NAMA Facility

NAMA Support Project Outline

Ambition Initiative – Round Two

To the Members of the NAMA Facility Board
NAMA Facility - Technical Support Unit (TSU)
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Country:	Nepal
Project Title:	**Nepal's Mitigation Action (NeMA):** **Promoting Sustainable Forest Management and BioEnergy**
Applicant:	Ministry of Forests and Environment (MOFE), Government of Nepal (GON)

The following documents and annexes are enclosed:

List of abbreviations

DPP	Detailed Preparation Phase
GCF	Green Climate Fund
GHG	Greenhouse gas
GID	General Information Document
MoFE	Ministry of Forests and Environment
NDC	Nationally Determined Contributions
NSO	NAMA Support Organisation
NSP	NAMA Support Project
ODA	Official Development Assistance
SMF	Sustainable Management of Forests
TA	Technical Assistance
ToC	Theory of Change
TSU	Technical Support Unit of the NAMA Facility
NeMA	Nepal's Mitigation Action
ARI	Acute Respiratory Infection
REDD+	Reducing Emissions from Deforestation and Forest Degradation

RPP	REDD+ readiness Preparation Proposal
BDSPs	Business Development Service Providers
DFO	Division Forest Office
CFs	Community Forests
PFs	Private Forests
GMF	Government Managed Forests
PRD	Provincial Directorate of forests
SMEs	Small and Medium Enterprises
CFUG	Community Forest User Group
IT	Information Technology
COP	Conference of Paris
FDF	Forest Development Fund
FY	Fiscal Year
UNDP	United Nations Development Programme
COVID-19	Corona Virus Disease 2019
GDP	Gross Domestic Product
LPG	Liquified Petroleum Gas
SPM	Suspended Particulate Matter
SOx	Sulfur Oxide
BC	Black Carbon
PM	Particulate Matter
GFOI	Global Forest Observations Initiative
NDCP	NDC Partnership
GCF	Green Climate Fund
BRCRN	Building Resilient Chure Region in Nepal
FPP	Forest for Prosperity Project
AFOLU	Agriculture, Forest and Other Land Use
SNRM	Sustainable Natural Resource Management

1 NSP Concept

Executive summary 595 words

The proposed project aims to build the capacity of Nepal's three levels of governments forest communities and private sectors in order to enhance carbon sequestration capacity of about 75,060 ha forests that directly contribute to reduce emission by at least 4.91 million tCO2 eq, creating 760,000 person days of employment opportunity from sustainable management of forests and pellet production, generating more than 5 million US$ equivalent additional income and improving livelihoods of at least 100,000 men and 200,000 women of the three districts of Madhesh province of Nepal.

The main challenges that the project aims to address are frequent forest fires, inadequacy of sustainable forest management practices and incentive mechanisms, use of cattle dung as cooking energy, and increasing use of coal (fossil fuel) by brick and cement factories and industrial boilers. Forests are simply protected, not managed, hazardous biomass is left behind in the forests despite its huge potential to be used for the production of bio-energy (such as pellets). The use of cattle dung and agricultural residues as cooking fuels account for 489 tons of Oil equivalent or 711 tons of coal equivalent (2005-2018), causing inadequate compost to the field and declining agricultural productivity1. Cement and brick industries operating in those areas use coal as a source of energy. These aforementioned factors are the key challenges to a carbon-neutral development pathway as envisioned by the Second NDC of Nepal.

In alignment with the second NDC, the objective of NSP is to substitute fossil fuel by the use of densified biomass pellets produced from floor biomass .
In addition, the NSP will pay extra attention to the following

- occupational health and safety of local communities and forest workers,
- gender-sensitive policy and practice both at domestic and industrial management,

NSP will bring four transformational changes:

- proper utilization of hazardous forest biomass as part of sustainable forest management practice, converting biomass into pellets and contributing to the reduction of forest fires,
- initiating behavioral change of fossil fuel (coal) consumers and adapting to pellets in brick and cement industries and boilers, contributing to the environmental friendly industrial growth and well-being; and
- creating job opportunities by establishing SMEs related to bio-energy.

NSP will use the following financial mechanisms and business case as below:

Financial mechanisms
Grants
(i) Direct Grants,
(ii)Performance based Payment
(iii) Matching grant

Business cases
(i) Capacity enhancement of Federal, Provincial and Local Government Entities
(ii) Partnership for private forest promotion
(iii) Mobilization of the local Forest User Groups

(iv) Partnership with private sector entrepreneurs

A sum of 20.05 million Euros is requested from NAMA Facility for implementation.. By doing so, NSP is expected to leverage 31.8 million Euros of public, private and other donor funding to support the implementation to maintain the NSP assets beyond the life of the project.

Co-benefits include increased forest condition and biodiversity, watershed, farmers' increased revenue, , and better provision of ecosystem service impacting residents within the intervention area of the NSP.

[1] Coal Resources and Their Status in Nepal. Department of Mines & Geology (DMG), Ministry of Industry,Government of Nepal

1.1 Barrier analysis

- [~ 500 words, present analysis as a text, table or in bullet points]

Areas/Actions	Statement	Current Plans/Actions	Lesson Learnt
Regulatory	Unclarity of the functions of three spheres of government over the management of forest resources, poor forest governance, tediously working procedures, non compliance of legal frameworks and policies	Nepal has formulated Second NDC, third communication report, REDD+ strategy, national forest policy and legal framework. Nepal's community and collaborative forestry approach promotes transfer of management rights of forests to local communities. Utilization of biomass from community and collaborative forests for bio energy could be an opportunity for addressing the forest fire challange.	Devolution of power to local government and communities can help to develop local ownership; robust compliance and monitoring mechanism, capacity building of government staff and logistic facilities can help improve governance. Need clarity of the division of roles and responsibilities, benefit sharing mechanism among three level of governments and local communities and incentive system to attract private sector investment
Financial	Low-level investment in the forestry sector, cumbersome bureaucratic process to attract private sector to market forest products, disregarding of forest economy and investment potential by commercial banks and remittance agencies. Forestry sector gets only less than 2% of the total annual budget (UNICEF)	NDC proposes more than 50% of the Terai forests be managed sustainably. Forestry for prosperity projects targeting planttaion in public and private land.	Increased participation of local population and government and private sector investment in forestry and environment sectors create local employment. Simplification of bureaucratic processes is also required to encourage the private sector to invest in GHG emission reduction and carbon sequestration.
Socio economic	Poverty and social exclusion, gender issues, lack of job opportunities, shortage of domestic labor due to migration abroad.	At least 50t least 50% income of community and collaborative forests needs to be spent for poverty reduction, women empowerment and enterprise development (Forest Act, 2019). The overall income from forests,	Increase in investment in sustainably managing community and collaborative forests subsequently contributes to poverty reduction, gender equality and social inclusion. Create enabling policy and incentivizing entrepreneur in the

		however, is below their potential.	forestry sector can create space for poor and women for job opportunities and prevent youth migration abroad in search of employment opportunities.
Technical	Lack of technical management capacity of the forest agencies - inadequacy of skilled human resources, institutional set up at local level, fire fighting, harvesting equipments and efficient hauling mechanism	The government is providing some technical training on forest management but not sufficient.	Enhancing technical skills of sustainable practice of forest pruning, thinning and cleaning and efficient logistical and managerial capacity of stakeholders could help to develop forest-based enterprises that create local employment.
Behavioral/ Cultural	Reluctance in changing behavior from the use of cow dung as fuelwood to alternative sources, lack of policy incentive to make industries aware of the benefits of using bio-energy over fossil fuel	Government is making people aware on the importance of the use of renewable energy but at the same time providing LPGs and petroleum products in subsidized rates	Need for an appropriate policy framework, education and awareness campaigns to facilitate behavioral and social changes to switch over the use of agriculture residue, cow dung and fossil fuel to bio-energy
Structural	Unclear legal and regulatory framework and organizational structure of forest agencies to govern forests by local, provinces and federal governments, local communities and farmers.	GoN has been preparing guidelines to clarify the roles and the forests under the jurisdiction of federal, provincial and local governments, communities and family forest owners.	Giving management responsibilities of the national forest close to the settlement to the local level could give better output.

1.2 Project rationale

Further information in Annex 2

[~ 1500 words]

- **Starting situation and barriers addressed**:

The NSP will intervene in those municipalities of Madesh province in the central south part of Nepal where rural farmers use firewood and cow dung as the major sources of cooking energy. Many brick and cement factories and also the boilers, the main consumers of the imported fossil fuel, are also in operation in these areas. The REDD+ readiness Preparation Proposal (RPP) of Nepal has identified forest fire, unsustainable management of forests and waste biomass are the major sources of emission in this region. So, this project will work very closely with all three sphere of governments, local communities and private sector in a coordinated manner to address the main drivers of GHG emissions i.e. use of fossil fuel (coal), wood fuel, agriculture residue, forest fire, and forest degradation due to the lack of sustainable management of forests.

This project intends to collect forest biomass (hazardous source of forest fire) produced naturally and during the process of forest management operations and utilize them to promote alternative energy (biomass pellet as bioenergy) and promoting the behavior change of industries and domestic consumers to switch over from coal and wood fuel to densified pellets as bio-energy.

Objectives of the NSP:

The main objective of NSP is to contribute to achieving Nepal's long term strategy to net-zero emission by 2045. The outcome of the NSP is enhancement of carbon sequestration and emission reduction capacity of forest and behavioral change of fossil and conventional (cow dung and firewood) fuel users to switch over to low carbon emission densified bio pellets. By the end of the NSP 75,060 ha of forest will be sustainably managed thereby contributing to production of 100,000 Mt of bio-pellet per year, reduction of 4.91 M tCO2 equivalent emission. In addition, the project intends to demonstrate the practical tools to be used and institutionalized in the area of occupational health and safety measures, gender sensitive bio-energy based SMEs to be established and operated. Overall, these ambitions will cover the entire cycle of adapting to new changes and emitting less in the long run.

Scope of the NSP:

- Compliance and implementation of the established forest and agriculture policy, legal, institutional and tenure framework at federal, provincial and local government levels conducive to a good governing practice for sustainable forest management of government, community and private forests and climate smart agriculture.
- 75,060 ha of currently unmanaged forest are sustainable managed to produce 165,000 Tons of biomass per year which otherwise would cause forest fire with a potential annual emission of approximately 605,000 tCO2eq from forest floor biomass.
- 100,000-ton densified biomass pellet will be produced and used each year to substitute fossil fuel(coal) in cement and brick industries, industrial/commercial boilers and firewood in domestic cooking energy
- 2,500 people, largely unskilled local individuals, mainly women (70% or 1750) in particular will obtain full time employment in the collection of biomass2 . USD 33 million saved by avoiding import of coal and diesel using convertible currency. Five no of new bio-energy based enterprises established. 165,000 ton of hazardous forest biomass is

converted into bioenergy annually and additional investment value 8.5 million US$ through private sector actors

- 50% annual reduction of forest fire and the burning of agricultural residue which otherwise would contribute to the emission of 981,239 tCO2. Conversion of hazardous biomass to make pellet contribute to improve the forest health of 75060 ha and generate employment of women and local population, improve health of children and elderly who are most affected by the poor quality of air .

Target group(s):

3 Federal Ministries, their relevant departments and parastatal organizations under the Ministry of Forests and Environment, Agriculture and Livestock Development and Industry and Commerce, one (Madesh) provincial Government and 53 local governments. The main role of these agencies would be to provide enabling policy, legal and procedural framework to all the stakeholders involved in the NSP. Moreover, 252 local forest user groups and 5000[3] farmer households organized in family forests associations are also the primary target group of the NSP.

5 Private sector investors (e.g. stove manufacturer, wholesalers etc.)

3 Commercial banks

5 Pellet producing industries

100 plus locally available business development service providers (BDSPs) - Trained local human resources in the area of business planning available locally in the settlement will be mobilized as incubators and facilitators as an agent for establishing linkage among potential SMSEs, investors, banks, government entities and

Helvetas Swiss Intercooperation as NAMA Support Organizations and BAKAS Renewable Energy Private Limited as main implementing partner will collaborate with all these organizations and agencies to ensure that the project will achieve its objectives.

[2] (Source: Field test by BAKAS: one person harvests 300 kg forest floor biomass per day and assume 220 working days/year)
[3] (estimated private forest size of 0.5 ha/family)

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1.3

Project conceptional. business case / model, financial support mechanism, and capacity building

○ Further information in Annex 2 and 5a/5b

○ [~ 3000 words

▪ **Proposed technologies/practices**

This NSP aims to reduce emissions and enhance carbon sequestration from sustainable management of national and private forests and improve the economic condition of local communities creating employment opportunities in forest management and forest based enterprises. The conceptual theory of change (ToC) of the proposed NSP is presented below:

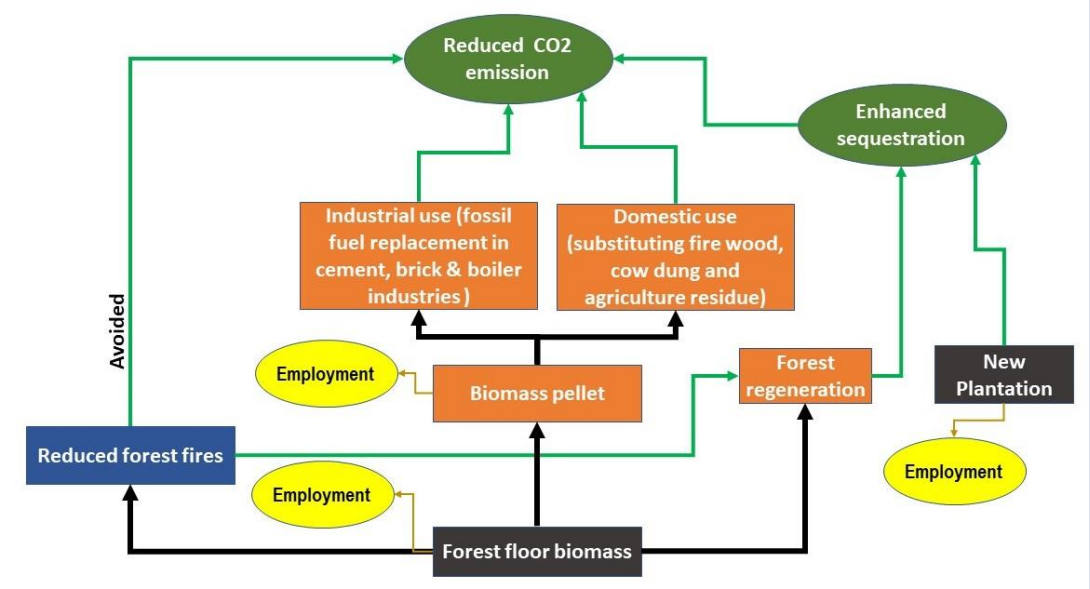

Figure: Theory of Change of the proposed NSP

To achieve the above mentioned objective the NSP will focus its intervention on four highly integrated outputs which form the key pillars of its intervention:

- **Output 1**: Improved National Forest Management.
- **Output 2**: Afforestation and private forest management promoted
- **Output 3:** Production and utlization of the biomass pellet
- **Output 4:** Improved Governance Framework and dialogue.

Output 1 Improved Forest Management:

Sustainable Management of Forests (SMF) has been a major policy agenda of the Ministry of Forests and Environment, thus tending of forests and removal of hazardous substances from forest to control forest fire and enhance carbon sequestration will be the major mitigation actions. Lack of implementation of SMF policies and plans are the main barriers for increased capacity of forests to enhance carbon stock for mitigation measures.

Scope: The total area of the national forests of the proposed project is 75,060 ha, of which a total of 54,278 ha forests are community, collaborative and leasehold forests directly managed by 252 community groups. But due to lack of management plan and intensive labor requirement, the management including tending operation and disposal of hazardous biomass is poor and could be improved significantly. So, there is a scope of managing 75060 ha of national forests sustainably in the proposed project area.

Value Proposition: Minimize biomass loss from forest fire by collecting the biomass fuel and utilizing them for pellet production. By the end of the NSP, approximately 495,000 tons of biomass will be removed to prevent burning from forest fires.

Key activities: Support local communities for the preparation and implementation of forest management plan of the handed over forests.

This will be done through:

- Preparation/ revision of forest management plans;
- Tending operation as prescribed by the forest management plan;
- Setting up sustainable financial mechanism to ensure implementation of actions after the NSP completion;
- Strengthening provincial and local forest services in monitoring implementation of the forest management plan; and
- Enhancing collaboration between the Community based Forest Management Groups and forest administration

To achieve this output, the project will apply the business model no 1 and 3 described below in the concept note.

Technical assistance (TA) measures

Technical assistance will be provided for the preparation and revision of the forest management plans. For this the NSP will provide capacity building training for the staff of provincial government, division forest offices, community-based forest management groups and community leaders.

Output 2: Afforestation and private forest management promoted

Private forests have been an integral part of the Nepalese farming systems and rural livelihoods. The extent and coverage of registered private forests (PFs) in the country is not very encouraging. However, the Terai districts have a higher number of PFs in comparison to hill districts., The share of timber supplied in the market from the PF is very high (83.17%), higher than that from community forests (CFs) or government-managed forests (CFD 2017).

Scope: Private forestry is one of the important sources of income for many farmers in the proposed project districts. They are switching into it due to a number fo reasons including low fertility of land, labour shortage and higher income potential of timber.

Value Proposition: Support private forest management of 2,000 ha and establishment of private plantation in 500 ha

Activities:

1. Technical support to forest seed nursery
2. Support establishment of private tree growers' network
3. Provide financial incentive to grow trees on their land.

To achieve this output, the project will apply the business model no 2 as described below in the concept note.

Output 3: Production and utilization of biomass pellet

Fossil fuel (coal) is the major source of energy use in brick and cement industries in Nepal. Firewood, cow dung and agricultural residue are the most abundantly used sources of cooking energy in rural settings although it is in reducing trend, substituting it with LPG. However, these practices are harmful for health and the environment. It is in this context that the proposed project, the first of its kind, can be justified that aims to implement the ambitious policy of sustainable forest management and can substitute the use of fossil fuel (coal) , wood fuel and hazardous biomass by environment friendly bio-energy that generates revenue, and increase employment.Forest fire is a major source of carbon emission and forest degradation in the project district because of not doing any tending operation and removal of hazardous forest biomass on time. If the forests are managed with regular tending operation and available biomass is collected and used for densified pellet production, there will be biomass fuel available for substituting fossil fuel in the industries and cooking energy.

Pellet production from the forest floor biomass has recently been initiated in Nepal by BAKAS and it is expected to start production by 2022. Installation of pellet producing plant with a capacity of producing 20,000 tons of pellet production from forest floor biomass has been established. Conversion of hazardous biomass to pellet making will prove to be the *pearl from the peril or making black diamond from green gold.* This ultimately contributes to reducing the emission to a great extent and generates employment and supports people's livelihoods. In addition, it initiates the behavior change of people to use pellets (instead of raw wood fuel), which reduces the smoke, would be another mitigation action that the NDC aims for.

Scaling up the production and consumption of pellet, and pellet manufacturing industries would help increase employment and the country's economy on a larger scale. It is an ambition towards promoting environment friendly economic activities which conserve forest resources, biodiversity and saves human health from air pollution. Biomass of deciduous forest land (which is almost 44% of Nepal's landmass) causes massive forest fire each year. Besides, burning of agricultural residues is a traditional practice. These two combinedly contribute GHG emission, which causes rise in pollution level. In the past year Kathmandu's pollution level was marked as 400 AQI, at its maximum due to the smoke emitted from forest fire.

The most ambitious action of the NSP is to change the behavior of both industrial consumers of fossil fuel (coal) and domestic consumers of wood fuel and agriculture residues and enable them to switch over to the use of environment friendly decarbonated bio energy i.e., Pellets.

Scope: The current piloting of decarbonated pellet production is 20,000 tons per year, which demands 33,000 tons green biomass. Sustainably managed forests of the proposed NSP districts could produce approximately 270,000 tons of biomass available for pellet production. In addition, management of some 2000 ha forests could also generate additional

10,000 tons of biomass. So, there is a good scope of producing more than 170,000 tons of biomass pellet in the project districts.

Value Proposition:

. The NSP, based on the ongoing pilot, aims to expand the capacity to 40,000 tons in year 2 and 60,000 tons in year 3 of its implementation. The production capacity in year 4 will increase to 80,000 tons and 100,000 tons in year 5 of NSP implementation.

Key activities:

1. Sustainable management of forests and removal of hazardous forest biomass
2. Upscale the manufacturing capacity of biomass pellet production and expanding the *market* across in the country and in the region (along Indian border on the South and East of Nepal) by collaborating with private sector
3. Awareness raising of stakeholders (mainly brick and cement industries, boilers, rural households) and facilitation for switching over to biomass pellet from fossil and conventional fuel (cow dung, firewood, agri-residue).

To achieve this output, the project will apply the business model no 4 and 3 described below in the concept note.

Payment to these private sector entities will be made through this NSP as a matching fund for the establishment of SME enterprises for biomass pellet production and consumption of pellet for industrial and domestic use to replace fossil fuel and wood fuel.

Collaboration with BDSPs play a vital role in promoting and marketing the pellets. From making operational strategies to executing marketing campaigns, these BDSPs will be responsible for creating a brand value of the finished product. Pellets need to be easily accessible to the general public.

Output 4: Improved Governance Framework and enabling environment.

Forest strategy of Nepal (2016-2025) states that "Strong community forest rights help communities protect their forests, reducing CO_2 emissions from deforestation and improving forest health". Improving governance is key to addressing the drivers of deforestation and forest degradation. essential in sustainable management of national and private forests involving public and private actors, and from formal and informal sectors.

Scope: Participatory Forest management is a proven successful practice in Nepal. However, effective participation of different stakeholders is essential to address key forest management issues, and involve other sectors that affect, or are affected by, forest governance. Among them, women in particular must be taken into account. It is essential that women be involved in these processes because rural women's dependence on forests is different from, and often greater than, men's due to the gender division of labor and different access to economic resources. In Nepal, policy, legal, institutional, and regulatory frameworks for the forest sector are generally robust, although there is room for improvement. Significant efforts are needed to reform and strengthen national planning and decision-making processes as well as to improve implementation, enforcement, and

compliance with forest policy laws and regulations. This NSP will work to improve good governance practice in forestry sector by performing the activities as described below.

Key activities:

1. Support review and revision of the Forest Act and Regulations to enhance private sector involvement in forest management
2. Support the provincial government to prepare a simple working procedure on the management of biomass fuel produced during the tending operation of forests.
3. Support development of guidelines for the benefit sharing of the income received from biomass fuel management among user group members
4. Awareness and capacity building of women and marginalized groups for effective participation in forestry sector decision making process
5. Prepare a guiding document of government/s to include the principles of good governance like adherence to the rule of law; maintaining transparency; effective participation of stakeholders in decision making process, ensuring equal rights for stakeholders; maintaining accountability and minimizing regulatory burden
6. Empower forest managers for cross-border collaboration and information-sharing.

To achieve this output, the project will apply the business model no 1 and 2 described below.

- **Business case/model related to the proposed technologies/practices**

Business Case 1: Capacity enhancement of Federal, Provincial and Local Government Entities

Capacity enhancement of federal and provincial government entities for the management of national forests and plantation areas including 10,000 ha Sagarnatha plantation area. This involvement shall bolster the priorities set out in the NDC with viable actions and procedures.

The joint investment of the federal, provincial and local governments would facilitate forest governance enabling them for sustainable management of forest and plantation areas.

Payment will be made based on the areas of forest protected and managed sustainably and the quantity of fire hazardous biomass extracted annually from the forests by the governments through their own resources (leverage for NeMA).

Business Case 2: Partnership for private forest promotion

Tripartite agreement will be made among the project, local government and households for the promotion of trees and vegetation in 500 ha cultivated private and communal land and sustainable management of already established 2000 ha private forests for mitigation measures. Farmers will be educated and trained on biological carbon sequestration and ethical plantation.

A joint investment between the local government and the NSP is envisioned in this business model.

Business Case 3: Mobilization of the local Forest User Groups

This model emphasizes the mobilization of the local community and collaborative groups for the sustainable management of forests. Grants will be provided to forest management groups through the DFO for SMF. In addition, User groups will get reimbursement from the Divisional Forest Offices through government fund following the verification of the implementation of user groups' forest operational plan based on the result agreed. The indicative results would be the area of forest protected and managed with tending operation, biomass generated and fire protection measures are undertaken, area of the plantation, improved condition of forest and vegetation, and so on.

The performance-based grant will be made to 196 Community Forest user Groups, 7 Collaborative Forest User Groups (CFUG), and 49 leasehold forestry groups will be mobilized under this model by the Government through DFO after upfront support from NSP in the first cycle.

Business Case 4: Partnership with private sector entrepreneurs

This model highlights the partnership with private sector entrepreneurs and BDSPs. This directly prompts private sectors and investors to get involved where result-based payment will be ensured based on the agreed result areas.

The engagement of BDSPs is key to leverage private sector investment and link the private sector with the financial institutions and potential investors (commercial banks, cooperatives and returnee migrants).

the private sector actors include:

(i) biomass processing/ bio-energy pellet producing enterprises;

(ii) pellet consumer industries such as brick and cement industries, boilers

(iii) Potential investors for SME related to bio-energy;

Payment to these private sector entities will be made as a matching grant to their investment based on the result of the establishment of SMEs on the production target of biomass collected, processed and pellet produced and the consumption of pellet for industrial and domestic use to replace wood fuel and fossil fuel.

The above business models and financial mechanisms aim at supporting the implementation of planned activities of the NSP. The choice of the proposed model/s is based on their efficiency in reaching the NSP outcomes economically and at the same time ensuring the sustainability of the project results. It is planned that the whole NSP funding will be absorbed during the period of NSP implementation. At the end of the NSP, the ownership of the outcomes will be handed over to the respective legal entities outlined in all 4 business models

Financial support mechanism(s)

The key financial mechanism for the NSP will be grant in the following forms.

(i) Direct grant- Direct payment will be made to SMF groups. For the SMF groups, the grant will cover costs for cutting and chipping equipment and some upfront grant for initial mobilization of community. Later, when they start earning by selling the biomass, the NSP will stop providing grant. For private actors, grants will basically cover the partial cost of establishment especially the costs for new technology/plants/machineries.

(ii) Performance Based Payment- for private forest management and private plantation Performance based payment will be provided to farmers for establishing new plantations in their farmland and management of plantation forests. Similarly, performance-based grants will also be provided to private companies based on the quantity of biomass pellets produced per year. Agreement will be made with Division Forest Offices (DFO) for the performance-based grant. The grant will be provided to the farmers based on the performance report verified by DFO.

(iii) Matching grant: Matching grant will be provided to leverage Private Sector Investment for establishment and operationalization of pellet producing enterprises Agreement will be made with the commercial bank and microfinancing institutions for providing matching grant. Detailed mechanisms for this will be established during the DPP phase.

- **Key milestones and activities during the NSP implementation**

What are key milestones and activities during the NSP Implementation Phase to achieve the objectives of the NSP?

For NSPs piloting novel technologies, please state clearly the duration and the milestones to be achieved by the smaller pilot phase preceding the scale-up of the project.

The proposed NSP is about Sustainable Forest Management, and Bio-Energy based initiatives. Its bigger aim is to reduce GHG Emission and enhance carbon stock made from forest and biomass management. It focuses its interventions in 2 main areas: (i) reducing emission from the improved management of 75060 ha forests, avoidance of burning of 375,000 Mton of biomass and use in replacement of fossil fuel (coal) mainly in brick and cement industries and boilers, and (ii) changing behavior of domestic and industrial consumers of wood fuel/agricultural residues and coal to switch over to the use of bioenergy.

These actions will contribute to convert hazardous (fire) forest floor biomass into pellets (densified bio-energy), contribute to the social and economic development of the populations and provide a solid model of sustainable forest management. Total Forest cover within the NSP intervention area is 75060 ha including private agricultural land with tree cover totaling 2000 ha. 252 community, leasehold and collaborative forest user groups will engage in the management of these forests.

Table: Key milestones of the NSP is presented in the table below:

S. N	Key activities	Achievement time				
		Year 1	Year 2	Year 3	Year 4	Year 5

1	Preparation/revision of forest management plans for handed over participatory forests (cumulative, in Ha)	21,600	32,400	43,200	54,000	
2	Forests with tending operation completed (Ha, cumulative)	10,800	21,600	32,400	43,200	54,000
3	Afforestation in private and farmland (Ha, cumulative)	50	150	300	450	500
4	Private forest management (Ha, cumulative)	500	1,000	1,500	2,000	
5	Densified biomass pellet production (Tons/year)	20000	40000	60000	80000	100000

In addition to carbon revenue, non-carbon revenue will also be generated. These include: better ecosystem service upstream conservation, soil fertility improvement, watershed management and water source availability, income generating activities, more productive agriculture practice- the expansion of cash crops through agroforestry systems outside natural forests such as coffee, tea and fodder trees on private land.

1.4 Embedding

[~ 1500 words]

- **National climate policy context**

Nepal has set an ambition to reach zero emission or carbon neutrality by 2045 under the COP26 summit held in Glasgow. It has signed the Paris Agreement, and has prepared Nationally Determined Contributions (NDCs) – the first in 2016 and second in December of 2020, which aims to increase the sequestration capacity of carbon stocks and reduce GHGs emissions by taking actions to mitigate and minimize climate related risks and generate adaptive approach and strengthen resilience, By 2025, for example, Nepal intends to enhance sink capacity of land use sector by instituting the Forest Development Fund (FDF) for compensation of plantations and forest restoration (NDC 2020:p6). Similarly, by 2030, Nepal aims to ensure 15% of the total energy demand is supplied from clean energy sources (NDC, 2020: p2). For which, it aims to maintain 45% of the total area of the country under forests cover and put at least half of Terai and Inner Terai forests and one fourth of middle hills and mountain forests under sustainable forest management regime including through the use of funding from REDD+ initiatives (NDC, 2020: p3).

- **National Covid-19 pandemic context and green recovery strategy**

The economic impact of the covid 19 pandemic has been devastating for many sectors in Nepal. Unemployment in Nepal has become a matter of great concern putting the pro-poor and rural livelihood at risk. Additionally, the pandemic has affected all but women, poor and marginalized have been affected more than others in terms of job loss, increased debt, shock, domestic abuses and psychosocial negative effects. Economic growth in Nepal has reached a negative level of 2.12% (Nepal Economic Survey FY 2077/78). As per the latest survey conducted by the central bank of Nepal from 52 districts covering 674 businesses, 22.5% of their workforce has been laid off which means that over one-fourth of the Nepali workers are unemployed.

About 23% of households were found to be food insecure whereas ,9% lost their livelihoods (UNDP, August 2020). Most of the jobs have been lost in the hotel's industries followed by agriculture, forestry and fisheries, and business. SMEs and industries have been facing average salary cuts by more than 18.2% on average and lowering their pay by 13.6%[4].
GoN has responded to COVID-19 with different fiscal and monetary measures. It has mainly emphasized four measures: immediate relief program, reduce the impact of COVID-19, economic support measures and liquidity support measures (World Bank, 2020). The government has launched an economic support package that includes deferred payment on tax, concession on interest rate payment and utility payments that cost about 5% of the GDP (World Bank, 2020).

Designing and investing on solutions that are more nature focused such as ecotourism, green transport system, transformation of carbon source to sink and sustainable forest management have been suggested UNDP as key areas for new employment opportunities to address the unemployment problem due to COVID 19 pandemic.

The following package will be offered to these vulnerable and most affected people through local community groups in close collaboration with federal, provincial and local government entities.
Some indicative local actions are as follows.

- Gender-sensitive pro-poor policy provisions and their effective implementation
- Capacity enhancement and formation of human assets: Human capacity is perceived as very valuable for creating educational opportunities.
- Access to physical assets:
- Access to natural resources: Provisions of forest products and biomass, land allocation for land-based income generation activities

Once the project demonstrates its impact in indicative result areas and co-benefits mentioned above, additional revenue can be generated from the sale of GHG Emission Reduction resulting from the actions after the end of NSP period.

- **Sector policy**

Forest and environmental sector including climate change is governed by a number of policy and legal frameworks (see Appendix for details) and these instruments currently revolve around who administers and controls the forest resources. The sector's policy is complicated by the tendency of many to interpret the constitution as a decentralization of functions, as under a unitary government, rather than the devolution of political power to provincial and local governments. In this context both the structures and the organization of the forest sector, as revealed in the new federal Act for Amendment and Integration of Laws Relating to Forest (2019), appear to be a closer approximation to decentralization of functions within a unitary system rather than a real devolution of powers.

The forest sector constitutes the political processes, bureaucratic structures, civil society and private sector organizations. There are other arenas that impact on the sector including infrastructure, industry and finance including the banking sector and agriculture, as well as those institutions responsible for the utilization of land, water and watershed resources.

It is in this context, the climate policy, specifically NDC, aims to achieve net-zero greenhouse gas emission by 2045. For which, by 2025, it intends to enhance the sink capacity of the land use sector, increase growing stock and forest biomass, restore and manage degraded forests, ensure increased access of climate-smart agriculture technologies to women and by 2030 adopt low emission technologies in brick and cement industries, and industrial boilers to reduce coal consumption and air pollution (NDC:2020p4-6).

- **GHG relevance of the sector**

GHG emission target of this NSP is 981,239 tCO2eq per year. The total annual emissions of Nepal is 23 million tCO2 per year. So the proposed project will contribute to achieve the target of a second NDC by reducing annual carbon emissions by 4.3%.

- **Sustainable development co-benefits**

Environmental co-benefits:

The introduction of modern, efficient and climate friendly clean energy solutions will contribute to the reduction of indoor pollution and improve air quality. This action will therefore contribute to the reduction of health issues due to the emissions of particulate matters, particularly for women and children who have more exposure than males. The project itself will also allow an increase in the knowledge of the local government and the stakeholders about the impacts that efficient technologies can have on their daily lives.

[4] https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---ilo-kathmandu/documents/briefingnote/wcms_745439.pdf

Gender-sensitive development impact:
The project enhances the women's access and entitlement of benefits. In addition, the replacement of firewood by biomass pellets will reduce the workload of women for the collection of firewood, resulting in time saving that the women can use for other productive activities.

Social and Economic co-benefits:
The introduction of efficient biomass pellet stoves will increase access to clean, reliable and affordable energy for the population.

On top of it, the coal and LPG replacement will nurture internal consumption of clean energy in line with the hydro power potential of the country and should significantly reduce the government's trade deficit.

- **Related initiatives, programmes and projects**

The relevant projects being implemented in Nepal are:

1. REDD+ Readiness Preparation Support Project. THis project is supported by the World Bank, Forest Carbon Partnership Facility (FCPF) to prepare Nepal to engage in and benefit from the emerging performance-based system for REDD+ within the context of the international climate negotiations of the UNFCCC.
2. Emission Reduction Program. THis program is supported by the world bank and implemented by the MoFE to reduce emission and sale of carbon credits from Terai Arc Landscapes of Nepal.
3. Forests for Prosperity Project. This project is also supported by the world Bank for the key interventions on forest management, increase monetary or non-monetary benefits from forests, and Net GHG emissions (tons CO2 eq.) reduction.
4. Enhancing the resilience of ecosystems and vulnerable communities by adopting climate-resilient land-use practices. This project is being implemented in the Churia region of Nepal, which has a vital role in maintaining the ecosystem of the heavily populated Terai plains. For decades, the region's natural resources have been managed unsustainably, leading to land degradation and now, exacerbated by the effects of climate change.

These project works for emission reduction and enhancement of carbon sequestration from national forest management. The lesson learnt and the tools developed and the best practices of forest management and emission reduction conducted in the above-mentioned project could help for better implementation of proposed NSP.

- **Justification of the NSP and additionality**

The ongoing projects for emission reduction and enhancement of carbon sequestration mainly focused on SMF and has not given attention for the management of forest floor biomass, which is the major source of forest fire and carbon emission in Nepal. The proposed NSP tries one step further to address this issue by using hazardous forest floor biomass to produce densified pellet to replace fossil fuel and thereby contributing emission reduction form the use of fossil fuel and minimize trade deficit from purchasing coal annually from the international market.

2 NSP Ambition

3.1 Potential for transformational change

[~ 1000 words]

The raw material for pellet production is collected from the forest which has dry biomass, the main driver for igniting forest fires in the forest areas during the dry season. The collection and removal of hazardous material from the forest floor will have a direct impact on reducing the events and extent of forest fires in the forest areas. The biomass thus removed from the forest area will be used as a raw material to produce biomass pellets. The pellet has been proven to have the capability of replacing fossil fuels, especially the coal and diesel, wholly or partially from key industrial sectors of Nepal. Notable among them are the cement and brick industries as well as food and beverage industries. Burning of coal produces Suspended Particulate Matter (SPM), Sulfur Oxide (SOx), Black Carbon (BC) and PM10. Coal is the major fuel for brick firing in Nepal while other fuels such as firewood, agricultural residue, rice husk, saw dust are also used. Similarly, coal is the major source of energy for cement industries. Nepal is importing a large quantity of coal each year, which is contributing significant GHG emissions in Nepal. In addition, the country is investing a substantial proportion of foreign currency for buying fossil fuels.

The activities of this NSP like awareness and capacity building of fossil fuel energy users to switch into renewable energy, research and technology development innovation and the financial mechanism developed to promote renewable biomass energy will help to create interest of the stakeholders on the renewable energy. Regular dialogue with different levels of governments to prepare enabling policies to scale up the biomass energy production and use will help to promote the production and use of renewable biomass energy throughout the country. In order to replicate the successful impacts of the NSP, the project will organize field learning visit of stakeholders, regular dialogue with private sector and investors like commercial banks to create their interest in establishing additional pellet producing industries, organizing field learning visit of community based forest management user groups to sustainable forest management sites to understand the importance of biomass collection on reducing forest fire and generating income from the hazardous biomass burning and how local community can get benefit form pellet producing enterprises. These interventions will help to scale up or replicate the successful impacts of the NSP beyond its boundaries contributing a significant role in the carbon-neutral development pathway as envisioned in the second NDC of Nepal.

The coverage of the proposed project is 75,060 ha of national forests from Sarlahi, Mahottari and Dhanusha districts. Sustainable management of forests is proposed in whole forest areas of the project districts. The NDC of Nepal has set a target of managing 50% of Terai and Inner Terai and 25% of middle hills and mountain forests sustainably by 2030. The total forest area of Terai and Inner Terai is 1,785,323 and the middle mountain occupies 2,253,807 ha of national forests. The estimated emission reduction from sustainable management of forests under the proposed NSP is nearly 1 million tCO2 per year. To achieve the NDC targets, Nepal has to manage 892,660 ha forests of *Terai* and *Inner terai* and 563,450 ha of middle hills and mountain forests sustainably. With the present estimate of GHG emission reduction of 1 million tCO2 eq by managing 75,060 ha, there is a potential of GHG reduction of 35.5 million tCO2 eq each year from Sustainable Forest management of Nepal. So, this will have a big transformational change in reducing GHG emission by

	achieving the SMF target of the country. Similarly, replication of this project will help in achieving the national target of 15% of the total energy demand supplied from clean energy sources by 2030. So, with the replication/scaling up of the proposed NSP, there will be a significant technological paradigm shift in achieving the long-term strategy of Nepal's net zero emission by 2045.There will be a significant reduction in the consumption of fossil fuel in Nepal and this will help minimize the trade deficit of the country. The replication of this project demands a large number of skilled and unskilled laborers. So, there will be good employment opportunities in the country and this will help retain a large number of youths migrating each year in search of employment opportunities. So, the proposed NSP will four major transformational changes and they are: 1. proper utilization of hazardous forest biomass as part of sustainable forest management practice, converting biomass into pellets and contributing to the reduction of forest fires, 2. initiating behavioral change of fossil fuel (coal) consumers and adapting to pellets in brick and cement industries and boilers, contributing to the environmental friendly industrial growth and well-being; and 3. creating job opportunities for maximum people by establishing SME enterprises related to bioenergy. 4. fostering government-community-private sector partnership in Sustainable Forest Management and associated bio-pellet enterprises These transformational changes are technically, socially, financially and environmentally feasible in Nepal. Technically, a pellet producing enterprise in Nepal is already established on a small scale and is about to start producing biomass pellets from forest biomass of plantation forests. The use of pellets for substituting coal is already tested in cement and brick industries and proven that it is technically feasible. Large number of skilled and unskilled human resources is required for this purpose. So, this NSP will provide employment opportunities to a large number of people. In addition, the biomass pellet produces less smoke compared to firewood and there will be less respiratory disease problems if the pellet is used for cooking. So, this technology will be socially accepted. Pellet production will be cost effective compared to purchasing fossil fuel for industrial use. So, the cost of importing fossil fuel will be reduced significantly. The dead/dry biomass available in forests is the major source of forest fire each year. The fire has a negative impact on biodiversity and ecosystem health. The forest fire is also a major source of environmental pollution. If the biomass is collected each year from sustainable forest management sites, there will be less biomass available for forest fire. So, this type of intervention is also environmentally sound and very easy to show demonstration effect so that the stakeholders will motivate for its replication.
3.2 Financial ambition [~ 1000 words]	For NSPs piloting technologies, please elaborate on the source and quantity of the financial contributions that are expected during the pilot and scale-up stages. This NSP ambition is to leverage 31.8 million Euros funding from different sources to directly contribute to support its implementation and in opening sustainable funding to take over required support after the NSP completion. This leverage is not possible until a demonstrable project is established and ready to be replicated. Private sector at this time is

Further information in Annex 5a and Annex 5b	reluctant to invest in forestry due to regulatory and bureaucratic barriers as well as the risks associated with uncertainty in a new area of investment. Community groups managing forests are not currently capable of capital formation and investment in enterprises from forest income in the absence of sustainable forest management that increases forest products and biomass. Government budgets are limited in the forestry sector until the sector significantly contributes to the public treasury from increased revenues, taxes and other incomes through a large area of sustainable forest management and associated forest-based SMEs including bio-energy enterprises. Once the NSP starts, the following outcomes are expected. ● It is anticipated that 0.2 million Euro will be contributed by the federal government in research plot management and biomass quantification. ● 18.4 million Euro from Provincial Government's contribution in implementation of 2nd NDC and NAP, to develop sustainable financing mechanism, developing demonstration sites and support for Sustainable Management of Forests. ● 8.5 million Euros from the private sector for biomass pellets production and distributions. The NSP intends to support part of the investment for biomass pellet production and leverage funds from private sectors to invest in additional pellet producing industries. It is envisioned that the annual revenue generation from the sale of pellets at the end of NSP period will be 21 million Euros, (75,060, increment in biomass by 1.4 ton/ha/year and the price per ton Euro 200) which could make the private sector self-sustain. So, the proposed NSP creates opportunities for private sector investment in GHG mitigation through production of renewable energy involving community. The investment of private sector for biomass pellet production and replacement of fossil fuel by biomass pellet will be around 12.37 million Euros per year (100,000 tons pellet production @Rs14.85/Kg) in the project site and it is estimated that private sector invests 5 times more (61.85 million Euros per year) than this amount outside the project districts due to demonstration effect. The federal, provincial and local government could provide conditional grants to promote private and farmland forest management and support community groups for sustainable management forests beyond the project districts. In the initial stage of production, the provincial government could provide matching grants to pellet producing companies and pellet using industries to motivate them to use renewable energy and reduce emission. Green Climate Fund (GCF) financed Building Resilient Chure Region in Nepal (BRCRN) and Forest for Prosperity Project (FPP) funded by the World Bank are also implemented in the proposed districts. One of the common objectives of the BRCRN and FPP projects is to enhance the climate resilience of ecosystems and vulnerable communities in Nepal´s Churia region through integrated sustainable natural resource management (SNRM) approaches. So, it is anticipated that this project will contribute for sustainable forest management of the project districts and beyond in the Chure region and will also support private forest management.

3.3 Mitigation ambition

All assumptions and calculations are presented in Annex 6

[~ 200 words]

All assumptions are based on the forest status report of the Forest Research and Survey Department of Nepal and IPCC Good practice Guideline, which are presented in annex 6 in detail.

(i) Direct mitigation at the end of the proposed NSP

By the end of its 5-year implementation period, it is estimated that the NSP will generate direct mitigation of 4.91 million tC02 equivalent. Below is the detailed direct annual mitigation generated during the life cycle of the NSP.

(ii) Annual mitigation over the next 10 years

The annual direct mitigation generated by the NSP over the next 10 years is tabulated below. The cumulative direct mitigation of the next 10 years period is estimated at 18.67 million CO2 equivalent.

In addition, within the implementation of the NSP, soil carbon emission through forest and agriculture activities is reduced, organic materials are preserved. Protection, restoration, afforestation, and agroforestry practice will have a positive impact on the **local climate regulation** through carbon storage, and reducing the risk of local drought with negative impacts on forests and agriculture cropsBy the end of the NSP, it is expected that the NSP will contribute significantly to the sustainable management of forests land and make the pellet products readily available in the market specifically to brick and cement industries and boilers thereby sustaining the forest resource and generating employment and income to the local population and additional revenue to the nation and contribute to national economy by reducing the gap of trade deficit..

Summary table from Annex 6:

	Direct mitigation potential		**Indirect mitigation potential**	
	NSP Implementation period	10 years after NSP end	NSP Implementation	10 years after NSP end
	tCO_2e/a	tCO_2e/a	tCO_2e/a	tCO_2e/a
Year 1	277,451		0	
Year 2	660,862		222,243	
Year 3	941,152		641,485	
Year 4	1,316,211		1,078,447	
Year 5	1,710,519		1,491,783	
Year 6	0	1,852,777	0	1,826,067
Year 7		1,855,760		3,359,775
Year 8		1,858,773		3,362,757
Year 9		1,861,815		3,365,770
Year 10		1,864,888		3,368,812
Year 11		1,867,992		3,371,885
Year 12		1,871,127		3,374,989
Year 13		1,874,293		3,378,124
Year 14		1,877,491		3,381,290
Year 15		1,880,720		3,384,488
Year 16		0		0
Average	**981,239**	**1,866,564**	**686,792**	**3,217,396**
Total	**4,906,195**	**18,665,636**	**3,433,959**	**32,173,957**

Grand total	**23,571,831**		**35,607,916**	
Over technology lifetime:				
Average	**1,887,277**	tCO_2e/a	**3,390,980**	tCO_2e/a
Total	**15,564,467**	tCO_2e	**34,138,722**	tCO_2e

3 Expected Budget and Financing Structure of NSP Implementation Phase (in EUR)

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