

Table 10. Types of participation in NSP AIG project

Pattern of Participation	Number of respondents	Percentage	Cumulative percentage
Livestock rearing	10	17.9	17.9
Fisheries	10	17.9	35.7
Nursery	10	17.9	53.6
Horticulture	5	8.9	62.5
Hand loom	4	7.1	69.6
Poultry	1	1.8	71.4
Patrol group	12	21.4	92.9
Co-management Councils (CMC)	4	7.1	100.0
Total	56	100.0	

Source: Field data

This type of program intervention has been welcome by the stakeholders. The project was also highly supported by the stakeholders. More than 80% people agreed on the appropriateness of the public private partnerships between DoF and NSP to perform joint activities to run the project (Table 11).

Table 11. Appropriateness of FD-NSP collective approaches

Response of respondents	Number of respondents	Percentage	Cumulative percentage
No	11	19.6	19.6
Yes	45	80.4	100
Total	56	100	

Source: Field data

The project indirectly addressed another area namely hunting behavior of the residents which is a threat to conserve biodiversity in the forest area. Before the project intervention, almost all people were engaged in hunting; of who around 70% fully depended on hunting. However, after the project started its activities by involving local people, around 43% people completely abstained from hunting (Table 12 & 13).

Table 12. Hunting before participation in the project

Response of respondents	Number of respondents	Percentage	Cumulative percentage
Fully	39	69.6	69.6
Partially	17	30.4	100.0
Total	56	100.0	

Source: Field data

Table 13. Hunting after participation in the project

Response of respondents	Number of respondents	Percentage	Cumulative percentage
No hunting	24	42.9	42.9
Partially	32	57.1	100.0
Total	56	100.0	

Source: Field data

Another important factor that prevented locals from remaining abstain from doing detrimental activities to forest biodiversity and green resources is their household saving which was possible because of income generating activities initiated by the project. Before launching the project around 52% people could not save a single coin after mitigating all sorts of household expenses. But after being involve in the project around 64% could afford to save money ranging from BDT 1,000 to 10,000. Different programs have been introduced for generating income of the forest villagers and it is observed that their savings have increased during this period.

Table 14. Savings before participation in the project

Level of savings (BDT)	Number of respondents	Percentage	Cumulative percentage
0≤	29	51.8	51.8
1000 to 3000	2	3.6	55.4
3000 to 5000	20	35.7	91.1
5000 to 10000	3	5.3	96.4
10000≥	2	3.6	100.0
Total	56	100.0	

Source: Field data

Table 15. Savings after participation in the project

Level of savings (BDT)	Number of respondents	Percentage	Cumulative percentage
0≤	19	33.9	33.9
1000 to 3000	1	1.8	35.7
3000 to 5000	11	19.6	55.4
5000 to 10000	21	37.5	92.9
10000≥	4	7.1	100.0
Total	56	100.0	

Source: Field data

Before the initiation of the project people from among stakeholders were self-employed like hunting, collection of resources from the forest as well as their own profession. During their involvement in the project around 29% got full employment and rest of the stakeholders got partial employment (only 1 to 3 months unemployed in all the year round) (Table 16).

Table 16. Unemployment period around the year (in months)

Year of unemployment	Number of respondents	Percentage	Cumulative percentage
0	16	28.6	28.6
1	7	12.5	41.1
2	10	17.9	58.9
3	23	41.1	100.0
Total	56	100.0	

Source: Field data

The study also found that in spite of the project intervention, still some problems are remaining to successfully manage and maintain the task of conservation of biodiversity and green resources at the park area; this mainly because a significant portion of stakeholders (around 16 percent) could not be brought under the project activities. Those challenges mainly involve: illicit feeling of the stakeholders (about 31%); encroachment (around 27%); and disagreement with DoF officials (about 18%); another important problem is land related conflict between the authority and local people (9%) (Table 17).

Table 17. Existing major problems at the forest

Challenges faced by respondents	Number of respondents	Percentage	Cumulative percentage
Illicit feeling	17	30.4	30.4
Encroachment	15	26.8	57.1
Illegal hunting	9	16.1	73.2
Land related conflict	5	8.9	82.1
Disagreement with DoF officials	10	17.9	100.0
Total	56	100.0	

Source: Field data

Concluding remarks and policy recommendations

The study of on PPP and the Natural Resource Management Procedure demonstrate a guide to improve our socio-economic status and bring positive changes without hampering the environment. The

livelihood programs applied in the forest conservation project have provided the necessary essentials to analyze environmental project. It also suggests that the forest conservation project based on 'co-management' approach or broadly PPP or in other forms might not be as harmless as it appears. And the officially declared values, norms, ideas which provide for the governance of such project are perhaps for something else in many cases. Thus one must not be misled in his/her judgment by only focusing on such normative framework of governance apparently based on certain universal values like transparency, participation, accountability etc. To understand the complex dynamics of such project, it is necessary to dig into the intrinsic relationship of the actors to assess who is influencing who and for what reason. Particularly attention is needed to focus on the political and economic interests that bind the actors together within an ideological framework and thus functioning and interacting with each other cutting across both state and non-state levels. NSP (provides a description of the park, an assessment of biodiversity, resources protection and management, human interactions, forest resources use patterns, interface landscape situation, past biodiversity management and practices, etc) with a documentation of main findings and issues. PPP should be based on a co-management approach comprising:

- i) Protection and conservation of all remaining ecosystems including natural forests and constituent biodiversity in the park;
- ii) Conversion of monocultures of exotic tree species into natural and manmade regeneration of indigenous species by gradually opening the canopy;
- iii) Identification of interface landscape and development of co-management agreements (and linking PA conservation with benefit sharing arrangements) with key stakeholders to reduce ongoing habitat damage by helping them achieve sustainable livelihoods through participatory forest use and alternative income generation activities; and
- iv) Provision of support to better administration and management of the park including capacity development, infrastructure, training, and wider extension and communication.

It is important to have sufficient flexibility needed for making required modifications and adjustments to management activities within the limits set by overall goals and objectives. Hence, although five year schedules of activities and inputs are presented, it is recommended that needed changes in timing, inputs and outputs will be reflected in annual work plans to be prepared by park managers every year. The strategic programs and priorities (comprises prescriptions for future development and management of the park with detailed guidelines) for a sustainable National Park. The plan, as a guide to development interventions, will be useful for the PA managers, planners, decision-makers, researchers, donors and other stakeholders including local forests dependent communities. The scope, timing and relative emphasis on specific activities may be modified by the park managers on the basis of experience, success and progress as the plan is implemented. The overall levels of inputs indicated under each activity will be maintained to the extent possible in order to ensure reasonable success in management implementation.

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