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# Implementation of Response to Lima Action Plan in Indonesia: Strategy and Progress in Relation to SDGs

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**Abstract.** Possessing 11 biosphere reserves (BRs) and three more are underway, Indonesia has been conducting various efforts and programmes to support and implement man and Biosphere (MAB) Strategy 2015-2025 and Lima Action Plan (LAP) 2016-2025. The number of conservation areas as and their surroundings for economic development to be nominated as biosphere reserves including in the eastern part of Indonesia, has been increased. This due to the increase of awareness of local government and community and a better approach through improved communication. The increase number of new BRs has to be accompanied with legislation i.e. Government Regulation concerning Biosphere Reserves which is now in drafting process. Legal aspect would ensure sustainable funding reflected in Long and Medium Development Plan which the next one covers the period of 2020 – 2024. Different levels of stakeholders have been involved although the participation is varied between sites. Programmes and action plans concerning BRs as a model for sustainable development, collaboration and networking, partnership and sustainable funding for MAB programmes, improvement in communication and effective governance have partly been implemented. It is necessary to strengthen the link within the region and the World Network of BRs which is now still weak. Although the promotion of products through collaboration on branding, has just been commenced recently, it has shown positive responses and impacts. Partnering with universities especially local ones in each site has resulted in result – oriented policy. The involvement of private sectors still needs to be enhanced as it has been site specific. Dissemination of LAP has been conducted through relevant workshops held in 2016 and 2017 aiming at increased participation to support LAP implementation. Improved communication mechanism would also ease information sharing especially on lesson learnt among BRs in Indonesia and World Network of BRs. It remains a challenge to integrate other UNESCO programmes into MAB Programme which means multidisciplinary and multisectoral approaches to achieve SDGs, although it has occurred in certain BRs. In addition to progress and achievements, issues related problems on LAP implementation will be discussed.

## 1. Introduction

Indonesian terrestrial bioresources has not been fully investigated for the welfare of human-being. Exploration of marine bioresources for medicine, cosmetic and functional food and others have not even been explored as mostly the utilization has been as food and first generation products. Added value or secondary products as well as advanced materials in the era revolution industry 4.0 and society 5.0, are inevitable [1,2]. Society 5.0 is basically a political-ideological concept, it seems to be necessary to integrate several dimensions, such as: "1) Innovation Policy (from government side), 2)



Entrepreneurial spirit (from Society Side) and 3) Entrepreneurial Skills (from civil society and institutions) as described by Hayashi et al. [3].

Occupying 1% of earth's land, Indonesia's rainforest contain 10% or 35,000 species of known plant species, but only 17% (6,000 species) out it has been utilized [4]. Nearly 400,000 plant species in the world, but so far, only about 31,000 of these species have at least one documented use. These include uses for food, medicine, recreation, genes, poisons, animal feed, and building material. The highest number of utilization has been for medicine i.e. more than 15,000 species [5].

Without appropriate conservation strategy involving *in situ* and *ex situ* conservation which are covered in Man and Biosphere (MAB) of UNESCO Programme while as well effort to utilise sustainably, the species will extinct if the habitat is degrading at the same phase as these days. Therefore, MAB programme by establishing biosphere reserves as a model for implementing sustainable development, needs to be more recognised and the replication of biosphere reserves is needed.

## 2. MAB Strategy 2015-2025 and Lima Action Plan

UNESCO's Man and the Biosphere Programme (MAB) is an Intergovernmental Scientific Programme which was launched in 1971, aims to establish a scientific basis for the improvement of relationships between people and their environments. MAB combines the natural and social sciences, economics and education to improve human livelihoods and the equitable sharing of benefits, and to safeguard natural and managed ecosystems. Therefore, it is promoting innovative approaches to economic development that are socially and culturally appropriate, and environmentally sustainable. In the coming 10 years, the MAB Programme will concentrate its support to Member States and stakeholders in conserving biodiversity, restoring and enhancing ecosystem services, and fostering the sustainable use of natural resources; contributing to sustainable, healthy, and equitable societies, economies and thriving human settlements in harmony with the biosphere; facilitating biodiversity and sustainability science, education for sustainable development and capacity building; and supporting mitigation and adaptation to climate change and other aspects of global environmental change. The MAB Programme will harness lessons learned through sustainability science and education and use modern, open and transparent ways to communicate and share information. In relation to this, in 2016 in the 28th Session of International Coordinating Council of MAB in Lima, Peru, Lima Action Plan (LAP) was adopted. Using the MAB Strategy 2015-2025 and Lima Action Plan 2016-2025 as the key points of reference, MAB National Committees and MAB networks are strongly encouraged to prepare their own strategies and action plans. These should be founded in national and regional realities and imperatives and will contribute both to addressing these and to implementing the Lima Action Plan at the global level [6].

Through MAB programmes, among others, solving problems in the utilisation of bioresources and ecosystem which give impact to biodiversity degradation and the decrease of environment quality, through its 686 biosphere reserves in 122 countries which 14 of them are located in Indonesia, could demonstrate a harmonization between people and nature. These due to its three pillars i.e. conservation, economic development and research and monitoring in its *ex situ* in addition to *in situ* areas with multidiciplines. multisectoral and integrated approach.

In Indonesia, MAB Programme has been initiated since 1972, but first four biosphere reserves in Indonesia were not designated until 1977. The four biosphere reserves are Cibodas, Tanjung Puting, Lore Lindu, Komodo then another two biosphere reserves i.e. Pulau Siberut and Gunung Leuser were designated in 1981. Then after 28 years, Giam Siak Kecil – Bukit Batu Biosphere Reserve in Riau Province in Sumatera which was initially initiated by a private sector and local government was designated in 2009, followed by Wakatobi Biosphere Reserve in 2012, Bromo Tengger –Semeru-Arjuno BR and Takabonerate Kep. Selayar in 2015, Belambangan in 2017 and 3 were designated in 2018. The new style of initiation of nomination as new biosphere reserves i.e. by bottom up institutions was marked with the private sector initiation in 2009 which was appreciated by UNESCO. The progress of programmes developed in the biosphere reserves needs to be enhanced and monitored.

The issuance of LAP is a good standardized “guideline” or reference to monitor the progress and achievement.

### 3. LAP Strategic Action, SDGs and the Implementation in Indonesia

Since its adoption, the level of implementation of LAP in the 122 countries has been varied depending on the commitment of the government and other stakeholder, condition of the country which could include political condition. In Indonesia, although some actions stated in LAP are projected to be taken in 2018, they were already been conducted already in 2016 and 2017.

LIMA ACTION PLAN 2016-2025 consists of 5 Strategic Action Areas, 29 outcomes, 57 actions, 57 outputs. The 5 strategic action area are as follows:

- Strategic Action Area A. The World Network of Biosphere Reserves consisting of effectively functioning models for sustainable development.
- Strategic Action Area B. Inclusive, dynamic and result-oriented collaboration and networking within the MAB Programme and the World Network of Biosphere Reserves.
- Strategic Action Area C. Effective external partnerships and sufficient and sustainable funding for the MAB Programme and the World Network of Biosphere Reserves.
- Strategic Action Area D. Comprehensive, modern, open, and transparent communication, information and data sharing.
- Strategic Action Area E. Effective governance of and within the MAB Programme and the World Network of Biosphere Reserves.

The implementation of LAP in each member states of ICC MAB UNESCO is varied and has to be reported in yearly session of ICC MAB. The strategic action areas and their indicators and expected outputs are in line with the SDGs and other policies. However, the implementation has been varied due to many reasons, one of which is lack of information to policy makers, community, government agencies, and all other components in the country.

#### *3.1 Strategic Action Area A. The World Network of Biosphere Reserves consisting of effectively functioning models for sustainable development*

##### *3.1.1 Biosphere Reserves (BRs) recognized as models contributing to the implementation of Sustainable Development Goals (SDGs) and Multilateral Environmental Agreements (MEAs)*

- Promote BRs as sites that actively contribute to achieving the SDGs BRs have made measurable contributions in support of the achievement of the SDGs that can be replicated and scaled up.
- Promote BRs as sites that actively contribute to implementing MEAs, including the Aichi Biodiversity Targets.
- Establish alliances at local, regional, international levels for biodiversity conservation and benefits to local people, taking into consideration the rights of indigenous people.
- Use BRs as priority sites/observatories for climate change research, monitoring, mitigation and adaptation, including in support of the UNFCCC COP21 Paris Agreement.
- Promote green/sustainable/social economy initiatives inside BRs Sustainable development initiatives established that are inclusive and environmentally integrative.

In relation to Strategic Action Area A, the status and progress of implementation are as follows:

Biosphere reserves in Indonesia have not been all recognized as models contributing to the implementation of SDGs as not all governing body of the BRS which consist of local government, national parks or conservation area managers, community (religious) leaders, NGO, universities, private sectors, realised the role and and aware of the function related to SDGs.

Nationally, the Governmnet of Indonesia has been mainstreaming and appropriateness with Medium and Long Term Development Plan (94 targets in line with 169 SDGs targets): social (1-5), economy (7-10, 17), environment (6, 11-15), law & management (16). In Presidential Decree No. 59

Year 2017 on SDGs [7], the Roadmap and National Action Plan up to Provincial/District Action Plan are clearly described in State Ministerial Decree No. 7 Year 2018 [8]. Partnership Principles and multistakeholder participation are also described i.e.: trust building, equal partnership, participation, accountable and mutual benefit.

By implementing principles of BRS and its ideal programmes, at least at least eight goals of SDGs could be achieved and lead to another 4 and supporting other 5 goals. IBSAP (Indonesian Biodiversity Strategic and Action Plan) 2015- 2020 launched in 2016 have described the strategy and action plan for conservation and mainstreaming biodiversity in the central, provincial and districts level [9]. If this is implemented smoothly, it will give positive impact on the achievement of SDGs.

In relation to Aichi Target, not only the number of protected areas as *in situ* conservation areas are the core zone of BRs, have been given more attention, but also the *ex situ* conservation in certain BRs such as in the form of Botanical Garden have been contributing to achieve Aichi Targets.

With regards to contributing to Aichi Targets [10], programmes in BRs are relevant to all 5 strategic goals (Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society; Reduce the direct pressures on biodiversity and promote sustainable use; To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity; Enhance the benefits to all from biodiversity and ecosystem services; Enhance implementation through participatory planning, knowledge management and capacity building) which contributed to 20 targets at different levels. Awareness of the value of biodiversity (Target 1) has been significantly increased by the increase number of biosphere reserve in Indonesia. The logo established in at least 5 biosphere reserves consists of biodiversity component has made important stakeholders more aware of the value of biodiversity. As there are buffer and transition zones in biosphere reserves, agriculture crops conservation (Target 7) are maintained, although sustainable use level need to be assessed. Biosphere reserves support the achievement of Aichi Target 11 i.e. by 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes. This due to the three principles of biosphere reserves and their zonation which define buffer zone and transition zone in the outer area of conservation areas as the core zone of the biosphere reserves. The area in most biosphere reserves becomes up to five times larger than the core zone.

By implementing access and benefit sharing policy as stated in Nagoya Protocol in Act No. 11 Year 2013 followed by Environment and Forestry Ministerial Decree No. 2 Year 2018, the Indonesian government will ensure that local community and indigenous people will receive the benefit. However, technical regulations and guidelines are required for further implementation [11,12]. It has been encouraged and underlined in many international, regional and national events that biosphere reserves are ideal site for the implementation of otehr programmes such as related to climate change as they are representing various ecosystems including peatland, marine, mountaineous areas. The involvement of many stakeholders could also be used as development of economy based on natural resources abundant locally to support green economy scheme. The Wakatobi Recommendation in 2016 for strengthening the role of local government clearly stated the green economy for regional development. Many resources have not been explored, collaboration with many institutions and private sectors are necessary to produce high value products.

Branding has been developed for added value products or products meet certain criteria such as reduce-reuse-recycle, and environmentally friendly, and ecosystem services in the biosphere reserves that already have their own logo. At least three biosphere reserves i.e. Cibodas BR, Lore Lindu BR, and Takabonerate- Kep. Selayar BR have launched labelled products and homestay/hotel. More products and more biosphere reserves will be branded and launched in the bear future as some have been identified. With the label, the value has been increased, therefore, an integrated programme with marketing strategy so that the products could be exported when the quality is met.

### *3.2 Strategic Action Area B. Inclusive, dynamic and result-oriented collaboration and networking within the MAB Programme and the World Network of Biosphere Reserves*

#### *3.2.1 Effective BR managers/coordinators and engaged stakeholders of BRs*

- Organize global education, capacity building and training programmes
- Organize regional education, capacity building and training programmes

#### *3.2.2 Inclusive regional and thematic networks*

- Ensure the participation of all relevant stakeholders in regional and thematic networks

#### *3.2.3 Regional and thematic networks with adequate resources*

- Develop a business plan for each network.

#### *3.2.4 Effective regional and thematic level collaboration*

- Create opportunities for collaborative research, implementation and monitoring.

#### *3.2.5 Visibility of regional and thematic networks and their activities*

- Disseminate results of network activities internally, and externally, including cases of good practice in BRs.

#### *3.2.6 Transnational and transboundary cooperation between BRs*

- Create and implement twinning arrangements between BRs in different countries
- Designate and implement transboundary BRs (TBRs) TBRs designated and implemented

#### *3.2.7 An active and open interdisciplinary network of scientists/knowledge holders sharing MAB vision and mission*

- Establish an international network of scientists/knowledge holders working in and with BRs, that engages with national and other international networks of scientists/knowledge holders
- Develop a joint research and knowledge exchange agenda for the international network

In relation to Strategic Action Area B, the status and progress of implementation are as follows: Twinning arrangement between Indonesia's biosphere reserve with other member state's biosphere reserves have been initiated i.e. between Wakatobi BR and one of UK's biosphere reserve. Previously, the sites proposed in UK was Orkney but as Orkney which is well known as self sufficient renewable energy and product branding has not been designated as a biosphere reserve, other site is proposed. Isle of Man BR has been considered for twinning programme. This meets the target of LAP i.e. by the end of 2018 twinning arrangements have been made.

Regional and global education have been conducted at the same time during the regional SeaBRNet meeting. The Indonesia MAB National Committee has been invited by Japan MAB National Committee as a resource person to share the progress related LAP implementation.

Capacity building through among others, training courses are very important for biosphere reserve managers/coordinators. Through the World Network and Regional or thematic networks, some managers or related personnels have been fortunate to join international training courses. Lesson learned obtained by sharing information have been very useful. More training courses covering other aspects need to be enhanced.

A number of collaboration- international including transboundary - are prerequisite to solve the shortage of resources including human resources and budget. The involvement of private sectors, and funding agencies will be encouraged as only certain BRs have the collaboration. In addition, as one pillar of biosphere reserve is research, linking with research institution to conduct international programmes are necessary. Results from research conducted in BRs which integrated many aspects

and international programmes could be used to solve environmental, socio economic and culture problems.

One example is a collaboration involving a private sector and local government by integrating with other UNESCO's Programme i.e. IHP (International Ecohydrology Programme) to provide clean water in Giam Siak kecil- Bukit Batu BR by processing peat swamp water using an equipment and ecohydrology experts, has been appreciated by the community. The equipment provided by a private sector was once out of order but was then fixed after unclear authority in the area.

Involvement of private sectors widely known as a public-private partnership (PPP) needs to be enhanced. Not many industries are aware of the programme, therefore more awareness programme needs to be prioritised. PPP is a cooperative arrangement between two or more public and private sectors, typically of a long-term nature [13,14]. Governments have used such a mix of public and private endeavors throughout history [15,16].

Visibility of regional and thematic networks and their activities has been increased as the networks have been broadened and enhanced through an improved communication strategy.

Communication Forum of Indonesian Biosphere Reserves was conducted once a year in the past which became twice a year in 2017 and to be extended through web/on line/sub regional: west. Central and east Indonesia. The meeting which each biosphere reserve coordinators present the progress and as a media for sharing information have been appreciated by other member state considering the efforts and the distance of the sites in the large area of Indonesia.

Joint research has been progressing involving many international institutions and various agencies in Indonesia. Natural based-drug discovery research have been conducted in certain BRs such as an antibiotic candidate, preliminary screening for antibiotic and antioxidants, prebiotic, anti malaria. High content of artemisinin from plants in Cibodas Botanical Garden which is in the border of core zone and buffer zone of Cibodas BR, has been proven and used as the source of artemisinin [17,18]. Artemisinin has been considered as a powerful medicine for malaria disease. Research on inulin from tuber of dahlia (*Dahlia pinnata* L.) for medicine have been in the late stage as a private sector interested in processing to further end products have signed a MoU with Indonesian Institute of Sciences (LIPI) which researchers produced inulin from dahlia tuber planted in the Cibodas Botanical Garden in the buffer zone of Cibodas Biosphere Reserves [19]. Inulin is a prebiotic so it is considered as functional food and a potential for anti cancer treatment [20] Inulin has been imported and in majority produced from the tubers of artichoke (*Helianthus tuberosus*) and chicory (*Chicoryum intybus* L), therefore, it could reduce the dependency to import.

The potential of other microorganisms such as micro algae as alternative sources of bioenergy have been explored in Giam Siak Kecil - Bukit Batu BR and Wakatobi BR as certain species collected have a potential for biodiesel as they contain high lipid [20]. The utilization of microalgae as alternative production of bioenergy has been explored in other countries and considered as 3<sup>rd</sup> generation of bioenergy [21-24].

Research on ecosystem services in the biosphere reserves in Indonesia have been conducted collaboratively between research institutes, universities, national parks and other relevant partners.

Research on carbon stock in several BRs such as Cibodas BR and Siberut BR has been reported [25,26]. Research on ecotourism and tourism in general [27] and water resources in certain biosphere reserves such as Bromo Tengger – Semeru – Arjuno BR.

Research collaboration and programmes namely Blue Communities on marine biodiversity, health, and fishery products and energy is on going in several BRs such as in Takabonerate Kep. Selayar BR in South Sulawesi Province [28]. The three year collaboration is between Selayar District, Takabonerate Local government, National Park, CSERM Universitas Nasional, and Plymouth Marine Laboratory, UK.

There are many new species not yet explored for their utilization. LIPI have found new species and new characterization of Indonesia's Biota at the total amount of more than 1100 in 1967-2017 [29] Status of biodiversity covering fauna, flora and microorganisms has been up dated as a reference for

decision making process including for determining the quota for international trade and for scientific recommendation [30,31].

### *3.3 Strategic Action Area C. Effective external partnerships and sufficient and sustainable funding for the MAB Programme and the World Network of Biosphere Reserves.*

#### *3.3.1 Adequate resources for the MAB programme and the WNBR*

- Prepare a business and a marketing plan to be endorsed by the ICC.
- Implement the business and marketing plan.

#### *3.3.2 Recognition of the MAB Programme as a key partner within UNESCO and with other international organizations and relevant conventions*

- Create and realise opportunities for collaboration and partnerships within UNESCO Partnerships between MAB and other UNESCO programmes and entities established, maintained, and/or reinforced.
- Create opportunities for collaboration and partnerships with international programmes and relevant conventions.

#### *3.3.3 BRs and regional networks generating their own revenues*

- Support capacity building in approaches to generate revenue.
- Promote partnerships to raise funds from external entities with objectives that are compatible with those of the MAB Programme.

#### *3.3.4 Recognition of the MAB Programme as a key partner by private sector*

- Develop guidelines on private sector partnerships for national committees and BRs.

#### *3.3.5 Recognition that the MAB Programme contributes to the delivery of the objectives of national, regional funding programs*

- Create opportunities for projects and activities funded by national and regional funding agencies.

#### *3.3.6 Entrepreneurs and social enterprises contribute to BR activities*

- Provide guidance and training to entrepreneurs and social enterprises on involvement in BRs
- Create opportunities for entrepreneurs and social enterprises in BRs, including training, incentives and public procurement.

#### *3.3.7 Recognition of BRs nationally and internationally*

- Undertake an analysis of a strengthened global BR brand, and establish this, with associated national Guidelines.
- Use the brand in products and services in line with national guidelines BR brand used in marketing of goods and services in line with national guidelines BRs.

#### *3.3.8 Enhanced synergies between BRs*

- Encourage joint promotion and marketing of BR products and services among BRs and Beyond Information exchanged on the availability of goods and services in BRs and joint schemes implemented.

In relation to Strategic Action Area C, the status and progress of implementation are as follows: Business plan concerning the products that have been branded need to be discussed further to have a final version. The involvement of marketing experts to supervise the process is required.

Proposals for collaboration have been discussed with other relevant conventions or schemes such as ACM (Asian Consortium on Conservation and Sustainable Use of Microorganism) for using Biosphere reserves as the sites for research. In addition, a discussion has been made with GEF (Global Environment Facility) Asia Pacific Region personnel to use the sites as the implementation of SDGs. Partnerships to raise funds from external entities with objectives that are compatible with MAB Programme have been explored. By the establishment of one division in Indonesia MAB National Committee dealing with fund raising, a Trust Fund establishment has been considered. Project proposals prepared targeting not just regional funding agencies, but also international ones in line with shared objectives i.e. Newton Fund by the British Government administered by The British Council.

As mentioned in the previous targets, the use of the brand in products and services have been encouraged, and it is in line with the national guidelines BR brand developed by Indonesia MAB National Committee in 2017. The achievement was ahead than the target of LAP i.e. by the end of 2018 Official launch of the brand and guidelines. Number of products and services that carry the BR brand up to July 2018 is not less than 13 from three biosphere reserves. An analysis will be conducted in the near future on the impact of the use of brand in products and services in local community economy.

Guidance has been established but a more simple guideline to ease community to understand the procedure will be published in the near future. A set of training for entrepreneurs and social enterprises has been conducted to have the products by local community live in the buffer zone and transition zone branded, however, more training is needed.

Study visits conducted by other biosphere reserves to a biosphere reserve that is considered more developed i.e. Cibodas BR have been implemented. Not only visited by Indonesian biosphere reserves, Cibodas BR have been visited by ASEAN biosphere reserves to learn management and branding aspects. The products of other biosphere reserves have been informed to others, not just for promotion but also for encouraging others to have the same efforts.

### *3.4 Strategic Action Area D. Comprehensive, modern, open, and transparent communication, information and data sharing*

#### *3.4.1 Full availability of MAB documents, data, information and other material*

- Implement the open access policy adopted by the ICC in 2014.

#### *3.4.2 Increased awareness of all aspects of the MAB Programme*

- Create a communication strategy and an action plan Communication strategy and action plan created.
- Implement the communication action plan.
- Implement a coordinated Publications programme to facilitate data and knowledge Sharing
- Effectively implement the MAB web site (MABNet).

#### *3.4.3 Broader Engagement and outreach*

- Use social media and other novel information and communication technologies

With regard to Strategic Action Area D, the status and progress of implementation are as follows: Through simple, user-friendly mechanism with improved website, the communication among Indonesia's BR personnel would be more efficient. The report could be obtained with a simple reporting form, with the link in the website "my report" which covers three monthly, and annual report.

Other form of communication i.e. through face to face in the Communication Forum of Indonesia BRs conducted every year, which frequency will be increased by seeking other funding sources. To take advantage of social media, information will also be shared through on line and other media: WhatsApp Consortium of Biosphere Reserve, Fanpage Fb.

Communication using information technologies such as video conference or Skype have been planned, although some sites sometimes have a problem with internet connection.

### *3.5 Strategic Action Area E. Effective governance of and within the MAB Programme and the World Network of Biosphere Reserves*

- Strong support for the implementation of the MAB programme from the governments of Member States
- MAB National Committees have a trans-disciplinary membership
- Regular progress updates by Member States and monitoring of the Action Plan
- Effective functioning of regional and thematic network.

Regarding Strategic Action Area E, the status and progress of implementation are as follows:

The support from the government has been stronger as proven by the production of the draft of Government Regulation on Biosphere Reserve which will be further processed to the final draft in the near future. With this, the management, funding and programmes in all biosphere reserves would be standardized and have a secured funding allocation.

The composition of MAB National Committee in Indonesia has demonstrated a trans-disciplinary membership and multisectoral one as representatives of government institutions, private sectors, universities, NGO and society. It consists of 41 persons has shown the trans-disciplinary membership as the Board consist of 6 Ministries, the Chairman and Vice Chairman, Executive Director and 4 programme directors i.e. Programme Director of Nature Conservation and Ecosystem; Programme Director of R & D; Programme Director of Planning and Finance : Head of Conservation Asia Pulp and Paper); Programme Director of Communication and Dissemination.

The commitment of each member states in relation to this strategic action is strongly related to the strong influence and role of its MAB national committee. Network either regional or thematic, has been developed and strengthened linking Indonesia's BRs. In the last 3 years, Indonesia were hosting the SeaBRNet i.e. 9th SeaBRNet in Malang, East Java Province in 2015 and 10th SeaBRNet in Jakarta in 2017 [32].

The results of 10th SeaBRNet with the theme of "Interaction among UNESCO Programmes toward the Sustainable Development of Biosphere Reserves", have strongly recommended the interaction between MAB with other international programmes such as IHP, WHS and Geopark attended by its representatives and 50 MAB National Committee.

## **4. Problems in Implementing LAP and Possible Solution**

### *4.1 Problems*

Based on analysis on the implementation of LAP in Indonesian biosphere reserves which could also be the case of other country's biosphere reserves, there are major problems could be identified as follows:

- Frequent changing of local government leaders
- Not all regions have biosphere reserves have PERDA (Local Government Regulation) on BR management which gives impact on no funding allocation stated in the Medium and Long –term Development Plan.
- Lack of competence for building networking and establishing joint proposal
- Lack of funding for awareness/education on BRs, MAB, LAP.

### *4.2 Possible solutions*

There are a number of possible solutions could be addressed such as:

- Political will
- Strong legal basis
- Good strategy: planning, monitoring, evaluation
- Intensive communication

- Improved experience sharing exchange such as more frequent BR meetings
- Role and commitment of local governments and others are varied (at different level) towards BRs management and development, this needs to be strengthened
- More efforts concerning all sectors are needed
- More supports from various institutions/agencies are required

## 5 Conclusions

As Lima Action Plan (LAP) covers aspects of contributing to the implementation of Sustainable Development Goals (SDGs) and Aichi Targets, underlining the importance of inclusive, dynamic and result-oriented collaboration and networking, effective external partnerships; sufficient and sustainable funding; the need of comprehensive, modern, open, and transparent communication, information and data sharing as well as the necessity to conduct effective governance, the successful implementation of LAP reflects the success of achieving SDGs and could be used as tools to measure other recent development such as era industrial revolution 4.0 and preparedness to era of society 5.0. In other words, MAB programmes through its biosphere reserves support economic development, contribution to solving social and cultural problems while as well conserving biodiversity and landscape and habitat.

A Biosphere Reserve is a model of multi stake holders management such as Biosphere Reserve concept: requires replication as it demonstrates PPP scheme especially for down-stream process or commercialization for added value bio-resources based products and services.

It is prerequisite to enhance international collaboration involving regional bound such as ASEAN supported by other developed countries. Improve communication strategy to increase awareness is required to speed up the target achievement of SDGs.

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