

Documenting Traditional Forest-Related Knowledge of Medicinal Plants in Malaysia: A Comprehensive Approach

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Abstract

Before United Nations Convention on Biodiversity (CBD) 1993, documentation of traditional forest related knowledge on medicinal plants did not consider much the issue of sustainable development and sharing of benefits with knowledge holders. While some academicians obtained their higher degrees from research on local knowledge, the indigenous and local communities providing the knowledge gained little. With the signing of CBD, countries have taken efforts to document the traditional knowledge to achieve CBD's triple objective on conserving biological diversity, using natural resources sustainably and fairly and equitably sharing benefits deriving from the use of genetic resources. As a party to CBD, Malaysian government implemented a traditional knowledge (TK) documentation project on medicinal and aromatic plants of the aborigines (Orang Asli) in Peninsular Malaysia since 2007. In line with CBD and Malaysia's National Policy on Biological Diversity (1998), the process of TK documentation among 15 Orang Asli sub-ethnic groups involved a comprehensive approach. A wide range of activities were carried out, namely conducting rapid rural appraisal, holding workshop on awareness raising, obtaining prior informed consent, carrying out socio-economic household survey, capacity building on documentation among the Orang Asli communities, database development, lab analysis of selected potential medicinal plants, developing prototype products and development of benefit sharing mechanism. Malaysia's comprehensive model of TK documentation has attracted national and world attention. In 2013-2014, FRIM receives funding to conduct TK related R&D and training projects from (a) the Ministry of Agriculture (RM5.56 million), (b) international Islamic Development Bank (US\$30,000), (c) United Nations Development Program and Global Environment Fund (US\$533,000), and (d) Asia Pacific Association of Forestry Research Institutions (APAFRI) (US\$1,500).

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1. Introduction

Traditional forest medicinal plants of the local and indigenous communities (ILCs) has great potential in developing various nutraceutical, herbal, pharmaceutical, health care and other bio-technological products for the benefits of world community at large. However, with the ever advancement of the modern medicinal science, modern medication is now relatively more accessible even to the rural remote

communities. Consequently, the local knowledge is also fast disappearing and the use of medicinal plants among the ILCs is also dwindling. In the meantime, there is the outflow of this form of traditional knowledge to other countries which has long term implication on intellectual property rights.

Documentation of forest related medicinal plants is important for developing countries. Malaysia, one of the 17 mega-diverse countries in the world

(Malaysia 2004), have been used by about 3.4 million indigenous peoples and local communities in Malaysia (Sobrevila 2008) for a long time. The use of these forest medicinal plants and resources are is still important among the ILCs.

Before the signing of the international Convention of Biological Diversity (CBD) 1992, little attention was given to the issue of sustainable development and sharing of benefits with knowledge holder. With CBD, governments which are parties to it are expected to achieve its aims to pursue the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. The access to resources, their sustainable use and fair equitable sharing of benefits are expected to be achieved via prior informed consent (PIC) of the communities at the local level.

This paper presents a comprehensive approach in documenting and recording the Orang Asli's traditional knowledge (TK) in Malaysia. It is based on a project implemented by the government of Malaysia entitled "Database on forest traditional knowledge relating to medicinal and aromatic plants of Orang Asli (aborigines)" under the Ninth Malaysia Plan (2006-2010) and continues in the Tenth Malaysia Plan (2011-2015). This comprehensive approach involves a wide range of activities, namely conducting rapid rural appraisal, holding workshop on awareness raising, obtaining prior informed consent, carrying out socio-economic household survey, capacity building on documentation among the Orang Asli communities, database development, lab analysis of selected potential medicinal plants, developing prototype products and development of benefit sharing mechanism.

2. Engagement of Orang Asli in The Past

Before United Nations Convention on Biodiversity (CBD) 1993, documentation of traditional forest related knowledge on medicinal plants did not consider much the issue of sustainable development and sharing of benefits with knowledge holders. While some academicians obtained their higher degrees from

research on local knowledge, the indigenous and local communities providing the knowledge gained little.

Documentation of TK of the aborigines in Peninsular Malaysia in the past was generally not in the interests of the knowledge providers. Before CBD, there was limited with regards to obtaining prior informed consent from the local communities before researchers gathered information from the knowledge holders. Villagers were not aware of the potential economic value of medicinal plants for the local communities. Neither were they told of long term benefits for local communities. The Orang Asli easily shared their traditional knowledge with outside researchers, involving generally the following steps.

- i. Permission was easily obtained from the local headman, generally known as "Batin" or "Pengkulu" (term used in Upper Perak).
- ii. Orang Asli TK holders were identified.
- iii. The TK holders were requested to assist in sharing their knowledge on various plant species.
- iv. Specimen collection date was fixed.
- v. The researchers, their assistants and TK holders went into the forests looking for the medicinal plants used by local community.
- vi. Specimens were collected.
- vii. A small payment in cash and contribution in kind were given to the TK holders after the collection trips.
- viii. Researchers analyzed the data and completed their theses or reports.
- ix. The TK holders were acknowledged for their contribution in sharing knowledge and participation in the specimen collection trips.
- x. The TK holders did not gain anything if the knowledge were to be used for product development or commercial publication.

It was under these previous circumstances, community ownership, local traditional knowledge of medicinal plant resources, their utilization and national interests are under threat. The ease of obtaining TK from local peoples resulted in a situation where TK was easily slipped out of the developing countries as well as problems of piracy (GRAIN & Kalpvriksh 2002).

3. The New Requirements under CBD

In 1994, Malaysia became a party to CBD and there is the need to demonstrate its commitment by translating CBD's objectives of conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits. Under CBD, the old practices of engaging the local communities in sharing their knowledge on plant resources have to be changed. Article 8 (In-Situ Conservation) of the CBD stipulates that "Each Contracting Party shall, as far as possible and as appropriate: (j) subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of benefits arising from the utilization of such knowledge, innovations and practices".

Furthermore, Article 15 of CBD and its supportive document Bonn Guidelines (Secretariat of CBD 2002) on Access to Genetic Resources and Fair and Equitable Sharing of the benefits arising Out of their Utilization, article no IV (Steps in The Access and benefit Sharing Process): Access to genetic resources shall be subject to prior informed consent of the Contracting Party providing such resources, unless otherwise determined by that Party.

4. Documenting TK: A Comprehensive Approach

In line with the requirements of CBD (1992), National Policy on Biological Diversity (1998), and United Nations Declaration on Rights of Indigenous Peoples (2007), Forest Research Institute of Malaysia (FRIM) was entrusted the responsibility by the Ministry of natural Resources and Environment to document TK among the indigenous communities. FRIM adopts a new approach in TK documentation whereby the local communities involved understand the issues, what they want to do and with prior informed consent, are willing to share their knowledge for the benefits of all stakeholders.

To operationalize the implementation of this project, a partnership between FRIM researchers and 15 aboriginal sub-ethnic groups (known locally as Orang Asli) in Peninsular Malaysia. It was noted that these 15 sub-ethnic Orang Asli groups are among the 18 sub-ethnic groups of orang Asli who still have TK of medicinal plants. These aboriginal sub-ethnic groups are Jahai, Temiar, Semai, Semelai, Temuan, Jahut, Jakun, Orang Kanaq, Bateq, Semoq Beri, Che Wong, Lanoh, Mendriq, Kintak and Kensiu. Aboriginal settlements of these sub-ethnic groups with a population ranging from 100 people (Orang Kanaq) to about 2,000 people (Semelai) were approached to get involved in the TK documentation project.

4.1. Rapid Rural Appraisal

Communication with local communities started with rapid rural appraisal with the aim of gathering the basic information on the potential aboriginal communities. Having gained some basic information from Department of Orang Asli Development (JAKOA), the research team made several visits to meet their community leaders to explain about the project and TK issues. With the help of local informants, the project was also explained to the community in the local languages such as Semelai, Jahai, Jahut and Temiar languages. The community discussion involved knowledgeable persons of the community such as Bomoh, Mid-wives, Puyang (the most knowledgeable medicinal experts of Semelai community) and traditional practitioners (Lee et al 2007) of the Semelai aboriginal community.

4.2. TK Awareness Workshop

It is necessary to brief the local communities about the proposed project at village level. Even though local leaders have some understanding on TK issues, local community in general does not have adequate understanding on the potential economic value of their traditional knowledge. Many are not sure the actual benefits that could be derived from participation in this project implemented by FRIM.

The community has to be informed of this project, its involvement and the implications. These awareness workshops were held with cooperation from district office of the Department of Orang Asli

Development (JAKOA) and other agencies such as Ramsar office and state park.

The number of villagers attending the workshops depends on the size of community involved. For example, the workshops were attended by 160 Semelai villagers from Iskandar RS in Pahang and 14 Orang Kanaq villagers from Sg. Selangi in Johor (Table 1). The participants (comprising men, women and youths) were briefed on the background of CBD, National Policy on Biological Diversity (Malaysia 1998), the current project and its importance was highlighted. The TK awareness workshop acted as a platform for exchanging of experiences relating to TK issues in Malaysia. In particular, issues on prior informed consent (PIC), potential economic benefits

and fair and equitable sharing of benefits were discussed. This TK awareness workshop also involved exhibition of the medicinal plants and TK video show, based on the experience by the Sarawak Biodiversity Centre (SBC) in documenting TK.

TK awareness workshops resulted in gaining cooperation among all 15 aboriginal sub-ethnic groups. During the workshops, 14 of the 15 local communities agreed to participate in the project. It was generally felt that there is potential economic value to the medicinal plants used at the local level. In the case of the Semelai community, villagers hope FRIM could consider developing a research sub-station in the area to further exploring the potential value of medicinal plants through R&D activities.

Table 1: Villagers attending Awareness workshops (2008-2014)

Orang Asli Settlement	Total households	Total villagers attending workshop
Semelai in Iskandar	366	160
Jahai/Temiar in Banun	352	141
Semai in Ulu Geroh	91	38
Temuan in Pulau Kempas	144	29
Jahut in Paya Mendoi	68	35
Jakun in Bangkong	80	45
Semoq Beri in Sg. Berua	60	24
Orang Kanaq in Sg. Selangi	25	14
Bateq in Aring 5	35	21
Che Wong in Kuala Gandah	30	33
Lanoh in Air Bah, Perak	50	58
Mendriq in Kuala Lah, Kelantan	38	60
Kintak in Gerik, Perak	30	37
Kensiu in Baling, Kedah	60	42
Total	1,429	737

The exception was the Che Wong community which initially showed a lack of interests to get involved in the TK documentation project. There was the lack of confidence among Che Wong villagers on how the project was to be implemented. There was also the worry that the project might not bring benefits to

the knowledge providers in the long run. Hence, in this community, more consultations were held and three representatives were invited to attend a formal meeting involving all Orang Asli leaders engaging in the project. This led to raise the confidence of local leaders

of Che Wong community who subsequently approved the implementation of the project.

4.3. Formation of Local TK Committee

The local community in Iskandar RS and Banun RS are aware that to have a long term commitment to FRIM's project, there is a need to organize itself. The community has to give their consent for this project to proceed. For this purpose, a special village committee known as Jawatankuasa Pengetahuan Tradisi Semelai Pos Iskandar Tasek Bera and Jawatankuasa Pengetahuan Tradisi Semelai Pos RPS Banun Gerik were formed. In Iskandar RS, the local TK committee has 45 members and in Banun RS there are 48 committee members. By 2014, a total of 7 local TK committee were formed, namely Semelai, Jahai/Temiar, Jahut, Jakun, Bateq, Che Wong and Orang Kanaq. Other settlements are yet to form such committee.

4.4. Visit to FRIM

The villagers' confidence in engaging in the TK documentation project is enhanced by visiting FRIM. Most of the villagers did not hear of FRIM prior to the implementation of this project. They were not sure of the status of FRIM, its location, role and research activities. To enhance their knowledge and confidence in FRIM, a special visit was arranged. Such a visit is necessary to enable the villagers to have a better understanding of the project and the role of FRIM. With the assistance of JHEOA, bus transportation arrangement was made.

On 2 July 2008, a total 28 Semelai villagers (including traditional leaders, medicine men, women and youths) from Iskandar RS visited FRIM. There were briefed on various R&D activities. They visited FRIM's Ethnobotanic Garden where more than 200 medicinal plants were planted. They also visited the lab that analyses the biological and chemical contents of plants collected. The visit thus provided a holistic view of what will happen to their traditional knowledge on medicinal and aromatic plants when the specimens collected reach FRIM.

4.5. Obtaining PIC

In line with CBD, an important aspect of engaging local communities is to achieve fair and equitable sharing of benefits is to obtain PIC from the local community. The local community like to know the followings in the process of sharing traditional knowledge.

- i. In what ways are their interests taken care of?
- ii. What is the potential economic value of their knowledge on traditional medicinal and aromatic plants?
- iii. In what ways will they benefit from participating in the project in terms of benefit sharing when products are developed later, publications are sold and the creation of new employment and business opportunities.

It was difficult for FRIM to provide definite answers. The research team sincerely explained the current situation of TK product development in Malaysia. Subsequently, the following understanding on the potential economic value of their traditional knowledge was reached.

- i. Since the current project is confined to research activities, it was agreed that the issue on benefit sharing from product development will be discussed at a later stage when certain medicinal plants are found to have potential for product development.
- ii. FRIM will look into appropriate mechanism on profit sharing from the sale of publication, if there is any.
- iii. The creation of business opportunities is not relevant at this stage but holders of traditional knowledge will be given incentive for sharing their knowledge, particularly on plant identification, their uses and specimen collection.

The subsequent challenge was how could PIC be obtained from the local communities? After lengthy discussion at both ministerial, FRIM and local levels, it was decided that PIC was to be obtained from individual households. In May 2009, the draft PIC was presented and amended after discussion with Jawatankuasa Pengetahuan Tradisi Semelai Pos Iskandar Tasek Bera. The amended draft PIC was

subsequently approved by the legal officer in NRE for implementation. The contents of the PIC for the Semelai in Tasek Bera comprise the followings.

- i. Letter head and logo of FRIM with full address, telephone and fax numbers.
- ii. Title: Agree to participate in TK project on medicinal and aromatic plants of the aborigines in Peninsular Malaysia.
- iii. Name, identity card number and address of household heads.
- iv. Agree to share information (including household survey conducted in May 2008) with FRIM.
- v. Use of information provided: non-commercial publication (printed or electronic) and development of web site together with Jawatankuasa Penasihat Pengetahuan Tradisi Semelai Pos Iskandar Tasek Bera.

- vi. Name, identity card number and signature/thumb print of household heads.
- vii. Name, identity card number and signature/thumb print of witness.
- viii. Date of signature.
- ix. Name, identity card number, ethnicity & address of person explaining and translating the PIC into the Semelai language.

With the assistance of the local TK committee, local leaders in the villages were identified and entrusted the responsibility to explain the project to local households in the villages and subsequently sought their support by signing the PIC. In this study, 80% of households in 15 communities provided PIC to the implementation of the project (Table 2).

Table 2: PIC 1 obtained from local communities.

Orang Asli Settlement	Total households	Households providing PIC	% of households providing PIC
Semelai in Iskandar	366	271	74
Jahai/Temiar in Banun	352	344	98
Semai in Ulu Geroh	91	61	67
Temuan in Kuala Langat (3 villages)	144	74	51
Jahut in Paya Mendoi	68	62	91
Jakun in Bangkong	80	71	89
Semoq Beri in Sg. Berua	60	43	72
Orang Kanaq in Sg. Selangi	25	13	52
Bateq in Aring 5	35	30	86
Che Wong in Kuala Gandah	30	23	77
Lanoh in Air Bah, Perak	50	42	84
Mendriq in Kuala Lah, Kelantan	38	30	79
Kintak in Gerik, Perak	30	26	87
Kensiu in Baling, Kedah	60	58	97
Total	1,429	1,148	80

4.5. Household Socio-Economic Survey

TK documentation needs an understanding on local knowledge and use of medicinal plants. After obtaining the PIC from local households, the household

heads or their spouses were asked on their knowledge and extent of their practices in using the traditional medicinal and aromatic plants. In each survey, information was gathered by experience researchers,

research assistants and assisted by undergraduate aboriginal research assistants. The assistance extended by the aboriginal enumerators was instrumental in gaining the trust and cooperation of the aborigines within a short time. For example, in Iskandar RS, the

survey in 2008 was assisted by six Orang Asli undergraduate enumerators. The survey provided more understanding on the potential economic value of medicinal plants. In total, 80% of total households in these 15 settlements were surveyed (Table 3).

Table 3: Socio-economic survey among local communities

Orang Asli Settlement	Total households	Households surveyed	% of households surveyed
Semelai in Iskandar	366	186	50
Jahai/Temiar in Banun	352	187	53
Semai in Ulu Geroh	91	61	67
Temuan in Kuala Langat (3 villages)	144	67	47
Jahut in Paya Mendoi	68	60	88
Jakun in Bangkong	80	59	74
Semoq Beri in Sg. Berua	60	43	72
Orang Kanaq in Sg. Selangi	25	13	52
Bateq in Aring 5	35	26	74
Che Wong in Kuala Gandah	30	23	77
Lanoh in Air Bah, Perak	50	42	84
Mendriq in Kuala Lah, Kelantan	38	30	79
Kintak in Gerik, Perak	30	26	87
Kensiu in Baling, Kedah	60	58	97
Total	1,429	1,148	80

4.6. Prior-Informed Consent on Documentation Training and Specimen Collection

A second prior informed consent was obtained from those participating in the TK documentation training which is to be conducted in two phases. Each phase of training was attended by 22-26 participants, comprising elders with TK knowledge, women and youths. They were divided into 4-5 groups with 5 members each. The traditional TK holders and villagers were taught to collect and document the specimens using scientific methods. The plant specimens are identified scientifically by FRIM's botanists. As of October 2014, a total of 317 PIC 2 was provided by those attending the training among 14 communities (Table 4).

Table 4: PIC 2 obtained from TK documentation training participants

Orang Asli Settlement	Total participants
Semelai in Iskandar	22
Jahai/Temiar in Banun	25
Semai in Ulu Geroh	20
Temuan in Kuala Langat (3 villages)	22
Jahut in Paya Mendoi	25
Jakun in Bangkong	25
Semoq Beri in Sg. Berua	27
Orang Kanaq in Sg. Selangi	25
Bateq in Aring 5	26
Che Wong in Kuala Gandah	25
Lanoh in Air Bah, Perak	25
Mendriq in Kuala Lah, Kelantan	26
Kintak in Gerik, Perak	24
Kensiu in Baling, Kedah*	-
Total	317

*Yet to have documentation training

5. Towards Commercialization

The TK documentation project has produced the below outcome between 2007 and 2014.

- i. 3 seminars organized
- ii. 15 awareness workshops
- iii. 28 capacity building workshops
- iv. 1 book entitled *Memartabatkan Pengetahuan Traidsi Tumbuhan Ubatan dan Beraroma Orang Asli Semai* (2014)
- v. 1 seminar proceedings
- vi. 1 award winning publication
- vii. 2 journal papers
- viii. 47 working papers

Towards commercialization involves database development, lab analysis of selected potential medicinal plants, developing prototype products and development of consultation mechanism. By May 2014, the research team has come up with two prototype products known as the "Semelai secret". The

long term plan is to produce R&D commercialized products and the benefits derived would be shared among the stakeholders.

6. Gaining National and International Recognition

Malaysia's comprehensive model of TK documentation has attracted national and world support as listed below.

- i. In mid-2013, the Ministry of Agriculture (MOA) provided a total funding of RM3.6 million for Forest Research Institute Malaysia's TK team, together with other agencies, to document the Malay TK on medicinal plants in Peninsular Malaysia.
- ii. In June 2014, MOA allocated another funding amounting to RM1.961 million for FRIM researchers to conduct another TK related project entitled Value Chain of Herbal Industry in Peninsular Malaysia.
- iii. As winner of 2012 Islamic Development Bank's Science and Technology Prize, with financial support amounting to US\$30,000 from the international Islamic Development Bank, FRIM is entrusted the responsibility to train the researchers in Brunei Darussalam in a project entitled Capacity Building on Documentation of TK on Medicinal Plants in Brunei Darussalam for the 2013-2014 period.
- iv. In January 2014, under a project entitled Developing and Implementing a National Access and Benefit Sharing Framework in Malaysia, the United Nations Development Program and Global Environment Fund has provided finance (US\$533,000) to support the TK documentation project undertaken by FRIM, with the objective leading to the development of prototype products for potential commercialization.
- v. In July 2014, FRIM researchers received a small grant of US\$1,500 from Asia Pacific Association of Forestry Research Institutions (APAFRI) to conduct a socio-economic survey on a Orang Asli community under the project entitled Documenting Traditional Forest-related

Knowledge for Ecosystem Services in ASEAN Countries

7. Conclusion

The TK documentation project implemented by the Malaysian government since 2007 has gradually evolved into a world model. A totally new and comprehensive approach is adopted emphasizing working closely with local communities in TK documentation to ensure villagers concerned are aware of the nature of collaboration and they participated willingly for mutual gains and potential equitable sharing of benefits.

This comprehensive approach involves a wide range of activities, namely conducting rapid rural appraisal, holding workshop on awareness raising, the obtaining of prior-informed consent, carrying out socio-economic household survey, visiting FRIM and participating in TK documentation trainings. All these have enabled from villagers to share, document and collect plant specimens related to their TK. The next step is producing commercialized products based on R&D which is expected ultimately leading to benefit sharing with stakeholders.

With this new approached in documenting TK among the indigenous peoples, Malaysia has charted a new direction in research and development activities benefiting all stakeholders. This new approach in TK documentation could be considered for adoption by other researchers conducting R&D projects among the indigenous peoples. It can also be applied by countries committed to CBD.

By conducting TK documentation training in Brunei Darussalam, FRIM is contributing its expertise, knowledge and experience to the world. In this process, the national image is raised and FRIM as a bright star in world forestry R&D map is also enhanced.

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