



UDC 633; DOI 10.18551/rjoas.2022-12.20

CULTIVATION POTENTIAL OF PORANG (*AMORPHOPHALLUS MUELLERI BLUME*) IN CENTRAL INDONESIA

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ABSTRACT

The porang plant (*Amorphophallus muelleri* Blume) is one of the mainstay commodities of plantations because it has the potential for cultivation according to regional growing requirements. For example the suitability of topography, weather, and climate characteristics. This study aims to identify the potential for porang cultivation in Central Indonesia. The research location was determined by purposive sampling (deliberately) in East Lombok Regency. Respondents were taken using a survey method equipped with a questionnaire. The number of research informants was 25 farmers whose function was to provide information and data related to the potential for porang cultivation. The primary research method is qualitative. Estimation of the study of the potential for porang cultivation using GIS and WebGIS application computing programs. The results showed that based on the existing Porang land area of East Lombok Regency, HKm was 1,230 Ha, plus the outside HKm land was 28,827 Ha (30,057 Ha). While the location of existing land (already planted) for porang is 228.3 ha. This means that only 0.76% of the total potential land area available.

KEY WORDS

Cultivation, potency, porang.

Porang plant is a tuber plant of the *Amorphophallus muelleri* Blume species which is included in the Araceae family (talas-talasan) which is still in the same family as suweg, walur, and iles-iles. The types of porang that are often found in Indonesia include *A. campanulatus* (Dennst.) Nicols, *A. variabilis* B.I, *A. spectabilis* (Miq). Engl, *A. decus-silvae* Backer, Alderw, *A. muelleri* B.I, and *A. Titanium* Becc. Of the many types of porang plants that are grown and used as food and industrial materials, only *A. campanulatus* (Desrnt.) Nicols is also known as suweg, bosot in local terms (Fauziyah et al., 2013).

In recent years, the porang plant has become one of the plantation commodities because it has important economic value due to high domestic and foreign market demand (Iskandar et al., 2022). Porang is used as a raw material for the food industry, cosmetic industry, medicine, and health (Simatupang et al., 2022). Indonesia still imports glucomannan flour on average 20 tons/per year equivalent to foreign exchange of more than US\$ 3 million (Mutmaidah & Rozi, 2015). Thus the potential and opportunity to develop porang as a cultivated plant to increase sources of income and farmers' welfare can be an option, especially in agroforestry areas (R. Sari & Suhartati, 2015). In Indonesia, intensive porang cultivation is still limited to farmers in several areas on the island of Java, while agroecological, porang plants have the opportunity to be developed in various areas outside Java (Wahyono et al., 2017).

The development of the porang plant is very important, among others, because the plant has a high economic potential (Pasaribu et al., 2022). This will be very helpful in improving people's living standards (M. N. Sari et al., 2022). In the province of East Java, the porang plant, has even become one of the province's leading non-timber forest products (HBBK). Porang developed in state forests in Madiun also shows high economic yields (Hamdhan, 2021). Given the high potential for porang production, in the context of developing porang plants, the government allocates land for porang cultivation in 2020



covering an area of 17,886 ha in 6 provinces, namely West Java, Central Java, East Java, Banten, NTT, and South Sulawesi. Rahayuningsih, 2020).

Forests as an ecosystem not only prepare natural resources in the form of wood but there are still many non-timber capabilities that residents can take advantage of through the cultivation of agricultural plants on the forest land (Priyanto, 2017). This cultivation activity is expected to provide benefits both in terms of cheapness and in terms of ecology, where soil fertility will always be maintained without changing its main use (Hermudananto et al., 2019). Activities that can be tried by residents near the forest in the context of using land at the base of forestry tree stands, generally in the form of intercropping plants include planting: rice, corn, oranges, papaya, pineapple, chili, pepper blimbing, watermelon, vanilla, or porang (Priyanto et al., 2016).

Community forest management implemented in the East Lombok district has natural resource potential in the form of community forest land (HKm) which in the management process is handed over or given to the community, with a duration of management permit for each HKm which is 35 years. The HKm Areas in the East Lombok region sequentially according to the year of opening consist of 1). HKm Sambelia which is located in the Sambelia sub-district is known as HKm Wana Lestari which has an area of 420 Ha; 2). HKm Sapit is located in Sapit village, Suela sub-district, known as HKm Dongo Baru with an area of 450 Ha; 3). HKm Pringgabaya is located in Pringgabaya sub-district known as HKm Lembah Sempager with an area of 360 Ha; then two HKm locations are in the southern region of Lombok, namely 4). HKm Sekaroh with the name HKm Sekaroh Maju with an area of 369 Ha and 5). HKm Sekaroh under the name HKm Sekaroh Jaya with an area of 423 Ha. With a total land area of 2022 Ha HKm managed by the community, almost all of them still manage the HKm land with the type of plant in the form of processed wood. From the productive forest area, a mapping of the area of land that has the potential to empower porang cultivation will be carried out.

Research on the potential and distribution of porang has been carried out. Research by Hermudananto et al., (2019); Yasin, Padusung, et al., (2021) explored the potential of porang plants as cultivated plants in the community forest system (HKM) of North Lombok Regency. Mapping the potential of porang plants as export commodities (Priyanto, 2017). Prospects of cultivation as one of the agroforestry systems (R. Sari & Suhartati, 2015). Porang agribusiness development strategy (Simatupang et al., 2022). Economic prospects for the development of porang plants during the COVID-19 pandemic (Made Astuti Wahyu Utami, 2021). Effect of tuber size on growth and yield of porang tubers on alfisol soil structure (Soedarjo, 2021). Based on these conditions, studies on the potential of porang have been carried out previously. However, it is necessary to develop further localization related to the potential of porang resources in East Lombok. The purpose of this study was to identify the potential for porang cultivation in East Lombok Regency.

METHODS AND RESEARCH

The location of the research was determined by purposive sampling (deliberately) because the research location is a center for the development of porang cultivation in East Lombok Regency. The study was conducted in July-October 2022. Respondents were taken using a survey method equipped with a questionnaire to obtain data from porang farmers in each sub-district in the East Lombok Regency. The number of respondents was 25 farmers, including several key informants whose function was to provide information and data related to the potential and prospects of porang cultivation in East Lombok Regency. The basic research method is qualitative. Estimating the study of the potential for porang cultivation in Central Indonesia using GIS and WebGIS application computing programs.

RESULTS AND DISCUSSION

East Lombok is one of the regencies in the administrative area of West Nusa Tenggara Province. Located in the eastern part of Lombok Island with an astronomical



position at 116°-117° East Longitude and 8°-9° South Latitude. The area of East Lombok Regency is 2,679.88 km² consisting of a land area of 1,605.55 km² (59.91 percent) and an ocean area of 1,074.33 km² (40.09 percent). The plains in East Lombok include mountains and lowlands that stretch to the coast. The mountainous area is located in the northern part of the Mount Rinjani National Park area with a peak height of 3,726 meters from the surface. sea. For in the middle to the south in the form of lowlands. Based on its topography, East Lombok has a sloping area from north to south. The area with a slope of 0-15% (flat land) is around 920.46 km², steep land (slope 15-40%) reaches 473.32 km² and the other 211.77 km² is an area with a very steep category (slope of more than 40 km). %).

East Lombok Regency also has a tropical climate with temperatures ranging from 19°C-35°C while rainy days reach 150 days with rainfall in the range of 3-304 mm per month. The northern part of East Lombok always has the rainiest days with high rainfall such as in Sembalun District in one year experienced 129 rainy days with the highest rainfall of 503 mm in February 2020. Based on the rainfall data which can reach 304 mm/month it can be concluded that the weather and climate conditions in East Lombok Regency are very suitable for porang cultivation activities. Porang (*Amorphophallus muelleri* Blume) is one of the leading plantation commodities in the future because it has a fairly high economic value due to high market demand both domestically and abroad. Porang is used as a raw material for the food industry, cosmetic industry, medicine, and health. Given that porang plants have a selling value, people feel interested in optimally cultivating porang plants.

Table 1 – Area and Altitude (mdpl) of District Areas in East Lombok Regency

| District | Area (Km ²) | Altitude (mdpl) |
|---------------------------|-------------------------|-----------------|
| Keruak | 40,49 | 17 |
| Jerowaru | 142,78 | 54 |
| Sakra | 25,09 | 230 |
| Sakra Barat | 32,30 | 197 |
| Sakra Timur | 37,04 | 157 |
| Terara | 41,41 | 360 |
| Montong Gading | 25,66 | 408 |
| Sikur | 78,27 | 301 |
| Masbagik | 33,17 | 340 |
| Pringgasela | 134,26 | 355 |
| Sukamulia | 13,49 | 214 |
| Suralaga | 27,02 | 190 |
| Selong | 31,68 | 136 |
| Labuhan Haji | 49,57 | 4 |
| Pringgabaya | 136,20 | 50 |
| Suela | 115,01 | 373 |
| Aikmel | 122,92 | 292 |
| Wanasaba | 55,90 | 260 |
| Sembalun | 217,08 | 1200 |
| Lenek | - | 278 |
| Sambalia | 245,22 | 131 |
| Jumlah (Km ²) | 1.605,55 | - |

Source: BPS Lombok Timur, 2020.

Porang is a plant that has a tolerance of up to 60% with shade and can grow at an altitude of 100-700 meters above sea level. But ideally, of the 21 sub-districts in East Lombok Regency, most or 17 sub-districts have the potential for the development of porang cultivation according to the characteristics of the porang plant, which is at an altitude above 100 masl.

Based on the potential of the area and land, East Lombok Regency has a potential area for the development of porang cultivation, both in the HKM area and outside the forest area (outside HKM). The total land area of HKM is 972 1,230 Ha, including 1) HKM Wana Lestari in Sambalia has an area of 420 Ha; 2). New Dongo HKM in Sapit Area with an area of 450 Ha; 3). HKM of the Sempager Valley in Pringgabaya District with an area of 360 Ha;



Meanwhile, the potential land outside the HKm area is in the form of agricultural land, not rice fields covering an area of 28,827 Ha consisting of upland/garden=16,863 Ha, Huma field=8,749 Ha, plantation=3,215 Ha. so that the total potential land area for porang cultivation is: $1,230+28,827 = 30,057\text{Ha}$.

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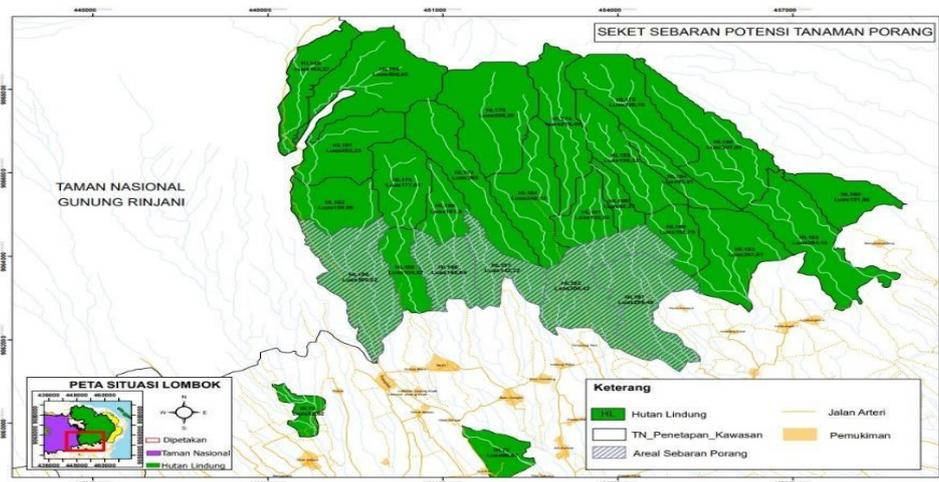


Figure 1 – Distribution Map of Porang Plants in East Rinjani HKM Area

The entirety of East Lombok is said to be in the East Rinjani area. This East Rinjani area includes HKM in the sekaroh forest area (southern East Lombok). The climatic conditions of HKM which are located in the north and south are very different. HKM in the northern part near Mount Rinjani has high annual rainfall ($> 2000\text{mm}$) so it belongs to climate types B and C; while the HKM in southern Lombok has rainfall of $\pm 1400\text{ mm}$ and belongs to the D4 climate type (Yasin, Suwardji, et al., 2021). Along the foothills of the northern mountains, there are dense forests which are now protected forests, community forests, production forests, and community forests (HKM). The wood trees planted in these forests are rosewood and mahogany, Bajur, but after becoming Hkm most of these timber trees are replaced with fruit trees such as durian, jackfruit, candlenut, etc. Production of non-timber HKM that is mostly produced by HKM farmers is taro, papaya, banana, and various tuber crops.

HKM conditions in southern Lombok are very different from those described above. The environmental conditions of HKM in south Lombok are generally worse than HKM conditions in the north. HKM in southern Lombok has a rainy season lasting only a few months, and young wood trees (wood tree seedlings) are more difficult surviving. Trees whose wood can survive to stay green in the dry season are turi trees, banyan trees, and bamboo. There are not many fruit trees that are suitable to grow in this area, because of the type of climate, except for mangoes. Fruits such as papaya, bananas can survive and



produce, while the most preferred seasonal crops planted by farmers are corn, cassava, sweet potato, upland rice, chili, and several types of long beans. Soil conditions in the northern and southern HKm are also very different. HKm forests in the northern mountains generally have soils whose texture is dominated by fine sand. This coarse-textured soil causes the soil to be very porous, and very easy to pass water. If the ground surface is tightly covered by trees with wide canopies, when it rains most of the water will be absorbed by this porous soil. This can reduce water flowing on the ground surface (Koswara, 2013).

According to Santoso, (2015); R. Sari & Suhartati, (2015); Yasin, Padusung, et al., (2021) in the case of HKm land which tends to have an open surface, the surface runoff can destroy soil material and carry soil particles in the process of draining surface water. In the southern part of HKm Lombok, the soil conditions are very different. The dry climate causes not much vegetation to stay green in the dry season. Most natural plants wither (drop their leaves) in the dry season. This causes erosion to occur at the beginning of the rainy season. Even the slightest surface runoff is still able to erode the soil surface, especially if the land is in a sloping condition. This causes most of the HKm in southern Lombok to own land.

Bersolum shallow, rocky, and in critical condition. Characteristics that are very easy to see that this hilly land is the presence of large and small stones exposed to the ground surface. In planting corn, some of the seeds are ditugal on the sidelines of the rocks. In flat places, there is a soil solum that is quite deep and more productive. This section is planted with cassava, corn, and various other seasonal crops. However, this portion of the arable land area may be less than 10% of the total HKm land in southern Lombok.

Porang plants like soil that is fertile, loose, and contains lots of organic matter. Soil acidity ranges from 6.0 to 7.0. The soil should be deep enough so that the tubers can develop properly. But it can also produce well on soils that have a very clay texture such as in Vertisol soils in southern Lombok. This refers to suweg plants that can grow and produce tubers or high yields. Basically, all types of soil are suitable for planting porang plants as long as the soil is fertile and contains high enough organic matter (Wahyuningtyas et al., 2013).

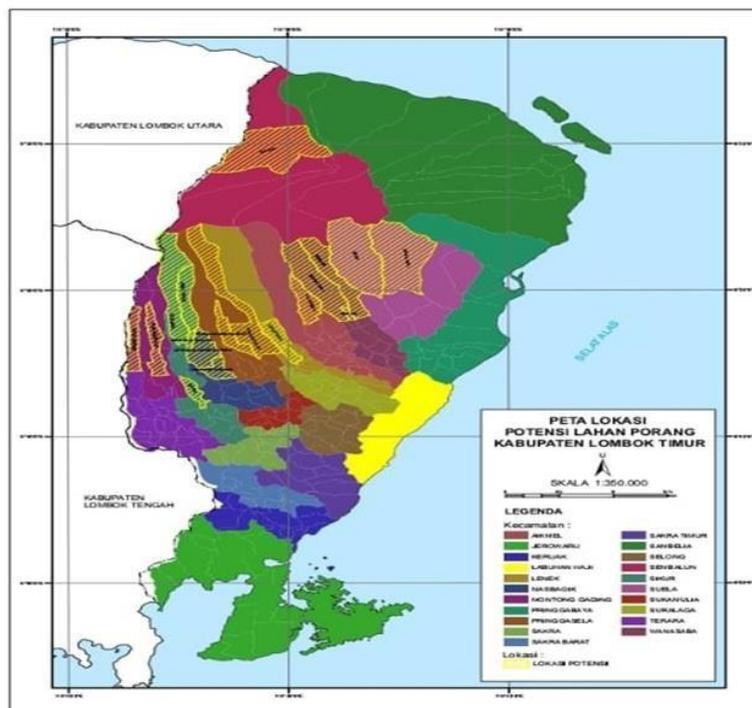


Figure 2 – Potential Map of Porang Cultivation Land

According to Yasin, Padusung, et al., (2021), the problems that arise in southern Lombok are because the hilly land in southern Lombok is converted into HKm land, which has a thin solum and rocky soil surface. This can be overcome by planting porang in a hole



made in the soil measuring 20 cm x 20 cm x 20 cm or 0.008 cm³. This planting model does require time, energy, and capital but it can be expected that the results in the form of tubers can approach porang planted on loose soil. Porang generally does not require fertilization of high doses of artificial fertilizers, it is recommended to add organic matter or treatment of manure or compost at a dose of 5 to 10 tons per ha (Lebi, 2013). Furthermore, according to Sukartono et al., (2020), porang can grow well in all types of soil in HKm-HKm throughout Lombok Island, as long as the soil is fertile, loose, and contains high enough organic matter. If the soil is less fertile or the organic matter is low, the plants will grow.

Porang needs to be given organic fertilizer in the form of manure or compost so that the soil contains sufficient nutrients. 4. Based on the size of the farmer's land that has the potential to be planted with porang, a very large HKm area is available because porang can be planted in vacant land, understanding trees, in bunds, between seasonal crops (rice, corn, cassava etc.) and on lands in the corners of the land that are difficult to plant other crops because of the position and shape of the land.

Meanwhile, the results of FGD I and FGD II which were attended by farmers, porang cultivators, and related agencies, obtained data on the existing land area and distribution of porang plants in East Lombok Regency which can be presented in the following table.

Table 2 – Existing Data on Distribution and Area of Porang Cultivation Land in East Lombok Regency

| District | Village | Area (Ha) |
|----------------|-------------------|-----------|
| Sikur | Sikur | 27 |
| | Kota Raja | 20 |
| Masbagik | Lendang Nangka | 5 |
| Aikmel | Toya Aik Prapa | 10 |
| Suralaga | Suralaga | 0,8 |
| Sembalun | Bilok Petung | 20 |
| | Sajang | 15 |
| Pringgasela | Pengadangan Barat | 40 |
| | Timba Nuh | 22 |
| | Pengadangan | 3 |
| | Jurit Baru | 2 |
| Suela | Mekar Sari | 6 |
| | Perigi | 5 |
| | Sapit | 3,5 |
| | Suela | 4 |
| Montong Gading | Joben | 30 |
| Jerowaru | Pemongkong | 5 |
| Wanasaba | Bebidas | 10 |
| Amount | | 228,3 |

Source: East Lombok P3N, 2022.

The area of land that has been planted with porang in East Lombok Regency is spread over several areas starting from the northern region in Sembalun, Montong Gading, Pringgasela, Suela. In the central region, there are Pringgasela, Aikmel, Suralaga, and Wanasaba, while in the southern region only a few are in the Jerowaru area with a total area of 228.3 Ha. The following is the distribution of land area for each region presented in graphical form.

Based on the distribution map and existing data, the area of porang cultivation in East Lombok Regency consists of a potential area of HKm = 1,230 Ha, plus land outside HKm = 28,827 Ha. Quantity: 30,057Ha. While the area of existing land (already planted) for porang is 228.3 ha. Only 0.76% of the total potential land area is available. The potential for porang cultivation in East Lombok seen from the land area is very large.

The potential for the development of porang cultivation in East Lombok Regency, both based on climate, topography, and land area, has a quite good potential considering that the porang growing conditions between 100-700 mdpl have been met, where 17 of the 21 sub-districts in East Lombok Regency have a topographical height of more than 100 mdpl. Likewise with climate and rainfall. Based on the rainfall data which can reach 304 mm/month,



the weather and climate conditions in East Lombok Regency are very suitable for porang cultivation activities.

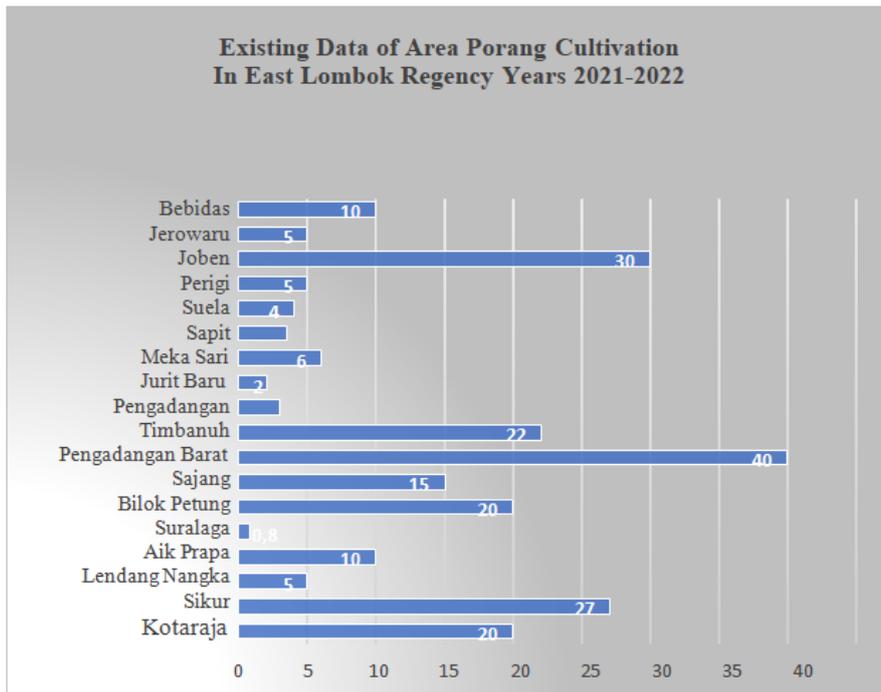


Figure 3 – Existing Graph of Distribution and Area of Porang Cultivation Land in East Lombok Regency

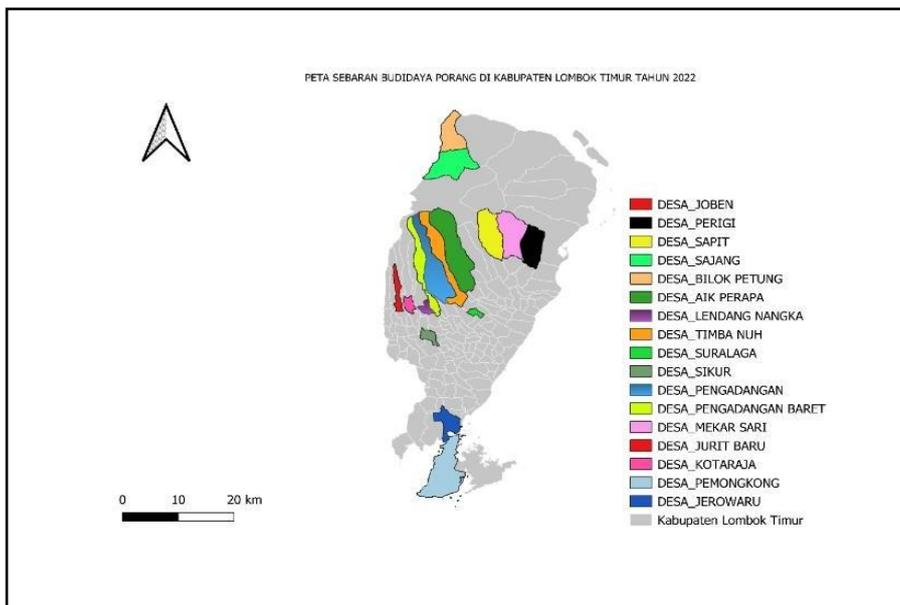


Figure 4 – Existing Location Map of Porang Cultivation Distribution in East Lombok Regency

The results of research related to the potential for porang cultivation in East Lombok Regency carried out by researchers are in line with the results of research conducted by the Porang Study Center Team of Perhutani KPH Nganjuk (2012), namely that porang plants are native to the tropics, which grow understands with sufficient humidity. temperature is around 25°C-35°C and rainfall is between 1,000-1,500 mm. The optimal place to grow is a place with an altitude of 100-600m above sea level, with the required light intensity between 60% to 70%. The soil conditions needed for porang to grow well are soil with a sandy loam texture and clean weeds with a neutral pH (6-7).



CONCLUSION

The area of East Lombok Regency has the potential for the development of porang cultivation. This is supported by the suitability of topography, weather, and climate characteristics which are conditions for growing porang plants. Porang tubers are one of the export commodities. Porang tubers can be processed to become food ingredients, cosmetic ingredients, medicines, and industrial raw materials so that they have prospects for cultivation. Porang land area of East Lombok Regency HKm is 1,230 Ha, plus land outside HKm is 28,827 Ha (30,057 Ha). While the area of existing land (already planted) for porang is 228.3 ha. This means that only 0.76% of the total potential land area is available. The topography is more than 100 meters above sea level with rainfall reaching 304 mm/month. This means that porang cultivation is very suitable in East Lombok Regency.

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