

Management by objectives: the Puerto Princesa Underground River, Palawan Philippines

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Abstract. Puerto Princesa Underground River (PPUR) was proclaimed as national park in 1971 and included in the seven wonders of nature in 2012. It is located in the West coast of Palawan Philippines and north of Puerto Princesa City, Palawan Philippines. The underground river is the longest navigable river with a unique karst environment, home for endangered and endemic flora and fauna is a must see destination for tourists. Its management is unique, since it is managed by the city government and the Protected Area Management Board. The objective of this study is to describe and assess the activities done by the management in terms of its objectives as national park which is divided into three categories as; primary (genetic diversity, environmental services and tourism and recreation), secondary (scientific researches, Wilderness protection, and natural features and education) and tertiary (sustainable use). Documentary analysis, actual site immersion, interviews and focal group discussion were employed to gather pertinent data for this study. Result showed that the unique management of PPUR had done several activities in consonance with its objectives as national park. Activities done is geared on keeping the balance between community-driven protection and conservation of the park's ecological integrity, its Outstanding Universal Value, and inclusive development through Transformative Tourism activities. Community empowerment had transformed the lives of residents in PPUR without prejudicing the environmental sustainability of the park.

1. Introduction

Puerto Princesa Underground River (PPUR) formerly known as Puerto Princesa Subterranean River National Park (PPSRNP) was declared by Proclamation No. 835 on March 26, 1971 as a natural park. It is located in the West Coast of Palawan, 81 kilometers north of Puerto Princesa City (Figure 1). The said park has the land form associated with rocky mountain (of marble and limestone) running from north to south. Two-thirds of the area is covered by lush tropical rainforest from the shoreline to the highest peak, and one-third is thinly vegetated karst limestone. The vegetation types include lowland forest (often with 35 meters canopy), coastal forest and karst forest. This National Park is currently a popular destination for visiting bird-watchers, and most of the threatened and restricted range birds (Palawan Pheasant Peacock and Philippine Cockatoo) of the Palawan Endemic Bird Area have been recorded here [1].

Since its proclamation in 2012 as one of the New 7 Natural Wonders of Nature, PPUR has nearly been singularly using this title to highlight its supposed integrity, and subsequently, in promotions [2]. It is operated by the Park Management. It is supported by the Ugong Rock Adventure and the Mangrove Paddle Boat Tour being the community-based sustainable ecotourism as well as other ecotourism support activities such as nature/wildlife watching and adventure sports tourism. Globally known as the world's longest navigable underground river, the inscription of the Park in a UNESCO World Heritage



Site in 1997 increased the City's attractiveness. First explored in 1930, the cave main gallery, branches and tributaries to over 8 km were completely explored in 1973 and in early 80's. Several other expeditions between 1986, 1992 and 2011, have brought the cave development into 32 kilometers [3], [4].

Located in the Saint Paul Mountain Range, north-west of Puerto Princesa, the capital of Palawan Province the property consists of various landforms, the most impressive of which is the karst mountain landscape and the 'mountain-to-sea' ecosystem, it contains has some of the most important forests in Asia. The park is home to 165 bird species, 30 mammal species, 19 reptile species, 10 amphibian species and over 800 plant species. Endemic mammals include the Palawan tree shrew, Palawan porcupine and Palawan stink badger. Dugong have been recorded in the marine component of the park. Monitor lizard and marine turtles are also present. The Palawan Peacock Pheasant has also been recorded in this site. The subterranean fauna has not been studied in detail, but comprises fish, prawns, snakes and insects. The tunnel and chambers of the subterranean river are home to abundant populations of swiftlets and bats (eight species). Approximately two-thirds of the site is forested, dominated by hardwood species. Three forest formations are present: lowland, karst and limestone. In the coastal area, mangroves, mossy forest, seagrass beds and coral reefs are also found. The property is home to a number of iconic species including plants and animals found on the IUCN Red List such as the Palawan Hornbill (*Anthuracoceros marchei*), Philippine Cockatoo (*Cacatua haematuropygia*), Alexandrian Laurel (*Calophyllum inophyllum*), Almaciga (*Agathis philippinensis*), Blackboard Tree (*Alstonia scholaris*), Philippine Flat-headed Frog (*Barnourula busuangensis*), Philippine crocodile (*Crocodylus mindorensis*), Green Turtle (*Chelonia mydas*), Bearcat (*Arctictis binturong*), and Palawan monitor lizard (*Varanus palawanensis*). To maintain long-term conservation of natural resources and to keep the ecosystems in the (St. Paul) Subterranean River National Park intact, Presidential Proclamation No. 212, s. 1999 declared an area of 22,202 hectares under the National Integrated Protected Area System Act of 1992. Confirmation of the demarcation on the ground has resulted in a slightly smaller area of 21,826 hectares (Figure 2). The property includes land within the boundaries of three Barangays (local administrative units; Cabayugan, Marufinas, Tagabinet) within City of Puerto Princesa. [5].

PPUR is managed by the City Government of Puerto Princesa and anchored on the program environmental conservation and sustainable development. It is designated core area for the Palawan Biosphere Reserve under the Man and Biosphere Program [6]. Devolution of PPUR to the local government, the responsibility for the management and the protection of the property, is provided at a local, or provincial, rather than a national level through a Memorandum of Agreement (MOA) for Devolution that places local ownership of the property, and hence management responsibility, with the City Government of Puerto Princesa. While management responsibility is placed with the local authority it is also covered by the National Integrated Protected Area System (NIPAS) Act of 1992, providing National level legal protection and conservation of the property. All management decisions for the property are made by the Mayor in consultation with the Protected Area Management Board (PAMB), which includes representatives from relevant local authorities, communities (including those with Certificates of Ancestral Domain Claims (CADC) and Protected Area Occupants), and provincial staff from national level agencies.”

The organizational structure is as shown in Figure 3. The property is managed by the City Government of Puerto Princesa through the Protected Area Superintendent (PASu) and staff, who report to the City Government and the Protected Area Management Board (PAMB). The role of the PAMB, is to advise on the management of the property including the implementation of the management plan and issues related to public participation in protected area management. The Protected Area Superintendent and the members of the PAMB hold primary responsibility for reporting to the City Mayor and for implementation of the Management Plan for the property, along with other key responsibilities for the day to day management including tourism and approval of development proposals. Under the PAMB is the Project Development and Evaluation Committee (PDEC) and EXECOM. These units inspect and evaluate structures and projects (PDEC) that will be implemented in PPUR and also recommend approval (EXECOM) for PAMB. The PASu Secretariat which is directly under the PAMB is responsible in management information system of PPUR. It also oversees and directly manage the Public Education. Administrative arm, (Supply and finance and General Services and Maintenance Division)

Conservation, Community Empowerment and Tourism as well as Community Enterprise Development of PPUR under the supervision and approval of PAMB [7].



Figure 1. Location of PPUR

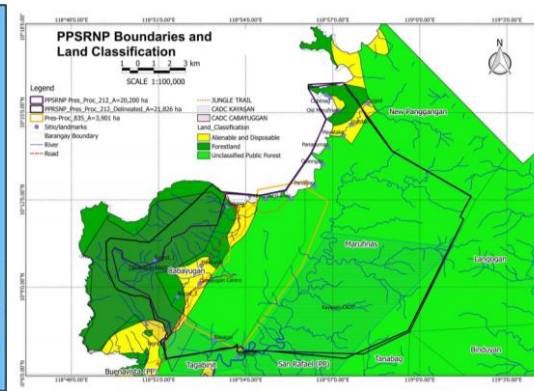


Figure 2. Boundaries and Land Classification of PPUR (UNESCO 2015)

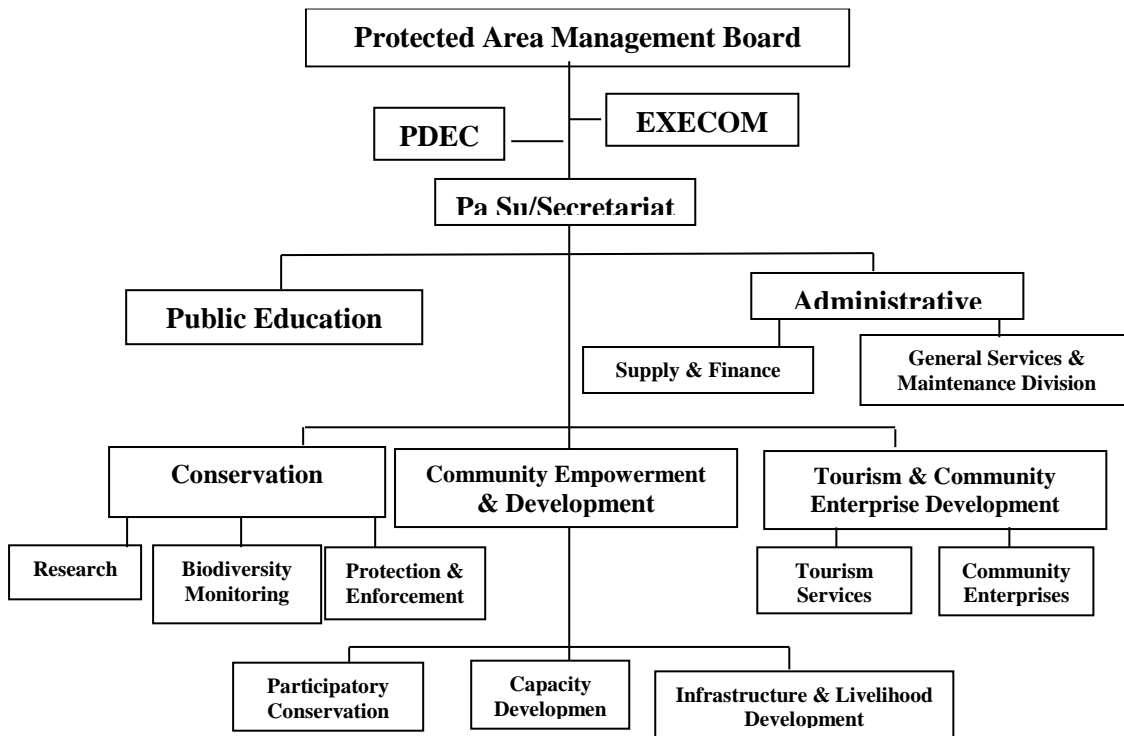


Figure 3. Organizational Chart of PPUR (PPUR Progress Report 2013-2017)

2. Methods

Descriptive research method was used in this study. Documentary analysis of the current management plan of PPUR was done to describe and assess management activities in the national park. To support documents and reports that were gathered, actual site visit and observation was implemented. Furthermore, it was enriched and affirmed by Focal Group Discussion (FGD) with key informants. Semi-structured questionnaire was used as a guide during the focal group discussion.

3. Results and Discussion

The ecotourism management programs of PPUR constitute a body of work anchored on its tenet of keeping the balance between community-driven protection and conservation of the park's ecological integrity, its Outstanding Universal Value, and inclusive development through Transformative Tourism

activities. Management programs are geared towards cementing the programs on Conservation and Protection, Community Empowerment and Development, Public Information and Dissemination, as well as the Tourism and Community Enterprise Development, which ensure sustainability and strength to withstand the test of time [9].

3.1. Genetic Diversity

To maintain the genetic diversity of PPUR, programs implemented were; Biodiversity Monitoring. Key informants reported that the initial results of the PPUR's Biodiversity Monitoring System show a significant amount of wildlife species still thriving within the area. The Forest Cover assessment through satellite imaging shows that the PPUR's old-growth forests are still intact. These are indicators of its integrity and success of its protection and conservation efforts. Satellite Imaging has enabled the baseline data gathering of the Forest Cover of the PPUR. In 2017, 20,811.78 hectares out of the 22,202 hectares of the Protected Area remain forested, despite some parts of the Protected Area being declared as Multiple-Use Zone under the RA 7611 or Strategic Environmental Plan for Palawan Law's Environmentally Critical Area Network Zoning

3.2. Environmental Services

The programs and activities conducted by the Park management was gathered from documentary analysis and affirmed by key informants. The thrusts of programs and activities is leading to the development, improvement, and upliftment of the welfare of the residents living in the PPUR. These strategies resulted to the overall protection of the biodiversity of the park because the people would serve as our resilient partner in the conservation and protection of the park's Outstanding Universal Value. The most notable management activity done in PPUR is the Community Empowerment and Enterprise Development Component (CEEDC). It aims to empower and uplift the quality of living of the residents of the National Park and World Heritage Site, particularly the Indigenous Peoples. These aims are geared towards sustainable management of natural resources to maintain the Outstanding Universal Value (OUV) of PPUR. Participatory management is evident for the people residing within the park. Most of the major accomplishments in the past years were achieved in collaboration with long-time project partners such as, the Pilipinas Shell Foundation Incorporated (PSFI) and United Nations Development Programme (UNDP) Small Grants Programme (SGP). The partnership with the latter benefited 14 Peoples Organizations (POs), through the two mother proponents, namely, Sabang Mangrove Paddle Boat Tour Guide Association (SMPBTGAI) and Sabang Ferry Multi-Purpose Cooperative (SMFPC). The success the partnership with the UNDP can be attested by the increase in the number of POs from 14 to 22.

Activities conducted through the active participation of communities residing in the park aimed to fully equip and empower the People's Organizations formed and organized by the Park management towards independence and sustainability. The Protected Area Management Board (PAMB) Aid/Grant generated from the entrance fees has likewise provided the communities with eco-friendly and sustainable enterprises livelihoods. Establishment of the Community Store in Barangay Marufinas that provides cheap basic goods to the Indigenous People and awarding of different livelihoods in Sitio Sugod 1 in Barangay Cabayugan are some of the successful projects. The community water system project in Sitio Tagnipa, Barangay Cabayugan, which has been initiated, will provide sustainable and potable water supply to Indigenous People households in the area. Empowering the Indigenous People's Community in the Park is a shared commitment with the Pilipinas Shell Foundation Inc. Through the programs Turismo at Negosyo dulot ay Ingat Kalikasan (TANDIKAN), Integrated Support to Indigenous People (ISIP), and Save, Invest and Nurture Green Energy (SINAG), the commitment has provided valuable and necessary trainings and seminars to the CBST associations established within the park. Facilities and equipment support have been likewise provided to the Isla Felomina Dive site, Community Park Warden Association, and Hundred caves. Part of the PAMB aid intended to fund community. These activities conducted by the park management through the support of various offices of the City Government of Puerto Princesa and those of National Agencies have resulted in the upliftment of the quality of living of families inhabiting the park and its surrounding. These have earned respect for the park's management and fostered the sense of ownership of the people living in the area. These are

evidenced by the consistent participation and involvement of different stakeholders in the activities related to conservation and protection. The Park itself serves as a huge source of employment of community members who are hired as members of the park staff. As of April 8, 2019 an interview with the head of Nursery project (tree seedlings) of PPUR, the management is conceptualizing the expansion of the current nursery project to agroforestry project in the near future. This aims to provide employment of people in the locality. It will also serve as additional tourist destination. The theme of the proposed agroforestry project is organic farming, wherein it is pattern from “Yamang Bukid” in Barangay Bacungan.

3.3. Tourism and recreation

Growth of tourism in terms of tourist arrivals showed that there is a remarkable increase from 1992 to 1998 contributed by the devolution of PPUR [9]. Its unique attraction draws domestic and foreign tourists. The park made a pride for the City and further boosted the development of the City in terms of tourist visits.

From 1999 to 2014, the tourist arrivals greatly improved and steadily increase from 95,033 to 740,272 being dominated by domestic tourists (Table 1) [10]. The now recognized Puerto Princesa Underground River (PPUR) is a “must-see” tourist destination in the City of Puerto Princesa [11]. PPUR had become the most important show cave of the Philippines, with over 150,000 visitors per year in a self-imposed tourism carrying capacity of 500 tourists per day [12].

Since PPUR was included in the 7 wonders of Nature, tourism in the province of Palawan had boomed. The very unique karst environment is a must to visit. The Sabang Wharf was developed to cater for the needs of tourist. Ticket office, comfortable waiting shades, clean comfort rooms comparable with other tourist destinations in Asia was constructed in the scenic view of Sabang Wharf (entry point to PPUR). One can have picture perfect views in Sabang Wharf with the pristine and white sand of Sabang Beach, the sea and the prominent Saint Paul mountain ridges as backdrop. There are hotels and lodging houses in Sabang Wharf with safe, clean and scenic beach where tourist can enjoy sunbathing while watching sunrise and sunset.

Proper waste management in Sabang Wharf is strictly monitored by PPUR staff. Management also oversees and maintain environmental sustainability of the area. All structures are allowed only 100 meters away from the shoreline. Travel and recreation is not complete without visiting the famous UR, the stalactites and stalagmites, the black cliffs composed of black marbles and home for some animals like long tailed Macaque monkeys. For adventurers the jungle trail is also open but tourist with medical attention is not permitted to try the trail. The very unique X-Zipline in Sabang Wharf is an added attraction for adventurers. The long zipline (800 meters) with a sea view is 12-15mins walk from Sabang Wharf. It was in the early 2000 that additional tourist destination in PPUR was launched-the Ugong Rock Adventures. It is located 18 kilometers from Sabang Wharf. Ugong Rock is a limestone rock formation which stands 75-feet high in the middle of a rice field. Within are caves and narrow passageways leading to a viewing deck situated at the top of the stunning rock formation. It was named as such because a hollow limestone inside the cave makes an *ugong* or a reverberating sound when tapped. It is manage by the community under the Community Based Sustainable Tourism (CBST). Adventures and hikers can enjoy the zipline in Ugong Rock. The stand-by health care personnel assure safe adventures in the facility.

The increase of PPUR fee took effect on February 1, 2017. The rate of PhP500.00 applicable to local and international tourists, with 20% discount for all tours booked by the accredited travel operators of this city and 40% discount for the bona fide residents of Puerto Princesa has been implemented. General Entrance inside the park will be pegged at PhP100.00 for local tourists and PhP150.00 for international tourists. Guests with ages from 3 to 12 years would be charged PhP75.00. Guests 13 to 20 years old would be charged PhP100.00 and Senior Citizen/Persons with Disability will be charged 20% less. The increase was decided according to the ideas from various consultations amongst stakeholders. Ensuring sustainability of its programs and operation as affected by the non – IRA dependency of the PPUR management and anchored on the thrust to conserve and protect the ecological integrity and outstanding universal value of the PPUR was the underlying theme.

Table 1. Tourist Arrivals and Receipts of Puerto Princesa from 1999-2014

Year	Tourist Arrival	Tourist Receipts
1999	95,033	836,760,148
2000	106,103	934,230,867
2001	78,455	690,791,803
2002	79,203	697,377,900
2003	98,118	863,923,397
2004	120,674	1,062,527,692
2005	134,824	1,187,117,635
2006	147,806	1,301,423,405
2007	176,347	1,552,725,283
2008	221,736	1,952,372,841
2009	268,942	2,368,018,980
2010	417,593	3,676,882,562
2011	515,148	4,535,848,777
2012	654,033	5,758,723,285
2013	692,982	6,101,667,010
2014	740,272	6,518,052,764
TOTAL	4,547,269	40,038,444,351

Source: DOT: National Tourism Development Plan (2011-2016)

3.4. Scientific researches

The only approved scientific study done in UR and passed the Palawan Council for Sustainable Development (PCSD) is the PPSRNP-PAMB and Tagbalay Foundation-Laventa partnership that ended last May 2017. The partnership led to the successful administration of “Support for Sustainable Eco-Tourism in the Puerto Princesa Underground River” funded by a grant from the Italian Government through the Philippines-Italy Debt for Development Swap Program. The Index Map generated by Laventa Scientists shows the various caves and trails that have been explored and mapped during the second expedition. The map is beneficial to the PPUR management and PAMB because this can guide both in planning additional tour destinations.

3.5. Wilderness protection,

Eight (8) forest formations is located in PPUR. The management frequently monitors suitability of the forests by assigning forest rangers as standby rangers in each forest. The number of Park Rangers was increased, from 11 in 2013 to 47 at present, to strengthen and ensure the protection of the PPUR’s Ecological Integrity. Of this number, 6 serve as Protection and Conservation Component Heads. Four rangers are assigned to the village of New Pangangan, which serves as the buffer of the property. In addition, the original number of 5 rangers that patrol the village of Marufinas, which is the site of the biggest land area of the park, was increased to 9. There are 20 rangers in the village of Cabayugan and 8 in the village of Tagabinet. Regular foot patrolling is conducted by the Park Rangers within the park’s boundary. These changes, coupled with the establishment of ranger stations in the identified hotspot areas in the park, resulted in the minimal incidence of illegal activities.

3.6. Natural features

To date the natural features of PPUR (karst environment) is strictly maintain by PPUR Management. Carrying capacity of 800-1200 per day is strictly implemented. Scientific studies need to pass the PCSD approval. Only the Sabang Wharf is continuously developed to provide comfort and convenience to tourists and visitors. Strict management of solid waste disposal is implemented. PPUR management is composed of several technical people with their main responsibility of maintaining the unique environment of PPUR. Marine biologist and environmentalist are employed to monitor any adverse condition of UR (Underground River). They do quarterly water analysis. Forest Rangers safeguard the 8 mountain formation in PPUR. Agronomist headed the nursery project of PPUR. The improvement of facilities needed in Sabang Wharf include; the provision of additional waiting area, repair and upgrading of comfort rooms. The Sabang Integrated Terminal Design and its environmental studies are being formulated and conducted and the Sabang Renewable Energy in Cabayugan (SREC) project started in 2018. SREC will solve the problem of no electric current in Sabang Wharf during daytime.

3.7. Education

PPUR has been serving as destination for educational field trips not only for Filipinos but for foreigners as well. The unique karst environment, the endemic flora and fauna, the forest formation and marine environment caters to ecology and environment enthusiasts. Key informants and staff of PPUR revealed the plan of management for installation of Information kiosk and mini - museum in Sabang Wharf. These intend to showcase the culture, biodiversity, and beauty of the destinations within the jurisdiction of PPUR Photo galleries will be also be set up. The PPUR Festival commenced on November 11, 2017 and Day of Karst every March 26. The management had exerted tremendous protection of the protected properties of PPUR. The management also provided educational opportunities to IP's in the area through the Integrated Support to Indigenous People or the ISIP program. It has provided free education through the Alternative Learning System (ALS) aimed at improving the literacy rate. The program has benefitted more than 80 IP youth.

3.8. Sustainable use

The initial results of the PPUR's Biodiversity Monitoring System show a significant amount of wildlife species still thriving within the area. The Forest Cover assessment through satellite imaging shows that the PPUR's old-growth forest are still intact. These are indicators of its integrity and success of its protection and conservation efforts. The addition of speed boat, and two motorized boats. Top-downs and bicycles were also provided by the management for rapid mobilization of rangers, environmentalist and marine biologists on monitoring environmental safe activities in the area. Zoning of the 7,400 hectares of the Marine Protected Area has been undertaken. Areas critical to the Marine Habitat have been declared as a No-Take Zone. Buoys have been placed to demarcate the said zone. These areas have a total of 1,000 hectares. The maximum capacity of PPUR per day is 1600 people. But to sustain and protect it, PAMB strictly imposed 800 carrying capacity per day and only 1,200 for peak season.

4. Conclusion and Recommendation

The management of PPUR performed its function based on its objective as a national park. Community empowerment is evident in the activities conducted, viz a viz with maintaining the environmental sustainability of the park. The present challenge to the PPUR management is how to safeguard the environmental integrity of the Park and maintain its "outstanding universal value" (OUV) as described in its UNESCO World Heritage Site inscription. The impacts of tourism, natural resource utilization, technology, and growth of communities in and around the PPUR should be studied. Environmental Impact Assessment be done with emphasis on CEEDC and its impact on the lives of residence in PPUR

5. References

- [1] Palawan Council for Sustainable Development n.d Puerto Princesa Subterranean River National Park. Retrieved February 10, 2019 from <https://pcsd.gov.ph/gov/protected-area-palawan/puerto-princesa-subterranean-river-national-park>
- [2] Guerrero B (2018). Puerto Princesa River: A call for new branding and prestige. Business Mirror April 2018 issue.

- [3] Balazs D 1976 Karst types in the Philippines. *Proceedings of the 6th International Congress of Speleology*. Praha: pp.13-38.
- [4] Piccini L and De Vivo A 2012 Ilcarsodel Monte Saint Paul (Palawan – Filippine). *Speleologica* vol 66 pp 46-59
- [5] UNESCO 2015 Report on the mission to Puerto-Princesa Subterranean River National Park. World Heritage Patrimoine Mondial. Retrieved February 10, 2019 from file:///D:/My%20Files/Downloads/mis652-dec2014.pdf
- [6] Mercado A and Lopez. A 2012 Knowledge, Attitude and Practices of tourists in the Philippines Toward the Puerto Princesa Underground River. *Saint Paul Quezon City Philippines- Student Journal* vol 1 no.10 pp.33-43
- [7] PPUR Progress Report 2017 Report of PPUR Management. Palawan-Philippines.
- [8] Bantayan N, Cereno R, Cruz R, Racelis D and Villanueva T 2001 Management of Protected Areas (Los Banos Laguna Philippines-UP Open University Printing Press)
- [9] Maclang B 2017 Puerto Princesa Progress Report 2013-2017 (Palawan Philippines- Puerto Princesa Underground River) p. 1
- [10] Dressler W Kull C and Meredith, T 2006 The politics of decentralizing national parks management in the Philippines, *Political Geography* (Elsevier) pp. 789-816
- [11] Manalo J 2017 Development through sustainable tourism and effective .policy implementation: Practices of Puerto Princesa City, Philippines *Asia Pacific Journal of Multidisciplinary Research*, vol 5 no. 1.pp.1-8
- [12] De Vivo A Piccini L Forti P and Badino G 2013 Some Scientific Features of the Puerto Princesa Underground River: One of the New 7 Wonders of Nature (PalawanPhilippines).*Conference Proceedings: 17th International Congress of Speleology*. Czech Republic.

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