Comments to the
Review of REDD Related Documents for REDD+ Readiness in Nepal for the Contract
Develop National Database of Basic Attributes of all Forest Management Regimes and Develop National REDD+ Information System or Registry: (FCPF/REDD/S/QCBS-24)

April 2016

Introduction

We received the review report of the NFD/NFIS assignment from the REDD IC. In the present document the Team Leader together with the Consultant Team provide punctual responses to all questions raised in the Report. As requested by the Client, the responses were placed into a Comments Matrix following the questions raised under **Chapter 4** Review towards Coverage of the Terms of Reference. The Chapter has 4 Comments areas:

4.1 **Assessment of coverage, functionality and applicability of database and information system developed by the consultants**

4.2 **Assessment of each report based on objectives and methods set in the contract, ToR and technical proposal**

4.3 **Assessment of conclusions and recommendations based on consistency with national policies and regulations and international policies and practices**

4.4 **Opinion of feasibility and implications of implementing recommendations**

The Comments Matrix is provided below. Where modifications in the Final Reports were made it is reported in the Consultant Team's Reply column. The revised Final Reports are delivered together with this Comments Matrix.

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4.1 Assessment of coverage, functionality and applicability of database and information system developed by the consultants

Sub-heading / paragraph of Sub Chapter	Review text	Consultant Team's Reply
A.	COVERAGE OF FUNCTIONS OF THE MINISTRY AND ITS CONSTITUENT ENTITIES: Appendix A of the SRS essentially provides a coverage of the functions the Ministry and its respective units deal in. This appendix covers (a) the different steps of the processes leading to the management approval and handover required for forest management (with or without forest produce from the identified area) by respective entities (depending upon the type of forest) of the different types of forest area, including (i) Protection Forest, (ii) Religious Forest, (iii) Collaborative Forest, (iv) Leasehold Forest, (v) Government Managed Forest, and (Vi) Community Forest; (b) the different steps of processes required for the formation of the Community Forest User Groups (CFUGs); and (c) availability for Forest Produce. The review consultant feels that the collaborating stakeholders who have been consulted must verify whether all functions of the Ministry and its constituent units have been covered in line with what was agreed. The review consultant feels a large number of processes may have been left out unless it was out of the contracted scope of work.	Appendix A of SRS Reports provides only a schematic coverage of the functions the Ministry and its respective units deal in. A more detailed analysis is provided in the Report*: Need Assessment of data acquisition from the field and reporting at the local, sub-national and national level in the forestry sector* which is not mentioned in the Review Report. Moreover as per TOR and also discussed in the Inception Report and with national stakeholders, the present version of NFD-NFIS database is bound to forest management regimes only. As stated in the TOR *"Ideally the database should cover all forest types including community forests, collaborative forests, leasehold forests, national forests, government managed forests, forests under protected areas and buffer zones, private forests and religious forest."*
B.	SKEWED COVERAGE OF FUNCTIONS/PROCESSES ACROSS ALL DELIVERABLES: The Terms of Reference (ToR) for the consultants requires the coverage of functions including forest resources, forest carbon accounting, forest management, forest users and beneficiaries, LULUCF/Activities, and REDD+ Safeguards[1]. The review consultant feels that not all of these have been dealt with to comparable depth. In particular, coverage has been found to be poor in forest carbon accounting, forest management based on silvicultural practices and REDD+ Safeguards. However, in line with the limitations of this study (see later in this document) this comment should be taken only as indicative and a more definitive opinion needs to be taken by the participating stakeholders from the Ministry and related entities as to whether their functions have been covered in adequate detail.	The approach to carbon accounting is described in the *Methodologies for calculating forest biomass and carbon contents for Nepal forests in the framework of NFD-NFIS* Report and in the *A quick analysis of Carbon emissions Reference Level data produced by CAMCO Services in the framework of FCPF programme implemented by the REDD+ Implementation Centre (MoFSC, Nepal)* Report. Moreover, as stated in the *NFD – NFIS Final Report*, severe limitations on forest inventory data were encountered during the Project execution. Questions related to LRMP and FRA data availability are discussed later in this document. Generally speaking the NFD/NFIS exercise was not intended to generate new data but towards organizing existing data made available.

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C.	DEPICTION OF FUNCTIONS/ PROCESSES THROUGH PROCESS MAPS/ WORKFLOWS: The "process maps" used to depict the work flow for different activities covered under the above functions do not follow the globally accepted standard methodology of depicting work flows through process maps. It is advised that, as BPMN methodology is s considered the globally accepted standard methodology to depict workflows through process maps, the same (or at least an equivalent) methodology be followed so that details could be captured to the required extent.	Please review underlined updated work flow under Annex-A of System Requirement Study Report"
D.	UNCLEAR DEFINITION OF ROLES ASSOCIATED WITH DIFFERENT STEPS OF THE PROCESSES: In the existing process maps roles have not been defined clearly. For example, in the workflow representing the approval and handover of forest area for "Protection Forest" three main actors are identified- People or Community, District and Government. Each of these entities are large groups in themselves. In order to bring clarity and accountability in the approval management processes it is necessary to identify, for example, the exact role (or official) participating in this process from the "Government". Under a role-based user access (enabled by login/password) this will fix accountability of the process to the precise individual who would be responsible for the different components of the process. The concept of "swim lanes" covered in the process map under the BPMN methodology takes care of this.	The processes documented in the reports are derived from extensive consultation of national stakeholders and reflect to our best knowledge their understanding of the procedures. As a general comment the review of the *Need Assessment of data acquisition from the field and reporting at the local, sub-national and national level in the forestry sector* Report may clarify some of the issues. Moreover detailed work flow for each forest types has been explained under updated Annex-A of "System Requirement Study Report"
E.	NO COVERAGE OF RE-USABLE COMPONENTS: The review consultant feels that the processes covered for the different types of forest have many re-usable components (or sub-processes) across different forest types that could be re-used. These components (for example, the verification component which is common to all the processes) have not been identified. When, downstream an application is developed to cover these processes this will impact the scalability of the application as for every new forest type that is identified in future new processes will need to be drawn completely and existing codes would not be re-used thus leading to avoidable duplication.	This comment is well placed and pertinent. However during all phases of our Project we found that in general all Departments/Divisions seem to work independently especially in terms of information contents, data formats, reporting requirements, etc. So each module had to be designed as nearly stand-alone.
F.	UNCLEAR DEFINITION OF PROCESS STEPS: In the process description covered in the workflows, there is substantial uncertainty as reflected in the	The workflows represented in the Reports reflect the information as discussed with the local and national stakeholders. Moreover detailed work flow for each

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	workflow diagrams. For example, in the workflow that depicts processes leading to the allocation of Forest Produce (FP) in Government managed forests it is captured that "sometimes" request is forwarded directly to the DFO from "Ilaka" without being routed through the "Sector". However, the circumstances under which this direct communication would take place has not been recorded. This will not make or logic-driven programming and, in the process, accountability would suffer (in this case, accountability of the missing links, the sector). This fallacy has been noticed in a few other places too.	forest types has been explained under <u>updated</u> Annex-A of "System Requirement Study Report"
G.	SIMPLISTIC DEFINITION OF PROCESSES: In the same process referred (of Government Managed forest) the depiction is simplistic and does not take into account the dependencies between different sub-systems of the NFIS. For example, the allocation of Forest Produce in this example must lead to updating the forest produce inventory but the same has not been mentioned anywhere in the requirements though a linkage ("Maintain Record") has been shown.	Comments made on points G. and H. seem contradictory. It is not clear is the description of processes is too simplistic or too complex. However the description of processes has been <u>updated</u> in the revised "Annex-A of "System Requirement Study Report".
H.	TOO MUCH INFORMATION IN THE WORKFLOWS: The workflow depictions are cluttered in that too much of information appears to be conveyed through one workflow. For example, in the workflow under "Community Forest User Groups", processes that are sought to be covered include, (a) Formation and approval of CFUGs, (b) Handover of Forest area(s) to the approved CFUGs, (c) Annual Reporting of information by the CFUGs to the DFO, and (d) Renewal of CFUG "license" upon expiry. By attempting to cover all these processes in one workflow critical details are missed for the different processes mentioned above. Ideally each of these sub-processes above should be covered independently in different process maps. Again, this fallacy too has been noticed in a large number of places in this document.	Annex-A of System Requirement Study Report" shows only our understanding of existing work flow at surface level. It's just summary of activities. Some of the activities are completed manually (i.e. without software involvement since it's not possible to complete through software) & some activities are completed through the software. Activities those carried through the software are described under "Annex-D of System Analysis & Design Report Part-1"
I.	MASTER DATA CREATION: In the System Analysis and Design Document Part I (SAD-I) screens/interfaces for creation of master data entries are not seen. For example, in "Appendix B: Input Interfaces" for Collaborative Forests, fields by the name of Districts, VDCs are invoked; however, no data entry interfaces are seen whereby such data are created.	General data entry and maintenance is dealt with in the Report on *NFD/NFIS - Standard Operating Protocols and User's Manual*. In general the NFD-NFIS made a considerable effort on standardizing District, VDC, Ilaka and even Community forests names and spelling which were quite often different depending on the source. In our case the naming convention adopted was in accordance with Central Bureau of Statistics to avoid the many inconsistencies

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		found in the original data for both spatial and statistical information. That is why fixed drop-down menus are proposed to avoid mis-spelling and coding errors. However it is true that this rigid structure is not appropriate if new definitions of Regions, Districts, Ilaka, Sectors and VDC is foreseen as per the new Nepali constitution. However this problem is not solely for NFD-NFIS database, but for all future Government databases.
J.	ASSOCIATION WITH GIS: In general association with GIS is not found anywhere on the output interfaces (or "reports") provided in SAD-I though in many places such an association would be very helpful in visualising outputs of queries executed on a map.	This seems to be due to incomplete documentation provided to the reviewer. The Reports on *System Design and Architecture Online GIS Platform* and *User Manual – Online GIS Platform* describe in detail the possibilities offered by NFD-NFIS to integrate spatial and statistical data. Moreover the *NFD – NFIS Final Report* clearly says that "*Spatial data collection and handling has been perhaps the most successful implementation of NFD-NFIS Project. In addition to a consistent and rich collection of spatial databases and maps, both in raster and vector formats, a considerable effort was made to comply with the requirements of integrating spatial boundaries of the forest management units*"
K.	PROCESSES IN THE SRS DOCUMENT NOT CAPTURED IN SAD-I: The SRS document attempts to capture workflows for processes taking place on the ground as has been described above. However, none of the data entry interfaces captures these processes. Unless such processes are to be performed manually with only their results to be captured through the NFD-NFIS system, the design is erroneous in this aspect.	The data entry and management procedures are dealt with in the *NFD/NFIS - Standard Operating Protocols and User's Manual* and not specifically in the SRS document. If the questions related to on the ground vs. database protocol transition, it is reminded here that the only structured document on procedures for data collection made available was Annex 15 of Community Forests Guidelines. Other Departments or Division could not provide a structure for data recording, data flow, nor standard requirements for reporting.
L.	UNCLEAR AS TO HOW MODIFICATIONS ARE TO BE CARRIED OUT: On page 23 of the SAD-I document it is not clear how a user would be able to modify a record that has been erroneously entered (for example, if a species name has been spelt wrongly or the number of trees has been entered incorrectly for a species that has been spelt right. Further, it is suggested that instead of asking the user to enter species name directly (complex botanical names) the same should be available from a drop-down list so that data inconsistency is reduced.	The data entry and management procedures are dealt with in the *NFD/NFIS - Standard Operating Protocols and User's Manual*, including data modifications and use of drop-down lists where applicable.

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M.	LACK OF CONSISTENCY BETWEEN SRS AND SAD: There is issues of consistency between different types of reports- for example in Collaborative Forests data is recorded at the level of VDC whereas in the case of Leasehold Forests, total number of groups (summary data) is to be recorded. Further no correlation can be established with SRS (program code and program type not mentioned in the SRS document anywhere). Similarly, for data entry related to private forests, there is very little consonance with the workflow captured for the same process in the SRS document. In particular for this screen (as with others too) where geographical parameters are to be recorded a GIS interface would be required but is found missing on the interface. In the same interface a tabular window to record data for planted species (since there is an "Add More" control provided) would have been helpful but is found missing. Again as with some of the other interfaces there is no facility seen to modify data already entered.	Inconsistency between data is inherent. Some data for some forest management regimes like private forests, or sometimes collaborative forests are provided in disaggregated formats and so are recorded in the database. In some other cases, like most of leasehold forests, only aggregated data at VDC, Project or District data are available. The database reflects these situations. During the development phases changes has been done as per the feedback collected from users.So updated input forms are provided under "System Analysis & Design Report Part-1 (Appendix-B-Input-Interfaces)". For the comments made on the GIS component, see point J, above.
N.	VIEWING REPORT RESULTS SPATIALLY AND OTHER GEOGRAPHICAL ASSOCIATIONS: In none of the reporting screens have any GIS windows been found. To illustrate, for example, in the forest data reports provided in SAD-I it should be possible to select one or more of the returning rows from the executed query and see their geographical association on the map. Conversely it should be possible too to select geographical features on the map and view their attributes as drawn from the NFD database (MIS). Moreover, the attribute database in the NFD-NFIS should be the same as the one captured in the GIS system to ensure there is no conflict. This aspect, in particular has also been covered in a subsequent point later in this section	For the comments made on the GIS component, see point J, above and also *Report on training on GIS Component of NFD/NFIS conducted at Central and Regional level.*
O.	MISSING DATA ENTRIES FOR FIELDS SHWON IN THE REPORTS: Among the reports shown on page 25 are "Time Series Forest Data Reports" and "View Forest Data Survey List". However, data entries with respect to these reports were not found either in the SRS or the design document (though a couple of survey fields are found in the database tables in System Analysis and Design Document Part 2 or SAD-II). Again the reports for which queries have been executed is an output field by the name of "Forest Condition" for which no data entries have been found in either of the two documents	During the actual development of software few changes has been done on the basis of feedback collected from the client. Updated list of reports generated from each forest types has been further provided under "Appendix-C of System Analysis Design Report Part-1". General data entry and maintenance is dealt with in *NFD/NFIS - Standard Operating Protocols and User's Manual*

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	mentioned above. Moreover, the notations of VG, G, D, VD and NS show in the report outputs have not been explained anywhere.	
P.	LACK OF A PROPER EXPLANATION OF THE FIGURES: Most of the information covered in Appendix D has not been covered in the data entry screens in the SAD document or even in the SRS document preceding that. A proper explanation needs to accompany the figures and should be covered elaborately in the SRS document before embarking on the System Analysis and Design.	Due to the lack of infrastructure like digital signature & others rule & regulations, few activities are not possible to be carried out through the software. Further updated input screens have been provided under "Annex-B of System Analysis & Design Report Part-1". General data entry and maintenance is dealt with in *NFD/NFIS - Standard Operating Protocols and User's Manual.*
Q.	SHORTCOMINGS WITH THE DATA FLOW DIAGRAMS: The data flow diagram do not follow the standard Data Flow Diagram representation methodology. Since the SRS mentions that the AGILE methodology has been followed, a DFD must show the flow of data from external entities into the system, as to how the data moves from one process to another, as well as its logical storage[2]. However in the DFD representations the process aspects are missing both in the Level 0 and Level 1 diagrams. As has been mentioned above the process aspects described in SRS have not been elaborated at all in the SAD. The Level 1 diagram of the DFDs only mention the data entry and reports but do not cover the processes. Some processes are sought to be covered under "Level: One NFD-NFIS Data Flow Diagram (LFUG (DoF))" but there is no corresponding Level 0 diagram for the same. Moreover, the diagrammatic representations are not the standard ones that are supposed to be followed. The LFUG DFD in particular is inconsistent with the information captured in the SRS whereby "Generally grow cash generating crops" only have been mentioned and there is no mention of "Livestock" in the same. Such inconsistencies and anomalies are found for many of the DFDs for the other Forest Types covered in the report.	Updated information has been provided under the "Appendix-B,C,E of System Analysis & Design Report Part-1 "
R.	Third Normal and Redundancy: SAD-II maintains that the NFD is designed as a normalized database (typically 3rd Normal Form) as it would be handling transactional type applications. The main objective of this was, among other things, to eliminate data redundancy so the same piece of data shall not be stored in more than one place. In view of the points made immediately below it should be seen whether these characteristics need to be retained.	In some of the cases that were mentioned, the ideal normality and redundancy criteria for the database could not be maintained due to original data a-normality. For instance in many cases the breakdown of CFUGs composition by well-being, caste and ethnicity, just to give examples, are not coded in the original data, where only total values are available. In these cases it is obvious that totals should be calculated through queries/views but this would generate zero or missing

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		values if the breakdown is not given. The benchmark of the database design and performance had to match with the quality and quantity of original data.
S.	SUPERFLUOUS TABLES IN THE DATABASE: While commenting on the database design (and owing to paucity of time for the review exercise) a review of the database for Community Forests (the largest aggregation of tables in the System Analysis and Design Part 2 or SAD-II) was done. It appears that there are quite a few database tables that are redundant. For example, while tbl_cfug_households shows CFUG committee's structural inclusiveness in terms of caste and wealth ranking covering presumably the households in a CFUG, tbl_cfug_total_households shows the total households by caste and wealth ranking of CFUG. In this case the latter table (with dependent variables) is easily derived from the first (with independent variables as a result of direct data entry). Another pair with the same fallacy is tbl_cfug_members and tbl_cfug_total_members. If a particular table has been included for the sake of a report then the same is clearly superfluous and the report could equally be generated through a "view" instead of a table. Similar superfluousness is reflected in other tables of the database. Yet another case has been found in the tables lu_positive_forest_area_changes and lu_negative_forest_area_changes and related child tables. In this every field in the "positive" table is repeated in the "negative" one with difference only in the type of change (positive or negative).	See point R above
T.	SUPERFLUOUS FIELDS IN THE SAME TABLE: In the database tables on Community Forests instances of superfluous fields have also been detected. For example, in the table lu_forest_conditions (page 33) both lu_forest_condition_id and lu_forest_condition_code have been found. Since both are used as unique identifiers for lu_forest_condition_description it appears that one of them could have been avoided and, if retained, could lead to avoidable complexity.	The ERD image has been updated to reflect the implemented database. It was an error in the image. (File: System Analysis and Design Part 2)
U.	MISSING BASE TABLES: Missing base tables to hold data related to territorial entities (for example, district, ilaka, sector) appear to be missing. Such tables would hold data related to the territorial entities and their hierarchy when they are created.	Please refer to point J. describing misinterpreted links with GIS spatial elements.

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V.	HARD-CODING OF SOCIO-ECONOMIC GROUPS IN THE DATABASE TABLES: There are also instances of discrete value fields being hardcoded in the database tables. To illustrate, for example, in tbl_cfug_households there are fields by the name of num_of_poor_hh, num_of_medium_hh and num_of_wealthy_hh. However, the review consultant feels it would have been better if the definition of these categories of poor, medium and wealthy were made in a reference/index table with index values being included in this main table. If the categorisation of poor, medium and wealthy were to change (through a government order, for example), the proposed table design will make it difficult for such changes to be easily incorporated. Similarly in tbl_cfug_executives_members the same fallacy is found to be repeated with caste-based fields.	Please see comments made under point S., and point I for clarifications.
W.	STAND-ALONE TABLES IN THE DATABASE: The System Analysis and Design Part 2 (SAD-II) provides details of the database design with the most details being covered for the CFUG forest type (Community Forests). A quick look at the tables reveals that there are many stand-alone tables. For example, although species-wise data and tree-wise data is being stored in the database (pages 39 and 46), on page 51 the growing stock is not being calculated from entries made in the above tables but is instead being entered independently into the system here. It may be noted that in forestry (for example in the Indian context) volume tables enable the calculation of growing stock from trees once the trees have been enumerated through a comprehensive sampling exercise using sample plots. Such sample plots are drawn after duly stratifying the forest area according to parameters like Forest Type, Age Class, Site Quality Stocking Status, Canopy Density and the like. In the case of the NFIS it appears that the growing stock (species-wise) is being calculated offline and then being entered into the database. It must be checked whether this extrapolation exercise was a part of the consultant's scope of work or not. Further, nowhere in the document are seen data fields corresponding to Site Quality which is an indicator of soil health.	The issue of growing stock and consequently carbon and carbon accounting is well pointed out, especially in the present REDD+ environment. For this reason a specific document was drafted: *Methodologies for calculating forest biomass and carbon contents for Nepal forests in the framework of NFD-NFIS*. However, as stated in the technical document and in the Final Report this approach is insufficient, since it can be categorized under Tier 2 of IPCC guidelines. A more precise approach using field inventory tally sheets would be desirable, moving towards Tier 3. This approach was envisaged during the Project but had to be abandoned, for the time being. In fact it was found that practically all forest inventories are outsourced to private consultants who deliver only aggregated data to Government bodies. As per our direct experience no original field inventory data in a usable format for growing stock and carbon calculations were found, and this is the reason for the approach followed.
X.	LOOKUP LISTS NEED EXPANSION: The current lookup lists include alphanumeric variables such as forest condition, forest types, vegetation types,	The updating of lookup lists is by definition a dynamic process. Current lists and values were defined as per national and local stakeholders consultations; see for

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	forest products, wildlife species, tree species, forest activities (and sub-activities), forest protection approaches, well-being status and social category as variables already listed for the lookup tables. It is felt that many more would be required if above changes are to be incorporated.	instance the Report on *Need Assessment of data acquisition from the field and reporting at the local, sub-national and national level in the forestry sector*. We see no obstacles in improving/enhancing the lookup lists as new requirements are defined by MoFSC.
Y.	MULTI-CHANNEL INCLUDING ACCESS FOR MOBILE DEVICES: The design documents do not mention accessing the NFIS or select components thereof through mobile devices including the mobile phone, a key tenet of user and citizen convenience in accessing public information. The review consultant feels that at least some components of the NFD-NFIS should be made available over the mobile web and specific mobile apps could also be developed for those elements of the NFD-NFIS system that are in frequent use.	This is certainly a good idea, for the future. In our Project it has not been implemented being outside the TOR.
Z.	A MORE COMPLETE DEFINITION OF USER CATEGORIES: The design documents define users to be mainly in two categories: Administrators (at various levels, central. Division, district etc.) and Non-Administrators or ordinary users. It is felt that the second category of users needs to be more nuanced and complete. For example, every non-administrator user need not have the same set of privilege in accessing the NFD-NFIS as the same needs to be strictly role-based on a need-to-know basis	Users categories are just proposed, according to a reasonable understanding. More precise roles, responsibility and privileges will have to be agreed with MoFSC during the forthcoming extension activities. See also *NFD/NFIS - Standard Operating Protocols and User's Manual* for more details.

4.2 Assessment of each report based on objectives and methods set in the contract, ToR and technical proposal.

In this Section, the following reports are mentioned by the reviewer:

1. System Requirement Specifications (File Name: 4 - System_Requirement_Study_Report.pdf)
2. System Analysis and Design (File Name: 5 -System_Analysis&_Design_Report-Part 1.pdf and 6- System Design Part – 2.pdf)
3. National Forest Database and Information System Architecture (File Name: 7 - National Forest Database and Information System Architecture and 9 - System Design and Architecture_formatted)
4. User Manuals (File Name: 11 - User Manual.pdf and 10 - User System Installation Manual.pdf
5. Pilot Implementation Report (File Name: 8 -NFD-Pilot_Region)

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Table 3 Assessment of Reports based on objectives set in the Technical Proposal and the Terms of Reference

Report and File Name	Brief Description of Targeted Contents of the Report	Review of the Actual Contents of the Report	Comments of the Authors
System Requirement Specifications (File Name: 4 - System_Requirement_Study_Report.pdf)	The purpose of the "Requirement Study Report" (SRS) is to identify fields/ parameters2 for the development of the "National Forest Database-National Forest Information System" and have the same verified from clients in order that the NFD-NFIS system could be used to support the planning, implementation & monitoring of multi objective forest management activities. Besides this the NFD- NFIS should also have the ability to maintain current forest inventories and generate and retrieve spatial data (maps). The SRS Report must provide a complete description of all the functions and specifications as are relevant to the expected audience of this system including the Forest User Groups, Districts, Department of Forest, Research & Survey, Department of National Park & Wild Life Conservation, and Department of Soil Conservation & Watershed Management & Department of Plant & Resources. The SRS would form the basis for the application architecture and design.	The following review observations are made: 1. It is generally felt that the user requirement specifications have not been captured to any significant level of detail in the document. Given that the SRS document must be the basis on which other downstream deliverables of the assignment would be drafted this is a major shortcoming. Ideally the SRS document should cover brief details of the participating client entities, their functions, services extended to citizens, and their organisational structures with more detail being provided for the functions that are sought to be computerised. Such documentation not only goes to streamline the project development but also provides very useful reference literature for the assignment after the consultants leave. Lack of details in the documentation will prove to be a major challenge for the department in the operationalisation phase of the project. 2. Section 2.1 on "System Architecture" does not really belong in this document and should be moved to be a part of a later deliverable where system architecture and design aspects are covered. Same is the case with section 2.6 on "Design & Implementation Constraints" and section 2.7 on "Naming Convention". 3. While Section 3.1 on "Hardware /Server Requirements" is also out of place in this deliverable, the document does not provide any basis on which the hardware specifications have been arrived at (in terms of volume of data, number of users (peak/concurrent), number of hits on the portal or application server and such similar requirements).	Updated Appendix-A under System Requirement Study Report has been provided.
System Analysis and Design (File Name: 5 - System_Analysis &_Design_Report-Part 1.pdf and 6- System Design Part – 2.pdf)	The main purpose of the System Analysis and Design Report (contained in 2 parts) is to show the clear picture of NFD-NFIS development in order that the audience of the system could be aware of the features available in developed system. Developed NFD-NFIS system will effectively handle the forest activities, accurately maintain	The following review points are made: 1. As has been commented elsewhere an overall solution architecture is missing in the documents submitted which is key to understanding the NFD-NFIS system. Ideally, the SAD should have dwelt on a comprehensive description of the NFIS application system, its sub-systems (modules) with a description of what each module does. However, no mention is made of the different sub-systems or modules of the overall NFIS system	For clarifications on the issues raised see the following Reports a) System Design and Architecture - Online GIS Platform b) User System Installation Manual - Online GIS Platform c) User Manual - Online GIS

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Report and File Name	Brief Description of Targeted Contents of the Report	Review of the Actual Contents of the Report	Comments of the Authors
	the same in its database and meet the routine and ad hoc reporting requirements at the different levels through features including a secure normalized database, reporting facility to all the levels according to requirement and search facility through various combinations of requirements.	anywhere (unless Collaborative Forests, Community Forests are the intended modules though not described likewise anywhere). These modules are perhaps covered in "Appendix D: Logical interface of NFD-NFIS" in SAD-I but here too an explanation of the different flowcharts presented is missing. 2. It has earlier also been commented that the interlink between the SAD documents and the SRS document preceding them is weak with most of the processes described in the SRS not appearing to have been captured in any of the input screens. One assumes, therefore, that the mentioned processes in SRS are to take place offline with results being entered through the data entry interfaces. This aspect needs to be checked and verified. 3. There is a lack of consistency between the data input screens (which would indicate the data fields being populated in the database) and the resulting reports (that are supposed to draw from the data fields thus populated). For example, the entry screen for Leasehold Forests on page 26 of SAD-I does not relate to the flowchart for Leasehold Forests shown on page 35 of the SAD-I report. Such inconsistencies are found throughout the document. In fact, by looking at the data model provided in SAD-II it appears that data entry screens for most of the fields have not been provided. Then again in the flowchart for Collaborative Forests information related to "Forest Biomass & Carbon Content Information" are shown to be required the data entry interface on page 19 of SAD-I makes no mention of this field nor could the value be calculated from any of the fields shown in the data entry screen. 4. It should also be noted that large parts of the System Analysis and Design Part 2 (SAD-II) on the database design have been repeated in the document on Information System Design and Architecture (file name: 7 - National Forest Database and Information System.pdf) Architecture.	Platform d) Report on training on GIS Component of NFD/NFIS conducted at Central and Regional level e) NFD/NFIS - Standard Operating Protocols and User's manual. Also, updated "Appendix-B,C,E under System Anlysis & Design Report part-1" has been provided.

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Report and File Name	Brief Description of Targeted Contents of the Report	Review of the Actual Contents of the Report	Comments of the Authors
National Forest Database and Information System Architecture (File Name: 7 - National Forest Database and Information System Architecture and 9 - System Design and Architecture_for matted)	The consolidated database and information system architecture would represent the complete solution architecture combining elements of both MIS and GIS into it. The architectural elements would include (a) user access and authentication; (b) a consolidated webserver to render results of queries or provide user interfaces for data entry/ viewing etc. over the web using standard protocols; (c) a consolidated application server providing logical and physical components of the consolidated application of NFIS including both bespoke and COTS elements; and (d) a combined database both for alphanumeric and cartographic fields.	The following review points are made: 1. The first document should actually draw from the SRS document and outline an overall solution architecture as described on the left. However, nowhere in this document a complete solution architecture for the complete solution is found. 2. Further Section 2.1.1 on "Methodology for Data Integration" actually describes the project management methodology to be followed for the assignment and does not really belong here. Instead the description offered here should actually have been part of an Inception Report for the project or a defining "Project Charter" that outlines how the project would be executed 3. Further, whereas the SRS document talks of security considerations being followed at the network protocol level through SSL this document while outlining the security elements (pages 2-3) does not make any mention of the same and instead invokes security at the interface level through user authentication only. The same is re-emphasised on page 19 of the document. 4. Some missing elements are detected on page 20 (top of the page). This needs to be checked. 5. The remainder of the document describes the data model and the database design proposed for the assignment which again, in the absence of on overall solution architecture or even a proper description of the main data entities is not really what the document merits. 6. As the scope of this document is to provide an architectural overview of the National Forest Database (NFD) and National Forest Information System (NFIS), database design and available applications by capturing and conveying the	For clarifications on the issues raised see the following additional Reports a) System Design and Architecture - Online GIS Platform b) User System Installation Manual - Online GIS Platform c) User Manual - Online GIS Platform d) Report on training on GIS Component of NFD/NFIS conducted at Central and Regional level e) NFD/NFIS - Standard Operating Protocols and User's Manual. 3. In the proposed NFD- NFIS, the users need to be authenticated in order to access the system resources and the access is granted as per their roles. Further in the section it clearly states that the system security measures is implemented mainly based on authentication and authorization. Thus, outline/assumptions in (pages 2-3) in the document (File Name: 7 - National Forest Database and Information System Architecture) are correct. 4. It looks okay in both (file: 6- System Design Part – 2.pdf) and (File Name: 7 - National Forest Database and Information System Architecture)

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		infrastructure and high-level database design which forms the basis for the key NFD NFIS system components and the external or public facing application, the document does not really address these concerns (also stated on the left). The second document also dwells on the system architecture and design aspects with the following review points being offered: 7. While the document does provide details on the architecture in so far as GIS aspects is concerned there is not enough clarity on how the integration with aspatial data would be achieved, although it is stated that the CFUG database in PostgreSQL includes both spatial and Non spatial database stored (this aspect has been covered in greater detail above). The end user (both within and outside the department) is not expected to know how to operate a GIS application/ platform but would be more interested instead in the functionalities provided in the custom-built NFD-NFIS for the Ministry and its agencies. Additionally, the following points are advanced: 8. The references quoted in the Introduction section of this document are not provided anywhere in the report. 9. There is also an unnecessary coverage of generic GIS concepts which could be attached to an annexure with the main document focussing on specific design and architecture aspects related to NFD-NFIS which the user or the reader would directly relate to.	5. Descriptions and diagrams of the main data entities of the database are in the design document (file: 6- System Design Part – 2.pdf) 6. From database point of view, it already covers high level database design. (File Name: 7 - National Forest Database and Information System Architecture) (alsoin file: 6- System Design Part – 2.pdf)
User Manuals (File Name: 11 - User Manual.pdf and 10 - User System Installation Manual.pdf	The User Manuals must provide a complete guide for installation and usage of the system and should address the needs of not only those who would be administering the system but the end users too who are the ultimate beneficiaries.	Coverage in the documents mentioned on the left is actually restricted to installation of the system, mostly the GIS component and the database element of the MIS part of the NFD-NFIS. No coverage is seen as a helpful aid to the end users both within and outside the departments as to how they would be able to make best use of the NFD-NFIS.	For clarifications on the issues raised see the following additional Reports a) System Design and Architecture - Online GIS Platform b) User System Installation Manual - Online GIS Platform c) User Manual - Online GIS Platform d) Report on training on GIS

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			Component of NFD/NFIS conducted at Central and Regional level e) NFD/NFIS - Standard Operating Protocols and User's Manual
Pilot Implementation Report (File Name: 8 - NFD-Pilot_Region)	The pilot implementation exercise is an activity that is supposed to be conducted using the developed and tested NFD-NFIS in a pilot location with a view to testing the functioning of the system in a limited environment and learning from the mistakes, if any, made during this effort so that the same can be corrected upon subsequent scaling up of the implementation to non-pilot locations.	The following review points are made: 1. The pilot implementation report focusses only on the migration of data from existing databases in MS Access and MS Excel worksheets to the NFD and procedures involved therein. The following should be covered at the least in any pilot implementation exercise and in the report accompanying it: a. Functionalities of the NFD-NFIS that were tested through the pilot implementation: b. Volume of data that was used for the pilot implementation; c. Capacity building of staff and officials involved in the exercise; d. Hardware and network components on which the pilot exercise was conducted; and e. Problems faced during the exercise and how they could be circumvented in the subsequent scaling up during operationalisation of the system on a nation-wide basis.	For clarifications on the issues raised see the following additional Reports a) System Design and Architecture - Online GIS Platform b) User System Installation Manual - Online GIS Platform c) User Manual - Online GIS Platform d) Report on training on GIS Component of NFD/NFIS conducted at Central and Regional level e) NFD/NFIS - Standard Operating Protocols and User's Manual.

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4.3 Assessment of conclusions and recommendations based on consistency with national policies and regulations and international policies and practices

Review comments (page 21)	Consultant Teams's Reply
It appears from the documents shared that the LRMP is not one of the data sets that has been used as an input into the NFIS. The RPP proposal also points out that differences in methodologies, definitions and data resolution have meant that most inventories conducted since the LRMP have been incompatible with the LRMP data[	This statement is incorrect. In terms of geo-database the NFD-NFIS has conducted a comprehensive review of the spatial information available in Nepal related to forests, carbon and land use. This includes, among others, LRMP data, FRIS data and many more. In particular the NFD-NFIS exercise benefitted from the past experience of the MRV Project. The spatial data catalogue provided by MRV was maintained and enhanced.
While the NFD-NFIS system is not inconsistent with the requirements of the RPP it is clear that a more comprehensive system (compared to the ND-NFIS) is required for the system to be able to accurately and precisely measure forest carbon stocks using sample data. The ND-NFIS implementation must therefore ensure that the NFD-NFIS system is (a) fully compatible with the geo-datasets that emerge from the FRA and (b) the attribute data help within the ND-NFIS is consistent with and feeds into the database created under the FRA.	The importance of integrating FRA data into NFD-NFIS has been recognized from the beginning. For this reiterated requests were submitted to DFRS for getting their data. However this was not possible due to administrative reasons, since FRA data had not been fully validated by MoFSC during the execution of NFD-NFIS Project, and could not be shared. At the very end of the Project, data on land cover of Terai and Siwaliks were made officially available and were then incorporated in the NFD-NFIS geo-database

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4.4 Opinion of feasibility and implications of implementing recommendations

Comments of the reviewer	
In the set of documents that were shared no roadmap has been found for a country-wide implementation and operationalisation of the NFD-NFIS. In light of this a strategic exercise, however brief, must be conducted that would clearly outline a roadmap for country-wide scaling up of the NFD-NFIS solution after the same has been approved.	This is a strategic option to be discussed with REDD IC and MoFSC
Additionally, among the documents that were shared no coverage has been noticed towards capacity building of stakeholders for sustained use and maintenance of the system. Regardless of whether this exercise was within the scope of the consultants' terms of reference, such an exercise also needs to be executed towards raising awareness levels of officials and staff and generally facilitate the transformation that the NFD-NFIS would bring about. This is also compounded by the fact that, and in line with what the consultants have also revealed, technology-awareness levels of officials and staff are low. The strategy exercise commented above must necessarily look into this aspect too.	The issue of capacity building is major concern, especially for the reasons described by the reviewer. For this reason training and capacity building sessions were organized at Central (Kathmandu) and Regional level (Pokhara) were organized.
Generally speaking the documentation provided by the consultants as shared with the review consultant is poor and this is likely to prove to be a major challenge during and after transition from the consultants to the department and once the consultants leave. There is a lot of generic matter that has been covered in the reports while specific user requirements have not been dealt with to any significant degree of detail as has been already commented above. Given the low capacities in the departments shortcomings in documentation will get further accentuated during implementation. Operating the system will likely then be dependent upon a few specific individuals who were associated with the consultants.	It is unclear if the reviewer could have access to the full documentation provided by the Project, since comments are made on few reports only.
For scaling up the initiative to a country-wide effort it is felt that this needs to be done only in degrees. Essentially, the scaling up of the initiative will need to be on three dimensions: (a) extent of coverage of functionalities; (b) extent of coverage of data, including historical data; and (c) extent of coverage of locations beyond the pilot. It is suggested that the solution be properly	This is again a strategic option to be taken by REDD IC and MoFSC. It is certainly true that the design and implementation of NFD-NFIS was quite an ambitious Project, and this relatively small Project was meant to be a pilot exercise. From the lessons learnt further actions need to wisely planned. One immediate suggestion would be to take advantage

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implemented, tested and operationalised in the pilot location first (preferably with full functionality and all data, except those that must be archived) before expanding to other locations. The seamless interworking of spatial and aspatial components must be seen to be working in a near fault-less fashion at the pilot location before any locational expansion takes place. It is also felt that introduction of applications specifically targeting business intelligence/data warehouse could be deferred for a later stage of the overall computerisation effort when all the basic systems are in place with full functionality.	of the recommendation made in the TOR to have a follow-up of six months for system maintenance. If implemented, this recommendation could ensure a proper system consolidation and further capacity building both at national and regional level.
A resident project management team with multi-dimensional competencies, preferably with local resources, must be deployed at the pilot location for the pilot implementation to successfully proceed	This is in line with RPP proposal and also with the recommendations made by the MRV previous Project for institutional and technical strengthening.