

CEPFOR Decision Support Tool

User Guide v 4.0

Produced by the CEPFOR Project

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Credits

Olivier Cottray of Oryx Mapping (<http://www.oryxmapping.org/>) and Finbarr O'Sullivan (<http://mapinformatics.com/>) designed the Java interface that is incorporated in the CEPFOR Decision Support Tool.

Version

This user guide refers to Version 1.6.4 of the CDST.

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Introduction

The **CEPFOR Decision Support Tool (CDST)** is a software tool that was developed by the CEPFOR Project, a collaborative research initiative that examined the factors influencing the success of commercializing non-timber forest products (NTFPs). The research was undertaken by a multi-disciplinary team drawn from organisations in the UK, Mexico and Bolivia, and examined 18 NTFP case-studies, ten from Mexico and eight from Bolivia. The CDST is based on the results generated by the research on these case studies, further details of which are available in the project reports accompanying this software tool on the CD-ROM.

The purpose of this tool is to support the process of decision-making when selecting NTFPs for potential development. The CDST is designed for use by anyone involved in NTFP commercialization, but is specifically aimed at supporting individuals or organisations working with communities and wanting to improve existing commercialization initiatives or establish new programmes of work. NTFPs are widely considered to offer a promising option for sustainable rural development. However, the successful development of a NTFP often requires, in addition to an enabling policy environment, substantial investment of time, money and human resources. This tool is designed to assist the process of effectively targeting such investments on NTFP commercialization initiatives most likely to succeed. In addition, it provides a means of identifying those situations where success is less likely, and where investments are therefore subject to a relatively high degree of risk.

The CDST is not designed to replace the decision-making process, but to inform it. It is recognised that the decision of whether or not to invest in developing a particular NTFP resource will be influenced by many issues, not all of which are explicitly considered by the tool. The CDST does not provide a categorical single answer to a given question, nor provide a single solution to a problem. However, the tool can be used to predict the likelihood of successfully commercialising a particular NTFP within a particular socio-economic situation. This enables the potential outcomes of different development options to be compared. For example, it could be used to choose between two or more NTFPs that are candidates for development, by comparing their relative likelihood of success in different socio-economic situations.

It should be emphasised that the success of NTFP commercialization depends not only on the characteristics of the product itself, but also on the socio-economic characteristics of the communities and households involved in commercialization, and the characteristics of the value chain. The 'value chain' is defined as the production to consumption chain originating from the community; the CDST is based on production to consumption systems originating in one community. These various characteristics should not be viewed in isolation, and the CDST explicitly considers them in an integrated manner. However, the CDST

could be used to compare different forest products within a given socio-economic situation, or different socio-economic situations for a given forest product, to examine the relative influence of these factors on overall success. Decision-makers are encouraged to use the tool in such an exploratory way, to identify potential risks and opportunities. The CDST could also be used as a diagnostic tool to identify specific problems or constraints for NTFPs already undergoing commercialization.

Installation

First you must install the Java Runtime Environment of at least version 1.5. This is supplied as the file `jre_1_5.exe`. This is the freely distributable Java Runtime supplied from Sun Microsystems (see www.java.sun.com). If you already have an earlier version installed on your computer, you must first remove it and then install version 1.5 by double-clicking the `jre_1_5.exe` file.

To install the CDST, double-click on the `cepfor.exe` icon. By default, the software will be installed on the `C:\` directory on the hard disk of your computer.

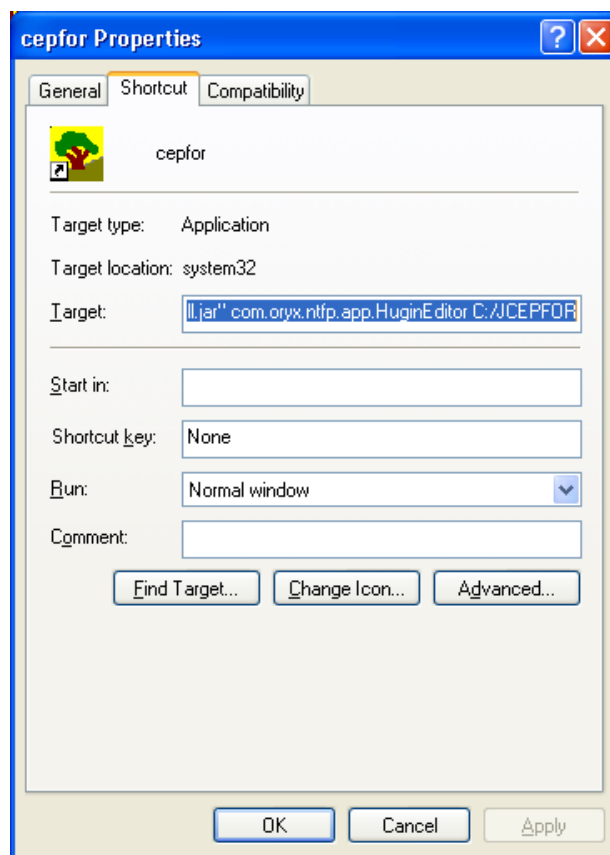
The following icon will be installed on your desktop:



You can launch the CDST by double clicking on this icon.

NOTE that when you first run the CDST, it may need to locate the Java Runtime Environment. This may take several minutes to complete. Please allow the software to find the file. Once the appropriate file has been located, then this will be remembered the next time that you launch the software tool.

The default will be to create the directory `C:\JCEPFOR` and the files will all be stored under that directory. In the default case the “root” directory of the installation will be `C:\JCEPFOR`. If, however, you decide to install it somewhere else you need to edit the command line associated with this icon to reflect the path to the files. To do this right-click the icon and select “Properties” to open the icon properties dialog as shown below. Then edit the command in the Target field to change occurrences of `C:/JCEPFOR....` to the new path (eg `E:/MyApps/JCEPFOR`, or whatever is appropriate).



How the CEPFOR Decision Support Tool is organised

When the CDST is launched, the user is presented with an interface screen, which enables values to be entered and the outputs to be visualised. Before describing how to enter values and interpret output, a brief description is provided here of how the CDST is structured.

Measuring success of NTFP commercialization

One of the main outcomes of the CEPFOR project was the realization that the success of NTFP commercialization can be measured in many different ways. These different measures can conflict. For example, commercialization of an NTFP could lead to an increase in monetary income for some households, but reduce access of other households to the forest resources on which they depend. Success should therefore be considered from many different viewpoints, and at product, household, community and value chain level, to provide a comprehensive assessment of the potential impacts of NTFP commercialization.

The CDST incorporates an approach to assessing the impacts of NTFP commercialization that was implemented by the CEPFOR project. The approach is based on a “livelihoods framework”, which considers the different assets

(including both material and social resources) that are required for living. Five different types of asset are considered:

1. **Natural capital.** This includes the natural resource stocks (eg forest resources) from which products and services useful for livelihoods are derived.
2. **Physical capital.** This comprises the basic infrastructure and producer goods needed to support livelihoods (e.g. shelter and buildings; tools and equipment used for farming or forest management; transportation, energy and communications; etc.).
3. **Human capital.** This includes the skills, knowledge, ability to work and health that people need to pursue different livelihood strategies and achieve their objectives.
4. **Financial capital.** This includes the financial resources that people use to achieve their livelihood objectives, including savings in various forms, access to credit, earnings, remittances and any debt burdens.
5. **Social capital.** This refers to the social resources that people draw upon to help meet their livelihood objectives, including networks and connections between people, memberships, relationships of trust, and the rules, norms and sanctions associated with different institutions.

The CDST framework is based on the amount of these assets available before and after commercialization. We propose that the process of NTFP commercialization can be represented as the conversion of one asset type to another (e.g. natural to financial). This conversion is influenced by the availability of all five asset types, and the availability of these different assets after NTFP commercialization determines the impact on livelihoods.

Further details of this approach to measuring the impacts of NTFP commercialization using the livelihood framework are given in the project reports accompanying this software tool.

The CDST considers the impact of NTFP commercialization on these five asset types at two scales: household level and community level. It is important to note, as found in the CEPFOR study, that impacts at the household level may differ from those at the community level.

A successful NTFP should ideally lead to increases in all five types of asset, at both household and community levels. However, this is often difficult to achieve in practice. Positive impacts on one type of asset, or at one scale, might therefore need to be traded off against negative impacts on another asset or at a different scale (e.g. increasing household financial capital to the detriment of community natural capital). The CDST cannot assist in making such decisions,

which are essentially value judgements. However, the CDST is designed to help visualize these different impacts and trade-offs, to provide a more complete picture of the likely impacts of NTFP commercialization on livelihoods.

Note that the CDST does not explicitly differentiate between the impacts on different actors or stakeholders, or their various roles. It is assumed that the communities considered, and at least a proportion of the households within these communities, are involved in NTFP production. Individuals within these communities may be involved in a number of other activities associated with NTFP commercialization, such as processing, storing, packaging, transporting or selling. In reality, many individuals are involved in more than one of these activities. The CDST does not attempt to define the impacts of commercialization on individuals in relation to their activities or roles. However, the successful completion of these activities is considered in relation to the assessment of overall success.

Factors influencing success of NTFP commercialization

The CDST is based on the concept that the impacts of NTFP commercialization on the different assets required by people to support their livelihoods are influenced by a variety of different **factors**. These factors include the characteristics of the product to be commercialised, but also include the socio-economic characteristics of the communities involved, and the characteristics of the value chain (or market chain).

A large number of factors could potentially influence the success of NTFP commercialization. The list of factors that could potentially be important also varies between products and between the socio-economic circumstances under which commercialization takes place. In order to ensure that the CDST is usable, the list of factors included has been limited to those that were found to be important in the case studies that were examined by the CEPFOR project. A total of 66 factors were included in the tool.

To use the tool, values are entered for these factors, as detailed in the next section. The impacts of these factors on overall success can then be visualized, as described in the section that follows. Ideally, detailed information on each factor would be available to enable accurate values to be entered. However, it is recognized that the information available for many NTFPs is often partial, inadequate or uncertain in nature. The CDST is explicitly designed to assist with the analysis of such uncertain information, through use of a number of features that are described in the following sections.

Entering values

The interface screen for the CDST prompts the user to enter values for each of 66 factors that are considered to be important in influencing the success of NTFP

commercialization. This process of entering values for the factors is referred to here as **scoring**.

We have attempted to make the process of scoring as simple as possible, by:

- prompting the user to answer a specific question relating to the commercialization of the product in question
- offering a small choice of potential answers, which have deliberately been kept as simple as possible.

Additional information on each of the factors, to help guide the process of scoring, is provided within the user interface. A full list of the factors included in the tool, together with details of how they have been treated in the tool, is provided in an Appendix to this document.

As an example of the scoring process, the question might be:

Is there evidence of overharvesting?

The user is then offered a choice between answering 'yes' or 'no' to this question.

Most of the questions require a 'yes' / 'no' answer. However, in some cases other responses are offered, such as 'High / low'. In general, the user is asked to choose between two possible answers, although in some cases up to four possible answers are provided.

It is appreciated that for a particular product, some questions will be difficult to answer. For this reason, the user is not required to state categorically whether the answer is one or the other of the options provided – for example, either 'yes' or 'no'. As a result of the analytical approach used in constructing this tool, it is possible to enter a **likelihood** or probability of a particular option. This feature enables uncertainty surrounding the scoring process to be incorporated in the analysis.

To illustrate, consider again the question:

Is there evidence of overharvesting?

The user is then offered a choice between answering 'yes' or 'no' to this question. If the user is completely sure that the answer is 'yes', then a value of 'yes' may be entered. This is achieved by first clicking on the 'yes' answer, then moving the slider bar to 100%. This indicates that the user is 100% sure that the answer is 'yes'. Similarly, if the user is sure that the answer is 'no', then the slider would be used to enter a value of 100% next to the 'no' option.

If the user is not completely sure of a particular answer, then a value of less than 100% may be entered. For example, if the user believes that 'yes' is more likely than 'no', but it is possible that 'no' might be the correct answer, then values of 75% and 25% might be entered for 'yes' and 'no' respectively. If values of 50%

are entered for both 'yes' and 'no', then this indicates that both answers are equally likely (in effect, indicating that the user is completely unsure what the answer is).

It is important to note that a certainty value must be entered for each of the possible answers given. For example, if the user wishes to enter a value of 75% for 'yes', then a value of 25% must be entered for 'no'.

The total sum of all of the values entered should add up to 100%. If not, then the software will automatically correct the values entered so that they do add up to 100%. If a zero value is entered against a particular answer, then this will be interpreted by the software as the user being definitely sure that this answer is not correct.

To summarise:

- enter a value of 100% against an answer if you believe that it is correct
- enter a value of 0% against an answer if you believe that it is not correct
- enter equal values against answers if you believe them to be equally likely to be correct
- enter a value of between 0-100% against any answer to reflect your degree of belief in the answer, but make sure that all your values entered for a set of answers to a particular question add up to 100%.

In this version of the CDST, once the value for one answer has been entered, the other values should be produced by default so that they add up to 100%. It is also possible to enter the numerical values directly in the box positioned to the right of the slider, instead of using the slider. Simply type the appropriate percentage value in the box, then press 'enter' or 'return'.

Another key feature of this decision support tool is that you **do not have to answer all of the questions to obtain an answer**. In some cases, information may not be available that would enable you to answer the question. In such situations, simply leave the question unanswered. The CDST is provided with a set of default values that represent the results of the 18 case studies investigated by the CEPFOR project. If you do not enter your own answer for a particular question, the tool will take the default value provided and use this in the prediction of overall success.

The factors are grouped into five sets, according to the asset type that they are most likely to influence. These asset types are precisely the same as listed above under the section describing measuring success, namely:

1. Natural capital.
2. Physical capital.
3. Human capital.
4. Financial capital.

5. Social capital.

There are different numbers of factors for each of the asset types. You may notice, as you explore the CDST, that some factors have a much greater influence on success than others. As the total number of factors is large (66), the effects of each individual factor tend to be relatively slight. However, the cumulative effects of many factors can be very pronounced. The user is encouraged, therefore, to examine the effects of groups of factors, rather than individual factors in isolation.

Interpreting the output

As described above, in the CDST the impacts of NTFP commercialization are considered on five different types of asset needed to support livelihoods:

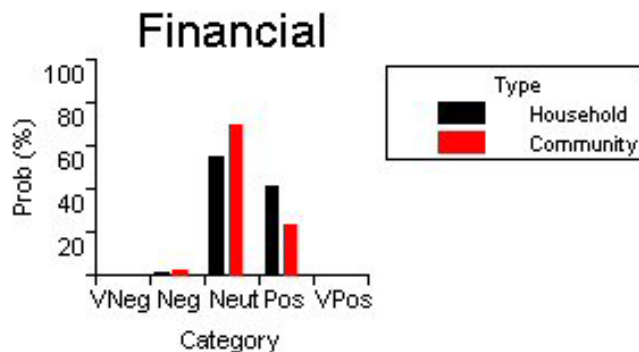
1. Natural capital.
2. Physical capital.
3. Human capital.
4. Financial capital.
5. Social capital.

Each of these is assessed both at the household and community level. In each case, the impact of NTFP commercialization is indicated by the following five categories:

- Very negative
- Negative
- Neutral
- Positive
- Very positive

It is important to appreciate that the analytical method used to calculate these outputs focuses on the use of likelihoods or probabilities. As each of the factors is entered as a likelihood, the outputs are visualized in the same way. This is appropriate, given the high degree of uncertainty surrounding the prediction of NTFP commercialization outcomes.

Outputs are illustrated as a set of likelihoods associated with the five impact categories. For example, the output for one particular asset type (e.g. financial capital) might look like this:



The values given are likelihoods ('prob') in percentages. In other words, in this case, NTFP commercialization has a 54% likelihood of having a Neutral impact on household-level natural capital, and a 69% likelihood of having a Neutral impact on community-level natural capital. Similarly, commercialization has a 40% likelihood of having a Positive impact on household-level natural capital, and a 23% likelihood of having a Positive impact on community-level natural capital. On the other hand, these results suggest a low (<3%) chance of impacts being Negative, and a zero chance of being Very negative.

Overall, in this example, the most likely outcome is Neutral – in other words, NTFP commercialization is most likely to result in the natural capital assets available to this community being unaffected. However, it should be noted that the next most likely outcome is Positive, implying an increase in financial assets available to both the community and to individual households. Note, however, that the likelihood of impacts vary at different levels: a Positive outcome is more likely at the household, than at the community level.

Even though the most likely outcome in this case is Neutral, there is a relatively high likelihood of the outcome being Positive, and a relatively small (but still greater than zero) likelihood of the outcome being Negative. This wide range of possible outcomes is typical of NTFPs, where there is a high degree of uncertainty regarding what the impacts of commercialization might be. This reflects the high degree of variation between NTFPs and the communities involved in their commercialization, and the difficulty of assigning livelihood impacts specifically to NTFPs, as opposed to the many other factors influencing the well-being of households and communities. However, the presentation of outputs in the form of likelihoods enables the most likely outcome(s) to be identified, and also provides an estimate of the likelihood of alternative outcomes. This approach is of particular value in estimating potential risks, and exploring intervention scenarios.

The outputs of the CDST should however be treated with caution, and should **not** be interpreted as precise predictions. The likelihoods generated are derived directly from the 18 case studies examined in the CEPFOR project, and therefore produce a verified, accurate outcome only for these products and communities that were investigated in the project. Our hope is that this tool will be of value for assessing the potential impacts of commercializing other products in other situations, but **to date this remains untested**. We believe that the overall approach adopted here, including the list of factors and measures of success incorporated in the tool, are generally applicable to NTFPs. However, further research is required to explicitly test this. Until the results of such tests become available, the user is advised to exercise caution in use of the outputs of the tool. Specifically, it is possible that some key factor relevant to a product in question is not incorporated in the tool as it is currently configured, and this may lead to output being misleading.

Users are therefore encouraged to use the tool in an exploratory manner, to examine how the output values change in response to altering values of the factors. In this way, it can be used to compare the potential impacts of different decisions. We suggest that the tool will be most useful for assessing the relative impacts of selecting different products or socio-economic contexts on the different assets required by rural livelihoods. Also, it might be of value as a diagnostic tool to identify areas with potential in a particular case study (e.g. good social organization, transport infrastructure) and to identify where weaknesses, obstacles, or limiting factors exist, so that these can be addressed with targeted interventions. This may enable key trade-offs to be identified, or specific risks to be highlighted. It would also be possible to use the CDST as a diagnostic tool to identify potential problems in NTFPs currently undergoing commercialization.

Saving and loading values

It is possible to save values that you have entered to a .CEP file. To do this, select 'Save Findings' from the 'File' menu positioned at the top left hand of the screen. These can then be loaded again at a later date by selecting 'Load Findings' from the File menu.

The default values supplied with the program can be reinstalled at any time. They are provided as a findings file entitled 'defaults.cep', supplied in the JCEPFOR directory. These can be loaded selecting 'Load Findings' from the file menu. The CDST also returns to the default values whenever the software is closed and relaunched. The default values represent the combined values for all of the CEPFOR case studies.

It is also possible to save the graphical output of the CDST as a JPEG file. Once you have opened the graph window, by clicking on 'View output as graphs', you can save the output by selecting 'Save as JPEG' from the file menu.

Accessing help within the tool

There are three yellow help buttons, one for each of part of the tool. Clicking on these buttons will provide access to the User Guide and additional help, from within the tool itself.

How the values are generated

The CDST is built around a Bayesian Belief Network (BBN), which offers an analytical approach for combining and modeling probabilistic information. A full specification of the BBN, with a description of how the BBN was developed in the CEPFOR project, as well as a brief introduction to the principles of Bayesian networks, is provided in the project reports accompanying this decision support tool. The BBN was constructed using Hugin Developer 6.3, which provides the inference engine for the CDST. Hugin Developer is a commercial software package developed and distributed by Hugin Expert A/S, Aalborg, Denmark. The Hugin Decision Engine (HDE) performs reasoning on a knowledge base represented as a Bayesian network or an influence diagram, and performs all data processing and storage maintenance associated with the reasoning process. For operating details of the HDE, the reader is referred to the Hugin Expert A/S website (<http://www.hugin.com/>).

Further support

If you have any comments or queries on the use of this tool, or encounter any problems in its operation, please contact the CEPFOR Project Manager: elaine.marshall@unep-wcmc.org.

Appendix 1. Details of the factors included in the CDST

Factor name	Capital asset affected	Question posed to decision-maker	Notes on response options	Response Category
Variable costs	Financial	What is the magnitude of variable costs (excluding labour) as a proportion of total costs at producer level?	Variable costs (VC) are all costs (except labour) which vary with vary with the volume of production (bags, fertilizer). Dividing the total VC by the gross margin (or total sales figure) provides the magnitude of VCs.	0-5%, 5-15%, 15-25%, >25%
Labour costs	Financial	What is the magnitude of the returns to labour?	Labour costs include family and hired labour, calculated using the local daily wage rate. Returns to labour = Gross Margin / total labour costs (number of days worked multiplied by the local wage rate). Answer low if returns to labour < daily wage rate; medium if the returns to labour = daily wage rate; and high if returns to labour > daily wage rate.	Low, Medium, High
Market trend national level	Financial	What is the trend in the market for the product at the national level?	Market trends are defined in terms of changes in the volumes or total value being traded over time. Consider changes over the last 10 years.	Expanding, Static, Declining
Market trend local level	Financial	What is the trend in the market for the product at the local level?	Local market trends refer to changes in the volumes or total value of the product being traded between communities within the sub-national region. Consider changes over the last 10 years.	Expanding, Static, Declining
Vertical integration	Financial	Is there vertical integration of the main production to consumption chain?	Vertical integration occurs when successive stages in the value chain are placed under the control of one enterprise, as in a management hierarchy. This may occur when a product's market has specific requirements and local conditions and or capacity for achieving these are low.	Yes / no
Combinability	Financial	Does the NTFP value chain depend on the value chain of other products?	Many product chains are viable because the product is traded with different products, either at the same time, or during alternate seasons. Does trade of the product depend on the trade of another product?	Yes / no
Consumer preference	Financial	Is consumer preference for product quality reflected in the price paid to producers?	Are producers paid more for producing a quality grade of their product, or for selling to a niche market?	Yes / no

Regulatory barriers	Financial	Are there regulations in place that increase costs of NTFP commercialization?	Regulations could include collection / harvesting or transporting permits / licences, specific taxes on the traded product or on associated products used in e.g. processing, product inspections or mandatory grading.	Yes / no
Entrepreneurs	Financial	Do entrepreneurs play a positive role in providing financial capital to commercialization	Are there entrepreneurs along the value chain, who provide financial support (e.g. credit or loans perhaps to establish a plantation), to help producers/collectors?	Yes / no
Substitution	Financial	What are the risks of substitution by another product, or another source of the same product?	Risks of substitution tend to be “high” for products that can be synthesized (e.g. plastic replacing palm fibre), or domesticated on an industrial scale (rubber). Risks of substitution tend to be “low” for more specialized or highly processed products (e.g. branded or niche products)	High / low
Brand identity	Financial	What is the degree of development of the brand identity?	Answer “high” if the product is collected, processed or packaged to make it unique and noticeable in the marketplace (e.g. certificate of origin, sustainable management stamps, etc).	High / low
Buyer number	Financial	How many buyers are available for the producer to sell to?	There may be only a few options of traders for collectors/producers to sell to, several traders working with the same product.	One, Few (2-5), Many (>5)
Perfect market	Financial	Does the price of the product vary in response to changing costs of production?	Answer “yes” if producers can change the product price if production costs change (e.g. if costs increase because of a poor yield)? Answer “no” if producer does not set the price for the product.	Yes / no
Losses	Financial	What is the magnitude of losses of product quality during commercialization, as a result of adulteration, inadequate collection or processing techniques, etc?	Answer “high” if a high proportion of the product is damaged in harvesting, destroyed during transport, or lost during processing (e.g. because of the removal of poorer quality components). Answer “low” if the collector/producer is able to sell most of the harvested product.	High / low
Fixed costs	Financial	What is the magnitude of fixed costs as a proportion of total costs at producer level?	Fixed costs (FC) are not linked to the volume of production and can include machinery, some licence fees, donkeys or vehicles. Dividing the total FC by the gross margin (or total sales figure) provides the magnitude of FCs.	0-5%, 5-15%, 15-25%, >25%
Investment capital	Financial	For what proportion of producers does lack of investment capital constrain commercialization?	What proportion of collectors/producers lack the funds to commercialize the product more competitively (e.g. by investing in long distance collection trips, storage facilities, processing equipment, plantation establishment)?	0-33%, 34-66%, 67-100%

Credit	Financial	Is there external financial support available in the form of credit or loans?	Are there government programmes, or non-government organizations that provide credit or loans to producers/collectors, for the purpose of commercialization of the product?	Yes / no
Subsidies for land use	Financial	Are there subsidies available for competing land uses?	These might include agricultural subsidies that might make it more lucrative to clear the land rather than to sustainably manage it as forest.	Yes / no
Buyer link organisation	Financial	Is there an organization that links producers or processors to buyers?	Is there any cooperation of actors undertaking similar roles (e.g. loose producer groups or more formal cooperatives or regional associations of processors), to improve ability to negotiate with buyers?	Yes / no
Income elasticity	Financial	Does demand for the product increase as the level of consumer income increases?	Answer "yes" if the product is a luxury good, that people tend to buy more of when their income increases. Answer "no" if it is a "basic-needs" good, which is purchased regardless of consumer income.	Yes / no
Price variation	Financial	To what extent have prices fluctuated in the value chain in recent years?	In the last 10 years has the product price varied a great deal (=high) or has it been static, or merely changed in line with inflation (=low)?	High / Low
Integration cash economy	Financial	What is the level of integration of producers into the cash economy?	Answer "high" if > 50% of producer total income (including subsistence) is earned as cash. Answer "low" if <50% of producer total income (including subsistence) is earned as cash, and/or if the NTFP is the only source of cash income.	High / Low
Technical support	Human	Is there technical support available?	Have organizations from outside the community (e.g. government, NGO) provided training or capacity building for collectors/producers?	Yes / no
Innovation capacity	Human	What is the capacity of the actors along the value chain to innovate and adapt the product to changing market requirements?	Answer "high" if there is evidence that collectors/producers have successfully adapted to changing market needs through innovation, including different harvesting techniques, local processing, etc.	High / Low
Labour combining	Human	Does the availability of NTFP combine well with periods when labour is available?	Does the NTFP harvesting/processing/trading cycle occur at times when labour is available and not needed for key activities, such as those involved in agricultural production.	Yes / no
Women involvement	Human	Are women involved in NTFP commercialization?	Do women help to harvest/collect, grow, process or trade the NTFP, or is it historically and traditionally a male activity?	Yes / no

Traditional use	Human	Is there a tradition of using or selling the product within this community?	Answer “yes” if the product been managed and utilized over many generations. Answer “no” if it been recently introduced.	Yes / no
Traditional link	Human	Is there a traditional link between the producers and the consumers?	This link might be present through family members who have migrated to regional market towns, through historical trade links, or traditional use for the product.	Yes / no
Entrepreneurs	Human	Do entrepreneurs play a positive role in facilitating NTFP commercialization?	Do intermediaries provide new market opportunities (e.g. through specialist knowledge of niche markets, or grading requirements, etc).	Yes / no
Technical information	Human	Is there a lack of technical information regarding the NTFP?	This information may pertain to production, processing, packaging, storage or transport of the product.	Yes / no
Health and safety	Human	Does NTFP commercialization have any negative impacts on health and safety of those who participate?	Answer ‘yes’ if producers/collectors risk being injured, or killed; or if processing involves noxious materials with insufficient protection, etc.	Yes / no
Processing required	Human	What is the degree of processing required between producer and first point of sale?	Some products are sold directly following collection (= ‘none’); others undergo basic drying and grading by the collector household (= ‘low’); others require more specialized processing (= ‘high’) such as fermentation or handicrafts.	None, Low, High
Trader characteristics	Human	Do the characteristics of the traders constrain successful NTFP commercialization?	Answer ‘yes’ if trading is a specialized activity (requiring certain characteristics such as age, experience, education, and skills). Answer ‘no’ if anybody can become a trader.	Yes / no
Processors market information	Human	Do processors have good access to market information?	Market information includes product price, quantity, quality, grades required, timing of sales, consumer preferences etc.	Yes / no
Technical processing	Human	Is there capacity for the technical management for processing of the first product traded?	If the raw product requires processing before sale, do collectors/harvesters have the necessary technical skills?	Yes / no
Producer experience	Human	What is the degree of experience of the producer communities at trading other goods?	Answer ‘low’ if the NTFP is one of the only products that is sold outside the community for money. Answer ‘high’ if many other agricultural or horticultural products are also traded.	High / Low

Technical management	Human	Is there community capacity for the technical management for production?	Is the community organized in any way to manage the wild or domesticated resource?	Yes / no
Quality variation	Natural	Does the quality of the product / raw material vary significantly?	This refers to product characteristics at harvest, which may be important, including leaf length, contamination, fruit size, flavour etc	Yes / no
Production per unit area	Natural	What is the productivity of the NTFP species in terms of volume per unit area?	Answer 'low' if individuals are widely dispersed and/or have very low yields. Answer 'high' for species with higher concentrations of harvestable individuals or very high yields per individual.	Low, high
Yield variation	Natural	Does the yield of the NTFP species vary significantly?	Thinking of the last 10 years has the yield ever varied by more than 50% between years? This may be due to climatic conditions, pests and diseases, biological variation (e.g. mast years).	Yes / no
Ease of domestication	Natural	Is the species easy to domesticate?	Answer 'no' if the species has very specific growth and productivity requirements which make it biologically difficult to cultivate, or there is no known evidence of successful domestication.	Yes / no
Seasonal availability	Natural	What is the seasonal availability of the NTFP?	This question refers to the number of months a product is biologically available for harvest (and not to how many months people may choose to harvest a product). 'Few' = 1-6 months; 'Most' = 7-10 months; 'All' = 11-12 months.	Few months, Most months, All months
Overharvesting	Natural	Is there evidence of overharvesting?	Evidence of overharvesting includes, for example, too many trees being cut down, no regeneration of young stock, significantly reduced yields per individual, available resources located at increasing distances, etc.	Yes / no
Competing land uses	Natural	Are there competing land uses for NTFP production areas?	Are there other activities, such as timber exploitation or agricultural activities, preventing the harvesting or collection of NTFPs.	Yes / no
Poor harvesting	Natural	Is NTFP quality affected by poor harvesting methods?	Does harvesting damage the plant, (e.g. introduce infection and result in lower yields) or the product quality (e.g. freshness, size or uniformity)?	Yes / no
Resource management	Natural	Is there effective resource management, with appropriate monitoring?	Is the resource managed to prevent overharvesting (e.g. through zoning, harvest quotas, enrichment planting, etc.)?	Yes / no
Pests and diseases	Natural	Are there losses of the product to pests and diseases?	There may be diseases which reduce the yield, pests that eat the product, etc.	Yes / no

Resource availability	Natural	Does the amount of resource available limit the success of NTFP commercialization?	Answer 'yes' if the harvestable quantities in a community are insufficient to supply market needs or cannot be harvested profitably.	Yes / no
Rights of access	Natural	Does lack of rights or access to the resource limit production?	Individuals or communities may be prevented from collecting products, due to unclear or absent rights of access.	Yes / no
Proportion wild harvested	Natural	What is the proportion of the product in the value chain that is harvested from non-cultivated sources?	How much of the product being traded from the community is harvested in the wild, as opposed to being domesticated or bought from another source?	0-25%, 26-50%, 51-75%, 76-100%
Proportion cultivated	Natural	What is the proportion of the product in the value chain that is harvested from cultivated sources?	How much of the product being traded from the community is harvested cultivated sources?	0-25%, 26-50%, 51-75%, 76-100%
Market information	Physical	Do producers have good access to market information?	Do producers have a reliable, timely and accurate means of obtaining information about consumer preferences?	Yes / no
Perishability	Physical	How perishable is the product at the point when it is first traded?	This refers to how vulnerable the product may be to losing value through loss of quality, post harvest/collection, before being sold on by the collector/harvester. Perishability is considered to be 'high' if the product must be sold within 5 days of harvesting.	Low, High
Infrastructure to production/ collection site	Physical	Does lack of infrastructure restrict access to the site of production of the NTFP?	Are harvesting sites remote with poor access such that harvesting is unreliable, and access is a deterrent to collecting?	Yes / no
Communication network	Physical	Does lack of a communication network restrict access to important information about the NTFP?	Communication network refers to telecommunications	Yes / no
Energy	Physical	Is sufficient energy (electricity, fuel, fertilizers etc.) available for NTFP commercialization?	Energy sources include electricity, fuel, fertilizers (etc.). Are these sufficient within the producer community?	Yes / no
Materials	Physical	Are necessary materials and facilities available for NTFP commercialization?	Materials and facilities include tools, equipment, chemicals for processing, appropriate storage / processing facilities. Are these sufficient within the producer community?	Yes / no

Storage requirements	Physical	Is the product demanding in terms of its storage requirements prior to the first point of sale?	Does the collector/harvester need a specific space or conditions (dry, dark, etc.) to store the product before it is sold on?	Yes / no
Transport infrastructure	Physical	Does lack of transport infrastructure restrict transport of the product to the market?	This refers to road, river or air transport for transferring the collected product to marketplace.	Yes / no
Accessible market	Physical	Are producers able to sell directly to consumers?	This refers to the length of the value chain. Answer 'yes' if it is very short with no intermediaries between producer and consumer.	Yes / no
Value per unit weight	Physical.	Does the processed product have high value per unit weight?	This refers to how bulky or heavy or voluminous a product is, in relation to its sold value. A gemstone is an excellent example of a product with high value per unit weight.	Yes / no
Women control income	Social	Do women have control over NTFP generated income?	Are women able to decide where and how to spend the income an NTFP brings in?	Yes / no
Community norms	Social	Are there community norms that facilitate NTFP commercialization?	Answer 'yes' if the community has customary norms or regulations to protect, enable or support producers and collectors in NTFP commercialization. Answer 'no' if such community norms are restrictive in nature.	Yes / no
Community organization	Social	What is the degree of community organization for NTFP commercialization?	Answer 'low' if there are no or no effective community organizations working on NTFP commercialization. Answer 'high' if the community is effectively organized (e.g. through church or community committees) to commercialize the NTFP.	High / low
Resource access	Social	Is there equitable access to the resource?	Do all people in a community have the same right of access to harvest/collect the product from communal and and/or to produce the resource on private land?	Yes / no
Market power	Social	Is there equitable exertion of market power along the value chain?	Answer 'yes' if all the actors in the value chain between production/collection and consumption are able to negotiate their own selling conditions, including timing, quantity, quality, price, etc.	Yes / no