MOBILIZING CITIZEN TO DOCUMENT HERPETOFAUNA DIVERSITY IN INDONESIA

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**INTRODUCTION**

Conserving biodiversity usually depend on the amount of information that scientists are able to gather during research, especially on the distribution of the species and the number of species occurs in any given habitats. Current practices in biodiversity conservation usually rely on professional scientists or conservationists with additional involvement from university students under the supervision of professional scientists. This approach has been carried out in many countries, including countries with high biodiversity. Unfortunately, a meta-analysis has shown that conservation research is low in areas with high diversity, including Indonesia (Wilson et al. 2016). The limited number of professional working as conservationist scientist in Indonesia can be shown by the number of conservation program in Indonesia that mostly focus on selected charismatic species (i.e. orang-utans, elephants, tigers and rhinos in selected areas) whilst neglecting other small and less charismatic species such as amphibians and reptile with high risk population decline due to human consumption, habitat change, pollutions and may other factors.

In the last decade, a volunteer based scientific program has been adopted in the effort to increase public participation in monitoring species. In this so-called citizen science scheme, general public participated in the collection of scientific data on certain taxonomic groups, geographic locations and time-frame, usually under the supervision of professional scientist. The volunteer-based scientific monitoring scheme, has been used around the world to overcome insufficient monitoring of diverse taxa (Aceves-Bueno et al. 2015, Theobald et al. 2015).

Citizen science program is a new tool that has not been utilized in full in Indonesia. Although volunteers-based program i.e. to clean beach and planting trees has been done for many years in Indonesia however, there is few reports on the use of volunteer to collect data on species. In 2017, a citizen program called GO-ARK (*Gerakan Observasi Amfibi Reptil Kita* or Movement to Observe Our Amphibian and Reptile) were launched in Bogor by Faculty of Forestry at Bogor Agricultural University and Indonesian Herpetological Society. The aim of this program is to gather distributional data of amphibian and reptile in Indonesia which will be used for the development of Indonesian Amphibian and Reptile Atlas. The first-year program selected Java and Bali as the main effort, due to the importance of Java and Bali for Indonesia in terms of politic, economic and conservations. This paper reports the development of the citizen science programs, result of the first Herpblitz in Java and Bali and the challenges to keep the program alive.

**METHODS**

Planning to mobilize public participation in citizen science program were carried out since 2016. The citizen science program uses bioblitz approach or a rapid field survey effort in which volunteers document as many species as possible in a defined location during a defined period (Parker et al. 2018). In this case, as we focus on amphibian and reptile it is called as Herpblitz. We decided to use application already available to enable volunteers to report the finding of amphibian and reptile through iNaturalist. This mobile application act as a crowdsourced database for biodiversity (<https://www.inaturalist.org>). We analyse number of species reported and percentage of usable data reported in the mobile apps. Data points from GO-ARK for amphibian and reptile in Java and Bali enabled us to add current locality record to the distribution maps that was produced based on MZB specimens (Kusrini et al. 2018, in preparation). We overlay data points from GO-ARK to the distribution map to see the contribution of this effort in increasing the locality data of herpetofauna in Java.

**RESULTS**

Steps to conduct Herpblitz can be broke down to four phases: Development phase, preparation phase, live phase and analysing and reporting phase. During the development phase we identify target participants, data storage and processing and develops protocols. Afterwards, during preparation phase we conduct training to selected targets to enable them identify species and develop promotional modules. Trained students are then mobilized during the live phase to lead observation in their community during the GO-ARK Herpblitz. Data are send through the iNaturalist program and analysed by our team. Figure 1 shows the schematic development of GO-ARK.

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Evaluate lesson learned

PHASE I: DEVELOPMENT PHASE

IDENTIFYING TARGET PARTICIPANTS

SELECTING DATA STORAGE AND PROCESSING

DEVELOPING PROTOCOL

PHASE II: PREPARATION PHASE

SELECTING TRAINEE

TRAINING AND FESTIVALS IN THREE LOCATIONS: BOGOR, YOGYAKARTA AND BALI

DEVELOPING PROMOTIONAL MATERIAL

PHASE III: LIVE PHASE

ACCEPTING DATA THROUGH GO-ARK BIOBLITZ

PHASE IV: ANALYSE AND REPORTING PHASE

Plan and complete data analysis and interpretation

Report results

Figure 1. Schematic development of GO-ARK citizen science program

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