

**Ministry of Forests and Soil Conservation
Kathmandu, Nepal**

COMPLETION REPORT

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ITTO Project No. PPD 6/99 Rev. 3 (M.F.1)

Preparation of Project Proposal for the Promotion of Non-Timber Forest Products
in the Terai Region of Nepal

Project Identification

Title: Preparation of Project Proposal for the Promotion of Non-Timber Forest Products in the Terai Region of Nepal

Serial Number: ITTO Project No. PPD 6/99 Rev. 3 (M.F.1)

Executing Agency: Ministry of Forests and Soil conservation (MFSC), Nepal

Host Government(s): His Majesty's Governments of Nepal

Starting Date: March 20, 2002

Actual Duration (months): 12 months

Actual Project Costs (US\$): NRs 3,465,308.06 (US\$ 46,828.50).

PART I: EXECUTIVE SUMMARY

1.1 Background Information about the Project

1.1.1 Key Problem

Non-timber forest products (NTFPs), also sometimes referred to as non-wood forest product (NWFPs) or minor forest products (MFPs) include all goods, other than timber or wood, that are produced in forests, pastures and meadows. Prominent examples of NTFPs are: medicinal and aromatic plants and herbs, roots, barks, leaves, fruits and nuts, grasses, bamboo and canes, resins and saps, lac and tasar silk, honey, etc., in their raw form (Bhattarai and Croucher 1996).

The NTFPs is a major source of income to the rural people, many of whom are socially and economically disadvantaged. They help sustain livelihoods to the many rural households and communities in Nepal. The promotion of NTFP through increased cultivation and sustainable management can help increase revenue for the government. The labour intensive nature of collection and harvesting, transportation and sale of such products have multiplier effects, both on the rural and urban economies of Nepal.

NTFPs' potential towards reducing poverty and sustaining rural livelihoods as envisaged in the present Tenth Five Year Plan can only be possible, if they are conserved and managed on sustainable basis. The research studies and development programmes on NTFPs in the past have been mainly focused on the Midhills and High Mountain Regions of Nepal. Even though the Terai region of Nepal is very rich in NTFP resources, very few studies and development programmes were initiated on the NTFPs in the Terai, the tropical/subtropical regions of Nepal. At present very little information is known about the status of NTFPs in the Terai Forests. The situation calls for documenting the information through collecting primary and secondary sources on the present status of NTFPs cultivation and management practices in the Terai region of Nepal. The high value NTFP species need to be identified and their *in-situ* and *ex-situ* conservation and their potential for domestication and commercialisation need to be explored.

Realising this situation, Ministry of Forests and Soil Conservation of His Majesty's Government of Nepal (HMG/N) requested the International Tropical Timber Organization (ITTO) to provide fund for the NTFPS promotion in the tropical region. Consequently, the International Tropical Timber Council (ITTC) approved a project entitled "Preparation of a Project Proposal for the Promotion of Non-Timber Forest Products (NTFPs) in the Tropical Region of Nepal" to be financed through the International Tropical Timber Organization. The concept of pre-project was envisaged before the preparation of a detail proposal on "Sustainable Management and Utilization of NTFPs in the Terai Region of Nepal". After the approval from the ITTO, the Ministry of Forests and Soil Conservation (MFSC) entrusted the study to the Center for Economic Development and Administration (CEDA), a research institute of Tribhuvan University in 2002. CEDA undertook this study by forming a multidisciplinary team of experts from relevant fields. The Project Steering Committee (PSC) constituted by MFSC supported, facilitated and coordinated the overall study.

1.1.2 Objective

The main goal of this pre-project study was to provide a basis for the preparation of a detailed project proposal for the promotion of sustainable development of Non-Timber Forest Products with socio-economic benefits to rural people residing in the tropical region of Nepal in line with the ITTO guidelines.

The major objectives of the pre-project were to:

- a. Quantitatively assess the NTFP resources of the Terai,
- b. Study the markets, marketing channels and market linkages, and
- c. Analyze the current status of NTFP management systems
- d. A project proposal for the sustainable management and utilization of NTFPs in the terai region of Nepal.

On the basis of above study the project should provide the following information:

- NTFPs resource of tropical area accessed
- National position paper on NTFPs prepared
- A project proposal prepared with the involvement of all concerned stakeholders.

1.1.3 Operational Arrangements

The Pre-project Agreement between ITTO and The Government of Nepal and Department of Forest of the Ministry of Forests and Soil Conservation on the Implementation of Pre-Project PPD 6/99 Rev. 3 (M,F,I) entitled "*Promotion of Non Timber Forest Products in Terai Region of Nepal*" was duly signed by three parties Dr. Sobral (ITTO), Mr. D. P. Parajuli (Chief, FACD, MFSC) and Mr. I. S. Karki, DG, DOF on January 18, 2000.

However, due to various internal factors within the country, the Pre-Project could not be started on its original stated time. MFSC prepared a revised work plan, which was afterwards approved by ITTO, and the work of Pre-Project actually started on March 2002.

A Project Steering Committee (PSC), composed of relevant representatives, was formed at the MFSC to support, facilitate and coordinate the proposed task. The following members were included in the committee;

Chief, Foreign Aid Coordination Division, MFSC	Coordinator
Representative, Planning and Human Resource Development Division, MFSC	Member
Representative, Department of Forests	Member
Representative, Department of Forest Research and Survey	Member
Representative, Department of Plant Resources	Member
Representative, Finance Section, MFSC	Member
Representative, Foreign Aid Coordination Division	Member-Secretary

The FACD of the Ministry developed a Terms of Reference (ToR) for the preparation of a detailed project proposal documents for the promotion of NTFP in Terai Region of Nepal. Ministry approved the ToR after some improvement in it on April 2002 and authorized the PSC to take necessary actions and made necessary decision towards the execution of the Pre-Project.

As per the ToR, interested and capable consulting firms/institutions/universities/research organizations (referred to as Consultant) was invited to submit a study proposal. Different specific tasks were carried out by the consultant(s) were also outlined in the ToR.

A detailed proposal based on the ToR for the preparation of Pre-Project proposal document on "*Promotion of Non-timber Forest Products in the Terai region of Nepal*" was submitted by the Center for Economic Development and Administration (CEDA), a research institute of Tribhuvan University. The PSC reviewed the Proposal submitted by CEDA and provided necessary suggestions for its improvement. The Ministry endorsed the improved proposal on May 31, 2002. Subsequently, an agreement was signed between the MFSC and CEDA on June 4, 2002 and the work of proposal development under aforementioned Pre-Project was awarded to CEDA.

CEDA started the work as per agreement since the date of agreement and prepared questionnaires for field survey. PSC with noted experts on NTFPs provided necessary feedback to improve it. The pre-testing was carried out in Bara, Parsa and Makwanpur districts in the Terai area. After the pre-testing of the research tools, revision was made over the research tools and main field work was initiated on 6th September 2002 and completed at the end of the month.

1.1.4 Methodology

The study was based upon the collection and analysis of both primary and secondary sources of information gathered on various aspects of NTFPs, such as market channel, trade volume, marketing practices, and their demand and supply situation. The sources and methods adopted for the collection of information were as follows:

Secondary Sources of Information

Secondary information/data regarding the geographical, biological, socio-economic, organizational and technological aspects of NTFPs were obtained from various institutions in and outside Kathmandu. Available literature was reviewed in order to arrive at a justified marketing and trade pattern of NTFPs in Nepal.

Primary Sources of Information

Twenty-four (24) strategic districts were identified in the Terai and Inner Terai representing five Development Regions of Nepal. To generate information/data from the field, participatory research tools such as Focus Group Discussion (FGD), formal and informal interviews and interactions with the key informants were undertaken. Major stakeholders of

NTFPs of the area were consulted during the fieldwork, and relevant information/data was collected. Structured questionnaires and checklists were developed and used. Several round of discussion and interaction with the members of project steering committee helped to bring the necessary refinement in questionnaires and checklists prepared for the study.

A pre-test field visit to Makawanpur, Bara and Parsa districts was organized involving the relevant experts. Based on the experience gained during pre-testing and further interaction with the experts cum steering committee members, research tools and questionnaire sets were refined to match the field conditions.

For the quantitative estimation of the NTFPs available in the selected districts, organizations such as Community Forest User Groups (CFUGs), traders and exporters of NTFPs, private growers, government herbal farms, custom offices, Trade Promotion Centers and District Chamber of Commerce were visited in several districts. Some Indian cities which import NTFPs from Nepal were also visited for the collection of information on market, demand, price and trend of NTFPs and verification of exports of NTFPs from Nepal. To arrive at relatively comprehensive information four types of survey were carried out. They are:

- Traders' survey
- Record of District Forest Offices
- Export records of Customs offices
- Information of some selected CFUGs

Besides administrating research tools in various selected locations, quadrats were laid out to verify physical resources of NTFPs in Sunsari, Bara and Banke districts. The quadrats were taken in the locations identified by the team including PSC members within the survey districts. For authenticity of the collected information, triangulation methods and workshops were conducted wherever possible.

In order to understand the habitat preference and type and composition of the surrounding vegetation of commercial medicinal plants, sample surveys were carried out in three sites, one each in the three Terai districts (Sunsari district, east Nepal; Bara district, central Nepal; and Banke district, west Nepal). Forest area and habitats facing different levels of disturbances and degradation were considered for the sampling. The sample area surveyed in each district corresponded to 0.16 ha of land using 16 circular quadrats of 5.64 m diameter each. Each circular quadrat also included four small quadrats measuring 1 square meter each, to study the herb flora.

1.1.5 Duration and Overall Costs

The overall duration of the project was 12 months starting from March 20, 2002 and overall cost was NRs 3,465,308.06 (US\$ 46,828.50).

1.2 Project Achievements

With the help and support of all concerned, the team accomplished the study and prepared five documents, out of them three are thematic reports, one consolidated report and the final one is the project proposal as mentioned below:

- i. Current Status of Marketing of Non-Timber Forest Products in the Terai Region of Nepal.
- ii. Current Status on Cultivation and Management of Non-Timber Forest Products in the Terai Region of Nepal.
- iii. Quantitative Resource Assessment of Non-Timber Forest Products in the Terai Region of Nepal.
- iv. A Synthesis Report on Current Status of NTFPs in the Terai Region of Nepal, and
- v. A Project Proposal on Sustainable Management and Utilisation of Non-Timber Forest Products in the Terai Region of Nepal.

Above three (i-iii) thematic reports provide background information to formulate a project proposal and provide further reference to future policy dialogues, reforms and program formulation. The project proposal has been prepared and submitted to International Tropical Timber Organization (ITTO) in order to request funds to implement various activities related to the promotion of NTFPs in the Terai region of Nepal.

1.3 Target beneficiaries

The direct beneficiaries of the Pre-Project were the local villagers, community forestry user groups, individual engaged in NTFP collection, trade as well as related government institution in Nepal.

1.4 Lessons

The quantitative assessment of NTFPs in the wild could not be done due to the absence of a recognized methodology. Methods used in ecological studies like sampling techniques using quadrat method, information on frequency, abundance, etc. can not be applied exactly to assess the varied products obtained from varied plants. Therefore, search for and development of a tolerable methodology to match the needs seems topical.

Although the survey teams visited 24 districts of Terai and Inner Terai districts of Nepal, it was not possible to interview all traders located in the districts because of time and resource constraints. Due to time limitations, it was not possible to visit all the private NTFP growers and CFUGs.

Cultivation management decisions should be based on a sound economic analysis and effective methods of forecasting enterprise operation. The lack of effective technique for analyzing and forecasting business activities due to non-availability of an economist at NTFPs enterprise, substantially hampers rational managerial decision-making.

Lack of scientific knowledge on sustainable harvesting and management practices has resulted into reduced availability of several NTFP species in the forest. As most of the species are collected and generally not cultivated on private lands, it can be said that NTFPs potential is not fully explored to its potential.

Official records of the Department of Forests based on the royalty collection indicate that the government collects annual revenue between Rs 13.90 million to 21.41 million by granting permission for the annual collection of about 2,100-2,900 metric tons of NTFPs. The annual income from NTFPs was worth to NRs. 16.6 million in the Fiscal year 1999/2000, NRs 21.5 million in 2000/01 and NRs 13.9 million in 2001/01 respectively.

India remains to be the major market for Nepalese NTFPs. The official custom records indicate that more than 134,000 metric tons of NTFP was exported to India in 2002/2003 officially.

1.5 Recommendations

Following recommendations are put forward based on the thematic reports that were the outcomes of the pre project study.

- A market information system could be significant cost-effective leverage, which would be beneficial to the local traders and collectors in Nepal.
- The minor processing, like cleaning and grading, packaging, cutting and grinding and drying, which does not involve any machine and special technology could offer a significant increase in income of villager groups undertaking improved trading activities.
- A clear criterion for royalties should be developed that is transparent and linked to some reasonable objectives.
- A review of the export ban some NTFPs should be carried out carefully investigating the availability of the plants, commercial exploitation and biological aspects.
- Out of the large number of commercial NTFP species, only a few species constitute the major proportion in trade both in terms of volume and value. Such species should be prioritized for additional research and development and management practices.
- Research on optimum harvest levels for every NTFP species should be conducted both *in situ* and *ex situ* so as to generate information both in forestland and farmland. Without this, it is not possible to sustainable harvest the product.
- The government system of issuance of permit for NTFPs collection by District Forest Offices (DFOs) needs to be revised. The permits should be issued in the districts where they are originated and quantity permitted should be based on resource inventory and environmental impact assessment.

PART II. MAIN TEXT

2.1 Project Results

2.1.1 Assessment of the Status of NTFPs

2.1.1.1 Nepal's forests and vegetation types

Nepal is positioned to offer the diversity of 6 phytogeographical provinces, 10 bioclimatic zones, 35 forest types and 75 vegetation types and 118 types of ecosystems represented by about 7000 species of vascular plants including 300 endemic species of flowering plants within 216 families and 1534 genera (Bajracharya *et al.* 1988; Joshi and Joshi 1991, Adhikari, 2000). Similarly, 2000 Nepalese plants reported to have medicinal properties. Among them 1463 are known to be used locally (Shrestha and Shrestha 1999), and many are demanded by Indian manufacturer of Ayurvedic prescription (Shrestha 1994).

There are more than 700 different MAPs species of medicinal and aromatic plants in Nepal and distributed in all the physiographic regions of the country. The distribution has been found to be approximately 31% in tropical and subtropical zones, 55% in temperate zones, and 14% in alpine regions.

Despite rich in forests and vegetation, NTFPs in Nepal are reported to be overexploited. The main factors identified are urbanization, industrialization, habitat destruction, acculturation and destructive harvesting practices (Malla, 1994). As a result, 13 MAPs species are listed to be either endangered, vulnerable or commercially threatened (see Table 1 below).

Table 1 Endangered, vulnerable or commercially threatened MAPs

Endangered	<i>Rauwolfia serpentina</i> and <i>Dactylorhiza hatagirea</i>
Vulnerable	<i>Podophyllum hexandrum</i> , <i>Swertia chirayita</i> , <i>Paris polyphylla</i> , <i>Picrorhiza scrophulariiflora</i> and <i>Nardostachys grandiflora</i>
Commercially threatened	<i>Dioscorea deltoidea</i> , <i>D. prazeri</i> , <i>Aconitum laciniatum</i> , <i>A. spicatum</i> , <i>A. ferox</i> and <i>Bergenia ciliata</i>

Source: Shrestha and Joshi 1996

2.1.1.2 Distribution of NTFPs

It is found that there are very few NTFPs that are strictly tropical in nature. However the following species occur in up to 1000 m altitude. They include: Sikakai (*Acacia rugata*), Simal (*Bombax ceiba*), Bet (*Calamus latifolius*), Sugandhakokila (*Cinnamomum galulescens*), Musli (*Curculigo orchioides*), Tendu (*Diospyros montan*), Pangro (*Entada phaseoloides*), Mahuwa (*Madhuca longifolia*), Bilaune (*Mesua ferrea*), Thakal (*Phoenix humilis*), Pipla (*Piper longum*), Kantakari (*Solanum surattense*), and Gurjo (*Tinospora sinensis*) (CEDA 2004 a; CEDA d).

Likewise, species such as Amala (*Phyllanthus emblica*), Amriso (*Thysanolaena mexicana*), Bans (*Bambusa nutans*), Barro (*Terminalia bellirica*), Bel (*Aegle marmelos*), Bhorla (*Bauhinia vahlii*), Bisfej (*Polypodium vulgare*), Tejpat (*Cinnamomum tamala*), Harro (*Terminalia chebula*), Kachur (*Curcuma aromatica*), Pakhanbed (*Bergenia ciliata*), Punarnawa (*Boerhaavia diffusa*), Ritha (*Sapindus mukorossi*), Sindure (*Mallotus philippensis*), Sal (*Shorea robusta*), Thakal (*Argemone mexicana*) are found in between 1000m and 2000m (ibid.).

There are many NTFP species, which are distributed in tropical through temperate regions (1000-3000m). These include: Babiyo (*Eulaliopsis binata*), Bojho (*Acorus calamus*), Chabo (*Piper mullesua*), Gujargano (*Cissempeles pareira*), Jiwanti (*Ephemerantha macraei*), Bhyakur (*Dioscorea deltoidea*), and Kurilo (*Asparagus racemosus*) (ibid.).

Species of lichen, locally known as 'Jhyau' are distributed between tropical (below 1000m) to sub-alpine zone (3000-4000m) of the country. Most of the species, although traded in the tropical region have their distribution in the sub-tropical (1000-2000m) zone and/or above it. Chiraito (*Swertia chirayita*), Chutro/Daruhaldi (*Berberis aristata*), Chutro/Daruhaldi (*Berberis asiatica*), Indreni (*Trichosanthes tricuspidata*), Gamdol (*Brachycorythis obcordata*), Sallo (*Pinus roxburghii*), Majitho (*Rubia manjith*), Sugandhawal (*Valeriana jatamansii*), and Timur (*Zanthoxylum armatum*) are some examples. Many of the NTFP items dealt in the tropical regions have not yet been botanically identified, and hence their distribution range is not ascertained (ibid.).

2.1.1.3 NTFPs of high demand

Quantitative data obtained from 19 District Forest Offices of Nepal for the fiscal year 2001/2002 indicate that there are 33 types of tropical NTFPs that are collected for commercial purposes that accounted for the collection of 3,283 ton of dry raw materials. The largest quantity of the collection is shared by (Babiyo-*Eulaliopsis binata*- ; 2016 ton) succeeded by Bhorla ko pat-*Bauhinia vahlii*; 398ton), Ritha-*Sapindus mukorossi*; 248 ton), Satawar/Kurilo-*Asparagus racemosus*; 128 ton), (Jhyau- *Lichen spp.*; 83 ton), (Sugandhakokila-*Cinnamomum glaucescens*; 74 ton), and Bhorla ko bokra-*Bauhinia vahlii* ; 61 ton) (CEDA 2004 d).

Data for the fiscal year 2001/2002 suggests that the total quantity of tropical NTFPs exported through 12 Custom Offices is equivalent to 104,000 ton of raw materials dominated by Amriso-*Thysanolaena maxima*; 101,000 ton) and succeeded by Jadibuti (unidentified medicinal herbs; 1000 ton), (Bans-*Dendrocalamus/Bambusa spp.*; 875 ton), (Ritha-*Sapindus mukorossi* -; 289 ton), (Sikakai-*Acacia rugata*; 80 ton), and others (ibid.).

The major NTFPs that generate the highest revenue in some of the District Forest Offices are given in Table 2 below. The major contributor NTFPs in the Terai and inner Terai region are found to be as follows.

Table 2 NTFPs that generate the highest revenue in the district (as of FY 2001-2002)

Type of NTFPs	Districts
Jhyayu	Makawanpur
Babiyo	Kapilbastu and Banke
Bhorla leaves	Saptari, Parsa, Kailali and Kanchanpur
Pawan bark	Bara and Rautahat
Dalchini	Rupandehi
Ritha	Morang, Sunsari and Udaypur
Timur	Surkhet and Dang

Source: Field visits, 2002

2.1.2 Cultivation, Management, Harvesting and Processing of NTFPs

2.1.2.1 Cultivation

Medicinal and Aromatic Plants (MAPs) that are currently cultivated in commercial scale and used as value added products in Nepal include: *Cymbopogon winterianus* (Citronella), *Cymbopogon flexuosus* (Lemongrass), *Cymbopogon martinii* (Palmarosa), *Matricaria chamomilla* (Chamomile), *Ocimum basilicum* (French basil), *Mentha arvensis*, *Tagetes glandulifera*, *Eucalyptus camadulansis*, *Tagetes minuta*. Similarly, some of the naturally occurring and indigenous aromatic plants that are found in national and community forests and substantially used for commercial products include: *Gaultheria frgrantissima* (Wintergreen), *Nardostachys grandiflora* (Jatamanshi), *Parmelia nepalensis* (Lichens), *Zanthoxylum armatum* (Timoor), *Cinnamomum glaucescens* (Sugandh kokila), *Cinamomum tamala* (Tej pat), *Rhododendron anthopogon* (Sunpati), *Juniperus communis* (Juniper berry and leaves), *Acorus calamus* (Calamus), *Curcuma zedoria* (Kachur), *Artemisea dubia* (Artemesia), and *Taxus baccata* (Loth Salla) (CEDA 2004 b; CEDA 2004 d).

In recent years, cultivation of aromatic plants such as Citronella, Lemongrass, Chiraita, Mentha, Broom grass and Cinnamon has been popular in many community forests of Eastern region. Similarly, Neem (*Azadirachta indica*), Amala (*Phyllanthus emblica*) Kurilo (*Asparagus racemosus*), Bamboo and Rattan have also found to be widely cultivated in central region. Sarpagandha (*Rauvolfia serpentina*), Babul (*Acacia nilotica*), Pipla (*Piper longum*), Kurilo (*Asparagus racemosus*), Harro (*Terminalia chebula*), Barro (*Terminalia bellirica*), Amala (*Phyllanthus emblica*), Bamboo, Rattan, Satawar (*Asparagus racemosus*), Bakaino (*Melia azadirach*), Kusum and Neem (*Azadirachta indica*) are frequently cultivated in community forests of Mid Western districts. Ratan (*Calamus* spp.), Pipla (*Piper longum*), Sikakai (*Acacia rugata*), Musli (*Curculigo orchioides*) and Kauso (*Mucuna pruriens*) were widely found in sample community forests visited in Far Western region. Amliso and Bamboo were also found to have been cultivated and were well adopted in leasehold forests. People now have started taking interest in cultivating Sugandha kokila (*Cinnamomum glaucescens*) and Kurilo (*Asparagus racemosus*) in many leasehold forests. During study, cultivation of NTFPs in private land has also been recorded. However, they were confined to subsistence level under homestead garden and on marginal lands) (ibid.).

Since 1980, Tamaghadi farm, a branch office of Herbs Production and Processing Company Limited (HPPCL), a government undertaking company, in Bara district has been involved in both research and development of NTFPs. The focus in recent years has been found more on the cultivation of aromatic plants rather than medicinal herbs. The major aromatic species include: Palmarosa, Citronella, Lemongrass, Mentha, Chamomile, French Basil, Holly Basil, Sarpagandha, Kurilo, Pipla, Eucalyptus, Tejpat, Bamboo and Rattan, Sikakai and Bel. Among all, mass cultivation of Palmarosa, Citronella, Lemongrass, Mentha, Chamomile and French basil was found prominent. The trend of cultivation of Mentha and Chamomile has been found to increase. These crops are also to be found more profitable than cultivating rice. Demand of seeds and seedlings of Mentha and Chamomile for cultivation is very high since HPPCL provides the processing facilities and guarantees the market (ibid.).

2.1.2.2 Conservation and management

There are few literature that specifically focus on the management aspect of NTFPs in Nepal. Conservation status of NTFPs in leasehold forests of Chitawan and Makawanpur districts, which were surveyed during the study period reveal that *in-situ* (on site) conservation of Amriso, Bamboo, Barro, Harro, Kurilo, Nigalo, Sugandhakokila and Sarpagandha has been practiced by forest users. Similarly, Lemon grass, Molasis, Nepier and Stylo are the major species conserved in *ex-situ* (off site).

Similarly, a survey of community forests in five Terai and Inner Terai districts namely Makawanpur, Bara, Parsa, Nawalparasi and Rautahat reveals that many NTFP species have been managed in community forests (table 3.1). The major species managed under *in-situ* conservation include Asuro, Amliso, Ameri grass, Amala, Bamboo, Barro, Bet, Chiuri, Harro, Kalomusle, Kurilo, Nigalo, Pipla, Ritha, Rattan, Sarpagandha, Sikakai, and Thakal. Similarly *ex-situ* conservation, which are recorded in community forests include Amriso, Bamboo, Bet, Kurilo, Nigalo, Pipla, Rattan and Sarpagandha (CEDA 2004 d).

2.1.2.3 Collection and harvesting

There are three main channels of NTFP through which NTFPs are collected and harvested. These include broadly: village/local level collectors, road-head middle man cum Nepali traders and Indian traders. District Forest Offices are the main authority that grant permits for collection, harvest and transport for all the channels mentioned above.

Records of District Forest Offices indicate that Babiyo generates the highest revenue (27% of the total annual revenue of twenty Terai districts), the major share of which comes from Banke district. *Bhorla ko pat* from Kailali is the second highest revenue generator that shares about 18% of the total revenue generated from twenty Terai districts. Khair, Resin, Jhyau, Timur, Ritha, Dalchini, Pawan bark, Sugandhakokila, Kurilo are other products that generate significant amount of revenue in the district (Table 3). These products however are not distributed in all districts. *Bhorla ko pat* and Ritha are the two products that are distributed in more than three districts (CEDA 2004 d).

Table 3 Major NTFPs that generate revenue

S.N	NTFPs	Annual Revenue Rs. ('000)	% Of total revenue of 20 Terai districts
1	Babiyo	3400	27.19
2	Bhorla ko Pat	2304	18.42
3	Khair	1180	9.44
4	Salla Khoto (Resin)	899	7.19
5	Jhyau	736	5.88
6	Timur	560	4.48
7	Ritha	442	3.53
8	Dalchini	439	3.51
9	Pawan bark	401	3.21
10	Sugandhakokila	373	2.98
11	Kurilo	262	2.09
12	Musli	157	1.25
13	Sikakai	155	1.24
	Total products	12657	100.00

Source: DOF (2002)

Official records of the Department of Forests based on the royalty collection of 2002 indicate that the country produces about 2,100-3,000 tons of NTFPs annually. The Mid-western Region of Nepal produces the maximum quantity of NTFPs (43%) followed by Western (19%), Central (16%), and Far- Western (16%) and Eastern (5.52%), respectively.

2.1.2.4 NTFP processing and enterprises

There are very few NTFP enterprises in Nepal comparing with its potentiality. Value addition within Nepal is, therefore extremely limited. Processing is limited to traditional oil extraction from Chiuri, a large unit for pine resin processing, production of paper from Lokta fiber, experimental grinding of Timur and a few menthol oil distillation units. In addition, as important commercial products, Jatamansi (*Nardostachys grandiflora*) and Sugandhawal (*Valeriana jatamansi*) are the two major items that are processed in Nepal.

Among the processing enterprises of tropical NTFPs, Natural Products Industries located at Jawabari, Kapilbastu district and Bahubali Herbal Essence Private Limited, Nepalgunj are the prominent ones. Similarly, the Bhrikuti Pulp and Paper Industry is one of the biggest paper factories that consume thousands of metric tons of sabai grass (*Eulaliopsis binata*) annually for high quality paper production. *Daphne* spp., locally known as lokta, is used as raw material for hand-made paper, which is based on local technology and flourishing enterprises in Nepal. It is one of the expanding cottage industries of the country with an annual turnover of around NR10 million. The industry provides direct employment for about 1500 families (Khatri 1994).

Bamboo and cane are other important products that are used extensively by the Nepalese small entrepreneurs to make traditional baskets, mats and furniture, and for building material in rural areas. *Calamus tenuis* is the most valuable rattan, which is used most widely for furniture. The monthly turnover of rattan industries is estimated to be upto US\$107.

Industrial utilization of MAPs has been made by the HPPCL at government level. About 30 value added MAP industries are operational at private level too. Major industries are still at the secondary stage. Nevertheless, some of the multinational companies like, Dabur Nepal Private Limited, Nepal Liver Ltd. Balsara Herbals, Cosmos Herbal Private Limited are attracted in Nepal in utilizing NTFPs. These companies are producing intermediary to final consumer products ranging from health care products to soap, detergents and cosmetics (CEDA 2004 d).

2.1.3 Marketing and Trade of NTFPs

2.1.3.1 NTFP producing districts

Banke, Kailali, Dang and Makawanpur are the main NTFP districts under study in terms of the amount of revenue that these districts generate. Banke and Kailali are the two districts that share almost half of the total revenue generated in twenty Terai districts. Makawanpur, Kapilbastu, Surkhet, Rupandehi, Rautahat and Udaypur district altogether contributes three fourths of the amount that the two district (Banke and Kailali) generates. The rest 11 districts share only about 11 % of the total annual revenue generated in 20 Terai districts (CEDA 2004 d).

Table 4 Share of Revenue by sample districts in Terai and inner Terai district of year 2001/2002

District	Revenue Rs. ('000)	% of the revenue of 20 Terai districts
Banke	2928	27.70
Kailali	2266	21.44
Dang	1119	10.58
Makawanpur	1047	9.90
Kapilbastu	631	5.97
Surkhet	531	5.04
Rupandehi	341	3.24
Rautahat	268	2.54
Udayapur	218	2.06
Dhanusha, Saptari, Sunsari, Mahottari, Morang, Bara, Chitwan, Kanchanpur, Bardia, Nawalparasi, Parsa,	1220	11.53
Total districts (20)	10569	100.00

2.1.3.2 Scale of NTFP trade

There are about 150 species of NTFPs that are traded. About 95 percent of the NTFPs is estimated to be collected from the wild enter into trade, and about 90 percent of the trade are directed towards the Indian markets. The number of traded species could be even higher as the government estimation is based on the formal market demand that tends to be conservative. District Forest Office records on the revenue collection give some indications on the trend of NTFPs exploitation and trade but often confusion is created as the existing recording systems adopted by custom officials as all NTFPs are placed on one heading or classified as miscellaneous item. The current recorded percentage figure of earnings from NTFP represents very insignificant in the household and national economy.

The official statistics shows that the trend of total traded value of NTFP since 1991/1992 indicates that there is a gradual rise of the traded items except in the year 1999/2000. Aromatic products are receiving increasing attention worldwide. However these traded items of Nepal are largely as dried herbs in “crude” and “unprocessed” forms.

The Customs offices charge a custom duty of 0.5 % of the value of the NTFP item intended for export. Data suggests that Custom Offices keep records of individual species of only 20 NTFP items; the majority of medicinal herb species are categorized vaguely as '*Jadibuti*' (medicinal herbs) and '*Anyu*', a miscellaneous item head (CEDA 2004 c; CEDA 2004 d).

In Nepal, the annual harvest and trade of commercial NTFPs from legal and illegal sources is roughly estimated to be between 10,000-15,000 metric tons with a value of US \$ 8.6 million in Indian boarder (Rawal and Paudyal, 1999). The scope of trade of NTFPs has been growing worldwide. The official data of the Ministry of Finance on the collection and trade of NTFPs from Nepal reveals that in 2000/2001 medicinal herbs worth of NRs. 71.5 million have been exported to India. Similarly, a total worth of NRs. 25.9 million have been generated from the trade of NTFP herbs from the countries other than India in the year 2000/01 alone. The Customs Department records indicate that about 135,000 metric tons of NTFP have been exported to India in the fiscal year 2000/2001. Ten years' official data of the Ministry of Finance indicates that India contributed 73-89 % of the total NTFP traded value from Nepal (Economic Survey 2001/2002).

Official records of the Department of Forests based on the royalty collection indicate that the government collects annual revenue between Rs 13.90 million to 21.41 million by granting permission for the annual collection of about 2,100-2,900 metric tons of NTFPs. The annual revenue from NTFPs was worth NRs. 16.6 million in the Fiscal year 1999/2000, NRs. 21.5 million in 2000/01 and NRs. 13.9 in 2001/02 (CEDA 2004 d).

2.1.3.3 Major traded items

Nepali hand made paper made from *Daphne* spp., locally known as lokta, is a flourishing business in Nepal. Nepalese hand-made paper is consumed at local as well as international markets. The total domestic consumption of hand made Nepali paper is estimated to be 7.4 million sheets annually. This is equivalent to 185 tones. The remaining 115 tones is consumed by others (CEDA 2004 c; CEDA 2004 d).

Nepalese essential oils have been well received in the regional and European markets. The conventional oils such as palmarosa, citronella, lemon grass and Tagetes have a growing

demand from foreign customers. The case is similar with certain newly introduced unconventional items such as *Rhododendron anthopogon* oil. Jatamansi oil (*Nardostachys grandiflora*) and Timur oil (*Zanthoxylum armatum*) require greater efforts for successful export. The future of the essential oil industry looks promising, with foreign firms entering Nepal for the manufacture of soaps and detergents (Rawal 1995). It has been estimated that about 39300 kg of dried jatamansi have been marketed annually whereas its potential annual production could be more than 100 000 kg (New Era 2001). It is estimated that 90 percent of the jatamansi in the Indian market originates from Nepal.

Nepalgunj is the biggest trading center for NTFPs in Nepal. There are more than 20 established NTFP traders in Nepalgunj. Out of them, 3 relatively big traders capture almost 75 percent of NTFP business. NTFPs landed at Nepalgunj are further exported to north Indian cities of Lucknow and Delhi. According to Jaributi Association of Nepal (JABAN), 796 metric tones of NTFPs were exported from Nepalgunj in FY 2001/2002. Major NTFPs traded in big volume were found to be Amala, Bhutkesh, Chiraito, Dalchini, Dhupi, Dhupjadi, Jatamansi, Ritha, Sikakai, Sugandhawal, Tejpat and Timur of which latter five are widely found in the siwaliks and Terai (CEDA 2004 c).

India remains to be the major market for Nepalese NTFPs. The official custom records indicate that more than 134, 000 metric tons of NTFP was exported to India in 2001/2002. This figure, however, varies considerably from one year to other. Parsa, Kapilbastu and Sunsari are the main custom points that share the highest revenue (Table 5).

Table 5 NTFPs to Indian Market from Different Customs Points (2001/2002)

Customs Points	Export Quantity (MT)	Royalty (NRs)	Royalty (US\$)
1. Kakarvitta (Jhapa)	7,126	499,495	6,750
2. Bhantabari (Sunsari)	96,995	1,304,800	17,632
3. Jogabani (Morang)	299	85,333	1,153
4. Malangwa (Sarlahi)	35	18,650	252
5. Vittamor (Mahotari)	26,035	18,800	254
6. Gaur (Rautahat)	35	349,900	4,728
7. Birgunj (Parsa)	289	84,824,000	1,146,270
8. Sunauli (Rupandehi)	423	207,016	2,798
9. Krisnanagar (Kapilbastu)	132	3,592,225	48,544
10. Rupaidiha (Banke)	727	NA	NA
11. Kailali	2,424	NA	NA
12. Kanchanpur	319	NA	NA
Total	134,839	90,900,219	1,228,381

Source: District Customs Department Offices (2002)

Amongst the six market places in India, Delhi was found to be the biggest market for Nepali NTFPs. The relatively high demand in the Delhi market for NTFPs is met by supply from Nepal, followed by India's own supply and that from Bhutan and Pakistan respectively.

There exists a long tradition of Nepali traders supplying a range of NTFPs to Indian traders. Different species of Nepalese NTFPs absorbed in Delhi market. Besides India, the market for NTFPs from Nepal exists in 19 other countries from around the world. They are - Pakistan, Bangladesh, Hong Kong, Korea, Taiwan, Singapore, Japan, USA, France, Germany, Italy, Sweden, Switzerland, Spain, Czech-Republic, Australia, Austria, New Zealand and Hungary. Some 28 types of species have been exported to these countries in the past, mostly in the processed form. The quantity of export ranges between 8 to 17 metric tons per year (CEDA 2004 c).

Among various species of NTFPs, Chiraito (*Swertia* spp.) occupies major position in the trade of wild medicinal plants. Thirty-four districts of Nepal have been found to contribute in the supply of Chiraito. It is traded in 27 major herb trade centers of Nepal from east to west. Comparatively, it is traded as one of the commonest commodities in the herbs trade. Nine different species of *Swertia* spp. have been identified from the trade samples of Chiraito. About 419,300 kg of Chiraito has been estimated in the trade during 1995/96. Out of the total trade of Chiraito, more than 50% is traded from east Nepal (Bhattarai and Acharya 1998).

2.1.3.4 Major trade centres

Kathmandu and Birgunj are the major NTFP trading hubs in the Central and Western Region. The traders at Birgunj and Janakpur export their collection to India (Delhi, Kolkata, Kanpur etc) whereas Kathmandu traders undertake processing and/or export to USA, Italy, France and other European countries besides India (CEDA 2004 d).

The major herbal trade centres surveyed in the Terai and Inner Terai region include: Birtamod (Jhapa district), Dharan (Sunsari district), Kanchanpur (Saptari district), Chandranigahapur (Rautahat district), Hetauda (Makawanpur district), Arunkhola (Nawalparasi district), Butwal (Rupandehi district), Nepalganj (Banke district), Birendranagar (Surkhet district), Ghorai/Tulsipur (Dang district) and Attaria (Kailali district).

The seven major herbal trade centres of Delhi, Lucknow, Kanpur, Kannauj, Tanakpur, Siliguri and Calcutta consume Nepal's major medicinal herbs. The major product that are consumed by these trade centre include: Gucchi chau, Atis, Okhar bokra, Jhayu, Dhup jadi, Salamdana and Ritha (ibid.).

2.1.4 Project Proposal

2.1.4.1 Project Summary

Brief summary of the detail project proposal prepared as per the objective of ITTC pre-project is as follows:

Title:	Sustainable Management and Utilisation of Non-Timber Forest Products in the Terai Region of Nepal
Field:	Forest Industry
Implementing Agency:	Foreign Aid Corodination Division, Ministry of Forests and Soil Conservation
Executing Agency:	HMG/N Ministry of Forests and Soil Conservation (MFSC)
Implementing Agencies:	District Forest Offices of Jhapa, Morang and Sunsari
Duration:	Three years (36 months)
Approximate Starting Date:	As per the agreement
Proposed Budget:	US \$ 383,288 (ITTO: US\$ 312.288; HMG/N Contribution: US\$: 71,000)

2.1.4.2 Project Justification

HMG/N has not been able to harness the full benefits of NTFPs in the welfare of the people despite their big advantages and potentials. The major constraints being (i) lack of proper market information system (ii) lack of NTFPs processing facilities, (iii) insufficient knowledge on biophysical characteristics, agro-based technologies, value-addition options, market characteristics and (iv) lack of proper coordination amongst stakeholders.

The basic cause of low involvement of rural farmers in the NTFP cultivation is due to lack of knowledge on its marketing potential and economic benefits. Some progressive farmers and FUG members in different localities of the Terai have initiated the cultivation of certain NTFPs including some commercially viable MAPs in private and community land. It is an indication of a progressive attitude. But, majority of the farmers are facing problems such as shortage of planting materials, lack of financial assistance for cultivation, lack of information on marketing and potential buyers and value-addition techniques through processing. The provision of training for capacity building is also lacking (CEDA 2004 e).

The three thematic reports prepared as an outcome of the pre-project study have highlighted the major problems and issues that need to be addressed for the promotion of NTFPs. These are as follows:

At policy and program level

- Identify policy and regulatory constraints, and initiate action for their resolution through consultation
- Develop a common vision among stakeholders for the promotion of NTFP sector in Nepal
- Establish a regulatory framework supporting the principle that NTFP based enterprises could be established in public-private-community partnership
- Strengthen established structure responsible for policy formulation and ensure inter and intra-sectoral coordination and public participation in policy making on NTFPs and provide them sufficient autonomy to deal with NTFP related matters
- Ensure adequate investments and budget for the promotion of NTFPs

At all Terai, district and local levels

- Develop and implement guidelines for cultivation technology, sustainable management, harvesting techniques, quality production and trade.
- Like at the centre, establish mechanisms for the co-ordination of NTFPs and sectoral development at all Terai, and district and local level that bring synergy and avoid duplication
- Establish and promote NTFP networks, associations, interest groups and other representative structures which will be able to bring field based experience and knowledge in the development of NTFP sector
- Increase knowledge and skills of government and non-government forestry sector agencies in technical information and monitoring, and ensure that they are properly utilized

At the community level

- Train agencies and community members in the use of appropriate methods and technology to cultivate, manage and harvesting of important species of NTFPs.
- Develop methodology to integrate indigenous and scientific knowledge concerning conservation, management, and utilization.
- Ensure that poorest members of the communities participate in, and benefit from any type of intervention related to NTFPs.
- Encourage community and private sector to develop NTFP based enterprise
- Develop training materials adapted to local conditions and building on both local and formal knowledge and practice.

At the Farmers or private growers' level

- Raise the awareness amongst farmers regarding the economic benefits of the cultivation of NTFPs.
- Inculcate the farmers with the knowledge of appropriate methods and technology to cultivate, manage and harvesting of important species of NTFPs.
- Encourage farmers to establish NTFP nursery.
- Encourage individual farmers to establish NTFP based enterprises.

2.1.4.3 Project Objectives

The long-term development objective of the project is to reduce poverty and sustain rural livelihoods through improved marketing, processing and cultivation of NTFP resources in the Terai Region of Nepal. The project has two specific objectives:

- i. To improve marketing and processing of NTFPs in the Terai region.
- ii. To develop appropriate cultivation and management techniques for high value NTFPs and promote their adoption in national, leasehold, and community forests and private farmlands.

2.1.4.4 Proposed Study Area

Current proposed project is mainly designed to concentrate in three Terai districts of the eastern Nepal to promote marketing, processing and increased adoption and sustainable management of NTFPs. These districts are Jhapa, Morang and Sunsari. At present, there is not any significant donor agencies support for the development of NTFPs in these districts even though these districts have the high potential (CEDA 2004 e).

Terai occupies 14% of the total land area while it is the homeland for about 48.4 % country's population. The cultivated land area is under high pressure to accommodate huge population. Due to the lack of alternative means of livelihood, rural people largely depend on the forest resources. There is a tremendous pressure on the forests of the Terai region, as a result there is a sharp decline in forest resources including NTFPs of the region.

Nepal Terai is a narrow plain extending from east to west and bordered by Churia hills (Siwalik range) to the north and India in the south. It is located between 26° 22' - 29° 10' N latitude and 80° 00' - 88° 12' E longitudes. Latitudinally, the Terai falls in subtropical region. However, the Terai belt is classified as tropical region on the basis of climate (precipitation, temperature, physiography, floristic characteristics, species composition, and mixture).

The climate of the region is subtropical/tropical with summer monsoon and with eight months dry period from October to May. The temperature is maximum 45° C in summer and minimum 2° C in the winter and the mean annual temperature of 20° C. In most of these areas precipitation occurs during June to September. The Terai region can broadly be divided into three sub regions depending on the rainfall pattern. Eastern sub region receives the annual precipitation above 2000 mm, the central sub region receives the precipitation between 1000 mm to 2000 mm. and the western sub region gets less than 1000 mm of precipitation (ibid.).

2.2 Synthesis of the Analysis

(a) Specific Objective(s) Achievement	Realised
(b) Outputs	Realised
(c) Schedule	Delayed, not seriously
(d) Actual Expenditures	Below planned
(e) Potential for replication	Significant potential
(f) Potential for scaling-up	Significant potential

PART III: CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

3.1.1 Quantitative Resource Assessment

- Justified methods to quantitatively assess NTFP resources in a geographical area seem lacking. Either an approved methodology has to be traced, or one should be developed.
- The domestic use of NTFPs, especially medicinal plants used in home remedies seems to have little or no impact on the depletion of resource, as the quantities harvested are relatively small and most of them are non-commercial species.
- Almost all NTFPs of commerce come from wild collection. A demarcation line needs to be drawn between the state property resource and the private property resource. This would facilitate their subsequent conservation, management and development.
- Although a large number of NTFP species are used for commercial purposes, only a few species cover the major proportion of the volume and value in trade.
- Majority of the DFO personnel and most of the Custom Office personnel are not very familiar with the identification of NTFPs in their raw forms (CEDA 2004 a; CEDA 2004d)

3.1.2 Cultivation and Management

Awareness about the crucial role that the NTFPs play in supporting the livelihoods of the forest-dependent communities has grown manifold in the recent years. Policy makers, funding organizations, governments and voluntary organizations working in the forestry sector are convinced that sustainable management of NTFPs has become an inseparable part of pro-poor forest management. In order to improve the policy framework, the MFSC needs to continue dialogue with the stakeholders, line agencies and the traders in the overall production of NTFP, including cultivation and management to minimize the hurdles. A review of existing government policies, rules and regulations, royalty rates need to be revised on regular basis for the sustainable development of NTFP resources in Nepal.

Provisions should be created to make sure that the collectors and the CFUGs get fair return from NTFPs. The expanding market of NTFPs on the one hand, and the challenge of improving rural livelihood on the other, demand a more sustainable, efficient and scientific management of NTFP resources in a framework that provides opportunities to growers, collectors, local traders and the end consumers.

There is a lack of information on appropriate cultivation and management techniques of NTFPs, which vary significantly with the species. The DOF, DPR and DFRS under the MFSC, NGOs/INGOs involved in the NTFP development and the role of industrial enterprises such as HPPCL and Dabur-Nepal can be crucial in this context. The situation also calls for effective training and extension services (CEDA 2004 b; CEDA 2004 d).

3.1.3 Marketing

The value of medicinal plants and NTFPs in the pharmaceuticals and herbal productions have been rapidly increasing worldwide. This has led scientists, researchers and multinational pharmaceutical companies investigate available plant species for active substances that could be useful for the cure of various diseases.

The official record of the Ministry of Finance reveals that herbs worth of NRs. 71.5 million were exported to India and worth of NRs. 25.9 million to other countries in 2000/01. The Customs Department records indicate that about 135,000 metric tons of NTFP have been exported to India in the fiscal year 2002/003.

Considering the fact that all transactions and usages are not reported and documented, a significant number of collectors often do not take collection permits and a significant amount of NTFPs are illegally exported and/or transported to different parts of Nepal, it may be concluded that the contributions in national choffer may be much more higher than the existing level (CEDA 2004 c; CEDA 2004 d).

3.1.4 Project Proposal

- The pre-project entitled, "*Preparation of a Project Proposal for the Promotion of Non-Timber Forest Products in the Terai Region of Nepal*" resulted into three different thematic reports, namely (i) Current Status of Marketing of NTFPs, (ii) Status on Cultivation and Management of NTFPs, and (iii) Quantitative Resource Assessment.
- Based on the above mentioned thematic reports, a detailed project proposal entitled, "*Sustainable Management and Utilisation of Non-Timber Forest Products in the Terai Region of Nepal*" was developed as per the main goal of the pre-project.
- The long-term development objective of the project is to reduce poverty and sustain rural livelihoods through improved marketing, processing and cultivation of NTFP resources in the Terai Region of Nepal.
- Current proposed project is mainly designed to concentrate in three Terai districts of the eastern Nepal to promote marketing, processing and increased adoption and sustainable management of NTFPs. These districts are Jhapa, Morang and Sunsari (CEDA 2004 e).

3.2 Recommendations

3.2.1 Quantitative Resource Assessment

- Due to lack of justified methodology to assess the resources in the wild, it is necessary that information on their economic flow should be properly recorded and analysed.
- Information on the use of commercial NTFPs for household purposes needs to be worked out quantitatively so as to understand the share and contribution of wild plant resources in the rural livelihoods.

- The productivity and production potentials of every NTFP species in their respective undisturbed habitats should be studied and recorded so as to understand the optimum productivity levels for each species under varied conditions.
- Out of the large number of commercial NTFP species, only a few species constitute the major proportion in trade both in terms of volume and value. Such species should be prioritized for additional research and development and management practices.
- Research on optimum harvest levels for every NTFP species should be conducted both *in situ* and *ex situ* so as to generate information both in forestland and farmland. Without this, it is not possible to sustainably harvest the product.
- Short-duration training on identification of commercial NTFPs should be frequently organized for the DFO and Custom Office personnel to overcome the existing difficulties created due to lack of knowledge on identification of Spp (CEDA 2004 a; CEDA 2004 d).

3.2.2 Cultivation and Management

- There is an urgent need to develop cultivation and management techniques for high value NTFPs such as Kurilo, Sarpagandha, bamboo, rattan, sabai grass and Amriso as there is growing interest of CFUGs, and private growers towards these NTFPs.
- The coordination between the Department of Plant Resources (DPR), DFRS and Institute of Forestry (IOF) should be institutionalised so that students have free option to choose potential NTFPs for an elective course.
- The scope and opportunities for NTFP management within community forests and leasehold forests needs to be widened for which the Forest Acts 1993, Regulations 1995 need to be revised to meet the present challenges.
- Promotion of aromatic plants such as Mentha and Chamomile without replacing the main crop in farmland as intercrops can play a significant role to create extra employment/income generation opportunity in the Terai and Inner-Terai Regions of Nepal.
- Enrichment plantings using locally collected materials should be encouraged, particularly in areas where NTFPs have been depleted by uncontrolled collection, and unscientific management activities and/or biotic disturbances.
- The government system of issuance of permit for NTFPs collection by DFOs needs to be revised. The permits should be issued in the districts where they are originated and quantity permitted should be based on resource inventory and environmental impact assessment (CEDA 2004 b; CEDA 2004 d).

3.2.3 Marketing

- A market information system could be significant cost-effective leverage, which would be beneficial to the local traders and collectors in Nepal.

- The minor processing, like cleaning and grading, packaging, cutting and grinding and drying, which does not involve any machine and special technology could offer a significant increase in income of villager groups undertaking improved trading activities
- The distillation of raw materials closer to the source allows for a reduction in transport costs and also contributes to the local economy.
- It is suggested that market studies, visits, observations and participation in trade fairs and exhibitions be organized to obtain information on price, demand and market of NTFPs.
- The royalty rates applied to all products should be reviewed and set more in line with the economic impact these royalties have on the products position in the market. A clear criterion for royalties should be developed that is transparent and linked to some reasonable objectives.
- A review of the export ban some NTFPs should be carried out carefully investigating the availability of the plants, commercial exploitation and biological aspects (CEDA 2004 c; CEDA 2004 d).

3.2.4 Project Proposal

- The pre-project study had identified problems in; coordination and linkages amongst stakeholders, incentives to NTFP producers, unpredictable market, regular monitoring mechanism, open access to NTFP resources, research and development, quantitative resource assessment of NTFPs and scientific knowledge regarding NTFPs. The proposed project should try to address those problems for its successful implementation.
- The major strategies proposed project should adopt should be; poverty reduction, participatory approach, partnership building and capacity building.
- The proposed study should provide concrete findings regarding the marketing, processing, cultivation and management techniques for high value NTFPs so that the findings could be replicated and scaled up to the other districts of the Terai region of Nepal as well (CEDA 2004 e).

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