Section SEVEN

Frankincense Resource Portal

While there are many open access global databases for plant species distribution and associated information that lend themselves to meta-analyses, acquiring, combining, sorting and quality control of these data can be time consuming and beyond the technical capacity of many potential users. It was therefore decided that a dedicated resource about *Boswellia* spp. may have value for stakeholders and interested parties given the widespread interest in and concern for frankincense.

Section 7.1

Portal development

In order to ascertain the value of such a resource, a total of 276 potential users across research, conservation, industry and other stakeholders were contacted and a short survey requested for completion to estimate what would be most useful and have value for a range of users. The survey was sent in both English and French.

The survey methodology is presented in Appendix 7.1.

Of the 252 surveys sent out to 154 organisations or individuals, respondents from 45 states (including all range states and representatives of some global organisations), 23 were returned completed (15% completion rate at the organisation level). The classification of the respondents is annotated below in Figure 7.1. The majority of respondents were from the research community.

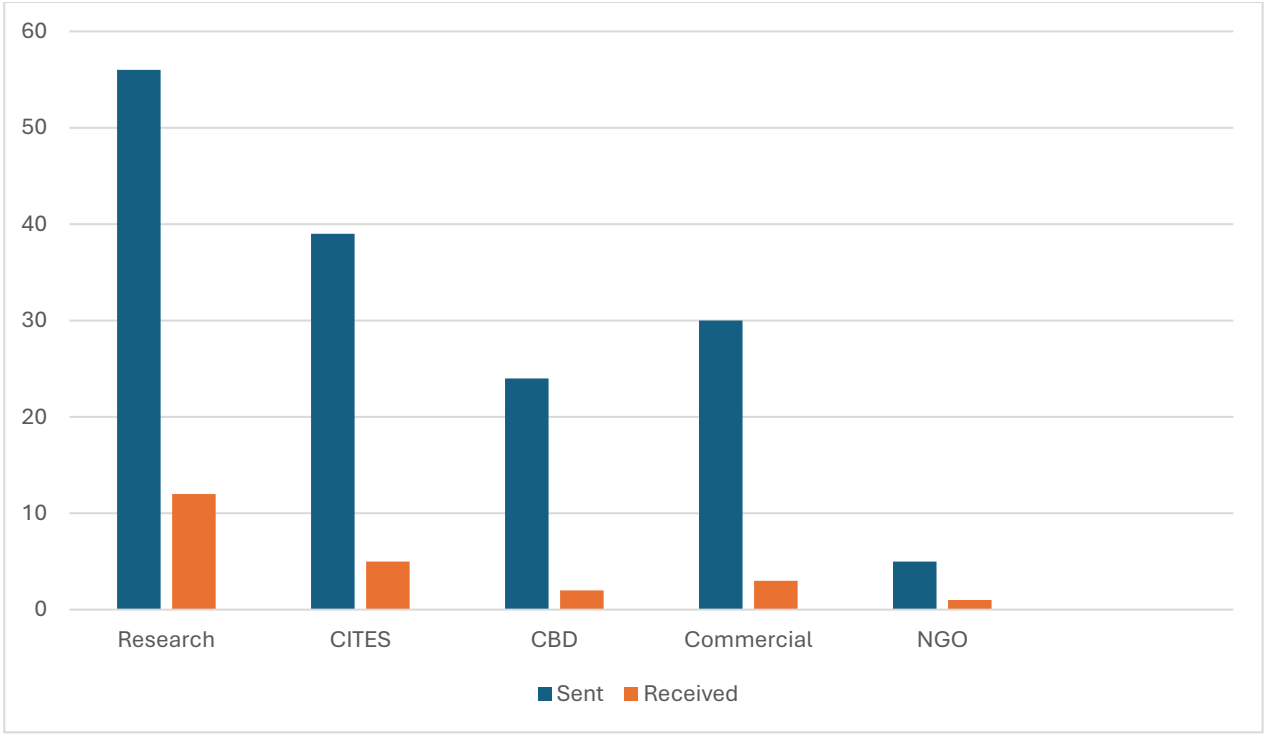

Figure 7.1. Classification of contacts and respondents.

When asking what type of information would be of most value to include in the Portal, all categories received more than 60% requirement – in essence, the majority of respondents believed that all proposed content would be of value most of the time (see Figure 7.2.). This is not entirely surprising, as users can then choose which information to access and ignore those that are not directly relevant to them at that time. The majority of these information sources are included in the portal or are planned for inclusion. The exception currently is harvesting information as work is still ongoing to develop standardised monitoring protocols and subsequent application as well as developing how these can be represented on the portal.

Figure 7.2. Respondents' categories of preferred information for inclusion.

When asked whether access to information about threatened species should be restricted in any way, while all categories featured in answers the most popular response was that all information should be open access (see Figure 7.3.). This is perhaps surprising, as many global distribution databases, especially GBIF, have strict regulations about obfuscating data on rare and threatened species to protect localities from damage.

Less surprisingly, the vast majority of respondents requested that in general, information presented should be open access (see Figure 7.4.). This is less surprising, as the concept for presenting such a portal is to make information of value available to stakeholders to use as they see fit, and as a more general reference resource. This result was mirrored in responses as to whether data presented should be open access for download (see Figure 7.5.). The majority of respondents also indicated that they should be able to download data directly, although some responses indicated that they felt registration would be a better option (see Figure 7.6.).

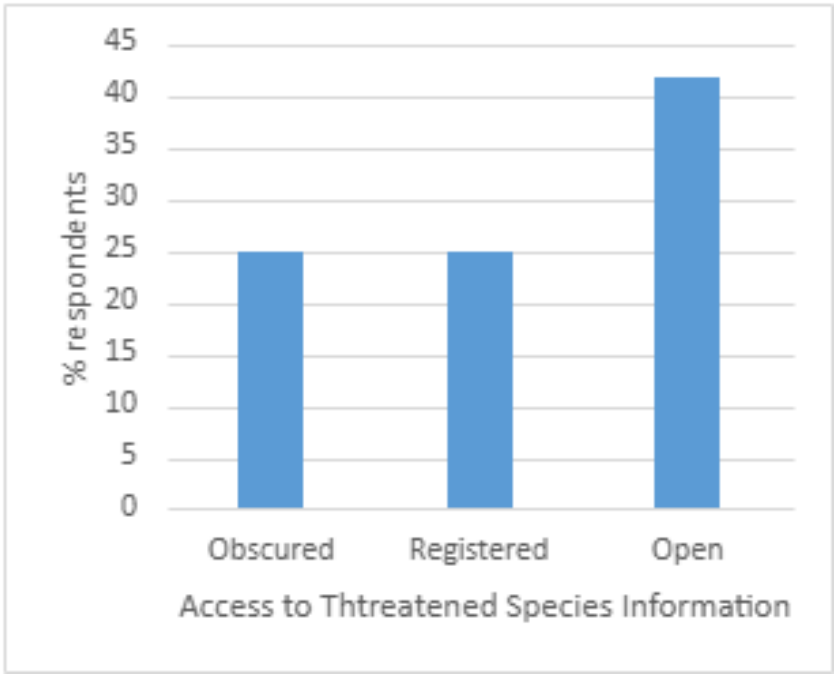

Figure 7.3. Respondents' preference on access to threatened species information.

For data upload, the vast majority of respondents indicated that data upload should be via an administrator or curator who could verify the data prior to any data being incorporated into the database (see Table 7.7.). This recommendation has been implemented: the underlying database has an upload "sandbox" that automatically checks submissions for errors or missing data fields which can then be ameliorated by an administrator. It is likely that a routine data upload – for example annually – will be implemented (although that may depend on the amount of new data submitted in each time period, which will be monitored in the first year of operation).

As to who should be able to upload data, all categories were included by respondents (see Table 7.8.). As there will be required data entry fields for all submissions, in essence it will not matter who submits the data as everything will go through the same process of curation.

Respondents were asked which languages it would be useful for the Portal to be available in. The three most popular languages requested after English were French and Spanish (thus representing the three languages most commonly adopted by the United Nations) along with Arabic which covers a number of range states. Other languages were requested and represented languages specific to particular range states (see Table 7.9.).

Although the number and percentage of respondents was relatively low, useful information was gained from this exercise and incorporated in the design of the portal. Once the portal is live, feedback forms will be sent to the same and additional users and stakeholders to raise awareness and to encourage use, participation and data submission.

Figure 7.4. Respondents' preferences for access to information.

Figure 7.5. Respondents' preferences on the ability to download information.

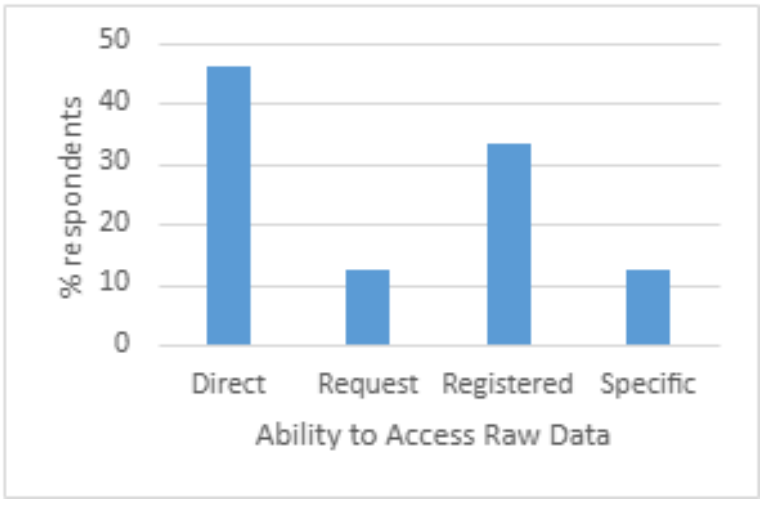

Figure 7.6. Respondents' preferences on the ability to download raw data.

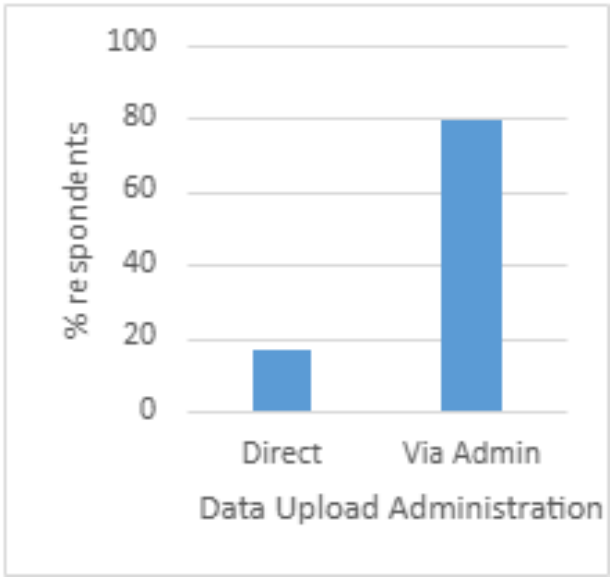

Figure 7.7. Respondents' preferences as to whether data upload should be direct or via a curator.

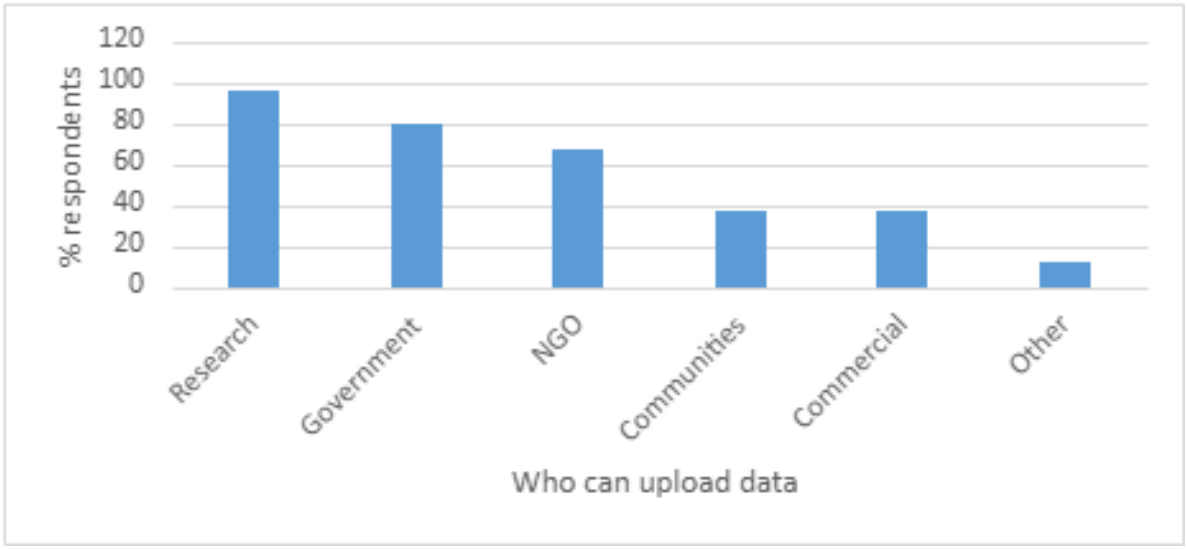

Figure 7.8. Respondents# preferences as to who should be able to upload data.

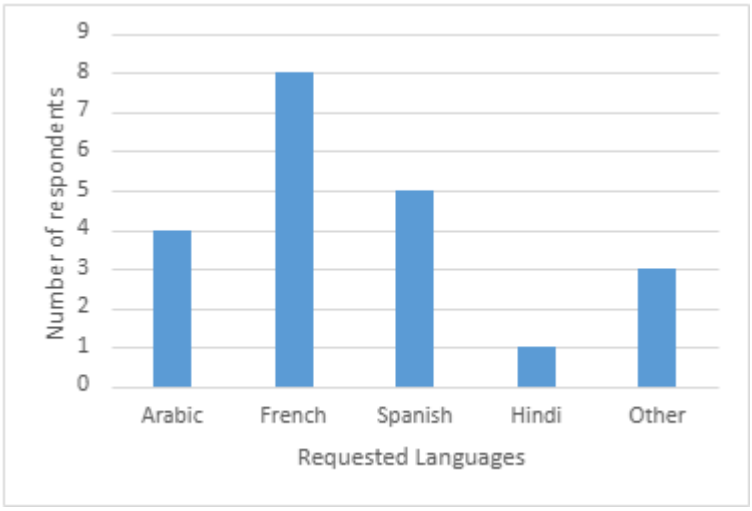

Figure 7.9. Respondents' suggestions as to which languages the portal should be available in.

Section 7.2

Portal Description

The Frankincense Resource Portal is available online and can be viewed at:

https://padme.rbge.org.uk/boswellia/index.php

The Home Page features a brief description of Boswellia and the portal.

The Species Page features images that link to detailed information about each species. Each species page includes complete nomenclature, a brief description, a list of countries in which it occurs, a contemporary distribution map based upon data held in the database, a predicted distribution map based upon geo-referenced herbarium vouchers as data points, details on flowering, fruiting and altitude, and details about IUCN Red List status. As all these details are held in a database they can easily be updated and a record kept of those updates.

The Key Page features the interactive identification guide to all species of *Boswellia* as detailed in Section 2. This was constructed by using available and recent taxonomic literature and input with ideograms representing characters and character states with the intention that language and detailed knowledge of taxonomic terminology would not be a prerequisite for use.

Distribution data is input via a spreadsheet with fixed data fields, which is then auto checked for errors before upload. An additional page where these forms can be accessed and submitted will be added to the portal in the near future.

Section 7.3

Future developments

The functionality of the portal, how the data is stored, input, and viewed, is more or less complete. However, there are a number of developments and additional features that we expect to implement as well as accessing feedback from users on the functionality and utility of the website.

The visible front end of the Portal will be re-designed in line with redevelopment of other websites at the Royal Botanic Garden Edinburgh while maintaining its own unique focus. There will be additional text in each species section.

It is intended to make to contemporary maps “live” in that each data point will have information attached and different types of data will be colour coded (eg. herbarium vouchers vs field and literature records). New data will be added at routine intervals when received from collaborators, and over a period of time comparisons between contemporary and modelled distributions can be made to elicit any difference that new data has contributed. Distributions modelled against future climate predictions will be published and added at a future date.

The identification key will develop by having images added of characters and character states from each species as and when these become available. This will assist in the ability to use the key without detailed knowledge of taxonomic descriptive language and also can be used without text with the addition of some simple training protocols.

It is also intended to enter discussions with stakeholders about the database hosting field survey results, and how these should be uploaded, displayed and used. This could form part of future funded programmes to expand monitoring surveys that would demonstrate the status of populations being harvested and contributing towards sustainable harvest and subsequent marketing.

Presenting parts of the portal in additional languages will be costed and scheduled for development.

The Frankincense Resource Portal was developed by and is currently hosted at the Royal Botanic Garden Edinburgh using an in-house database. This arrangement can be continued for the time being, albeit discussions about hosting if monitoring and survey results are also hosted here may need to include additional partners in the long term.