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**IDENTIFICATION OF KEY COMPONENTS OF PAYMENT FOR ECOSYSTEM SERVICES (PES) MECHANISM IN BEGNAS LAKE WATERSHED OF POKHARA-LEKHNATH METROPOLITAN CITY, NEPAL**

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**ABSTRACT**

Payment for Ecosystem Service (PES) scheme for certain ecosystem services is being used as a mechanism to provide incentive to suppliers of the services by the beneficiaries. In Nepal, PES like schemes is in practice since a long time, though the discussions on formal PES schemes have recently been started. This study has been carried out at Begnas Lake Watershed (BWS), a Ramsar site, at Pokhara-Lekhnath Metropolitan of Nepal. It aims to understand the perception of local residents towards the implementation of PES scheme in BWS. Furthermore, it also identifies key actors for PES implementation at BWS, their role in PES design and implementation as well as potential payment mechanism for the ecosystem services within the PES scheme at BWS. Finally, institutional structure for PES design and implementation is also presented. The study finds positive perception of local people towards initiating payment mechanism for the use of ecosystem services to ensure environmental conservation and sustainable management of the resources. Both upstream and downstream population favors mix of public/private PES scheme while upstream population favors cash-payment type scheme and downstream population favors the capacity building of upstream communities in conservation efforts. It is also noted that upstream people favor input-based mode of payment and downstream people are inclined towards output-based payments. The study found some 'PES-like' practices operational in the watershed. The study recommends the formation of 'Begnas Watershed PES Advisory and Coordination Committee' with due participation of identified stakeholders to initiate and institutionalize formal PES mechanism at BWS.

**Keywords:** Begnas Lake Watershed, Payment for Ecosystem Services, Stakeholders, ecosystem services

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## INTRODUCTION

With the increase in population, growing demand of ecosystem services and less efforts in conservation have led to a swirl of conservation innovations over the past decade in the form of various types of payment schemes (Wunder, 2007). Various payment schemes have been linked extensively to the provision of specific ecosystem services which resembles the concept of Payment for Ecosystem Services (PES) (Ferraro & Kiss, 2002; Wunder, 2007). PES occurs when the beneficiaries or users of an ecosystem service make payments to the providers of that service. In practice, PES takes the timely form of payments to suppliers for using various types of ecosystem services. The basic idea is that whoever provides a service should be paid for doing so (Fripp, 2014). PES has come to conservation front in the past decade as a possible solution to address environmental problems and ecosystem restoration. PES is a relatively new cooperative tool for environmental protection, it is important if used carefully (UN, 2014).

In context of Nepal, various forms of payment mechanisms exist for ecosystem services like drinking water, irrigation and tourism. But these are not the formal PES mechanisms because of lack of key elements of PES. In actual practice, the service providers do not receive payment for management of services. There is potential of localized PES schemes for sustainable management of resources in Nepal (IUCN, 2013). However, there lacks the clear provision within the policy, acts, rules, regulations and guidelines to institutionalize PES and benefit sharing. Awareness and empowerment of local communities is mandatory to end the situation of managers of services remain suffered and free riders getting the benefit. PES mechanism can play a significant role to improve livelihood of people and enhance biodiversity conservation (Kunwar, 2008).

Designing mechanisms for PES help to motivate individuals and communities to take actions that increase or maintain the provision of ecosystem services. As nature provides the services, it is not clear whom to pay but creating mechanisms or institutions for payment provide motivation for those who conserve the ecosystem. It can help to fulfill the goal of both conservation and sustained use of environmental services in a win-win scenario for both buyers and sellers.

This study intends to outline the perception of local residents towards PES mechanism for sustainable conservation of watershed along with perception towards potential approach and mode of payment in Begnas Lake Watershed in Pokhara-Lekhnath Metropolitan city of Nepal. It also identifies key actors of PES mechanism along with existing payment schemes.

Furthermore, this study outlines potential payment modality and role of identified stakeholders in the formal PES scheme to be implemented. Finally, the institutional structure of the PES scheme for the Begnas Lake Watershed is also designed.

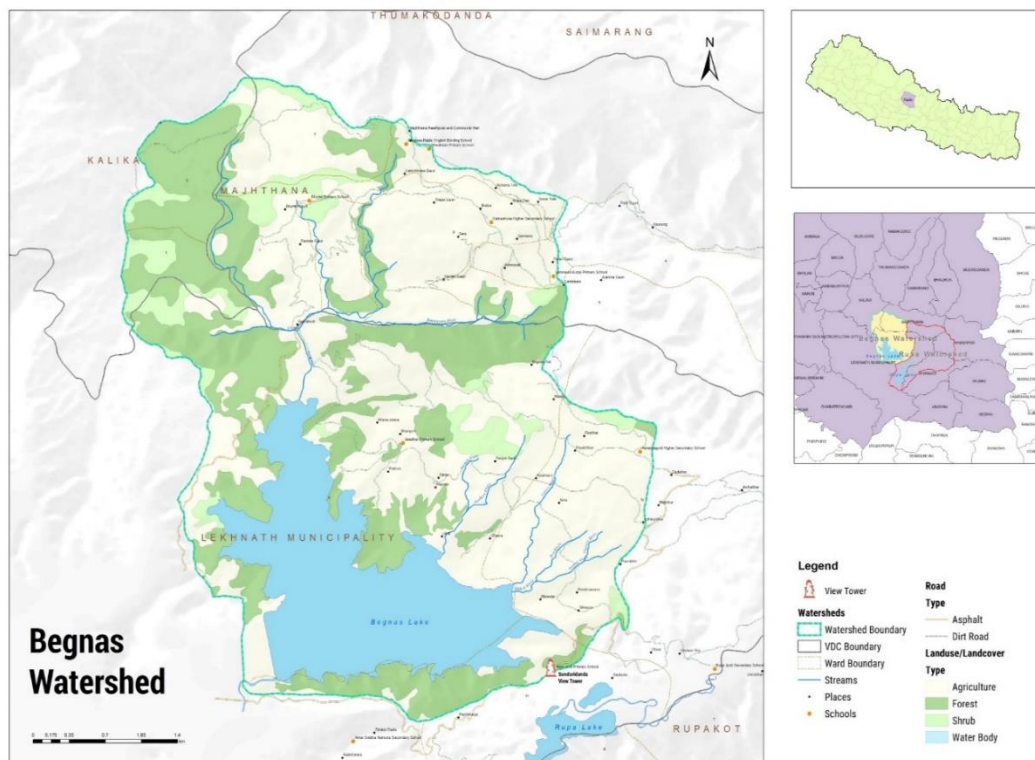
## **MATERIALS AND METHODS**

### **Description of the study site**

Begnas Lake is a freshwater lake situated in the Pokhara-Lekhnath Metropolitan of Kaski district in Nepal. It extends between 28° 7' N to 28°12' N latitude and 84°5' E to 84°10' E longitudes. The average depth of water in the lake is estimated to be 6.6 m with the water surface elevation 655.7 m abmsl (NLCDC, 2010). Begnas Lake is an eutrophic fresh water lake with total catchment area of 18.7 square km. The water body of the lake is 3.27 square km (373 ha) including the shallow areas i.e. the marsh fields towards west, north and east. However, the estimated land area of the watershed is 4,504 ha (Oli, 1996).

Begnas is the second largest lake of Pokhara valley after Phewa Lake in Nepal. It was designated as the Ramsar site on 2<sup>nd</sup> February 2016 along with other lake clusters of Pokhara valley (Ramsar, 2016). Begnas Lake Watershed (BWS) is undergoing various developmental pressures; mainly the urbanization which can be perceived as the major threat to sustainable environmental management. Drastic changes in the land use practices; conversion of cultivable land into residential areas and rapid increase in commercial areas have created significant impact on the environmental aspects of the watershed. Begnas Lake and its watershed area along with nearby Rupa Lake is a famous tourism site with large inflow of both domestic and international tourists.

A seasonal monsoon stream Syankhudi Khola is the major inlet stream to the lake. Small seasonal streams namely Lipdi, Maladi, Majhikuna are the other supporting inlet to the Begnas Lake. The outlet stream is Khudi Khola. Begnas Lake supports livelihood of large number of households and watershed area is extensively developed for domestic and international tourism. Moreover, Begnas Lake holds importance from the point of boating, trekking, bird watching and other eco touristic activities. Downstream population and people around Begnas Lake are directly dependent on the ecosystem services of the lake.



**Figure 1 Geographical location of the study site**

(Source: Adopted from Li-Bird, 2016)

## Research Methodology

The study used both qualitative and quantitative mode of enquiry. The research proceeded with identification of spatial and temporal context of the study site, identification of sampling frame, determination of sample size and identification of concerned business, governmental, nongovernmental organizations and concerned communities either as a producer, consumer of ecosystem services or involved in environmental conservation activities at the study site. Qualitative tools for the study included Observation, household surveys, Key Informant Interviews (KII), Focus Group Discussion (FGD) and desk research. The identification of location for household survey was done with consultation with experts and local environment activists. Sundari Danda, Bhanjyang-Panchbhaiya, Majhikuna and Lamichhane gaun at Majhthana were the places selected for household survey at upstream community whereas household survey at downstream community was carried out at Piple, Sisuiwa and Gagangauda areas. The rationale for selection of these places is that these places at upstream are well known for community forestry management practices and the selected places at downstream are the major users of ecosystem services either fishery, boating, irrigation or tourism. A total of 500 households representing upstream and downstream were surveyed. Focused Group Discussions (FGD) and Key Informant Interviews (KII) were carried out with

various stakeholder to identify the current payment mechanisms, their perceptions towards PES and their potential role in the formal PES mechanisms. Households from upstream community and downstream community were sampled using Strategic sampling procedure of Purposive sampling method. The major advantage of using purposive sampling is that the samples were identified under certain conditions to be assured they are the reliable sources of information, and a small sample size would be reliable to make generalization of the study. Special attention was given that sampled population includes beneficiaries of community forests, beneficiary groups like fishermen, boaters, hotel owners, other tourism entrepreneurs, farmers and other land users. The households were considered eligible for the sample under following assigned criteria:

- Residing at the study area atleast for five years.
- Household head must be atleast 30 years of age.
- Must have general knowledge about the environment and natural resources of the study area.
- A member of community forest user group (CFUG) for upstream.
- Involved in boating, fishing, irrigation, tourism or the beneficiary any other ecosystem services for the downstream.

Various institutions/organizations were also consulted for the purpose of the study. Following are the institutions consulted:

**Table 1 Organizations consulted for the study**

S.No.	Organizations	Rationale
1	Begnas and Rupa Tourism Promotion Committee	Major user of Ecosystem Services
2	Begnas Taal Boat Entrepreneurs Association	Major user of Ecosystem Services
3	District Agriculture Development Office	Major user of Ecosystem Services
4	District Forest Office, Kaski	Concerned stakeholder
5	Fish Entrepreneurs Association, Begnas Taal	Concerned stakeholder
6	Hotel and Restaurant Association, Lekhnath	Major user of Ecosystem Services
7	Ilaka Forest Office, Sisuwa	Concerned stakeholder
8	Irrigation Development Division, Kaski	Concerned stakeholder
9	LI-BIRD, Pokhara	NGO working in BWS environmental aspects of Begnas and Rupa Lake
10	SEED Foundation, Panchbhaiya	NGO working in BWS environmental aspects of Begnas and Rupa Lake
11	Ward Office, PL Metropolitan 30 & 32	Concerned stakeholder
12	Water User Association, Begnas	Major user of Ecosystem Services



Focus Group Discussion and Key Informant Interviews were conducted among the people representing various fields like business, leading farmer, local politician etc. to gather overall information regarding the availability of ecosystem services, tradable and consumptive ecosystem services and gather understanding on key components and general perception towards PES scheme. FGD was carried out using a semi structured checklist.

## **RESULTS AND DISCUSSION**

### **Respondent's perception on PES**

#### **Perception for activities of upstream people affecting flow of Ecosystem Services**

80% of upstream respondents and 60% of downstream respondents reported that they believe activities of upstream people effects the availability of ecosystem services to downstream people. However, 13.33% of upstream respondents and 16.67% of downstream respondents didn't believe on activities of upstream people affecting flow of ecosystem services. 6.67% of upstream people and 23.33% of downstream people replied that they had no idea about it.

**Table 2 Respondents' perception on activities of upstream people on flow of ES**

S.No.	Perception	Upstream	Downstream
		% Of respondents	% Of respondents
1	It affects	80.00	60.00
2	It does not affect	13.33	16.67
3	Don't know	6.67	23.33
	Total	100	100

(Source: Field study, 2020)

#### **Perception on paying and receiving compensation for use of Ecosystem Services**

73.33% of upstream respondents believe that downstream should pay compensation for their contribution on preserving ecosystem while 16.67% replied that they don't need any such compensation. However, 10% of respondents didn't have idea about it. Regarding downstream respondents, 70% of them are ready to pay compensation for upstream people. 20% aren't willing to pay whereas 10% didn't have any idea whether to provide compensation or not.

**Table 3 Perception on paying and receiving compensation**

S.No.	Perception	Upstream (Receive)	Downstream (Pay)
		% of respondents	% of respondents
1	Yes	73.33	70.00
2	No	16.67	20.00

3	Don't know	10.00	10.00
	Total	100	100

(Source: Field study, 2020)

### Perception on role of PES for sustainable management of watershed resources

Majority of respondents believe that implementation of PES scheme could enhance sustainable management and conservation of watershed resources. 76.67% of upstream respondents and 63.33% of downstream respondents believed that PES could enhance conservation. However, 13.33% of upstream respondents and 23.33% didn't believe role of PES in sustainable conservation and management. Meanwhile 10% of upstream respondents and 13.33% of downstream respondents had no idea on it.

**Table 4 Role of PES on conservation and sustainable management**

S.No.	Perception	Upstream	Downstream
		% of respondents	% of respondents
1	PES is needed for sustainable management of lake ecosystem	76.67	63.33
2	PES is not needed for sustainable management of lake ecosystem	13.33	23.33
3	Don't know	10.00	13.33
	Total	100	100

(Source: Field study, 2020)

### Perception on type of appropriate PES scheme

After elaborating the respondents about types of PES schemes i.e., public, private or public-private; most of the respondents favored public/private scheme. 66.67% upstream respondents and 70% downstream respondents chose public/private scheme. 23.33% upstream respondents and 13.33% downstream respondents favored private scheme whereas 10% upstream respondents and 16.67% downstream respondents favored public PES scheme.

**Table 5 Respondents' perception on type of payment scheme**

S.No.	Perception	Upstream	Downstream
		% of respondents	% of respondents
1	Public	10.00	16.67
2	Private	23.33	13.33
3	Public-Private	66.67	70.00
	Total	100	100

(Source: Field study, 2020)

### Respondents' perception on approach of payment

When asked what the approach of payment could be, half of upstream respondents reported that cash payment from the downstream people would be appropriate. However, 23.33% reported that downstream people should help in building capacity for upstream people, while 10% believed that downstream people should help in infrastructure development as compensation of using ecosystem services. However, 16.67% were willing to pay for lake management. Regarding downstream respondents, majority of respondents chose to pay for capacity building of upstream people (33.33%). Other chose infrastructure development of upstream (26.67%), cash payment (26.67%) and lake management (13.33%).

**Table 6 Respondents' perception on payment approach**

S.No	Payment approach	Upstream	Downstream
		% of respondents	% of respondents
1	Cash payment	50.00	26.67
2	Capacity building	23.33	33.33
3	Infrastructure development	10.00	26.67
4	Lake management	16.67	13.33
	Total	100	100

(Source: Field study, 2020)

### Respondents' perception on mode of payment

Majority of upstream respondents (63.33%) stated in favor of Input based payment i.e., payment for the process or initiatives of upstream conservation rather than the payment for benefit generated due to conservation attempts or investments. However, 36.67% of upstream respondents favored for output-based payment. But majority of downstream respondents i.e. 73.33% favored Output based payment scheme although 23.67% went for input based payment scheme.

**Table 7 Respondents' perception on mode of payment**

S.No.	Mode of payment	Upstream	Downstream
		% of respondents	% of respondents
1	Output-based	36.67	73.33
2	Input-based	63.33	23.67
	Total	100	100

(Source: Field study, 2020)

### Respondents' perception on who should pay

13.33% of upstream respondents stated that tourism entrepreneurs should be made liable for payment, same percentage of respondents believed District Development Committee (DDC) should pay. Only 6.67% stated fishermen should pay whereas 13.33% believed downstream farmers should pay and majority, 53.33% believed all of them should be made liable for payment. Considering downstream respondents, 30% of respondents reported tourism entrepreneurs should be made liable for payment whereas same 13.33% percentage stated DDC and farmers are to be made liable. 16.67% stated payment to be made from fishermen and 26.67% believed all of them should pay.

**Table 8 Respondents' perception on who should pay**

S.No.	Who should pay	Upstream	Downstream
		% of respondents	% of respondents
1	Tourism entrepreneur	13.33	30.00
2	District Development Committee	13.33	13.33
3	Farmers	13.33	13.33
4	Fishermen	6.67	16.67
5	All of them	53.33	26.67
	Total	100	100

(Source: Field study, 2020)

### Perception on condition for payment to upstream

When asked to downstream respondents about what upstream people should do to ensure regular flow of ES so that payment could be made, 13.33% replied that forest conservation should be the major condition. Very few, 6.67% replied that upstream should assure managed urbanization whereas 10% stated that upstream should assure about sustainable land use practices. Same 10% stressed on sustainable agricultural practices, 3.33% reported that pollution minimization should be major condition whereas 10% favored for conservation of water bodies as the major condition. However, almost half of the respondents i.e., 46.67% reported that all these factors should be the condition of regular flow of ES to downstream people.

**Table 9 Downstream respondents' perception on conditions for payment**

S.No.	Conditions	Downstream
		% of respondents
1	Forests conservation	13.33



2	Managed urbanization	6.67
3	Sustainable land use practices	10.00
4	Sustainable agricultural practices	10.00
5	Pollution minimization	3.33
6	Conservation of water bodies	10.00
7	All of above	46.67
	Total	100

(Source: Field survey, 2020)

### Key PES actors

#### Sellers/suppliers

To develop PES scheme, Sellers/suppliers are the crucial actors whose actions generate ecosystem services or they simply are in the position to ensure and safeguard regular flow of ecosystem services. Generally, land users, individual farmers, community groups, government agencies, and even private companies are sellers of ES (Jindal and Kerr, 2007). In context of BWS, upstream area is the major supplier of ES. Land user and farmers whose land use and agricultural practices impact soil erosion, flooding, water purification, sediment and soil retention are the major suppliers of ecosystem services. Community forests and user groups, owner of private forests, orchards and garden owners are other important suppliers of prioritized ecosystem services like irrigation in downstream, erosion control, carbon sequestration, water recharge and discharge, habitat for wildlife and availability of water, sedimentation control and nutrient retention at Begnas Lake. Furthermore, community organizations and local government bodies working for local conservation attempts and environment friendly development initiatives like road construction are also suppliers of ecosystem services.

#### Buyer/Beneficiaries

The development of PES scheme would be waste of time and resource without the identification of buyers of certain ecosystem services (ES). Buyers may directly consume or get benefited from the ecosystem service or may be indirectly benefiting from certain service, so clear identification of buyers of ES is crucial. In case of BWS, tourists and associated tourism entrepreneurs are the major buyers of ES of Begnas Lake. There are 165 hotels and restaurants in or around Begnas along with around 200 tea shops. Furthermore, the travel and tour operators selling Begnas packages are other major buyers. The serenity of the Lake is

major tourist attraction whose beauty depends on rate of erosion and nutrient flow from upstream area. Fishermen and farmers are the potential buyers of fishing and irrigation services. Livelihood of 42 Jalari families is directly dependent on wetland resources, 5000 farmers downstream are beneficiaries of Begnas irrigation system. Begnas Lake Boat Entrepreneurs' Committee (BBEC) is another buyer of ES. Nepal Electricity Authority (NEA) could be the potential buyer of electricity generated from Begnas Lake. Three types of service users i.e., beneficiaries could be identified in BWS. First group are the immediate final users like fishermen or farmers who use water resources for fishing or irrigation. Second group is the business group, like Begnas Lake Boat Entrepreneurs' Committee, Lekhnath Hotel and Restaurant Association or Nepal Electricity Authority. And the third as well as important indirect beneficiary is the government or local authorities. For instance, municipality levying tax on hotels and restaurant and District Development Committee (DDC) collecting tax from boaters or fishermen's association and central government collecting visa fee from the tourists.

### **Intermediaries**

Intermediaries serve as agents linking buyers and sellers and helps with scheme design and implementation. They help users and suppliers set up successful PES transactions. The potential intermediaries range from individuals, groups, NGOs, local governments, donors to private companies. They play the role of linking the service users and suppliers and taking lead over the implementation of the PES program (Jindal and Kerr, 2007). They help in building rapport between buyers and sellers and third-party monitoring of overall PES mechanism. In context of BWS local NGOs working could take a lead as intermediary. A Pokhara based NGO called LI-BIRD working in BWS since many years has recently taken a lead to establish PES like basket fund for watershed conservation. Local government could also act as intermediary to link upstream and downstream. The concerned ward officials could take a lead. The governmental departments and line agencies like District Forest Office (DFO), District Agriculture Development Office (DADO), District Irrigation Development Office (DIDO), District Soil Conservation and Watershed management (DSCWM) offices who are connected with both upstream and downstream people could act as an independent third man in design and monitoring of PES mechanism.

### **Knowledge providers**

Knowledge providers are essential to provide ideas and technical assistance regarding scheme development and implementation. They ensure the PES scheme designed is appropriate and

viable. They provide advice on appropriate management practices to service providers and steps to be taken to secure long term provision of ES for trade in PES mechanisms. Knowledge providers generally includes valuation experts, land use planners, resource management experts, regulators and business and legal advises to assure PES contract abides by the national laws and regulations. In context of BWS, local NGO LI-BIRD could be a primary knowledge provider regarding PES concerning it has initiated to develop basket fund for conservation linking service users and suppliers. Similarly other NGOs and INGOs like WWF, IUCN, Natioanal Trust for Nature Conservation (NTNC) who have worked for PES at other places could extend their help here. Various institutions like Agriculture and Forestry University (AFU), Fishery Research Centre, Begnas, Regional agriculture research Station, Lumle, Regional Irrigation Directorate, Pokhara, Regional Irrigation Directorate, Pokhara and other bodies like DFO, DADO, DIDO, FECOFUN, DSCWM could also extend knowledge support in PES scheme development in BWS.

**Table 10 Key PES actors in BWS**

Sellers/suppliers of ES	Buyers/ Beneficiaries of ES	Intermediaries	Knowledge providers
<ul style="list-style-type: none"> <li>Community forest User groups</li> <li>Private land owners</li> <li>Government as public land owners</li> <li>Farmers in the upstream</li> <li>Fruit orchid owners, coffee farmers and private forest owners</li> <li>Community organizations and groups working for environmental conservation in upstream</li> <li>Local government agencies working for conservation of upstream ecosystem</li> </ul>	<ul style="list-style-type: none"> <li>Begnas Lake Fish Entrepreneurs' Association (BFEA)</li> <li>Begnas Lake Boat Entrepreneurs' Committee (BBEC)</li> <li>Water User Association (BIS)</li> <li>Lekhnath Hotel and Restaurants Association</li> <li>Begnas Rupa Tourism Promotion Committee</li> <li>Pokhara-Lekhnath Chamber of commerce and industry</li> <li>Travel agencies selling Begnas Packages</li> <li>National and International tourists</li> <li>Nepal Electricity Authority (NEA)</li> <li>Small tea shop owners</li> </ul>	<ul style="list-style-type: none"> <li>District Development Committee, Kaski</li> <li>Pokhara-Lekhnath Municipality (ward 29, 30, 31, 32)</li> <li>Madi village council (Gau palika)</li> <li>Nepal government</li> <li>District Forest Office (DFO)</li> <li>District Agriculture Development Office (DADO)</li> <li>District Irrigation Development Office (DIDO)</li> <li>Federation of Community Forestry User Groups Nepal (FECOFUN)</li> <li>Department of Soil Conservation and Watershed Management (DSCWM)</li> <li>Department of road</li> <li>Fishery Research Centre, Begnas</li> <li>Regional agriculture directorate, Pokhara</li> <li>Regional Irrigation</li> </ul>	<ul style="list-style-type: none"> <li>LI-BIRD, Pokhara</li> <li>SEED Foundation, Panchbhaiya</li> <li>NGOS &amp; INGOS (WWF, IUCN, NTNC etc.)</li> <li>District Forest Office (DFO)</li> <li>District Agriculture Development Office (DADO)</li> <li>District Irrigation Development Office (DIDO)</li> <li>Federation of Community Forestry User Groups Nepal (FECOFUN)</li> <li>Department of Soil Conservation and Watershed Management (DSCWM)</li> <li>Department of road</li> <li>Fishery Research Centre, Begnas</li> <li>Regional agriculture directorate, Pokhara</li> <li>Regional Irrigation</li> </ul>

	<p>and street vendors around Begnas Lake</p> <ul style="list-style-type: none"> <li>• Downstream farmers</li> <li>• Land owners downstream</li> <li>• Local government bodies earning revenue from tourism and related enterprises</li> <li>• Researcher and explorers</li> </ul>	<ul style="list-style-type: none"> <li>• Department of Soial Conservation and Watershed Management (DSCWM)</li> </ul>	<p>directorate, Pokhara</p> <ul style="list-style-type: none"> <li>• Regional agriculture research Station, Lumle</li> <li>• Agriculture and Forestry University</li> <li>• Institute of Forestry, Tribhuvan University</li> <li>• Business and legal advisers</li> <li>• Academicians and researchers</li> <li>• National College, Kathmandu University</li> </ul>
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(Source: Field study, 2020)

### Existing PES mechanism in BWS

There is no formal PES mechanism in existence in BWS. However, it was found that stakeholders have been investing in Begnas Lake management activities every year. As reported by Jhalak Jalari, president of Benas Fish Entrepreneurs Association (BFEA) around 10% of annual income of annual profit is invested in lake management which includes cleanliness campaigns, removing noxious weeds including Jal khumbhi (*Pistia stratiotes*) and donation to road construction activities. The income from royalty through sell of fish i.e., NRS 5 per kg from the fishermen is collected and invested in lake management activities. Dhaknath Kandel, president of Begnas Boaters Entrepreneurs Committee (BBEC) also reported that BBEC also regularly invests in lake cleanliness and weed removal. BBEC, BFEA, Lekhnath Hotel and Restaurant Association, local government bodies and other line agencies invest in organizing Fish festival in Begnas Lake; usually in the month of Falgun (February - March). Certain percentage of profit of Fish festival is used in lake management. Recently, LI-BIRD, an NGO working in BWS has initiated the development of basket fund for watershed conservation. Established in September 2016, 'Begnas Lake Conservation Fund' is in due process of registration and supposed to work under Local Self Governance Act, and Local Self Governance Regulations. LI-BIRD has prepared Begnas Lake Conservation Fund Management Guidelines and has proposed among stakeholders. This fund would be managed by a committee formed among stakeholders after extensive discussion among them. The major aim of fund is proposed to be ecosystem conservation, biodiversity and lake conservation, construction of environment friendly infrastructures, forest conservation, promote local skills on organic farming, environment friendly agricultural



practices, bioengineering activities and construction of water sports infrastructure. The proposed potential funding source of fund is donations from INGO/INGOS, income from festivals and celebrations, amount collected from beneficiaries like BBEC, BFEA, Hotel and Restaurants Associations, Community forests, local government bodies and other beneficiaries. Regarding, working mechanism, the management committee would receive applications from local groups or organizations and funds would be provided after detailed examination with due priority for proposals from upstream, contributing to lake conservation and intended on uplifting livelihood skills on wetland dependent minority groups (LI-BIRD, 2016a). However, evaluating the funding mechanism, working guidelines and investing criteria and process, the initiative couldn't be termed as PES mechanism as there is no compulsory provision of payment by beneficiaries; it is a 'PES like' mechanism.

### Potential Payment mechanism for ES of BWS

Various payment mechanisms can be adopted in BWS for payment of its major ecosystem services. The common mechanism could be entrance fee, service charge, use fee, permit fee and channelizing the portion of royalty regenerated from sale of services for conservation activities and ecosystem management.

**Table 11 Payment mechanism for major ES**

Major ES	Payment mechanism
Recreation and Ecotourism	Entrance fee, Service fee and taxes, Use fee
Erosion control (Soil, sediment and nutrient retention)	Mutually agreed channel, additional charge on govt. taxes and investment on upstream
Fishing and irrigation	Water use fee, Additional charge and permit fee for fishing
Ground water recharge and discharge	Portion of royalty generated from water distribution, individual annual payment for lake management and conservation
Habitat for wildlife (Biodiversity conservation)	National and international grants for conservation, trade of tradable species, people's WTP for conservation
Carbon sequestration	International payment based on capacity building or infrastructure or livelihood development based on international accepted market price for carbon sequestration

(Source: Field visit, 2020)

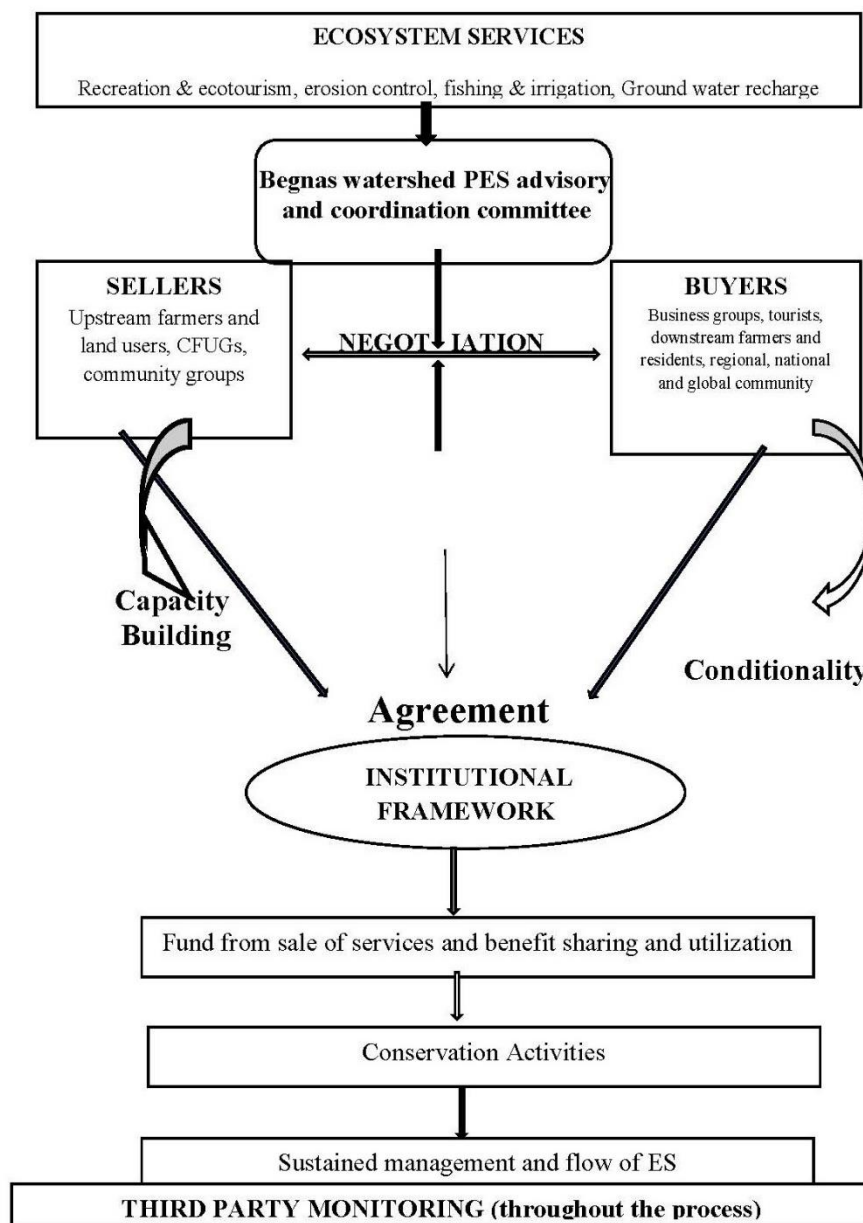
### Roles of key stakeholders in PES

Discussion with various service users, suppliers, entrepreneurs' groups, government line agencies, local government body, non-governmental organizations, community organizations through focus group discussion, key informant interview and stakeholder consultation helped

to generalize the potential roles of key stakeholders in PES process to be designed and implemented in BWS. District Development Committee can take a lead to implement/initiate PES in BWS with due consultation with other stakeholders and provide technical support in designing working mechanism of PES with due monitoring activities all the way. Government line agencies (DFO, DADO, DDO, DSWCO, Nepal Tourism Board (NTB), could help design PES scheme along with its organizational structure and funding mechanism through their input in particular ES. They can provide technical and material support to build up capacity of sellers in restoring ES and ensuring efficient flow of ES.

NGOs/INGOs can also play a significant role. As LI-BIRD has initiated a 'PES-like' scheme by establishing conservation fund in BWS, similar type of assistance could be provided by other INGOs like WWF, IUCN, NTNC etc. who have experience and expertise in designing and implementing PES in other areas. However, their key roles could be raising awareness about importance of PES, provide technical and material support and help in monitoring. As local government body, Pokhara-Lekhnath Metropolitan, village councils and concerned wards can provide consent on proposals about PES implementation in BWS and also provide legal consent to collect any type of service fee, collect and invest funds legally and help to resolve any conflicts arising in the process. They themselves can design and implement PES mechanism through legal measures. As a key party in PES scheme in BWS, service providers like Community Forestry User Groups (CSUG), land users, farmers or community groups should involve in negotiation process and show their commitment in ecosystem conservation and show their capacity in doing so. They should commit for proper fund investment. As a major service user groups, BFEA, BBEA, Water User Association (WUA), downstream farmers and downstream residents; their key roles include their commitment in payment for use services in a timely basis, involve in negotiation process as well as help in conserving ecosystem of upstream through constructive suggestions and participate in monitoring of PES fund mobilization. Local political parties could advocate for payment mechanism or influence their elected local representative to initiate such kind of scheme. Moreover, community groups and networks might assist help in capacity building and monitoring. Local leaders of political parties could build consensus among people for need and implementation of PES scheme and mediate any conflicts arising in the process.

## Institutional structure for PES implementation



**Figure 2 Institutional mechanism for PES implementation**

The suggested institutional structure for PES in BWS is sketched in figure below. The advisory and coordination committee should be formed including the representatives of major concerned government line agencies and local government agencies like DFO, DADO, DIDO, DSCWM, Metropolitan, wards etc. This committee should initiate and coordinate the overall process including the buyers, sellers and other intermediaries. The buyers and sellers should be made to come to a common platform for negotiation. NGO/INGOs, private sector, legal advisors and PES experts should act as intermediary and provide knowledge for effective negotiation and implementation of PES scheme. This should lead to a creation of

institutional mechanism for PES implementation. A third-party monitoring through individual group is suggested to monitor the effectiveness and efficiency of the PES scheme. The capacity building of the sellers or suppliers and conditionality by buyers remains crux of effectiveness of mechanism.

## **CONCLUSION**

There are various entrepreneurs' group in Begnas Lake area that are making notable income from the ecosystem services of BWS. Particularly, Begnas Fish Entrepreneurs' Association, Begnas Boat Entrepreneurs' Committee, Water User Association of Begnas Irrigation System (BIS), Lekhnath Hotel and Restaurants Association, Various travel agencies, small street vendors around Begnas Lake and tourists visiting the lake are the direct beneficiaries of ES services of BWS. They depend on boating, fishing, tourism entrepreneurship, which is primarily derived from the water regulation and recreational services of Begnas Lake i.e., BWS. So, they should be liable to pay the suppliers of those services i.e., the upstream land users, farmers and conservationists. Moreover, all the downstream residents of the watershed are beneficiaries of ES of watershed. But these beneficiaries are playing negligible role in watershed conservation. Their role is limited to conducting some sorts of Begnas Lake cleanliness campaigns and organizing Begnas Fish Festival. The major actors who are trading off some cost for generating the flow of ES are not getting the returns for their efforts. For this, development of PES mechanism would be best practice to ensure sustainable management and conservation of watershed as well as upliftment of livelihood of upstream people.

The consultation with major stakeholders revealed that they are ready to work for the environment conservation in the watershed. The portion of their income can be invested for conservational activities as well as to fund developmental initiatives in the upstream. Moreover, all the surveyed respondents, as a beneficiary of various ES are willing to pay for the sustainable management and conservation of the watershed. But there lacks the formal mechanism for sustainable financing the conservation activities and channelizing the fund collected from entrepreneur groups and other beneficiaries. For this, development of PES mechanism could be the best option. A Pokhara based NGO has initiated development of PES like scheme where various stakeholders have committed some amount on to-be-established basket fund for BWS conservation, called as 'Begnas Conservation Fund'. But lack of proper leadership and lack of binding mechanism to bind beneficiaries into the payment scheme would be obstacles to achieve the goal of such initiatives. So, various governmental agencies like DFO, DDO, DADO, locally elected peoples' representatives on



wards and Pokhara-Lekhnath Metropolitan who could act as intermediary and other NGOs/INGOs who have played vital role in development of PES schemes in other places should take a lead to establish sustainable financing mechanism for watershed conservation through development of PES mechanism. For this in initial stage, these stakeholders could form a 'Begnash Watershed PES advisory and Coordination Committee', make strategies, and bring upstream and downstream communities, entrepreneurs' groups and other beneficiaries into the payment mechanism.

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