



PROCEEDING

THE FUTURE MOUNTAIN AND VOLCANOSCAPE

Creativity to Prosperity

Mataram, Lombok, Indonesia
September 7-9 th, 2015

ORGANIZED BY :



ISLA
INDONESIAN SOCIETY OF
LANDSCAPE ARCHITECTS



IFLA ASIA-PACIFIC
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IFLA Asia Pacific Congress 2015, Mataram, Lombok, Indonesia

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Mataram, Lombok, Indonesia, 7-9th September 2015

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WELCOMING ADDRESS

On behalf of the Indonesia Society of Landscape Architects (ISLA), I am pleased to welcome all of you to 2015 IFLA APR Congress at the city of Mataram, Lombok island, The Province of West Nusa Tenggara, Indonesia.

Indonesia is a meeting point of several tectonic plates, making it one of the most seismically active areas on the planet with a long history within the Asia Pacific region, Indonesia lies on what is commonly known as "Ring of Fire" making it very prone to volcanic disasters.

The 2015 IFLA APR Congress will be held in conjunction with the celebrate of 200 years of the largest volcanic eruption recorded in the history of modern civilization. This occurred at Mount Tambora (4.300 m) which located at the Province of West Nusa Tenggara in 1815. This volcano totally created new landscapes, buried three kingdoms, killed approximately 17.000 people and produced global anomalous climate and political impacts.

The goals of the Congress are: to review the existing mountain and volcano areas from Landscape architecture perspective, to share ideas and experiences about these type of landscapes from different countries, and to find better future solutions for landscape planning, design and conservation. In keeping with the goals, the theme of the 2015 congress is "Future Mountain and Volcanoscape: Creativity to Prosperity".

Your participation on the planned enjoyable educational and social cultural program is critical to the success of the Lombok IFLA APR Congress in this year. I certainly believe that the Congress will bear fruitful results and lay firm groundwork for the future development of the IFLA APR.

Thank you very much.

September 06, 2015

Dr. Ir. Siti Nurisjah, MSLA, IALI
President of Indonesian Society of Landscape Architects

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LANDSCAPE DESIGN OF NATURAL TOURISM AT MOUNT BAWANG, WEST BORNEO

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Abstract

Bengkayang Regency has a variety of tourism potential, includes a panoramic tour of waterfalls, natural beauty of mountains, lush tropical rain forests, dazzling marine coastal tourism and many other potentials. However, at present time is still untapped potential in an optimal and ideal has not been developed. Especially in the tourist area of Mount Bawang mountainous landscape, which until today still require the development of an ideal design, considering the environmental landscape Mount Bawang area is so beautiful with the natural beauty of the panorama together to form the harmony of ecosystems that exist within it. Therefore, this study aimed to identify the characteristics landscape of nature mountain Mount Bawang to obtain detailed information about the characteristics and actual biophysical, social, cultural, and resource potential to support the existence of nature mountain landscape ecological Mount Bawang, this research is analyse the potential and constraints that affect the design of tourist landscapes natural ecology that supports the concept of an ideal. Afterwards, make the product design in the form of site plan drawing, image pieces, perspective drawing, planting design, and construction details are in harmony with the ecological concept of continuity of the function, structure, social, cultural, and economic. Further reference material can be thought and consideration for local governments in the utilization of natural resources for the development of Mount Bawang landscape can be a tourist area as well as doing landscape design in harmony with the nature of ecological conditions and integrated appropriately.

Keywords: Characteristics Landscape, Landscape Design, Landscape Ecology, Nature

1. Introduction

Bengkayang regency is located in West Borneo, which is currently doing constructions for the regional progress and welfare. One of them is to develop the potential of the nature tourism sector which have prospects to be designed with ideal design, because contribute in creating appeal, recreational activities, educational training, and support for nature conservation efforts, as well as to increase the income of the local economy around the destinations area. Exotic attraction that potential to be developed is a natural tourism area of Mount Bawang which is currently has the status of protected forest. This natural tourism area will be designed to provide natural scenery of tropical forests and beautiful waterfalls, diversity of flora and fauna, clean air and existing facilities. This area will be developed into a recreation area of active and passive activity such as picnics, bird watching, children playground, camping ground, hiking, outbound, and climbing.

Proximity of the town center being its own advantages, so it is easily accessible by local and foreign tourists, even from Malaysia. But currently this area is not yet developed optimally due to the absence of ideal design development, the area is relatively unknown, and the potential of this area is newly discovered. Therefore, the design of the natural tourism area apply the concept of appropriate and aligned according to the function, structure and state of the ecology of the environment, which are the use of volume and space that is ideal, based on the shape, size, material and texture, as well as other quality (Simonds and Starke, 2006) [1]. Therefore it can support the survival and the activity of the ecosystem.

The purpose of this research is to identify the characteristics of the landscape, analyse the potential and constraints of the area, and design the landscape area. Hopefully, this research is useful to present detailed information and actual characteristics of the biophysical, social, cultural and potential resource, as well as design produced can be the reference of thought, consideration and input for local governments in making the design of natural landscape of Mount Bawang so that it becomes a tourism area and a source of local revenue.

2. Method

Research carried out in the area of Mount Bawang with the area of 5 hectares and the distance of 10 km from the district center of Bengkayang regency, West Borneo. This research was conducted for 5 months, beginning in November 2014 until March 2015.



Figure 1. Research Location

This study used methods of surveys, analyzed descriptively and quantitatively through the stages of the process that refers to the method of Gold (1980) [2], which are:

1. Getting Started

Preparation beginning of the study consisted of goal-setting design, making the proposal, the preparation of the administration, and make the research permit.

2. Inventory

Inventory process includes observation and ground check of the site conditions, inventory of the general data, physical data, visual data, and social data. Inventory phase focused on collecting primary data and secondary data.

3. Analysis and Synthesis

Regional analysis was conducted using descriptive analysis of all data collected in the inventory phase. Afterward, analysis of the actual condition of the site is done to identify the constraints and potential of tourism area. Afterward, synthesis is done to produce synthetic form of the best designs.

4. Master Plan Design

Master plan design process begins with making concept diagram, followed by making the basic concept, concept design, and concept development. Forming a block plan which serves tourism activity program according to its function based on ecological considerations which will be formed into a master plan.

5. Landscape and Architectural Details

This process is a method of elaboration of the masterplan, create graphical model design in the form of site plan, sections, perspectives, planting design and construction details. Afterwards, it will be presented with descriptive explanations and 3D models in the form of a video. The design of the graphic model become a recommendation and more specific setting of potential development.

3. Result and Discussion

3.1 Inventory and Analysis

Administration and Geographic

Mountain Bawang area is a protected forest area that is administratively located in the village Ketiat, Betung River District, Bengkayang Regency, West Borneo. Overall area of protected forest area of Mount Bawang is 12,000 hectare and the area planned as a tourist area is 5 hectare (Picture 2). Mountain Bawang is located at coordinates 109° 24' 14" E and 0° 51 '20" S. Natural landscape are in the protected forest area under the management of Bengkayang government.

Accessibility and Transportation Systems

The natural tourism area of Mount Bawang can be reached through the paved road as far as 6 km and then through the streets as far as 4 km. The distance can be accessed using a vehicle for 30 minutes. A trip to the area past the mountainous region and treated to views of the tropical landscape in Equator thus giving pleasure. This potential needs to be explored to the provision of facilities such as shelters, parking areas, adequate welcome area, variety of facilities and infrastructure that support the accessibility and convenience of transport towards the development of the region.

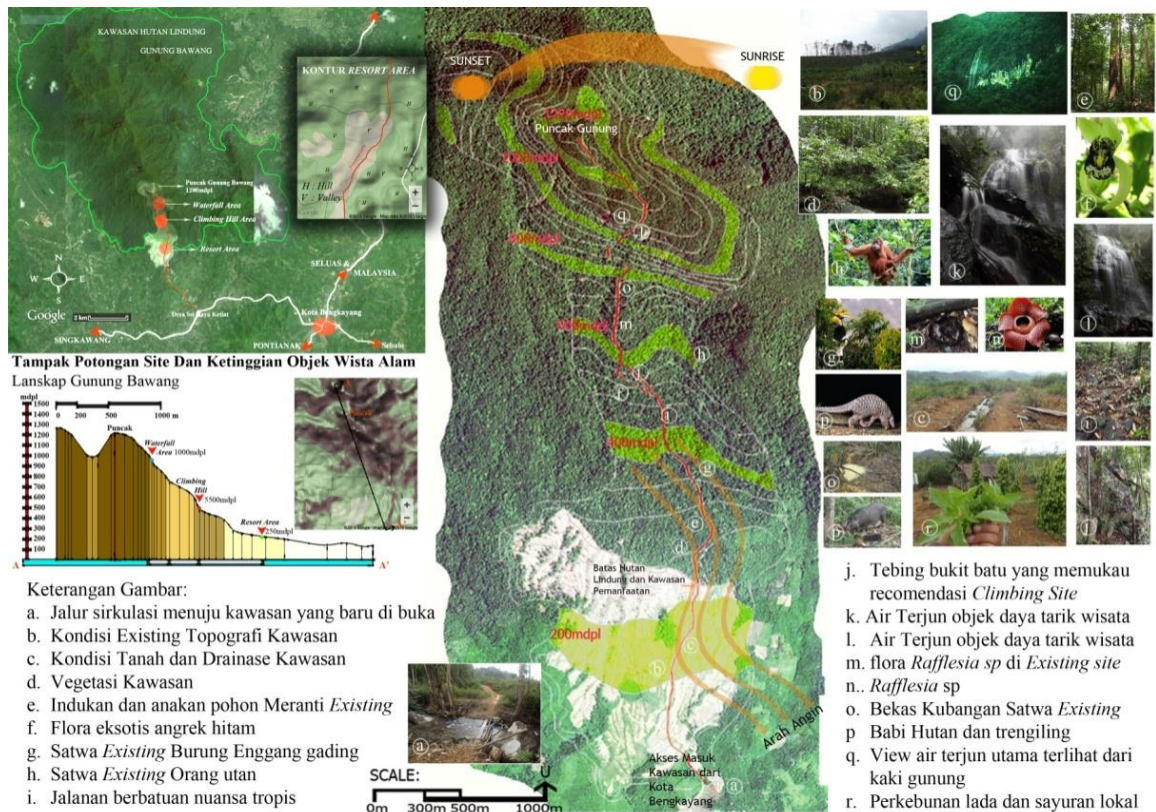


Figure 2: Map of existing condition

(Source: <https://maps.google.com/> and personal documentation)

Topography, Soil, and Drainage

The site located at an altitude of 400-1200 meters above sea level and the top of the mountain in 1.440 meters above sea level. The site is hilly with steep and sloping contour. There is relatively steep rock cliffs, with some groups of huge rock. The development is utilizing natural conditions and altitude of the location without changing existing contours so that the development can be aligned with the topography. The condition of soil types based on data from the Badan Pertanahan Nasional in 2014 [3] is identified as yellow red podzolic. This type of soil should be planted with grass to prevent erosion, muddy at rainy season, and drought at dry season.

The existing drainage can be seen from the flow of water in the trench that divides the valley. The drainage is used to drain the water from mountain springs to gather on one spot and into the upstream. This makes drainage looks irregular and sometimes overflowed and form a puddle on the circulation path during the rainy season. The development oriented towards the improvement of drainage and construction of channel to carry the flow of water from the mountains and brings together several tributaries that are outside the site. The channel will carry water to be accommodated, and flowed to the washing and bathing area, given the water in the mountains relatively clean and fresh.

Macro Climate and Micro Climate

Bengkayang climate classified as wet tropical climate. In general, Mountain Bawang has a temperature ranging from 21.1-33.5°C, (Basic Data of Bengkayang, 2013) [4]. In this region, the temperature difference is very significance at varying height, that is 28-33°C at the foot of the mountain and 22-26°C at the waterfall area which is misty and cool. To improve the comfortability, it is necessary to improve microclimate by using vegetation as a shade plant due to its ability to reduce solar radiation by 60-90% (Brooks, 1988) [5]. During the rainy season, the tourism area will be very misty and cloudy, that could harm the user to do extreme activities like climbing because the cliff rocks will be wet, slippery, and mossy. But it can be anticipated by creating a climate amelioration that suitable the site conditions and site engineering from the ideal design for the area.

Vegetation and Wildlife

Existing vegetation is dominated by different types of exotic plants and tropical trees like vanda orchids, black orchid and the *Rafflesia sp*. Development of tourism areas should pay attention to the ecological

functions that support the regional balance. Moreover, it is necessary to implement the suitable plant functions as former of aesthetic and specific function. Fauna dominated by birds that can be preserved using the plant that attract birds, creating a natural environment corresponding to its habitat. In addition, some animals such as “orangutans”, “enggang gading” birds, wild pigs, clouded leopards, honey bears, antelope, monkeys, hedgedog, pangolin (ant-eaters), and deer in protected forest areas need to be preserved by creating the design of nature tourism in the suitable zone by not disturbing wildlife habitat especially to animals that highly protected.

Visual Site

Natural tourism landscape at Mount Bawang has a good view. In the entrance area, there will be scenery of green hills and mountains and natural scenery of tropical rainforest. Afterwards, gurgling streams will be heard inside the forest. It formed from the composition of rocks and cliffs of steep rock, and there are large trees that are now rarely encountered. A series of good view can be seen and natural sound that's heard along while walking to the area gives the extraordinary impression. The scenery is the dominant landscape, must be developed in harmony with the use of area and space in the site, whether it will be maintained or abolished (Simonds and Starke, 2006) [1].

Social, Economic, and Cultural Society

Bengkayang is an extension of Sambas district. According to the data of the Regional Planning Agency in 2013 [4], Bengkayang has 17 districts with an area of 5.396,30 km². According to the data of Central Bureau of Statistics in 2013 [6], Bengkayang had a population of 228.771 inhabitants with diverse ethnic. According to the data from Department of Agriculture in 2013 [7], Bengkayang is dominated by four sectors of economic activity, namely agriculture, industry, trade, and service sectors. The tourism sector including in trade and services sectors that play an important role in increasing local revenue.

Livelihood is dominated by agriculture, plantation and fisheries to produce and supply food and clothing to fulfill the needs of the city. Trade and services sectors can be the alternative and livelihood that can be developed is culinary, services of tour guides and adventure equipment rentals such as tents, ropes, and other supporting facilities for the exploration of the forest area of Mount Bawang. Culture around the area can be a tourist attraction such as the Ba'kati Dayak culture where there are ceremonies and cultural activities. Therefore, it becomes potential tourism and cultural attractions.

3.2 CONCEPT

Basic concepts

“Make peace with nature” philosophy explains the presence of nature tourism area is needed by anyone. The concept of peace is to improve the quality of ecologically sustainable environment, accommodate the life cycle of the biotic and the abiotic environment, so it can support the survival in ecosystems. This makes the concept of natural tourism areas provide symbiotic mutualism between ecosystems, so that creates a strong relationship between the user and the environment.

Concept Design

The design concept was taken from andesite which have a strong structure, firm and may provide protection, peace, unity and characteristic of the region. Each of design form is the implementation of design concepts from andesite to strengthen the identity of the region, showing the uniqueness of the tourism area, with the establishment of modern design elements, abstract pattern and shape of the building, the zoning, and dynamic circulation.

Zone and Circulation Concept

Refer to the Peraturan Dirjen Perlindungan Hutan dan konservasi alam nomor: P.3/IV-SET/2011 [8], zones is divided into several zones, which are the utilization zone, buffer zone, and core zone. Utilization zones are designed in several segments, includes three segments namely Resort Area (segment 1), Climbing Area (segment 2), and Waterfall Area (segment 3) (Picture 3). Zoning aims to facilitate development of the area which is divided into several zones, create a boundary of each region, so that sensitive aspect will not be affected by activity that threatens the survival of regional ecology. The concept of circulation following the natural contours for comfortability and peacefulness of user while expose the landscape, the circulation implemented from the pattern of rock formation with a unique zigzag pattern, forming a clear flow and abstract path so that the pedestrian and highway synergy with the landscape design, using material which supports the absorption of water to support ecological and integrated with nature.

Vegetation Concept

The vegetation used is vegetation that is native plant so it's easy to get and the existing vegetation. Moreover, using the vegetation to be preserved from Mountain Bawang forest areas, as a form of environmental concerns and maintaining the ecological region. Vegetation provide certain functions, such as vegetation which has the function of shade or border, especially in the parking area, children playground and swimming pool. The vegetation at the site is dominated by trees in accordance with their respective functions.

Facilities and Utilities Concept

Facilities and utilities in the region designed to promote aspects of the function, structural and aesthetic in order to create a sense of safety, quiet, comfortable and avoid any unwanted things. Such as the extreme hiking paths is equipped with staircase and handrail, then tracking path is equipped with signage so that the user knows the direction. The presence of light to avoid the negative things that arise in the region and some post rest area. In addition, maps and directions serving every appropriate activities according with the facilities to support tourism and recreation convenience.

3.3 BLOCK PLAN

Block Plan is an overlay of development concept, a transition phase of site development into further development which have more specific and show the details relating to the space utilization of space, vegetation, and circulation (Picture 3).

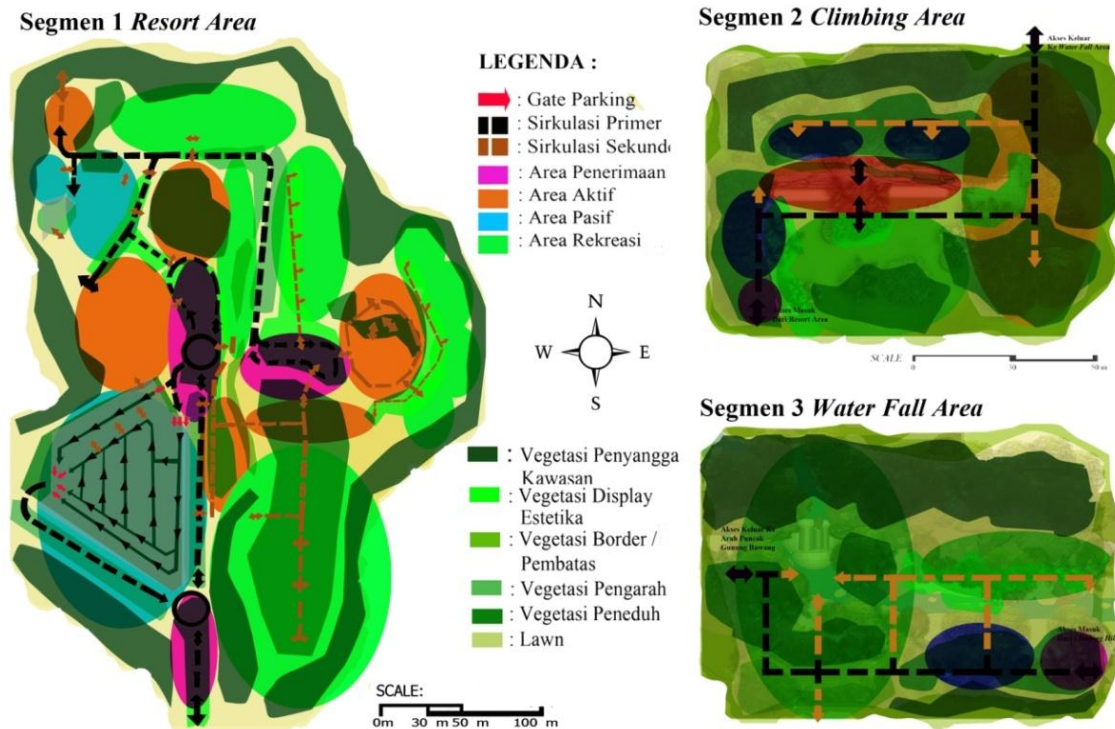


Figure 3 Block Plan

3.4 DESIGN

Overall, the landscape design of Mountain Bawang based on the results of the inventory, analysis, and design concepts associated with the development of the three ecological aspects, namely suitability function, structure, and building on the balance of nature. Nature tourism landscape design is more emphasis on the selection of design components, types of vegetation, and other combinations as a solution to the constraints on the site plans (Laurie, M. 1984) [9]. The natural tourism area is designed into a Resort Area, Climbing Area, and Waterfall Area (Picture 5).

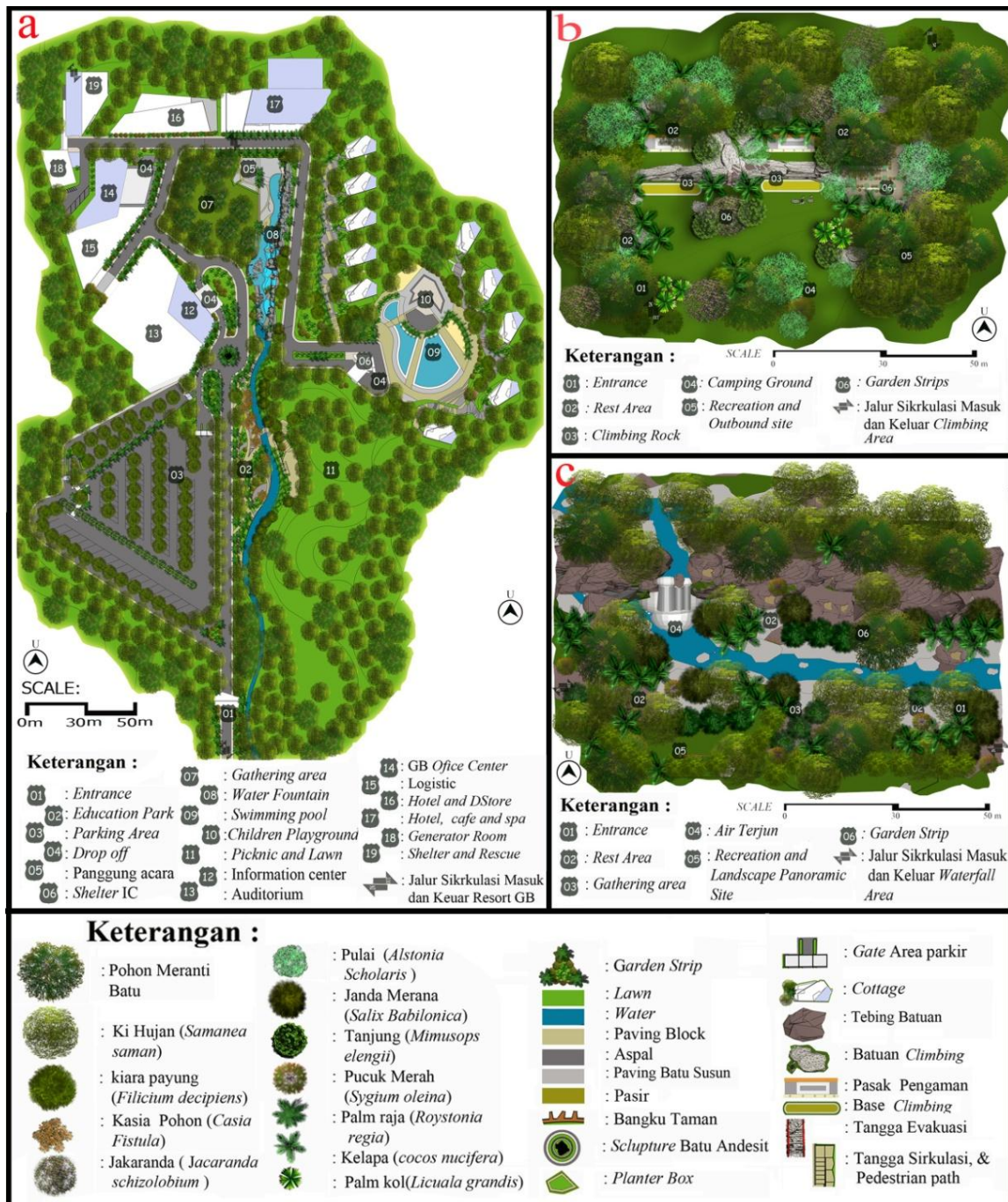


Figure 4 (a) Site Plan Resort Area, (b) Climbing Area, and (c) Waterfall Area

Segment 1 Resort Area

Landscape Resort Area is a form of nature tourism development of Mount Bawang as facilities and infrastructure to support the identity of the natural tourism areas as well as supporting tourism activities. In Picture 6a shows the Site Plan Resort Area which have spot areas in has been designed with pedestrian path, entrance and garden strip, drop off area, parking area, swimming pool, information center, children's playground, enviornment education mini park, water fountain, commercial area, cottage, picnic and lawn.

Segment 2 Climbing Area

Climbing Hill is a natural area of climbing rocks found in the area of the landscape of Mount Bawang, having varying heights of 5-20m from the area underneath the ramps. This area was developed as a

supporting facilities of adventure sport through attractive activities. Facilities in this tourism area are entrance and rest area, climbing rock, outbind, and camping ground.

Segment 3 Water Fall Area

Water Fall Area is a natural waterfall tourism area located at 1.000 meters above sea level, which has a height up to 500 feet with two parts waterfalls that comes from one stream. In the southern part, there is a panoramic view of nature in the other side of the mountain. Users can enjoy the freshness of the mountains, and hear the splash of water and the sound of the wind that blows. Besides, the waterfall area is a fantastic attraction for visitors and photographers. As a climax attraction of this area should be supported by the development and design of tourism activity that promotes enjoyment, recreation and comfortability. The facilities provided are entrance and garden strip, recreation and landscape panoramic, and rest areas.

4. Conclusion

The philosophy of design landscape Mountain Bawang is “make peace with nature”, and andesite is the media of design concept. Elaboration of the concept which gives uniqueness, comfort, safety, beauty or aesthetics, and the structure of the landscape with vegetation arrangement according to the function, as well as the circulation of tourist leisure activities creates a balance of ecology, flora and fauna life support. Natural tourism landscape is designed in several segments, which are the Resort Area (segment 1), Climbing Area (segment 2) and Waterfall Area (segment 3) to facilitate the development of the region and create an interaction boundary of one area to other areas. Then 3 segmentation can meet the needs of tourism activities, forming the unique characteristics and attractions as well as increase the attractiveness.

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