

He Ahunga Maurea:
Rongoā Knowledge-Base

Implementation Plan

30 June 2013

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Implementation Plan

Prepared for Te Kāhui Rongoā

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1. Summary

He Ahunga Maurea represents a collection of treasured items. We use this term to describe the mātauranga tuku iho associated with rongoā which Te Kāhui Rongoā indicated it would like to collate as part of a rongoā species database. There are places where information on rongoā species can be accessed on-line including databases like Ngā Tipu Whakaoranga (Landcare Research) however the opportunity exists for Te Kāhui Rongoā to establish a verifiable collection of mātauranga around rongoā rākau to support practitioner training and provide the foundation for a broader collection of knowledge associated with rongoā Māori. The primary function of *He Ahunga Maurea* would be to allow healers to collate and share practitioner knowledge with colleagues within their own rohe or across the country. Te Kāhui Rongoā would also be able to determine which secondary uses of the knowledge-base, like public education and advocacy, would be appropriate in support their vision and business strategy. This implementation plan outlines a staged development process for a Rongoā Knowledge-Base comprising a National Rongoā Database with linked Rohe-Collections.

2. Introduction

Māori have been quick to seek out the opportunities from new technology to develop, establish and control their own initiatives and knowledge content. A range of initiatives incorporating Mātauranga Māori have been implemented and are currently being explored by iwi, groups and societies in order to collect, maintain and organise Mātauranga Māori, including text, video, audio, along with methods for access and retrieval. For example, GIS has been used to display LINZ's information to support existing Māori land management, displaying NIWA and governmental data, assessing environmental health, pā identification for NZ Archaeological Association Site Recording Scheme as part of RMA, development of heritage plans and iwi heritage, Māori land court information and the verification of cultural information (Te Kahui Manu Hokai, 2012); and 3D technology has been used for the digital repatriation of taonga as part of the revalidation and reclaiming of taonga that were collected and exchanged during European voyages

to Polynesia and a digital databases of approx. 16,000 Māori treasures held in overseas museums, art galleries and allied institutions has been developed (Becvar & Srinivasan, 2009; Brown, 2008; Brown & Nicholas, 2012; Hogsden & Poulter, 2012; Newell, 2012; Ngata, Ngata-Gibson, & Salmond, 2012; Salmond, 2012; Tapsell, Edgar, & Hakiwai, 2011).

Iwi have also established their own digital archives to display and organise and protect iwi, hapū, whānau and individual cultural and intellectual property rights and to facilitate increased access to their material (i.e., the 'Pūtē Routiriata - The Taranaki Māori Digital Archive' (Te Reo o Taranaki, 2011), the 'Hauraki Digital library' (Hauraki Māori Trust Board, n.d.)), and a number of societies have also been actively investigating the possibility of using a digital content management system platform to enhance cultural identity, to store and curate important scientific knowledge and to generate economic returns (e.g., groups such as the Society for Māori Astronomy Research and Traditions (SMART) which holds a large

amount of data on Māori astronomy, including star names, constellations, myths and legends).

With the increase in research in documenting and affirming the knowledge and practice of traditional Māori healing (e.g., Ahuriri-Driscoll et al., 2008; Ahuriri-Driscoll, Hudson, Bishara, Milne, & Stewart, 2012; Durie, Potaka, Ratima, & Ratima, 1993; Jones, 2000a, 2000b), Te Kāhui Rongoā is developing a number of initiatives to share, nurture and protect their traditional healing systems. The development of a Rongoā Species Database is one part of this overall goal and would provide a foundation for a broader Rongoā Knowledge-Base.

2.1 This Document

This document outlines an implementation plan to develop a Rongoā Knowledge-Base for Te Kāhui Rongoā. Its key objective is to outline the phases, timeframes and resources required to establish a Knowledge-Base that has nationally accessible public content and Rohe accessible private content. The implementation plan will outline Content Management System (CMS) and User Interface components as well as processes for sourcing, verifying and managing content.

This document is intended to complete Phase 3 of a three-year developmental project of *Te Kāhui Rongoā*. Phases 1 and 2 were run under the auspices of *Te Paepae Matua mo Rongoa Trust*. In December 2011, *Nga Ringa Whakahaere o te Iwi Maori* and *Te Paepae Matua Mo Rongoa Trust* were merged resulting in a new national governance body – Te Kāhui Rongoā. In the following section, background information for the implementation plan to develop a Rongoā Knowledge-Base for

Te Kāhui Rongoā is presented. It draws from four primary sources: (i) a rongoā species database scoping report produced in June 2011 (Project Taunaha, 2011); (ii) a scoping research trip to India in December 2012 (Whaanga & Hudson, 2012), (iii) a Ngā Pae o te Māramatanga-funded research project that researched, collated and developed ethical processes for the digitisation of the Pei te Hurinui Jones collection of manuscripts, works and taonga (Whaanga et al., 2012), and (iv) the Traditional Knowledge Revival Pathway Project based in Australia.

2.2 Background to this Document

2.2.1 Scoping Report: Rongoā Species Database – June 2011

This document builds on an earlier scoping report prepared in June 2011 by Project Taunaha on behalf of *Te Paepae Matua mo Rongoa Trust* and *Nga Puhi Nui mo Rongoa* (Project Taunaha, 2011). The overall objective of that scoping report was “to identify options and provide a recommendation for an appropriate Rongoa Species Database” (§3.1.1). To achieve this, the report:

- a) identified plant species databases;
- b) sought feedback from Te Paepae Mahi (regional Rongoā Rōpu representatives), to identify species information that would be incorporated into a Rongoā Species Database; and
- c) identified potential sources of funding for future developments.

Six examples of databases of plant species in Aotearoa were discussed including databases developed and maintained by Government agencies who have invested a fair amount of resource to develop, implement, research, identify and ratify the information contained (e.g., Ngā Tipu

Whakaoranga – Māori Plant Use Database and Ngā Tipu Aotearoa – New Zealand Plants - Landcare Research NZ), sites developed by societies and networks that contain information on plant species (e.g., NZ Plant Conservation Network), and blogs and websites which contain information on Rongoā Māori, Māori uses of plants, remedies and courses (e.g., Rongoa New Zealand Network – Tenia O Ngahere; Aotea NZ Website; and Natures Bounty Website).

Three potential options of Rongoā Species Database (including advantages and disadvantages), were identified and discussed with Paepae Mahi (§6):

Option 1: *Stand Alone Database - Single User PC; Text-Based Data; Microsoft Access Software or similar.* The cheapest development option that can easily be copied and shared as a template file. Requires all data to be typed into the database by the User but cannot be effectively amalgamated or accessed by others. No multimedia capacity and would be very basic and limited in its capacity to be developed further for future needs.

Option 2: *Centrally Located Regional Database with Web Interface - used regionally, i.e. each region would have their own database copy to identify and record their own information.* Would enable regions to identify and determine access to and control of regional data. They would also be responsible for identifying, inputting, maintaining (updating) and managing data including data quality and integrity. The database may require built in capacity to feed into a National species database and share information with other regions.

Option 3: *Centrally Located National Database with Web Interface & GIS Mapping Capabilities-* a national rongoā species database capable of capturing all species data at a central point. Built in capacity for regional access and sharing of information. An easier option in terms of managing and maintaining data. Web-interface capabilities provide web based tools including multimedia recording. A first phase database, this option makes the most sense, i.e. to identify and record all rongoā species information at a central point, accessible by all including practitioners, whānau, hapū, iwi and members of the public. Capacity built into the database to enable regional groups and practitioners to use the database to record more detailed Rongoā information with multi-level security options available to mitigate the risk of security and IP concerns expressed by Paepae Mahi. Regions could still decide what regional information they would like to share through the database. This database option would sit with the national Rongoā Maori body but information would be accessible for all regions, practitioners and whānau.

The canvassing of feedback from Paepae Mahi members was conducted initially through an email introduction to the scoping objectives of the report and then by phone and email. Of the twelve Paepae Mahi members contacted “five provided feedback over the phone, one provided feedback over the phone and via email, one provided feedback via email” (§5.1.3). Preference for options presented included general consensus that a national database with generic rongoā species (rongoā rākau) information would be helpful for

everyone including practitioners, whānau, hapū, iwi, members of the public; and the majority preferred a central regional database – start locally / regionally first. Key areas identified include:

Levels of organisation:

Information suitable for a National Database: which incorporates generic plant species information already readily accessible; whakapapa of plant species and their family groupings; general location information identifying the various plants that can be found in the different regions; information about dependent species; the capturing of environmental needs; threats to plant species especially pests; reproductive and life cycles of plant species; botanical and growth information; and general rongoā Māori use of plant species. Other information that would be useful on a National database included practitioner contact details and profiles sanctioned by regional Paepae Matua; ability for practitioners to network via a website; and Matariki and the Maramataka information on planting, growing and harvesting times.

Information that should be kept at a Regional level: which incorporates karakia, cultural, recipes and preparations of ronga species used for Rongoā Māori; detailed information about locality of rongoā species within each region; and control of the information that is fed into a national database.

Levels of Access:

Confidentiality and Security: which incorporates any information collected and stored in a national Rongoā Species database should be general information that can be accessed by anyone; information specific to a region should remain within the region, in a regional database (preferably on a stand-alone

regional database); preference would be to develop regional databases in the first instance and then feed information up to a national database later; and concern was expressed about the ability to control and protect regional locality information for reasons including sustainability and kaitiakitanga and IP.

In relation to security, the report also discussed the relevance of multilevel security. Multilevel security introduces a classification of data and users based on a system of hierarchical security levels combined with a system of non-hierarchical security categories. Although the hierarchical levels are flexible, they require finalising prior to database development. Four or five levels of security, from the highest security to lowest were discussed, including Whānau, Marae and/or Hapū, Iwi / Regional and Public Access.

Levels of support:

Resources needed to identify, record and maintain rongoā species information within the regions: Hardware, training, and human resource to identify species information and locality, input and maintain data integrity, resources for Wānanga.

The report made a number of recommendations and provided advice on software, hardware and associated costs regarding a Rongoā Species Database (see *Appendix 1*). The recommendations include (§2-2.1.3):

- ❖ Paepae Mahi indicated their desire for regional databases where data specific to the region can be kept within the region under their control. However, as the majority of information required to identify and record the status of Rongoā species nationally is of a generic nature

which can be shared openly, and is already being shared in other national databases, our recommendation to Te Paepae Matua is to establish a central national database that has the capacity to be utilized by regional Rongoā bodies should they choose to.

- ❖ This would allow regions the opportunity to record their Rongoā species and other information in a central database accessible via a web interface that has built in high level security restricting access to approved and pre-determined levels. Alternatively, if a region was concerned about regional information sitting on an off-site central (national) database or server, or the risk of security and system errors that could allow regional information to be shared inappropriately, they could, if they had the financial capacity and human resource, be given a copy of the National Rongoā Species Database as a starting point for their own stand-alone regional database.
- ❖ A central National Rongoā Species database that records the generic information of species. This option provides the framework for a comprehensive Rongoā Species Database system, including accessibility at regional, marae, whanau, individual level OR can be copied for regional use and subsequent control. The PostGIS Open Source Software Option is also recommended to reduce costs for the establishment of the National Rongoā Species Database, and any independent regional databases that may be started from a copy of this national database.

Key points

- *Levels of organisation:* National access to generic rongoā knowledge vs. Regional access to local rongoā knowledge;
- *Levels of access:* confidentiality, security and IP;
- *Levels of support:* resourcing for capacity and processing.

2.2.2 Scoping Research Trip to India - Dec 2012

In early December 2012, four delegates from Aotearoa - two from the University of Waikato (Māui Hudson and Dr Hēmi Whaanga), and two from Te Kāhui Rongoā (Albert Stewart - Chair of Te Kāhui Rongoā, and Iwi Puihi Tipene - Deputy Chair of Te Kāhui Rongoā), travelled to India to visit the Institute of Ayurveda and Integrative Medicine (I-AIM) to observe and discuss their integrated approach to research, revitalisation and community development of traditional medicine in India as a potential model for the development of rongoā Māori in Aotearoa (Whaanga & Hudson, 2012).

I-AIM was first established in 1993 under the banner of Foundation for Research on Local Health Traditions (FRLHT) by Mr Darshan Shankar and Mr Sam Pitroda. It has since grown into I-AIM, a multi-disciplinary research, education and outreach institute situated on the outskirts of Bangalore incorporating four schools (School for Conservation of Natural resources; School of Educational Innovation; School of Trans-Disciplinary Studies; and the School of Health Sciences), an Integrative Healthcare Centre (a 100 bed hospital for Ayurveda and Yoga treatment), and a nursery of medicinal plants with rare collections of

rare species including medicinal orchids, bamboos and ferns.

Of particular interest to the development of a Rongoā Knowledge-Base is the Centre for ISM Informatics and Theoretical Foundations. This Centre has developed the nation's most comprehensive, multi-disciplinary databases on flora, fauna, metals and minerals of traditional Materia Medica. The use of Information Technology for processing the vast and rich Materia Medica of traditional systems of medicine was pioneered by IAIM-FRLHT in 1995. Data from primary texts over the period 1500 BC to 1900 AD have been systematically computerized to easily store and retrieve information on nomenclature, trade, distribution, Indian system of medicine, pharmacognosy and pharmacology. These databases have 68,000 plant names in 32 languages and 16,000 plant images (Institute of Ayurveda and Integrative Medicine, 2010).

A number of opportunities and approaches to integrated research, revitalisation and community development of traditional medicine were observed during this trip. The holistic nature of the institute and collection of knowledge relating to all aspects of the healing practices and traditions, are fundamental to the on-going development of the institute.

While there is a huge range of activities that would be of direct relevance to Te Kāhui Rongoā, a limited number of activities were identified as areas of development. These include (Whaanga & Hudson, 2012 p. 5):

1. Developing profiles of healers
 - a. format of information

- b. process for working with healer associations
2. Collection of knowledge on traditional plants and medicinal uses
 - a. format of information – access to copy of database
 - b. process for collecting information in conjunction with healers
 - c. consent processes and agreements

Key Points:

- *Scope of knowledge repository:* the rongoā species database was the foundation for a broader knowledge repository.
- *Knowledge repository has multiple uses:* knowledge repository supports training, research and community education activities.
- *Processes supporting collection of mātauranga:* developing culturally appropriate processes for the collection, verification and use of mātauranga.

2.2.3 Pei Jones Digital Collection – Greenstone Digital Libraries

The overall goals of this Ngā Pae o te Māramatanga-funded project was to research, collate and develop ethical processes and appropriately display, in a digital format, the manuscripts, works and collected taonga of one of Maoridom's prominent scholars the late Dr. Pei te Hurinui Jones, and to develop and produce an accessible digital library (Whaanga, et al., 2012). The initial findings of this project concluded that:

- ❖ There is a critical need to develop a set of principles and guidelines for the digitisation of Mātauranga Māori in institutions, libraries, archives and museums.
- ❖ Further research to inform these guidelines in the areas of access,

display, intellectual and cultural rights, ownership, copyright, custodial practices, policy development and consultation, is required.

- ❖ Consultation, consolidation and sharing between projects using digital initiatives is also required to allow for increased opportunity for Māori to create their own cultural narrative in the digital realm (Whaanga, et al., 2012).

Greenstone open source digital library toolkit was employed as the software framework for this project. Greenstone is a suite of software for building and distributing digital library collections (see www.greenstone.org), and is based on over a decade of digital library research at the University of Waikato (Witten, Bainbridge, & Nichols, 2010). Greenstone is a tool for building digital libraries which provides for a new way of organizing information and publishing it on the Internet in the form of a fully-searchable, metadata-driven digital library. The content can be stored locally, or accessed remotely via computer networks. Greenstone is an open-source, multilingual software issued under the terms of the GNU General Public License. It runs on a range of platforms including Linux, Windows, Solaris, MAC OS XJava and it has been developed and distributed in cooperation with UNESCO and the Human Info NGO in Belgium. Current examples of Greenstone installations include:

Papers Past: Papers Past is a Veridian collection of more than two million pages of digitized New Zealand newspapers and periodicals.

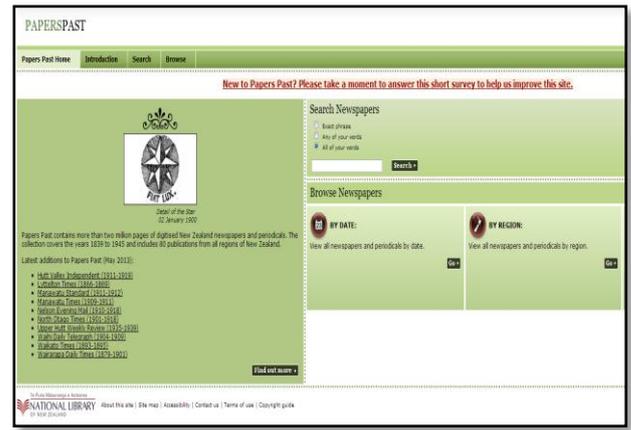


Figure 1: *Paperspast Homepage* (www.paperspast.natlib.govt.nz)

Auckland City Library - Local History Online: brings together the digital local history records originally held by the public library systems of North Shore City Council, Waitakere City Council and Rodney District Council.

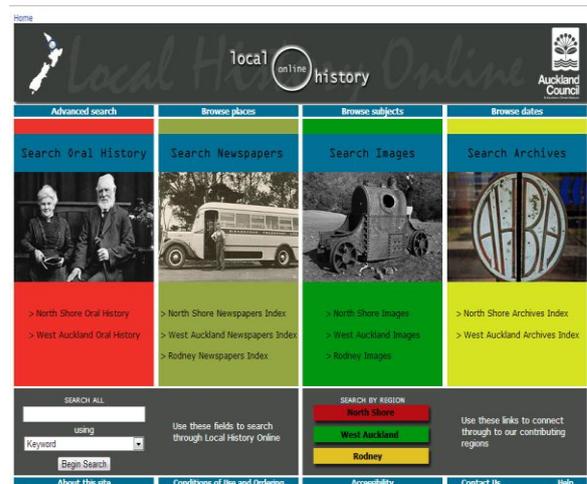


Figure 2: *Local History Online Homepage* (www.localhistoryonline.org.nz)

The African Building Capacity Foundation - Virtual Library: a virtual library on capacity development which is a one stop shop digital library that offers fast, well-structured and unified interface to access free full-text copies on capacity development produced and published by ACBF, its networks and partners.



Figure 3: African Building Capacity Foundation - Virtual Library
(elibrary.acbfpact.org)

Hauraki Digital Library: The Hauraki Digital library is recognised as the first-ever iwi digital library. It contains material from the Hauraki Treaty of Waitangi claims process, Hauraki photos, interviews and stories, and images from Alexander Turnbull Library.

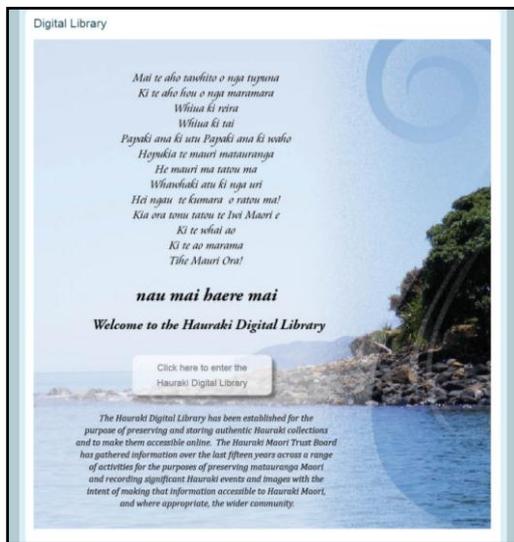


Figure 4: Hauraki Digital Library Homepage
(www.hauraki.iwi.nz)

The testing and development of the prototype library commenced in 2011 and was completed in early 2012. To enhance the interactive user management system,

an editable metadata and annotations embodied in the software architecture was developed in combination with the searching and browsing capabilities normally associated with the end-user interface can be used internally by digital libraries, archivists and curators to manage and enrich content (Cader, 2012, pp. 4-6). During the development and testing stage, a range of features were identified which would further enhance the functionality of the interactive user management system of the digital library. These features were added to the user management system (Cader, 2012, pp. 66-98).

An Advisory Group, which consisted of key stakeholders, including representatives from the Jones' whānau, Ngāti Tūwharetoa, Tainui/ Maniapoto, Te Pua Wānanga ki te Ao, the University of Waikato Library and Te Kotahi Research Institute, was established to address areas of concern regarding the management, conservation, care and display of these precious taonga. They raised a number of important points in relation to the digitisation of Mātauranga Māori including kaitiakitanga, contextualisation of information, and content development and control and developing multi-layered access points.

Key Points

- *Access to technical support:* Allows for customising of the digital library to improve usability.
- *Access to resources:* Students provide resource for processing of information.
- *Use of Advisory groups:* To ensure the digital library aligns to needs of the practitioners.

2.2.4 The Traditional Knowledge Revival Pathway Project

The TKRP project (formerly the Traditional Knowledge Recording Project, www.tkrp.com.au) was developed in 2001 by two Senior Kuku Thaypan Elders, Dr Tommy George and Dr George Musgrave (deceased), who recognised that social factors posed the greatest threat to the retention and application of Traditional Knowledge and initiated the TKRP as a way of ensuring their knowledge, beliefs and practices were recorded and preserved for use by present and future generations.

The team developed a unique and interactive methodology of recording and demonstrating Traditional Knowledge using digital video and computer storage equipment. The Project's Digital Knowledge base (or database) template was developed to encompass a number of identified core traditional knowledge fields. The database is the 'exact' knowledge of the Elders' processes so that taping their physical movements is essential – it is living knowledge and has the capacity to grow as knowledge is gathered (or returned) to the Traditional Owners. Each knowledge area is a specific field with its own categories that show the cultural links to country. Each field of knowledge has its own sub-fields (e.g. plants – spiritual uses, plant laws, relationships, craft uses, food uses, medical uses). In this way, the strength of this database is that it acknowledges the specifics whilst showing, through the use of appropriate knowledge and its application, how to also look after the whole system.



Figure 5: Awu-Laya Traditional Knowledge Database

This project has developed three core processes of knowledge acquisition and transfer that are culturally respectful and relevant. This transcends ethical behaviour as it is most commonly known and emphasises Aboriginal cultural lores and protocols. The three processes are described as: recording, transcribing and translating. The database protects the intellectual property and cultural heritage of the Kuku Thaypan in the use of two levels of Kuku Thaypan knowledge. These levels are:

1. Sensitive information for viewing and use of the Traditional Owner groups/clans/families;
2. Non-sensitive knowledge that is general information and suitable for viewing by outsiders (e.g. tourists, government staff).

The project's methodology has been developed with the protocols of the Traditional Way of managing and applying cultural knowledge and practices. Therefore, the project methodology seeks to respect and retain the integrity of the transfer of Traditional Knowledge from Elders to youth.

Key Points

- *Living Project*: The knowledge-base develops over time and requires on-going commitment to grow and develop
- *Holistic perspective*: Important to connect fields of knowledge together to enhance practical use.
- *Establish protocols*: Collaboration with practitioners is necessary to maintain respect and integrity of knowledge.

3. He Ahunga Maurea: Rongoā Knowledge-Base

When Te Kāhui Rongoā was formally founded in 2012, a Trust Deed was established outlining its obligations to:

- nurture, protect and grow rongoā me ōna tikanga in accordance with hapū and iwi tino rangatiratanga;
- assist, educate and support practitioners of rongoā;
- research and develop the science of rongoā;
- safeguard the knowledge and cultural and intellectual property of rongoā;
- develop and promote appropriate ethical guidelines for the use and acquisition of rongoā;
- develop education programmes in the knowledge and use of rongoā, including standards and competencies in the practice of rongoā;
- improve the health and wellbeing of Māori;
- advocate for equitable health funding for Māori;
- seek greater acceptance of rongoā among other medical practitioners and throughout Aotearoa;
- initiate and enhance exchanges with other indigenous peoples and practitioners of traditional medicine.

Te Kāhui Rongoā has also developed a knowledge strategy to support their vision and business strategy (see *Appendix 2 for Te Mahere Rautaki a Te Kāhui Rongoā 2012*). The development of *He Ahunga Maurea* as a Rongoā Knowledge-Base (RKB) provides a mechanism for realising the knowledge strategy and obligations outlined in the Trust Deed. Developing *He Ahunga Maurea* will require consideration of the key points identified in previous sections.

Key points

- I. *Knowledge repository has multiple uses*: knowledge repository supports training, research and community education activities.
- II. *Living Project*: The knowledge-base develops over time and requires on-going commitment to grow and develop
- III. *Use of Advisory groups*: To ensure the digital library aligns to needs of the practitioners.
- IV. *Establish protocols*: Collaboration with practitioners is necessary to maintain respect and integrity of knowledge.
- V. *Scope of knowledge repository*: Rongoā species database was the foundation for a broader knowledge repository.
- VI. *Holistic perspective*: Important to connect fields of knowledge together to enhance practical use.
- VII. *Levels of organisation*: National access to generic rongoā knowledge vs. Regional access to local rongoā knowledge
- VIII. *Levels of access*: confidentiality, security and IP
- IX. *Levels of support*: resourcing for capacity and processing
- X. *Processes supporting collection of mātauranga*: developing culturally

appropriate processes for collection, verification and use of mātauranga.

- XI. *Access to technical support:* Allows for customising of the digital library to improve usability.
- XII. *Access to resources:* Students provide resource for processing of information.

3.1 Organising principles and potential uses

The Rongoā Knowledge-Base could be organised into specialities which encompasses six broad areas of Rongoā Māori: Rongoā Rākau; Mirimiri / Romiromi; Mahi Whenua; Matakite; Wai / Hauwai; and Karakia/Ritenga. A process to determine what knowledge could be collected will have to be discussed with Te Kāhui Rongoā.

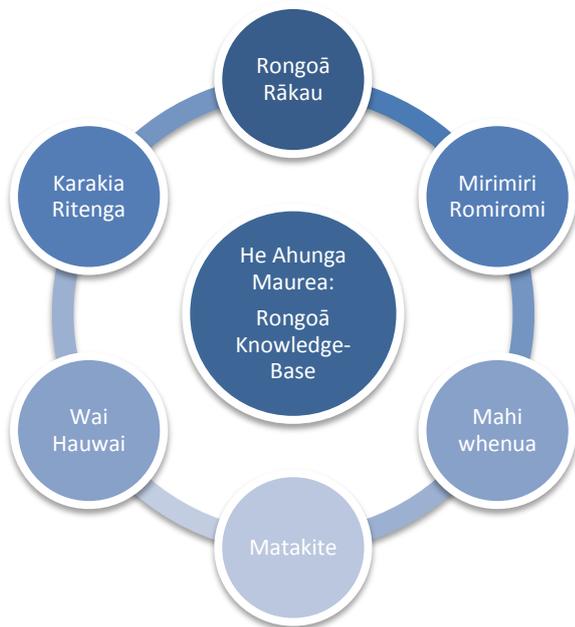


Figure 6: Organisation of the Rongoā Knowledge-Base

These six areas of speciality allow for a wider scope in terms of the potential uses of the repository including, but not limited to, practitioner training, community education, research, outreach

activities, media communications and advocacy. The primary uses will determine the type of information collected within the Knowledge-Base. We suggest that the primary use should be connected to practitioner training and support.

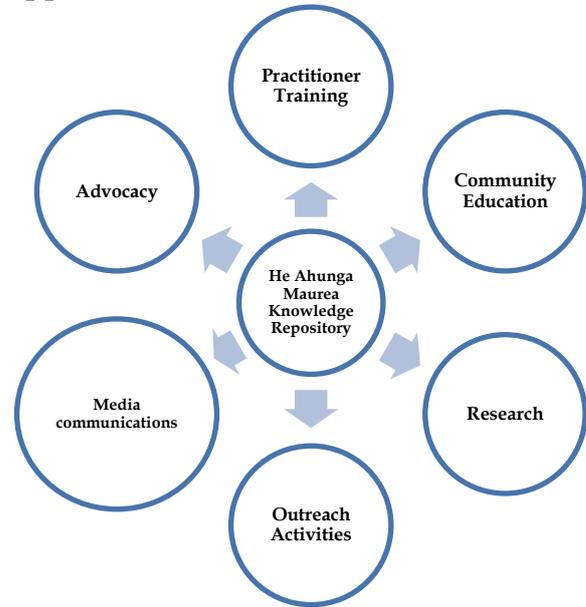


Figure 7: Potential Uses of the Rongoā Knowledge-Base

Given the previous work and consideration given to developing a rongoā species database it makes sense that this component forms the first stage of the Rongoā Knowledge-Base (RKB). The RKB would consist of a National Rongoā Database (NRD) and Rohe Collections (RC). The RKB of rongoā information in its entirety could eventually be accessible through the TKR website although for the development phase the Rohe Collections might be off-line collections until rohe become familiar and comfortable with the processes and content.

3.2 National Rongoā Database

The NRD could contain generic plant species information publically accessible from Landcare Research NZ sites (i.e., Ngā Tipu Whakaoranga – Maori Plant Use Database and Ngā Tipu Aotearoa –

New Zealand Plants), and generic websites, (i.e., NZ Plant Conservation Network, Rongoa New Zealand Network – Tenia O Ngahere; Aotea NZ Website; and Natures Bounty Website). This will require negotiation with the host entities around either direct access to their data or the establishment of links to their websites. The *NRD* could include generic information on:

1. Scientific name;
2. Common names;
3. Māori name;
4. Names of various parts;
5. Images;
6. General medicinal information;
7. Plant use (food, traditional, hunting and gathering, domestic etc);
8. Information on the threats to plant species especially pests;
9. Reproductive and life cycles of plant species;
10. Links to scientific articles and published sources;
11. Matariki and the Maramataka information on planting, growing and harvesting times;
12. Cross referenced to shared plant information –
 - i. general location information identifying the various plants that can be found in the different regions
 - ii. information about dependent species;
 - iii. botanical and growth information
 - iv. Whakapapa of plant species and their family groupings.

3.3 *Rohe Collections*

The Rohe-Collections (RC) would be private collections of information that could eventually be accessible to practitioners (in rohe, or across the motu)

through the Rongoā Knowledge-Base website (*This content would not be available to the public*). In the development stages of the project rohe can be given off-line copies of the Rongoā Knowledge-Base which they can supplement using knowledge collected from their practitioners. The *RC* might include information on:

1. locality of rongoā species within the rohe (GPS information);
2. Recipes and preparation methods used for Rongoā Māori;
3. Information on other practices / specialities in relation to rongoā, e.g. mirimiri and karakia;
4. Interviews with Rongoā practitioners;

3.4 *Processes for collection and management of content*

To develop a fully functional and integrated knowledge-base it will be necessary to develop processes and protocols for the collection and management of knowledge at three levels of operation; practitioner, rohe and national.

While processes would need to be developed in conjunction with Te Kahui Rongoā, they can be informed by established projects mentioned earlier. Collection processes can draw on established practices developed by Institute of Ayurveda and Integrative Medicine and Traditional Knowledge Revival Pathway. Management processes and procedures can be adapted from Pei Te Hurinui Jones project.

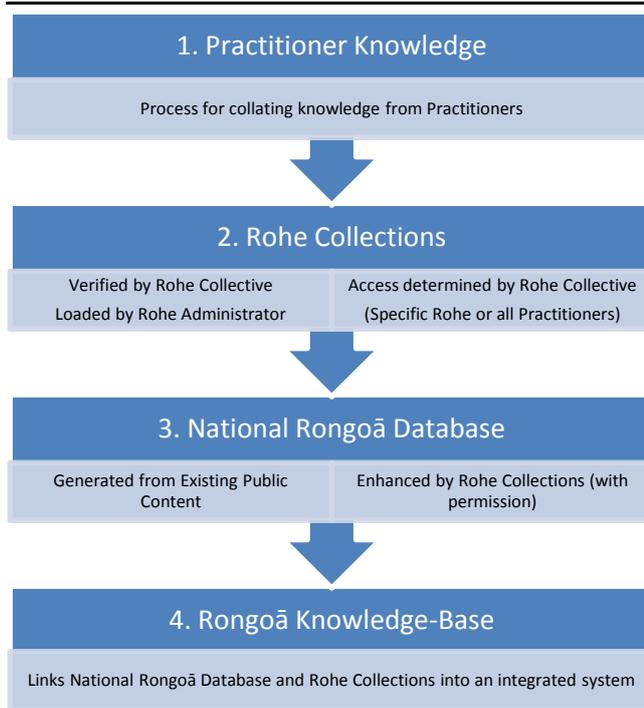


Figure 8: Process for generating content and determining access

1. Collection of knowledge from practitioners will require development of a process as well as training and support for kaimahi. Knowledge only available to the individual practitioner.
2. Process for Knowledge to be included in Rohe Collections. A Rohe Administrator should be responsible for loading material to RC once it has been verified as suitable by the Rohe Collective. Information available to the Rohe practitioners.
3. Process for inclusion of Rohe information in National Rongoā Database. Rohe collective to approve uploading of Rohe knowledge into National Rongoā Database. Knowledge available to the public.
4. Rongoā Knowledge-Base will be functional once Rohe Collections are transferred to digital on-line environment and integrated with the National Rongoā

Database. System allows for differential access restricting rohe collections to practitioners (local or national) or available as public content.

3.5 Central Content Management System (CMS)

Greenstone open source digital library toolkit will be employed as the software framework and Content Management System for this project. Its advantages include:

- Open source
- Large User Base
- Large Technical Support base
- Easy to use and to setup
- Collections are easily distributable
- Interoperable, Multilingual and Multiplatform
- Flexible Metadata Support
- Core developers and consultants in New Zealand

The website and the digital library database will remain separate and a middleware (like an API) will be used to connect the two entities. This ensures that the website and digital library can do the job that they are intended for – the website is usually an information / communication / transaction engine and the digital library usually holds a discrete set of data - and the API can work with whatever security measures are in place to access and share the digital library data. By keeping them separate, the digital library data can also be independently shared with not only the website but any other tools / websites / services as required.

He Ahunga Maurea should start with Greenstone 2.86, the latest production release version. Greenstone 3.05 is their research version of Greenstone and is still incomplete.

4. Development Plan for the Rongoā Knowledge-Base

The development plan is a 4 phase project (see *Table 1: Development Plan for the Rongoā Knowledge-Base* below for specific detail regarding the processes, resources, outputs, timeframes and risks):

Phase 1 – Project Set-up

- Set-up project advisory group.
- Identify and apply for funding.
- Identify an appropriate Project Coordinator.
- Develop organisational framework for RKB.
- Develop processes for gathering rongoā and species information including verification and access protocols.

Phase 2 – National Rongoā Database

- Identify key participants for User/Administrator profiles.
- Finalise access protocols for NRD.
- Commission Software Engineer/Programmer, Web Developer/User Interface Specialist and Research Assistant.
- Negotiate access or sharing agreements with existing providers
- Develop first pilot and manage content in one secure place.
- Define core functions of data models, metadata & preservation.
- Test and trial user interfaces, tools and usability.

Phase 3 – Rohe Collection Pilot

- Pilot RC with Rohe.
- Train Pilot Rohe Co-ordinator.
- Build prototype of RC for Rohe.

- Test and trial user interface for RC and database and editing features.
- Test and trial final prototype model of RC.

Phase 4 – Rohe Roll-out

- Roll-out prototype of RC with Rohe.
- Rohe Administrator training workshops (3 x 2 day workshops).
- Retest RC database usability with predetermined end-user groups.
- Link RC with NRD

Table 1: Development Plan for the Rongoā Knowledge-Base

Phases	Process	Resources	Output	Timeframes	Risks
Phase 1 – Project Set-up	<ul style="list-style-type: none"> • Set-up project advisory group (sub-committee of Te Kāhui Rongoā). • Identify and apply for funding (MOH Māori Provider Development Fund, Lotteries Health for NKR; Regional Trusts to support rohe collections). • Identify an appropriate Project Coordinator. • Develop organisational framework for RKB. • Develop processes for gathering rongoā and species information for the RKB and RC; <i>including verification and access protocols.</i> 	<p>Personnel</p> <ul style="list-style-type: none"> • 0.5 FTE Project Co-ordinator.¹ (15K) <p>Cost:</p> <ul style="list-style-type: none"> • Facilitation of hui (x4) costs, travel etc. (10k) • Grant writer. (5k) 	<ul style="list-style-type: none"> • Hui with advisory group. • Funding proposal. • Hui with advisory group. • Agreements finalised. • Phase 2-4 schedule and deliverables. • Finalize policies and specifications related to source material, selection criteria, copyright, document formats, and metadata for NKR & RC. 	6 months initially then on-going to support rohe resourcing	<ul style="list-style-type: none"> • Continuing support from TKR for project • Trust from Practitioners for TKR led process • Inadequate resourcing
Phase 2 – National Rongoā Database	<ul style="list-style-type: none"> • Identify key participants to establish hierarchical User/Administrator profiles. • Finalise verification and access protocols for NRD. • Commission Software Engineer/Programmer. • Commission research assistant to collate rongoā information. • Negotiate access or sharing agreements with existing providers (Nga Tipu Whakaoranga). • Develop first pilot collection with metadata and associated files. • Manage content in one secure place. • Focus on defining the core functions in the areas of: data models, metadata & preservation. • Commission Web Developer/User Interface Specialist and test and trial user interface for NRD. • Implement and test integration of new and existing tools. • Retest NRD usability with practitioners and end-user groups. 	<p>Personnel</p> <ul style="list-style-type: none"> • 0.5 FTE Project Co-ordinator. (30K) • 0.5 FTE Software Engineer/Programmer.² (35K) • Web Developer/User Interface Specialist.³ (20K) • 0.5 FTE Research Assistant (25K) <p>Cost:</p> <ul style="list-style-type: none"> • Facilitation of hui (x4) costs, travel etc. (10k) • Server to store the digital objects in the collection and the metadata for the objects. (5k) 	<ul style="list-style-type: none"> • Finalise workflows and responsibilities for digitization and loading and checking of content to NKR. • Build initial prototype of NKR collection. • Gather usability feedback on NRD (survey and user feedback). • Complete NRD and user interface. 	1 Year	<ul style="list-style-type: none"> • Resource to support collation of material into NRD • Usability of the database • Existing providers won't share information

¹ Develops phase 1-4 plan including scope, schedule and deliverables.

² Responsible for installing, developing and testing programs and scripts. Provides overview and demonstrates new tools. Implements and tests integration of new and existing tools.

³ Primary responsibility for public interface design and programming. Works with Software Engineer/Programmer on designing usable User/ Administrator profiles.

Table 1: Development Plan for the Rongoā Knowledge-Base

Phases	Process	Resources	Output	Timeframes	Risks
Phase 3 – Rohe Collection Pilot	<ul style="list-style-type: none"> • Build an initial prototype of RC for Rohe; • Test and trial user interface for RC; • Pilot RC with Rohe; • Train Pilot Rohe Co-ordinator. • Continue development of database and editing features. • Test and trial final prototype model of RC; 	<p>Personnel</p> <ul style="list-style-type: none"> • 0.5 FTE Project Co-ordinator. (30K) • 0.5 FTE Software Engineer/Programmer. (35K) • 0.2 FTE Web Developer/User Interface Specialist. (20K) • 0.5 FTE Research Assistant. (35K) • 0.5 FTE Rohe Co-ordinator. (30K) <p>Cost:</p> <ul style="list-style-type: none"> • Facilitation of hui (x4) costs, travel etc. (10k) <p>Resources</p> <ul style="list-style-type: none"> • Camera, computer hardware etc⁴ (10k) 	<ul style="list-style-type: none"> • Build an initial prototype of RC for Rohe. • Gather usability feedback on RC (survey and user feedback) • Complete RC prototype and user interface. 	1 Year	<ul style="list-style-type: none"> • Support and Training for kaimahi to ensure appropriate data entry and coding • Resources for rohe collection phase • Identification of suitable rohe for pilot
Phase 4 – Rohe Roll-out	<ul style="list-style-type: none"> • Identify schedule for rohe roll-out; • Roll-out prototype of RC with Rohe; • Rohe Administrator training workshops (3 x 2 day workshops).⁵ • Retest RC database usability with predetermined end-user groups • Integration and linking of RC with NRD 	<p>Personnel</p> <ul style="list-style-type: none"> • 1.0 FTE Project Co-ordinator. (60K) • 0.5 FTE Software Engineer/Programmer. (35K) • Web Developer/User Interface Specialist. (20K) • Resources – camera, computer hardware @ 10k per rohe • Resource for Rohe Administrators @ 5k per rohe <p>Cost:</p> <ul style="list-style-type: none"> • Training hui costs, travel etc. (20k) 	<ul style="list-style-type: none"> • Roll-out final NKR. • Rohe Roll-out. • Rohe Administrator training workshops. 	2+ Years	<ul style="list-style-type: none"> • Training for kaimahi to ensure appropriate data entry and coding • Resourcing for rohe rollout phase • Support from rohe to link RC with NRD

⁴ Suggested resources outlined in appendix 3

⁵ Rohe Administrator training workshops facilitated by Pilot Rohe Administrator, with assistance with from Project Coordinator, Software Engineer/Programmer, and Web Developer/User Interface Specialist.

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6. Appendices

Appendix 1: Software, hardware and associated costs (Project Taunaha, 2011)

Option One	<p>Would require Users to have access to Microsoft Access, an application of Microsoft Office, and be a competent User of the software.</p> <p>The estimated costs associated with developing this text-based database include:</p> <ul style="list-style-type: none"> • One-off database setup fee of \$2,000.00 to \$3,000.00 Plus • Microsoft Access 2010 Software - \$200.00 to \$250.00 OR • Microsoft Office Home and Business Software- \$350.00 OR • Microsoft Office Home and Student Software - \$150.00 OR • Microsoft Office Mac 2011 Home and Business - \$340.00 OR • Microsoft Office Mac 2011 Home and Student - \$165.00 • Time of contracted person to input generic rongoa species data • Time of User to input data • Time of User to maintain, update and back-up data 																																
Option Two and Three	<p>The database would need to be built using a fully featured relational database management system that is capable of storing spatial objects to be used for the database. Microsoft's SQL Server 2008 and PostGIS can achieve this.</p> <p>A web server would also be required and computer server operating system with appropriate licensing. Two options available are using free open source software (PostGIS) or a proprietary software such as that supplied by Microsoft (MS SQL Server 2008)</p> <p>Costs for setting up the Rongoa Species Database using the Microsoft SQL Server 2008 and PostGIS options are identified below:</p> <table border="1" data-bbox="392 1323 1444 2045"> <thead> <tr> <th>COSTS</th> <th>MS SQL Server Web Edition</th> <th>SQL Server Standard Edition</th> <th>PostGIS</th> </tr> </thead> <tbody> <tr> <td>Windows Server 2008 Operating System</td> <td>Included in lease</td> <td>\$3,500</td> <td>n/a</td> </tr> <tr> <td>Database Server Software</td> <td>Lease - \$60/per month / cpu</td> <td>\$13,300 one off</td> <td>FREE</td> </tr> <tr> <td>User Licensing (ongoing)</td> <td>Unlimited number</td> <td>Unlimited number</td> <td>Unlimited number</td> </tr> <tr> <td>HP Server Hardware (recommended) - Purchase</td> <td>\$2,000 to \$4,000</td> <td>\$2,000 to \$4,000</td> <td>\$2,000 to \$4,000</td> </tr> <tr> <td>Server Storage - Lease</td> <td>Varied, monthly cost</td> <td>Varied, monthly cost</td> <td>Varied, monthly cost</td> </tr> <tr> <td>Database Setup Costs</td> <td>\$5,000 to \$10,000</td> <td>\$5,000 to \$10,000</td> <td>\$5,000 to \$10,000</td> </tr> <tr> <td>Initial Data Population</td> <td>Personnel Costs</td> <td>Personnel Costs</td> <td>Personnel Costs</td> </tr> </tbody> </table>	COSTS	MS SQL Server Web Edition	SQL Server Standard Edition	PostGIS	Windows Server 2008 Operating System	Included in lease	\$3,500	n/a	Database Server Software	Lease - \$60/per month / cpu	\$13,300 one off	FREE	User Licensing (ongoing)	Unlimited number	Unlimited number	Unlimited number	HP Server Hardware (recommended) - Purchase	\$2,000 to \$4,000	\$2,000 to \$4,000	\$2,000 to \$4,000	Server Storage - Lease	Varied, monthly cost	Varied, monthly cost	Varied, monthly cost	Database Setup Costs	\$5,000 to \$10,000	\$5,000 to \$10,000	\$5,000 to \$10,000	Initial Data Population	Personnel Costs	Personnel Costs	Personnel Costs
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Database Setup Costs	\$5,000 to \$10,000	\$5,000 to \$10,000	\$5,000 to \$10,000																														
Initial Data Population	Personnel Costs	Personnel Costs	Personnel Costs																														

	Administration * (ongoing part-time)	Personnel Costs	Personnel Costs	Personnel Costs
	Map Server 6.0.0	FREE	FREE	FREE
Open Source Software Option	<p>The Open source option is based on using software freely available in the public domain.</p> <ul style="list-style-type: none"> • Operating System : Linux various options (Not Windows can be used as OS also) • Web Server : Apache 2.2/Tomcat 7.0 • Database Server : PostGIS • Map Server : MapServer 6.0.0 <p>The open source suite of software can be downloaded and installed without costs.</p> <p>PostGIS is open source RDBM, based on PostgreSQL. It adds support for geographic objects to the PostgreSQL object-relational database. In effect, PostGIS “spatially enables” the PostgreSQL server, allowing it to be used as a backend spatial database for geographic information systems (GIS), much like ESRI’s SDE.</p> <p>Post GIS follows the OpenGIS Simple Features Specification for SQL and has been certified as compliant with the “Types and Functions” profile.</p> <p>PostGIS has been developed by Refrations Research as a project in open source spatial database technology. PostGist is released under the GNU General Public License.</p> <p>PostGIS is a bulk licence with no ongoing monthly or annual licensing costs.</p>			

Appendix 2: Te Mahere Rautaki a Te Kāhui Rongoā 2012



Appendix 3: Hardware requirements for Rohe Collections

Canon XF100 video camera –	3400.00
MANFROTTO – 475B Pro Geared Tripod Kit	699.00
extra BATTERY PACK – Canon 7800 mAh	122.85
Kingston 32GB Compact Flash Ultimate 266X Card x 2	164.60
58mm UV lens filter	35.00
PELICAN CASE iM2720	529.00
APPLE iMac 27inch 2.9GHz * 8GB memory * 1TB hard drive	2799.00
APPLE MacBook Pro 13inch 2.9GHz * 8GB memory * 750GB hard drive	2199.00
Western Digital 4TB My Book Studio USB external harddrive	489.95
Belkin firewire cable (drive > computer)	44.95
Other	266.65
Total	10750.00