

Annex 1: Optional Guideline and Questionnaire

To Assist with Preparation of an FCPF Readiness Plan Information Note (R-PIN) 3/8/08

The guidelines and questions below are designed to assist a country in preparing its R-PIN submission to the Forest Carbon Partnership Facility (FCPF):

1. Following this guideline and answering these questions is optional. We hope this Annex may assist some countries in organizing their information for filling out some questions in the R-PIN, or elaborate further on some information
2. The data-related questions are intended to establish what data are currently available for use in land use/land cover change and biomass/carbon emissions analyses.
3. Analysis-related questions are focused on determining the in-country capacity for analysis that would be required to monitor carbon emissions and identify pertinent REDD policies.
4. Institutional questions are geared toward determining the current capacity of the country's governmental system to successfully implement a carbon emissions reduction strategy.
5. Only selected template questions are included below.

Template question 2. Which institutions are responsible in your country for:

a) forest monitoring and forest inventories:

- (1) Which government institutions, NGOs, or other organizations will be responsible for monitoring and verifying land use/land cover change? How do you plan to manage collaborations between/among these institutions?

(This question is intended to establish the benchmark for current capacity, and help you design a work plan for improvement. Please describe the capacity of major governmental and non-governmental institutions involved.)

The Forestry Superintendence (SIF) will coordinate the monitoring and verification of land use change with government institutions and involved NGOs.

Since 2005 the SIF is monitoring large-scale deforestation (minimum deforested area sensed: 6 has) at national level in almost real time based on MODIS data using a system implemented with own human resources and technical support from the German Cooperation. The system was designed by IMPE, Brazil

Also, SIF jointly with Fundacion Amigos de la Naturaleza (FAN Bolivia) is developing the national monitoring system to assess the degradation progress based on the methodology developed by Carlos Souza from IMAZON (Souza et al. 2005). It is foreseen to implement this monitoring system at the SIF.

The Natural History Museum Noel Kempff Mercado (MHNNKM), together with Conservation International, has developed the first analysis of deforestation patterns 1990–2000–2004 at the national level (56 Landsat TM/ETM scenes, please refer to Killeen et al. 2007) and it continues to monitor the deforestation with data from different high resolution sensors (CBERS 2, LANDSAT TM).

Under the new REDD national framework, SIF will coordinate the monitoring activities of deforestation and degradation, the execution of large scale deforestation monitoring in almost real time, and the executing of the degradation monitoring system. The MHNNKM will continue with the annual monitoring of deforestation of high spatial resolution (>30m).

Template question 3. Current country situation (e.g., Where do forest deforestation and forest degradation occur in your country, etc.)

ANALYTICAL CAPACITY

(1) Briefly summarize the most important studies, data bases or other information related to deforestation and/or land use/land cover change in your country.

(2) (This will provide an overview of what information is available today for policy makers. Provide background and details of the research available, and briefly review the relevant literature under the headings of: biophysical; social; economic)

Deforestation detection: KILLEEN et al. 2007 show that the annual deforestation rate has grown exponentially from ~400 km² in the 60's to ~2,900 km² (2001–2004) mainly due to the expansion of the industrial livestock production. It also indicates that the creation of new protected areas has not curbed the progress of deforestation.

However, the analysis of large-scale deforestation patterns carried out by SIF (FORESTRY SUPERINTENDENCE 2006) shows, that the forest regimen established by the Forest Law 1700 was able to stop the progress of deforestation in the forest concessions.

Degradation detection: The preliminary results of feasibility study to detect degradation based on the SOUZA methodology et al. 2005 carried out by Forest Superintendence and FAN Bolivia indicate, that the different patterns of forest use could be discriminated and that the emissions from tropical rainforests could be quantified.

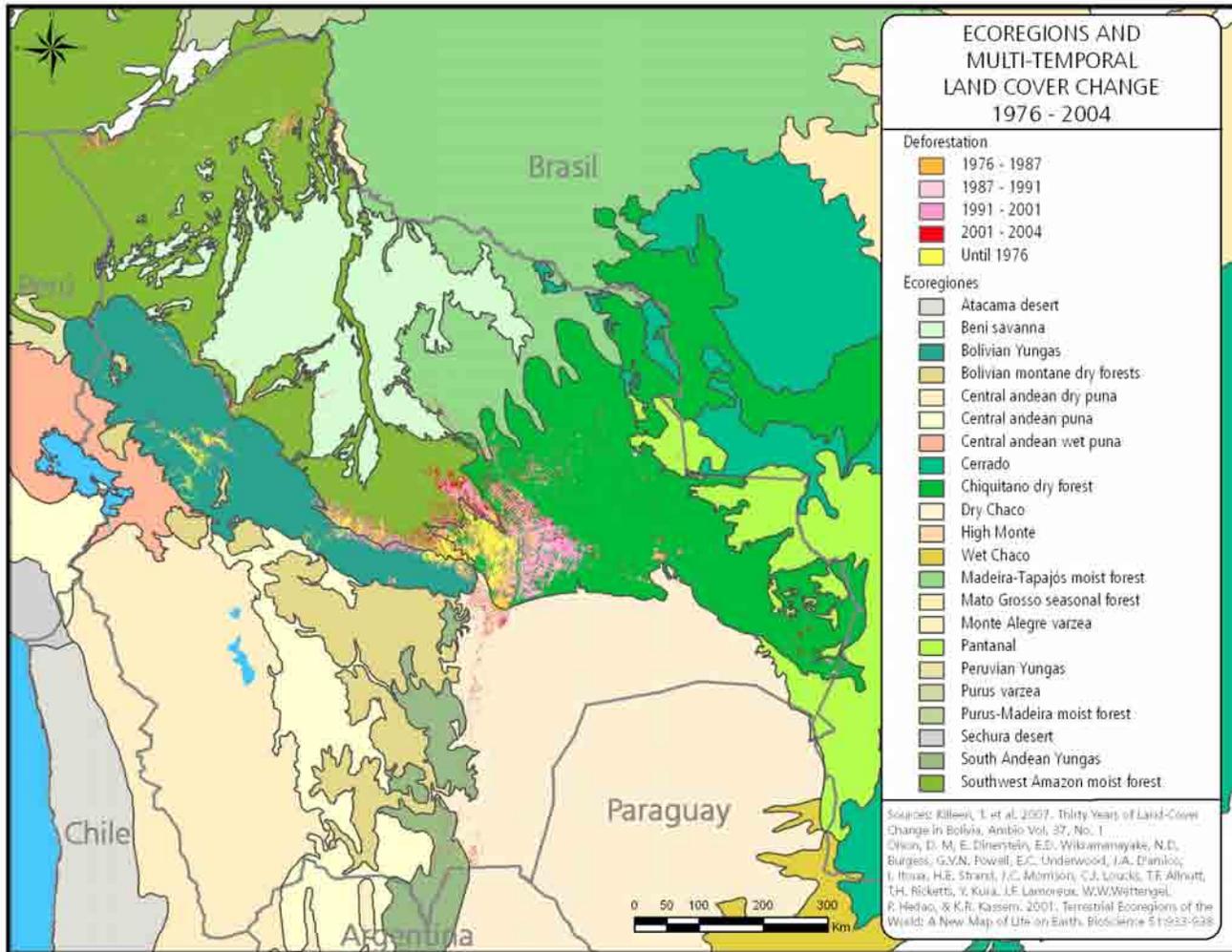
Deforestation Economy: PACHECO 2006 says that the deforestation was accelerated in the 80's because of the connection of the agricultural frontier to the international markets carried out by the programs for structural adjustment that favored the free trade.

Econometric modeling of wood harvest level: SOHNGEN and BROWN 2004 developed a model to project the level of wood harvest in Bolivia applying a Computable General Equilibrium Model. The model has been validated and certificated as a part of the methodologies of the Noel Kempff Mercado Climate Action Project (PACNK), the first certified REDD project in the world.

Deforestation spatial projection: Fundacion Amigos de la Naturaleza has developed a methodology in order to spatially project the deforestation at regional level using the GEOMOD model in the SIG IDRISI. The certified methodology makes it possible to record possible leakages and spatially discriminate the impacts from deforestation and degradation (Document of Project Design (PDD version 02.03 of PACNK).

Priorities for biodiversity conservation: Based on the comprehensive diagnosis of biodiversity in Bolivia (IBISCH and MERDIA 2004) the GAP-Analysis 2004 was developed to identify representation gaps of biodiversity in the National System of Protected Areas (SNAP).

Map 1: Deforestation in Bolivia's eco regions (1976 – 2004)



(3) Are there any studies or projects on forest governance issues (i.e., forest concession policies, decision-making processes, transparency of forest operations and management), or legal frameworks that might be pertinent to REDD?

ANDERSON et al. 2005 shows that the decentralization and redistribution of environment benefits through financial incentives for the municipalities could stimulate the interest of local organizations to strengthen the environment governance.

Various studies from CIFOR on decentralization and forest, forest and poverty.

(4) How much of this analysis was conducted by in-country experts, as opposed to international experts or organizations?

Deforestation detection: It will be necessary to temporarily harmonize the cover of the Landsat data for 1990 and 2004 since the data from GeoCover link images for different years (data for 1990 covers a range from 19987 until 1994).

Degradation detection: Since in Bolivia it is not feasible to use the "wall to wall" methodology to detect degradation levels, it will be necessary to calculate the impact using an area frame sampling applying the SOUZA 2005 methodology modified by SIF and FAN. The re-degradation pattern and the re-growing dynamic require a semiannual temporary resolution up to one year, depending on the region

Biomass measurements: Although Bolivia has biomass measurements carried out in more than 520 permanent parcels, there are still large gaps in the calculation and mapping systems for Bolivian forests' biomass. The Government is currently preparing a strategy to establish a national biomass inventory in conjunction with different scientific institutions in the country.

Opportunity costs to maintain the forest coverage forest and spatial analysis of the impact from road infrastructure road growth: In order to effectively allocate the financial incentives for the different actors, it is necessary to determine the opportunity and transaction costs to maintain the forest spatially explicit. Since the Bolivian road infrastructure is still being developed, impacts from such development should be projected to deforestation patterns.

Dynamic Projection from different livestock sectors: In order to establish referential scenarios of realistic emissions anticipating the specific national circumstances it is necessary to intensify the knowledge of different macroeconomic parameters explaining the demand for land use change. Specifically, it will be necessary to update and differentiate the social accounting matrix in order to estimate the economic impact from different sub sectors

(5) How much of this analysis was carried out by local experts and by international experts and/or organizations?

Most of the main studies above mentioned (1) and (2) were developed and implemented with the cooperation of Bolivian scientists and international teams. PACNK certification, the network for advanced biomass measurements, and the analysis of deforestation patterns show that the country has enough and relevant capacities to implement REDD programs.

Template question 8. Implementing REDD strategies:

b) Would performance-based payments through REDD be a major incentive for implementing a more coherent strategy to tackle deforestation? Please, explain why. (i.e., performance-based payments would occur after REDD activities reduce deforestation, and monitoring has occurred):

(1) Has the government already begun thinking about how to use future revenues from REDD and how it would redistribute income from carbon emissions reductions/avoidance? Or should this be elaborated during the Readiness Process?

(Outline major distribution channels for funds to be distributed by government agencies. Identify any voluntary markets within the country and the means by which these transactions are monitored.)

This will be defined during the REDD preparation process.

Template question 9. REDD strategy monitoring and implementation:

Physical Data Capacity:

(1) Does your country have a forest inventory?

(Forest inventories typically provide very accurate, on-the-ground estimates of timber volume, biomass, etc. Together with statistics on forest-area change, access to forest inventory data is critical to quantify carbon emissions resulting from land conversion.). If yes, consider providing the following detail:

- Is it a national or regional forest inventory? Or an inventory only for protected areas?
(It is important to know how representative the inventory is of existing forest conditions)

There is a network that includes more than 440 permanent parcels for biomass measurement. In

addition, all the forest concessions have forest inventories. The network of permanent parcels is formed by two types of parcels: conventional parcels of 1 has and experimental parcels of 20-27 have. The Bolivian Institute of Forest Research I (IBIF) is monitoring 240 parcels of 1 has and 28 experimental parcels of 20-27 has and FAN Bolivia is monitoring 280 parcels of 0.25 and 0.5 has. The experimental parcels are designed in blocs where 4 nearby parcels form a gradient of use intensity (witness, normal use, improved use, and intensive use). The network of permanent parcels has more than 1,000 has in total and is located in the eco regions of the Amazons, Pre Andean Amazons, transition forest amazon-chiquitano, in El Chaco and in Chiquitania

- When was it implemented?
(If an inventory was conducted only once in the distant past it will not be representative of current conditions but may be useful for establishing historical baselines)

The IBIF network of permanent parcels started in 1994, but later, other parcels that were not installed in 1994 were included. In 1998, the network started with at least 40 parcels of 1 has. After this date, the number of parcels gradually increased until reaching the 240 conventional parcels. In 2000 the experimental parcels started with a block of 4 parcels of 27 it has each one. In 2001 8 additional experimental parcels were installed (of 20-27 it has), in 2002 4 parcels were added, in 2003 8 parcels were added and in 2004 the last 4 parcels were installed. FAN installed 104 even parcels in 1999 applying the Winrock International protocols re measuring them in 2003 and 2007. In addition IBIF and FAN are installing 240 permanent parcels in 3 different ecosystems in 2007 and 2008

- What is the spatial intensity (i.e., plot density) and temporal frequency (i.e., time between inventories) of data collection?
(The higher the spatial and temporal frequency, the greater the capacity to monitor forest change)

La densidad especial de la red depende de la variabilidad de biomasa en cada ecosistema boscoso y del tamaño de la parcela. Generalmente, se mantiene un nivel de confianza de 95% con +/- 10% del promedio para cada clase de bosque. El reglamento de La Ley Forestal 1700 define un lapso de 5 años para actualizar los inventarios forestales de las concesiones. Sin embargo, todavía no existe un registro central para los inventarios forestales.

The network special density depends on biomass variability in each forest ecosystem and on the parcel size. Usually, a level of confidence 95% is kept with +/- 10% on the average for each type of forest. The regulation of Forest Law 1700 defines a 5 year period for forest concessions inventories update. However, there is not a central record for forest inventories yet.

- Are sample plots permanent, i.e., revisited and re-measured during subsequent inventories?
(Permanent plots are more useful for monitoring forest carbon uptake/emissions)

The parcels within the IBIF and FAN networks are permanent. In the case of IBIF, the first two years after its installation the parcels were re measured every year, after that they were re measured every 2 years. In the case of FAN network parcels were re measured every 3 years.

- Which vegetation attributes (stem diameter, canopy cover, etc.) are measured?
(This information is essential to understanding what the inventory can be used for, e.g., monitoring, modeling, etc.)

The diameter and height of trees are assessed, coverage, percentage of lianas, shaft quality, shape and quality of tress top, damages caused by forest use, on the top, shaft and roots. Each tree inside the parcels has a geographic reference. In the pilot parcels the opening percentage categorized according to the type of disturbance is also measured.

- What size classes/species (all species, commercial only, etc.) are measured?
(Measurements of most/all species and size classes provide for a more representative inventory)

Pilot parcels have a nested design, in such way that in each parcel, trees with more than 40 cm. of diameter are measured. In half of the parcels. Trees with more than 20 cm of diameter are measured. Within each experimental parcel there are 4 parcels of 1 ha, and here all the trees with more than 10 cm of diameter are evaluated. There also are transects across the parcels in order to measure individuals from 0 to 10 cm. of diameter These transects also have nested transects according to the trees size. In the conventional parcels of 1 ha trees with more than 10 cm. are evaluated. 20% of the total conventional parcels has regeneration transects, where trees smaller than 10 cm. of diameter are evaluated. In the parcels established in accordance to the Winrock International protocol, all the trees with a diameter greater than 10 cm are measured.

- Can you provide accuracy estimates for the inventory?
(Accuracy estimates are useful for determining the utility of an inventory for a particular application.)

Usually, there is a confidence level of 95% with +/- 10% on the average for each type of forest.

- (2) Are locally-derived, species-specific allometric biomass equations available?
(Allometric equations are needed for computing biomass estimates from forest inventory data. Local allometric equations provide more accurate estimates of biomass than regional equations do.)
YES

If yes, please provide specific information on the source(s) of these equations.

Source:

The Project for Climate Action Noel Kempff Mercado has calculated allometric equations based on a destructive sampling (See PDD version 02.03)

In addition, the Bolivian Institute for Forest Research (IBIF) has a data base of 130 allometric equations of wood species of which almost 50 equations were published by IBIF.

- Do you have access to the following remotely sensed data?
(Remotely sensed data can be useful in determining where changes are taking place, a question that may not be answered well with traditional inventory data)
- Satellite imagery

See data base description in R-PIN under 3. c)

- Aerial photography

Aerial photos from different dates are available for areas with pipelines. In addition, various missions of videography were carried out in all the forest areas to verify the results of deforestation detection 2000 – 2004.

(It is helpful to know how extensive a country's spatial data archive is. It is also useful to understand the extent to which data access is a limiting factor by itself.)

See the description of the data base in R-PIN under 3. c)

If yes, please specify coverage and spatial resolution (e.g., 30m, 1 km²) and temporal resolution (e.g., 1997 and 2001, biannual)

- (3) What other spatial data do you have access to?

FCPF Readiness Plan Information Note (R-PIN) Template, Annex 1 (Optional)

(The following spatial data are needed for more advanced (i.e., IPCC GPG Tier 3) model-based predictions of carbon emissions)

(4)

Category	Type	Source	Resolution	Coverage	Date
Land Cover	Bolivia Forestry Map	Navarro et al. 2007	30m	Bolivia	2005
Vegetation properties	Bolivia Vegetation Map	Navarro et al. 2007	30m	Bolivia	2005
Soils	Land Use Plan (PLUS) with physical and age parameters for all kind of soils available in 6 of the 9 departments	Prefecturas de Santa Cruz, Beni, Pando, Tarija, Chuquisaca, Cochabamba	desconocida	Santa Cruz, Beni, Pando, Tarija, Chuquisaca, Cochabamba	1994-2003
Climate	Measurements of climate standards of 356 available stations	Servicio Nacional Meteorología e Hidrología (SENAMHI)	n.a.	Bolivia	varios años
Hydrology	75 stations for hydrometric measurements	SENAMHI	n.a.	Bolivia	varios años
Transportation	Data base of all primary, secondary and tertiary roads, in SIG	Transportation Superintendence	n.a.	Bolivia	desconocida
Demography	Data from 1976, 1992, 2002 census for all the municipalities is available in SIG	Statistics National Institute(INE)	Municipalities	Bolivia	1976, 1992, 2001

For each category important for you, could you please provide: source, resolution, date, and coverage.

Template question 12. Please state donors and other international partners that are already cooperating with you on the preparation of relevant analytical work on REDD:

(1) How will you work in conjunction with independent national or international consulting teams?

(This question will allow the country to establish plans for improving capacity and service delivery. Describe which ones and their roles.)

Please refer to the institutions mentioned under 6.d) in R-PIN

FCPF Readiness Plan Information Note (R-PIN) Template, Annex 1 (Optional)

Donor	Counterpart	Type of Support	Activity
Netherlands Cooperation:	FAN Bolivia, Forestry Superintendence, PNCC	Financial Support	Feasibility study to detect degradation patterns and quantify corresponding emissions.
Conservation International	National History Museum Noel Kempff Mercado (MHNNKM)	Financial Support	Deforestation Analysis 1990 - 2000 - 2004
German Cooperation: GTZ/CIM	FAN Bolivia, Forestry Superintendence (SIF)	2 Integrated Experts	Coordination of REDD technical-scientific components
European Space Agency	FAN Bolivia, SIF, MHNNKM	Technical-Financial Support	Purchase and pre processing of 56 LANDSAT and AWIFS images.
Conservation International	National Program for Climate Change (PNCC)	Financial Support	Technical – scientific workshop on the REDD process
The World Bank	National Program for Climate Change (PNCC)	Financial Support	Study on opportunity costs of land use and economic development scenarios
The World Bank	National Program for Climate Change (PNCC)	Financial Support	Training process on climate change and REDD for national indigenous people.
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