The Next Generation Information Of Technology For Biodiversty Of Conservation

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Abstract—Monitoring and surveillance system in forest area is a system developed by implementing the achievement of technology and information to collect data and information in different ways. With the development of science, especially in the field of technology and information, especially in the development of the Internet of Things (IoT) increasingly provide opportunities to obtain information in real time, massive and accurate. ICT-related research for forest areas to be developed is an integrated system between forest ecosystems, buffer zones and urban areas through cloud computing systems involving integrated data centers for various data needs. IoT to be developed include: Visual Camera that can be used for surveillance of animals and vegetation, environmental sensors consisting of Weather Station, Temperature Sensor and Fire, GPS Sensor for Pal Limit. Access and data collection can use 450 Mhz point to point LTE BTS, or satelite at an economical price. Use for data. Keywords—IoT, Forest Management, ICT

1. Introduction

The concept of biodiversity is considered one of the most important and strategic issues, as it is linked to the concept of protected and endangered species diversity, forest fires, conservation of flora and fauna, global warming, nature tourism and traditional wisdom [1]. Indonesia in terms of biodiversity has endemistity content with a very high level of diversity, composed of 42 types of terrestrial ecosystems and 5 unique marine ecosystems, so that Indonesia has diverse biological resources, Indonesia is categorized as one of the countries with the greatest biodiversity in Indonesia the world (megadiversity) and considered the center of world biodiversity. Biodiversity has an important role and thus requires special treatment in its management, it is related to biodiversity that has tremendous benefits for the people of Indonesia and other important things biodiversity is beginning to be threatened with extinction. The functions and benefits of biodiversity have the functions and benefits of species, genes, and ecosystem levels. It requires good management in order to produce environmental services with high strategic and economic value. Indonesia is one of the most important centers of origin of the flora and fauna of its diversity, in Indonesia's forests estimated to contain thousands of species (species), while the rich diversity of fauna from the abundance contained in the Indonesian territory is 1,500 species of mammals, various reptilian and amphibian species world. In addition to the rich diversity of Indonesian flora and fauna, it has unique and endemic variety of endemic ecosystem types in Indonesia, making forests in Indonesia have high economic, social and cultural value [2].

The form of biodiversity management conservation, which is contained in Law no. 5 of 1990 on the conservation of Biological Natural Resources and its Ecosystem. In the elaboration of the law there is the term Nature reserve area and nature conservation area, these areas are protected areas of biodiversity from species, genes and ecosystem levels, with additional notes for natural conservation areas possible for carrying out the utilization action. From another legal aspect, there is Law no. 41 of 1999 on Forestry and Regulation of the Government of the Republic of Indonesia No. 8 of 1999 on the use of Wild Plant Species that regulates the problem of captive breeding, hunting, trade, delivery or transportation of plants and wildlife and sanctions for the spinning done.

2. Management For Wildlife Conservation

One of the efforts of the government to realize the declaration of biodiversity by determining the conservation areas in various regions. One type of conservation area is the National Park, with an area of about 57.9% of the total conservation area in Indonesia. Thus the national park has a strategic role

in the framework of protection, preservation and utilization of biodiversity so as to ensure the benefits of sustainability for the surrounding community in particular and throughout the Indonesian nation in general. Some things related to the management of the national park that is the synergy between the stakeholders with the community with the involvement of the community in the use of the area for cultural or ritual activities, so that the documentation of local wisdom of the wise community in the utilization of natural resources within the region‖ the indicators of the development of the utilization of natural resources based on wisdom local [3]. The need for the development of management and data management system with the latest ICT technology. One of the things that should be developed through the utilization of ICT, the use of tools for inventory and analysis of vegetation and integrated wildlife results through the database. So it can be monitored in an up-to-date manner. The level of data accuracy begins at the resort, sections and offices level into data and information to be considered, identifying the root of the problem, the issues on which the Annual Work Plan or Five Year Work Plan is based. A shared understanding of the national park management plan in the annual work plan (RKT) and the Five-Year Work Plan (RKL) involving the public so that what is done by Balai can run optimally, it is necessary a system capable of aspiration or similar kind of transparent public consultation and support planning. Thus the public also feels involved in the realization of planning, monitoring or monitoring of such planning. Thus a system that allows ICTs to monitor the park's performance in terms of development of management plans, the realization of management zoning arrangements, or national parks that already have management plans and monitor their realization.

An efficient system is required for conservation areas to be well maintained and monitored, not just relying on monitoring from staff in the region, but the need for collaboration from various parties. Human resources, funds and infrastructure in the area may not be sufficient to achieve optimal monitoring, in particular to prevent the occurrence of forest fires, fires. With this in mind, the policy collaboration has been set forth in the P.19 / Menhut-II / 2004 on "Collaborative Management of Natural Reserves and Nature Conservation Areas". It is possible that new patterns of conservation area management, better by involving stakeholders in particular, follow the current digital and social media, so that collaborative systems will be integrated into all existing national parks, as well as other conservation areas. Collaboration undertaken on the basis of ties between stakeholders to solve commonly formulated problems, with clear set of objectives. Thus, Cooperation in managing conservation areas in Indonesia is necessary because it involves the complexity of ecological, cultural, economic and political sub-systems with the linkage of various issues and the involvement of many interest groups within each of its subsystems, so that collaborative relationships are important when there is no agreement can be built simply and universally to get the best solution of the conflict [4]. Although collaboration has difficulties in its implementation, the increased success and benefits of collaboration in resolving issues have made this approach more popular [5].

Regulation of the Minister of Forestry Number P.56 / Menhut-II / 2006 on National Park Zoning Guideline which enables the spatial arrangement (zonation) of TN, including the establishment of special space or zone for people inside TN. P. 56 / Menhut-II / 2006 on National Parks Zoning Guideline explained that zonation of TN is a process of arrangement of space within TN into zones. TN Zone is an area within the TN area that is distinguished according to ecological, social, economic, and cultural functions and conditions of the community. The process of arrangement includes seven activities: 1) preparation, 2) data collection and analysis, 3) drafting of zoning draft, 4) public consultation, 5) document delivery, 6) boundary arrangement and 7) determination. In relation to the collaborative, it needs a system that can involve the public in planning, monitoring and evaluating the process of seven activities First, confirm that you have the correct template for your paper size. This template has been tailored Some seriously endangered Flora and Fauna are getting scarce and are protected by the Government of Indonesia having a list of protected plant and animal species. The latest version of this list is Government Regulation no. 7/1999 on 27 January, containing 236 species of animals (including 70 species of mammals, 93 birds, 29 reptiles, 20 insect insects, 7 fish, 1 antrozoa, and 13 bivalves) and 58 protected plant species. Some examples of the protected species are elephants, Javan tigers, Sumatran rhinos and Javanese, tapirs, anoa, babirusa, cassowary birds, maleo

birds, parrots, butterfly, belida, Raflessia flowers, black orchids and semar bags. For example, for mammals, most mammals are difficult to observe directly, because a) mammals have the ability to adapt to their natural conditions, b) very sensitive to human presence, c) occupy all forest strata, d) complex and inaccessible habitat conditions, taking into account the density of dense forest stands, the various contours or topography, the rushing streams. Thus, for now, observations, inventories, and censuses by understanding characteristics, behaviors, ranges and habitats are important to facilitate and minimize the error rate [6]. Some things to consider in habitat management are (1) fragmented forest ecosystems, (2) still encroachment activities, illegal logging and settlements (3) no basic data on periodic monitoring of the condition of the area. So it is expected to cause quality of habitat in terms of feed, water and cover, roaming areas become not qualified. For the management of habitat, the need for linkage of all parties that focuses on community empowerment program so that human activity in the area can be reduced / stopped altogether, the formation of program of habitat quality and quantity increase actively and taking into account the balance between ecosystem sustainability, economic benefit and local people welfare [7]. Management of protected areas and beyond, policies to protect particularly to protect ecosystems, the need for community support for the management of flora and fauna is guaranteed for the long term, so that natural resource management is carried out as much as possible for the people to do with social frameworks [8].

3. Information Of Technologi For Conservation

An important part of conservation management is data and information that can be properly managed, the fundamental issues are the truth of existing data and the integrity of data and information. All the individuals can input data problems other things to consider is how to develop a management system that is integrated with the standards or mutual agreement, so that although different opinions but have a common framework to obtain an integrated system by considering the balance between stakeholders, so that supervision is necessary , monitoring from external parties rather than internal parties, other things are data and information can be traced / traceabled and not changed data is guaranteed by various parties and not erased, although erased still able to trace the data initially. (hidden data), so how the organization, ownership of the system able to ensure the integrity of existing data. With the existing system people feel guaranteed to enter the existing data, so it has added value. If a common scheme is agreed upon in a systematic way, it appears that a data centralization allows data and information to have better data and value data. Thus can be accommodated needs in it.

The similarity of perspectives in the conservation and sustainable use of biodiversity from all stakeholders will naturally encourage the establishment of a conservation area network management system, especially based on Citizen Science or better known as Crowdsourcing. This situation is a social capital that must be developed and maintained continuity by sleuth especially the community in the conservation of flora and fauna from the policy until its implementation in the field. This social capital is not limited to local and national levels but also a global level because conservation has a real contribution to the conservation of global biodiversity. Flora and fauna will not be sustainable unless they have broad social commitments. In other words, conservation and conservation actions describe the social contract with the whole community at various levels and interests. The conservation, commerce and community [9]. Because of the legislation, it is not enough to be a solution to environmental problems especially relating to the man who manages conservation. It will eventually become a collection of knowledge called "Community Science" for example in the field of conservation [10]. Citizen science is a collaborative process of data collection, data curation and network analysis that contribute to knowledge through internet facilities via social media like Facebook or Twitter [11]. Several studies involving communities for conservation activities using mobile data collection and participants who collected data on support for environmental sustainability created gamifications that were given incentives to contribute to a competition supporting environmental sustainability [12]. Crowdsourcing to determine habitat in an environment is one of the new methods besides using remote sensing, which uses media photographs in its determination [13], mapping for wildlife distributions [14]. While [15]. Classifies Citizen Science into four categories: a)

Crowdsourcing b) Distributed Intelligence c) Participatory Science d) Extreme, which all levels can include for the field of conservation, at a certain level has been formed "Collaborative Science" where the various shareholders have together define the problem, collect the data and analyze it so that it can be taken a decision-making.

Community participation that is monitoring, knowledge development can be categorized as monitoring volunteer. While collaboration is done when the form of use of Cyber and its infrastructure will help the collaboration process, the technology used is usually Smartphone connected with GPS, sensors that are connected with several tools and websites that have data entry that is connected enough updating with GIS. Other outcomes are the provision of good governance frameworks for the management of flora and fauna conservation, as they facilitate the process of monitoring flora and significant con- corns on knowledge and awareness of conservation activities [16].
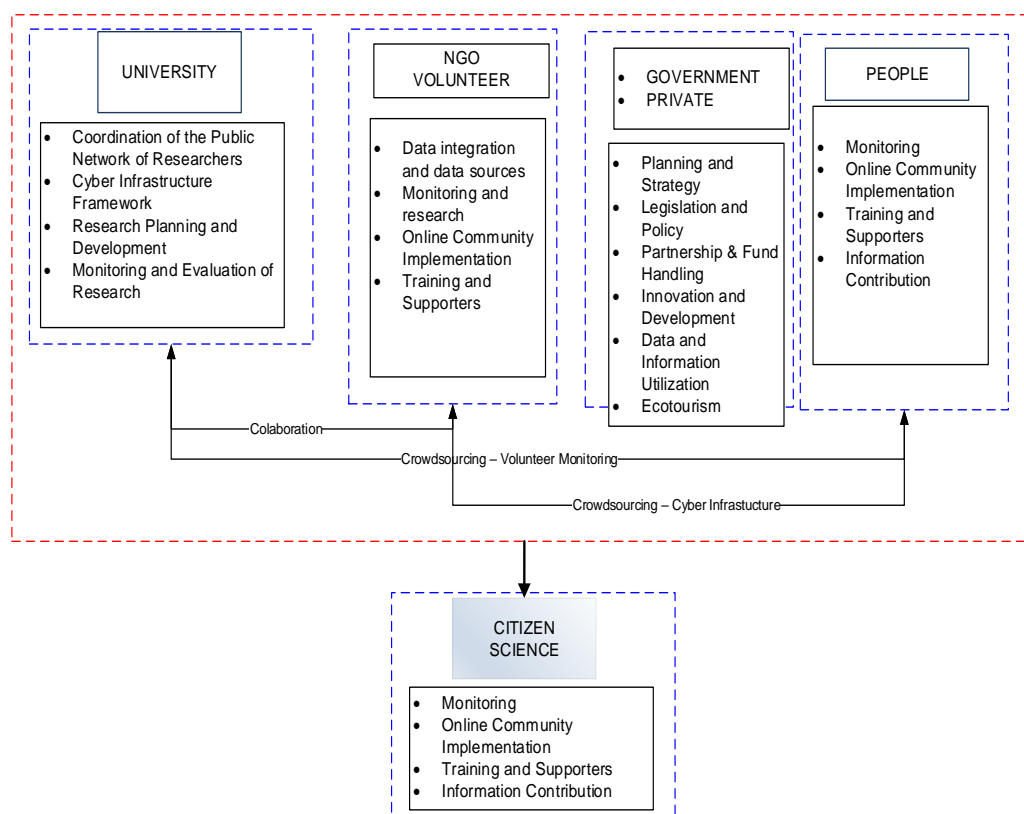

Figure 1. Framework for Conservation' colaboration of Information technology

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