The management of the area, especially the management of the Rinjani-Lombok biosphere reserve, is a complex and multi-stakeholder and multidimensional interest. In order to improve the effectiveness of its management it needs initiative and collaborative steps and a network to realize the management of the area that obviously conserve natural resources and improve the welfare of the community by carefully paying attention to the wisdom and culture of local communities and harmonious relationship with and within nature. The application of science, research, and technology in the management of Biosphere Reserve area is expected to improve the effectiveness and efficiency of regional management. This paper contains an overview of the experience of proposing Rinjani-Lombok Biosphere Reserves and hopes of increasing the welfare of the people of Lombok Island from the establishment of the Rinjani-Lombok Biosphere Reserve.

1. Introduction
Indonesia is very strategically bio-geographical, causing Indonesia to be very rich in biodiversity, so it belongs to the mega-biodiversity group. Indonesia, currently ranked third in the aspect of biodiversity. Biodiversity as a term to explain the diversity of ecosystems, and the various forms and variability of animals, plants, and microorganisms in the world. Thus diversity concerns the diversity of ecosystems (habitat), type (species) and genetic (varieties / race) [1]. Genetic diversity refers to information genes contained in living things, thus distinguishing between other species in each population. The diversity of species is the diversity of living things on earth as measured by the total number of species present. Ecosystem diversity concerns habitat types, biological communities, and ecological processes in which species are contained [2] According to Alikodra [3], that ecologically, socially and economically, biodiversity is very important for its role in the balance of nature, and for supporting it towards the welfare of society and development. The potential of this abundant natural resource requires serious handling so that natural assets can be maintained and used optimally for people's welfare while paying attention to environmental sustainability and the principle of benefits so that productivity can continue [4].
One way to continue to preserve the abundant potential of natural resources is by allocating a portion of the forest area to a conservation area. Conservation areas currently cover more than 10% of the earth's surface and continue to increase. Indonesia has a conservation forest with an area of 24 million hectares covering almost 20% of Indonesia's mainland forest area. According to Law Number 5 of 1990 concerning Conservation of Biological Resources and the Ecosystems of conservation areas include the nature reserve area (KSA) and nature conservation area (KPA). The difference between them lies in their function, where KSA only covers the protection function of life support systems and preservation of biodiversity, KPA has an additional function of one function, namely the utilization of area [5].

National parks are natural conservation areas that have native ecosystems, are relatively undisturbed and managed by zoning systems and have dominating natural values with high conservation interests, and there are high conservation and educational benefits for the region [6]. Each region in Indonesia each has biodiversity with distinctive characteristics and uniqueness to each other. One of them is the Mount Rinjani National Park area on the island of Lombok, West Nusa Tenggara Province. This area is designated as Gunung Rinjani National Park (TNGR) through the Decree of the Minister of Forestry No. 280 / Kpts-VI / 1997 dated May 23, 1997 with an area of 40,000 ha (or 41,330 ha according to the boundary). The management agency was established as the Technical Implementation Unit (UPT) on March 31, 1997 with the Letter of Decree of the Minister of Forestry No. 185 / Kpts-VI / 1997. In accordance with the Decree of the Directorate General of Forest Protection and Nature Conservation Number: SK 99 / IV / Set-3/2005 dated 26 September 2005 concerning Zone Arrangement in Mount Rinjani National Park. So for management purposes as a National Park in Indonesia, the TNGR area is divided into several management zones, namely: Core Zone covering an area of 20,843.50 ha, Jungle Zone covering an area of 17,349.50 ha, Utilization Zone covering 799.00 ha, and other Zones covering 2,338.00 ha [7].

Gunung Rinjani National Park (TNGR) is recent declared as one of UNESCO’s World Biosphere Reserve. This decision was reached at the 30th session of the International Coordinating Council of the Man and Biosphere Program (ICC-MAB) in Palembang, South Sumatra. The Indonesian delegation in the session was chaired by the Indonesian Ambassador to France and the Indonesian Permanent Delegation to UNESCO. The trial, which took place on the 23rd and ended July 28, 2018, was attended by 401 delegates from 50 countries, including 34 UNESCO MAB Committee members. Unesco Rinjani Lombok Biosphere Reserve is considered by Unesco as an original and unique ecosystem area that must be protected and preserved for the benefit of research and education. BIOSPHERE RESERVE is a regional management concept created by the UNESCO Man and the Biosphere (MAB) Program with the aim of harmonizing the interests of biodiversity conservation, socio-economic development and logistical support. The program also aims to promote a balanced relationship between humans and their natural environment. The establishment of TNGR into a UNESCO biosphere reserve provides considerable opportunities in sustainable economic development in addition to knowledge and education opportunities. The pre-development of biosphere reserves in TNGR can be an example of the application of ecosystem landscape management that combines conservation and science-based economic development so that it has an impact on regional sustainability and improved welfare of local communities.

2. Research Methods

2.1 Location Research
The research was conducted in Gunung Rinjani Lombok National Park, West Nusa Tenggara, the research location was in two villages directly adjacent to the Mount Rinjani National Park area, namely Village Senaru, North Lombok District and Sembalunlawang Village, East Lombok Regency, which was the starting point for the official hiking trail to the Park Mount Rinjani National.

2.2 Population and Samples
2.2.1 Population. The population in this study is the Manager of the Gunung Rinjani National Park (BTNGR) and the parties that are closely related in the management of ecotourism in the TNGR utilization zone as well as surrounding communities that are directly adjacent to the Mount Rinjaniya National Park area in two villages, Senaru and Sembalun Lawang Villages, the selection of these two villages is because it is the starting point of the official entrance to the climbing path of the Mount Rinjani National Park.

2.2.2 Sample. The sampling technique that will be used in this study is a non-probability sampling technique, namely sampling techniques that do not give the same opportunity / opportunity for each element or member of the population to be chosen as a sample [8].

Based on the secondary data from Senaru village, the number of households is 1,752 from a population of 6,391 people [9]. While in Sembalun Lawang village there are 1,293 households out of a population of 4,208 East Lombok Regency [9]. So the total household population of the two villages is 3,045 households.

2.2.3 Sample Intensity (IS). Sampling to represent the local community as a population is done by setting sampling intensity (IS), then calculated by taking into account the level of accuracy and the number of population in the area at a given time [10] with the following formula:

\[ n = \frac{N}{1 + Ne^2} \]  
\[ n_i = \frac{Ni}{N} \times n \]  

Where:

- \( n \) = Sample size or number of respondents
- \( N \) = population size
- \( e \) = critical value (accuracy limit) 0.1 (10%)
- \( n_i \) = strata sample size i
- \( N_i \) = strata population size i

Based on data from the villages of Senaru and Sembalun Lawang, the total number of households was 3,045, namely Senaru Village with 1,752 households and Sembalun Village with 1,293 households. The number of respondents is determined using the accuracy limit of 0.1 (10%) using the formula approach above as follows:

\[ n = \frac{3045}{1 + 3045 \times 0.1^2} = \frac{3045}{31,45} = 96.8 \text{ rounded 97 people} \]

**Senaru village:** \( n_i = \frac{1752}{3045} \times 97 = 56 \text{ people} \)

**Sembalun village:** \( n_i = \frac{1293}{3045} \times 97 = 41 \text{ people} \)

2.3 Variable Level of Community Welfare

Variable used to measure the impact of the effectiveness of ecotourism management in the TNGR conservation area on the level of community welfare uses criteria and indicators from the Center for International Forestry Research [11], namely: (1) Subjective welfare (SWB), (2) Welfare core (basic needs, such as material wealth, knowledge and health), and (3) Supporting environment (context) can be seen in the table as follows:
| Criteria                      | Indicator                          |
|------------------------------|------------------------------------|
| A Subjective Wellbeing       | 1) Poor feeling                    |
|                              | 2) Feeling happy                    |
|                              | 3) Feelings of prosperity           |
| B Basic Welfare              | 1) Poor feeling                    |
|                              | 2) Feeling happy                    |
|                              | 3) Feelings of prosperity           |
| C Support environment (context) | 1) Natural environment             |
|                              | 2) Economic environment             |
|                              | 3) Social environment               |
|                              | 4) Political environment            |
|                              | 5) Infrastructure and service       |

Source: CIFOR, 2007 [11]

2.4 Data Collection Techniques

The data collection technique in this study uses several methods, namely:

2.4.1 Observation. This technique is carried out by conducting observations in the field related to ecotourism management activities in TNGR and the socio-economic conditions of the communities in Senaru Village and Sembalun Lawang Village. In making observations, researchers act as structured observers, namely observations that have been systematically designed, about what will be observed, when and where the place is using research instruments that have been tested for validity and reliability [8].

2.4.2 In-depth interviews. The interview technique used in this study is interview using a questionnaire, namely a set of written questions given to respondents. The researcher asked directly to the selected informants, namely competent parties who were considered able to provide an overview and information used to answer the problems that exist in this study [8]. Through interviews using questionnaires, data can be obtained on the level of community welfare both in the Gunung Rinjani National Park.

2.5 Data Analysis Method

2.5.1 Community Welfare Level. The level of community welfare in TNGR can be measured by standards according to CIFOR [11] with regard to three aspects, namely: (1) Subjective welfare (subject to SWB), (2) Core welfare (basic needs, such as material wealth, knowledge and health), and (3) Supporting environment (context).

According to Singarimbun and Effendi [12] the determination of the level of community welfare can be known by conducting scoring on the questions in the questionnaire, the value to be performed on the answers of each respondent is 1, 2 and 3 depending on the criteria that exist or not in each variable. These values are then described per dimension from the respondent's answers according to the variables and indicators. The meanings of these values are explained as follows:

For a value of 1 it means the respondent's answer represents poor conditions based on criteria and indicators on the variables above.

For the value of 2, the respondent's answer represents the condition based on the criteria and indicators on the variables above.

For the value of 3, the answer of the respondent represents the condition of prosperity based on criteria and indicators on the variables above.

Before the index calculation begins, it is necessary to calculate the range of values in each index, namely nine basic indices, namely: subjective well-being, knowledge, material wealth, health, politics,
economics, social, nature, and infrastructure and services. The range of values can be seen from the lowest score (minimum), the highest score (maximum). Calculation of each index is done by normalizing the data, using the formula:

\[
\text{Index} = \frac{\text{(Total score obtained)} - \text{(Amount of minimum score)}}{\text{(Maximum number of scores)} - \text{(Total minimum score)}} \times 100
\]  

(3)

"Prosperous" limits are obtained by reducing the maximum index value (100) with the poor limit. Thus, the classification of the material wealth index, knowledge, health, politics, sects, nature, infrastructure and services uses the formula:

- Poor = 0 to the poorest average value
- Moderate = Poor boundary average value +1 up to prosperous limit value -1
- Prosperous = welfare limit value up to 100

After the basic index is calculated, the next step is to calculate the composite index, namely: core (material wealth, health and knowledge) and context (political, economic, social, and natural, as well as infrastructure and services). Calculation of a composite index is done by calculating the average base index which is part of the composite index:

The core index formulas are:

\[
\text{Core Index} = \frac{\text{I}_\text{Material} + \text{I}_\text{Knowledge} + \text{I}_\text{Health}}{3}
\]  

(4)

The context index formula (supporting environment) is:

\[
\text{Indeks Konteks} = \frac{\text{Politics} + \text{Social} + \text{Economy} + \text{Nature} + \text{Infrastructure and Services}}{5}
\]  

(5)

In the last section the total aggregate index can be calculated, which combines all existing indices. The total aggregate index is equal to the sum of the core index and context index (but does not include subjective well-being).

\[
\text{Aggregate Index} = \frac{\text{Core Index + Indek Context (support environment)}}{2}
\]  

(6)

Furthermore, the classification of the combined index and aggregate index uses the formula:

- Poor = 0 to the poorest average value
- Moderate = Poor boundary average value +1 up to prosperous limit value -1
- Prosperous = welfare limit value up to 100

3. Research Results And Discussion

3.1 Community Characteristics Index

3.1.1 Subjective Wellbeing Index. Based on the results of the primary data analysis in the two buffer villages of TNGR the subjective wellbeing index can be seen in Table 2 as follows:
Table 2. Subjective Wellbeing Index

| Level of Community Welfare | Criteria      | Indicator                          | Index Value | Index Value Total | Explanation |
|----------------------------|---------------|------------------------------------|-------------|-------------------|-------------|
| Subjective Welfare        | SubjectiveIndex| Feeling of Prosperity (Var 11)     |             |                   | Average     |
|                            |               | Feeling Poor (Var 21)              | 53.33       |                   |             |
|                            |               | Happy Feeling (Var 36)             | 53.33       |                   |             |

Based on Table 2, the above shows that subjective Wellbeing index is included in the medium welfare category with an index value of 53.33 based on assessment criteria, namely:

- Poor: 0-34
- Medium: 35-65
- Prosperous: 66-100

The category of moderate welfare level based on the above index values is greatly influenced by respondents' feelings subjectively in fulfilling their daily needs where a person or household has difficulty meeting basic needs, while the supporting environment lacks opportunities to sustainably improve welfare or to escape vulnerability. The feeling of subjective well-being is a collection of one's feelings; can be a feeling of prosperity, a sense of happiness, a sense of respect, a sense of recognition, a sense of poverty, a sense of inadequacy, and similar feelings. This feeling is very general and is influenced by all aspects of life. This feeling can be temporary and may be influenced by CIFOR's momentary events, 2007. This proves that maintaining the balance of relations between humans and the environment can provide ecological and economic benefits in improving people's welfare. giving different perceptions and very much depends on the ability of a person or household to meet basic needs. The subjective well-being of forest peoples can be greatly influenced by their emotional and spiritual ties to the forest landscape. These factors vary from place to place, but in this section we can touch on some of the main issues that define the condition of poverty in forested areas.

3.1.2 Core Welfare Index. Based on the results of primary data analysis in the two buffer villages of TNGR the core welfare index (material wealth index, knowledge index and health index) can be seen in Table 3 below.

Based on Table 3 below shows that the core welfare index is included in the medium welfare category with an index value of 48.9 based on assessment criteria, namely:

- Poor: 0-39
- Medium: 40-60
- Prosperous: 61-100

The category of moderate welfare level on the core welfare index above is strongly influenced by the knowledge index and health index, each with a medium welfare index category with index values of 43.3 and 41.7 only material wealth indices are included in the prosperous category with an index value of 61.7. The category of moderate level of welfare is caused by the low level of knowledge and education in both the Desa Desa Senaru and the villages of Sembalun. Most productive age people do not complete the 9-year compulsory education, but it is also difficult to access health services in the two villages, affecting the low life expectancy and high maternal and child mortality, which can be a trigger
for the low level of welfare of the people. This condition proves that there is a relationship between the good and bad condition of the surrounding environment and will have a direct or indirect impact on core welfare (material wealth, knowledge, health).

| Welfare Category | Criteria  | Indicator                                      | Index Value | Index Value Total |
|------------------|-----------|-----------------------------------------------|-------------|-------------------|
| Core Welfare     | Material  | House Condition (Var 15)                      | 61.7        |                   |
|                  | Index     | Have a motorcycle or engine (Var 16)          |             |                   |
|                  |           | Have satellite dish or refrigerator (Var 17)  |             |                   |
|                  |           | Formal education level (Var 18)               |             |                   |
|                  | Knowledge | The number of school children or out of school (Var 19) | 43.3        | 48.9              |
|                  |           | Informal knowledge (Var 20)                   |             | Average           |
| Health Index     |           | Lack of food (Var 12)                         | 41.7        |                   |
|                  |           | Access to clean drinking water (Var 13)       |             |                   |
|                  |           | Access to health service (Var 14)             |             |                   |

3.1.3 Supporting Welfare Index (Context). Based on the results of primary data analysis in both TNGR buffer villages supporting welfare index (natural index, social index, economic index, political index and infrastructure index and service) can be seen in Table 4 below.

Based on Table 4 below shows that the supporting welfare index (context) is included in the medium welfare category with an index value of 42.66 based on assessment criteria, namely:

- Poor: 0-39
- Medium: 40-60
- Prosperous: 61-100

The category of moderate welfare level in the context supporting index is strongly influenced by the political index with an index value of 35 and the value of the Natural Index index, the infrastructure index and services amounting to 38.3. The low access to natural resource users and the lack of access to information for local communities around forest areas has resulted in a low level of economic income for the community, especially as some people are very dependent on natural resources, in this case the forest resources in TNGR. Unclear land ownership weakens the political influence of forest peoples and threatens their livelihoods. It is common knowledge that forest peoples often do not have legal rights to the land they have occupied from CIFOR hereditary, 2007. They are considered landless squatters and, therefore, do not have political rights.
### Table 4. Supporting Welfare Index (Context)

| Welfare Category | Criteria Nature Index | Indicator | Index Value | Value Total | Explanation |
|------------------|-----------------------|-----------|-------------|-------------|-------------|
| Prosperity of worse | Level of environmental damage (Var 23a) | 38,3 |
| | The existence of birds (Var 24) | |
| | Purpay natural resources (Var 25) | |
| | Quality of water (Var 26) | |
| Social Indx | Level please help (Var 30) | |
| | Laughter of mutual trust (Var 31) | 46,7 |
| | Frequency of conflict (Var 32) | |
| Indek ekonomi | Source of income (Var 28a) | |
| | Income stability (Var 28b) | 55 |
| | Rice supplies and rice buying capabilities (Var 29) | |
| Political Index | Access to natural resources (Var 33) | |
| | Access to information (Var 34) | 35 |
| | To participate in the decision of the decades (Var 35) | 42,66 | Average |
| Infrastructu re and Service Index | Basic Education facility (Var 41) | |
| | Quality of school (Var 42) | |
| | Fasilitas pelayanan kesehatan (Var 44) | |
| | Quality health service (Var 45) | 38,3 |
| | Training and assistance (Var 50) | |
| | Street conditions and bridges (Var 51) | |
| | Market Facilities (Var 52) | |
| | Fasilitas komunikasi (Var 56) | |

In addition, there is also a low level of community participation in decision making, to determine policies in the management and development of the TNNGR area. The still high level of environmental degradation caused by activities in areas such as tourism tourism that exceeds the capacity and carrying
capacity of the environment, excessive natural resource extraction has an impact on the level of damage to the natural environment / area in TNGR. Therefore, awareness and understanding is needed by all stakeholders in maintaining the TNGR area as a biosphere reserve in accordance with the objectives that lead to conservation activities, sustainable economic development and logistics support (research, monitoring and evaluation, education and human resources). Based on CIFOR criteria and indicators, 2007 the aggregate index value of the welfare level of the communities around the TNGR forest is 48.3. The index value includes the category of moderate welfare index with assessment criteria, namely:

- poor: 0-36
- Medium: 37-63
- Prosperous: 64-100

Forests can create unique opportunities to reduce poverty, and can also present conditions that trap people in poverty. The links between forests and poverty vary depending on a number of factors, including the degree of remoteness of the forest, the mix of resources found in the forest, and how local communities interact with these resources. The decreasing function of the forest ecology of TNGR greatly affects the socio-economic conditions of the community. Increasing damage to the forests of Rinjani Forest Area (125 200 ha) including Mount Rinjani National Park (TNGR) has suffered a lot of damage mainly caused by disturbances in forest security such as illegal logging and encroachment of forests. Almost all of the water supply on Lombok Island (around 90%) for both clean water and irrigation purposes sourced from the Rinjani area Including the TNGR ecosystem (RI Ministry of Forestry, 2006 in Sukardi, [13]. Furthermore, according to Markum al., [14] that damage to forest resources resulted in the loss of a number of springs. In addition, regional claims under the pretext of belonging to ancestors still occur in TNGR.

4. Conclusion
- The level of community welfare based on CIFOR criteria and indicators, 2007 around Mount Rinjani National Park is included in the medium category with an aggregate index value of 48.3.
- Mount Rinjani National Park as one of the UNESCO biosphere sites has an important opportunity to improve the welfare of the community through the concept of regional management and development which leads to conservation activities, sustainable economic development and logistics support (research, monitoring and evaluation, education and human resources).

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