**Biodiversity and Conservation of Indonesian Medicinal Plants:**

**Sustainable Use and Standardization**

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**1. Short description of the action/programme/initiative/network (300 words)**

The aim of this program is promoting human and environmental health through sustainable consumption and production of standardized herbal medicine. This program is mainly funded by I-MHERE project in collaboration with Local Government, Agriculture Training, Research and Development Station (ATRDS/KP4) UGM, National Centre for Traditional medicine Research and Services (BP2TOOT) and Pharmaceutical Industries. The program was started in 2010 with the main focus of activities: establishing inventory and database system based on local properties, research and dissemination of research on herbal medicine, dissemination of GACP in herbal medicine cultivation, establishing “demplot” for cultivation of medicinal plants and standardization herbal raw material production, partnership with pharmaceutical industries and exhibition of herbal medicines and cosmetic products. The programs targets students, community, farmers, small/medium enterprises on traditional medicine and researchers with the main learning objectives of increasing knowledge, understanding the principal of sustainable development in the field of herbal medicines, experiencing and applying the techniques of GACP and management of herbal medicines as well as health promotion through sustainable management and production of medicinal herbal materials. The programs have been beneficial to community in that they have more access to data base of herbal medicine, increased knowledge on self-medication using herbal medicine, capable of producing qualified herbal medicine materials with more economic values, whilst the researchers have more opportunities to develop standardized herbal medicine/fitofarmaka. The students and small/medium enterprises are also benefited from this program since it provides media for acceleration on their studies and increased access to qualified herbal medicine raw materials, respectively.

**2. Description of the context in which the projects/programmes were undertaken**

Indonesia is a country considered to be rich in biodiversity, positioned as one of the world’s top two mega-biodiversiy centres alongside Brazil. Indonesia also plays a key role in the herbal medicine industry in regards to its rich biological heritage, cultural background and population. In recent years, there is a high demand for natural medicine in global market, with the global trade at over 250 billion US$ and now is growing day by day with the expectation of growing to 5 trillion by the year 2050. Like most other countries of the world, herbal medicines have gained a wide recognition within Indonesia.

However, in contrast to these conditions, there is lack of optimization in the development. Of the 30,000 plants, about 9,600 are listed as medicinal plants and only about 300 species are used commercially as traditional medicine and even less are being researched scientifically for their medicinal properties. In addition, there is a lack of systematic inventory or knowledge regarding its rich diversity of medicinal plants and their traditional usage in various parts of the country as well as lack of conservation and cultivation of herbal plants. Based on data released from Badan POM, only nineteen are proved to be standardized herbal medicine and five products as phytopharmaca. These conditions are in contrast with the high demand for herbal medicines which are relatively more affordable.

Government has paid attention to this lack of development of herbal medicine and put phyto-pharmaceutical research and development as one of National Research Agenda. In January 2010 the Ministry for Health announced the program of the so called “Jamu (Indonesian traditional medicine) scientifically program” with the intention of developing Jamu to be scientifically proved based of pre-clinic and clinical studies for medication. The president of Republic Indonesia also support this development by visiting “Balai Besar Penelitian dan Pengembangan Tanaman Obat dan Obat Tradisional” (Centre for Research and Development of Medicinal Plants and Traditional Medicines) in Tawangmangu established in July 2006 and encourage for more development as a clinic for traditional medicine.

In line with the mission of development of traditional medicine to be accepted in clinic and global market, Faculty of Pharmacy UGM develops itself as a centre of excellent of herbal medicine and supplement development. A number of efforts and projects are developed with one of them is “Biodiversity and Conservation of Indonesian Medicinal Plants: Sustainable Use and Standardization”. This project emphasize on documentation of local herbal medicines, inventory and data base systems, improvement of cultivation, dissemination of scientifically proven herbal medicine as well as optimizing the development of Indonesian herbal medicine to be scientifically proved and accepted in clinical application with the priority on the development of qualified herbal medicine and sustainable production.

**3. Main partners and their roles**

- students and community: documentation and establishment of inventory and data base system on herbal medicine developed locally (within the region of Yogyakarta), guidance of implementation to support sustainability of program

- KP4 UGM and farmers: together establish the proper cultivation strategies and applied GACP to obtained qualified herbal medicine raw materials

- Balai Besar Penelitian dan Pengembangan Tanaman Obat dan Obat Tradisional” (Centre for Research and Development of Medicinal Plants and Traditional Medicines) and Apotek UGM as partners for benchmarking and utilizing the raw materials for medication to patients

- Pharmaceutical industries: research development as Standardized herbal medicine

**4. Contribution of your project (300 words)**

The innovative aspect of this project is that the promotion of human and environmental health comes from traditional knowledge of the community and benefited for community. The development of herbal medicine inventory and database system as well as cultivation strategies are developed based on traditional knowledge of local people on herbal medication, based on what community traditionally used and then managed and supported by scientific literature studies. The communities are encouraged to use what are available in their environment for their health promotion but at the same time are encouraged to cultivate them to prevent extinction with required quality.

This project is benefited for community in terms of sustainable livelihood and better integration of production and consumption in herbal medicine industries. For community in general they have more access on herbal medicine in their own areas for health promotion which are relatively more affordable in which previously they did not know their function and values. This consumption is integrated with the system of not just using but also introduction of GACP to preserve the existence and supplying the qualified raw materials.

The unique long-term sustainability element(s) of this projects is the existence of the culture of using traditional medicine for health promotion which are available in their own environment.

The critical factors that made this project successful are the willingness of community to use local properties for maintaining their health supported by continued guidance from the experts. Something that came out from society is easily applied and integrated within themselves. Continued guidance from the experts is importance to prevent abuse of herbal medicines and guarantee continued supply.

The critical governance element that made this project successful is that this project is a part of faculty project on development of centre of excellent of herbal medicine and supplement development, so the program is continued supported by the faculty. The implementation itself is also integrated with Student Community Services-Community Empowerment Learning SEC-CEL) program run continuously to support the sustainability of the program and also applied in the area of KP4 for final year student thesis.

Indeed there is economic dilemma among community who wants to sell their products not only for fulfilling their need but increasing their income. However, continued productions of qualified materials with certain amount of supplies at certain times are the ones that pharmaceutical industries want. To address this issue, they are encouraged to sell the products not for pharmaceutical industries, but rather develop their own small medium enterprises in herbal medicine to increase their income.

The major institutional barrier that we have to face is how to function as facilitator for community and industries. This issue is address by dissemination of herbal medicine research to community to increase their knowledge on the values of herbal medicines and for industries as partners for herbal medicines development into standardized herbal medicines.

**5. Upscaling of project results**

The major actions that would enable similar activities to grow in scope, scale or impact.

* Keeping this program as routine program of faculty in promoting human and environment health through sustainable production and consumption of herbal medicine
* Expanding the area of development. At the moment we only focuses on KP4 UGM closed area and Brebah Sleman District. We are now targeting Kulonprogo area in Hargotirto which is already supported by the local government
* Continued collaboration with local government, pharmaceutical industries and Centre for Research and Development of Medicinal Plants and Traditional Medicines, Tawangmangu and Apotek UGM
* By expanding the area of development it is expected that the local people could exploit their local properties for their own benefit of health and economy and at the same time preserve the herbal medicine and traditional knowledge.