NMHS-FINAL TECHNICAL REPORT (FTR)

Demand-Driven Action Research Project Grant

NMHS Reference No.:	NMHS/MG-2016/010/8506-7	Date of Submission:	d	d	m	m	y	y	y	y

PROJECT TITLE

A SUSTAINABLE APPROACH FOR LIVELIHOOD IMPROVEMENT BY INTEGRATED NATURAL RESOURCE MANAGEMENT IN THE CENTRAL HIMALAYA

Project Duration: *from* (**01.04. 2016**) *to* (**30. 06.2020**).

***Submitted to*:**
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NMHS-Final Technical Report (FTR)

Demand-Driven Action Research Project

DSL: Date of Sanction Letter

3	1	0	3	2	0	1	6
d	d	m	m	y	y	y	y

DPC: Date of Project Completion

3	0	0	6	2	0	2	0
d	d	m	m	y	y	y	y

Part A: Project Summary Report

1. Project Description

i.	Project Reference No.	NMHS/MG-2016/010/8506-7								
ii.	Type of Project	Small Grant		Medium Grant	✓	Large Grant				
iii.	Project Title	**A Sustainable Approach for Livelihood Improvement by Integrated Natural Resource Management in the Central Himalaya**								
iv.	State under which Project is Sanctioned	**Uttarakhand**								
v.	Project Sites (IHR States covered)	Four village clusters in Hawalbag administrative block of Almora district in Uttarakhand state								
vi.	Scale of Project Operation	Local	✓	Regional		Pan-Himalayan				
vii.	Total Budget/ Outlay of the Project	2.42 (Cr)								
viii.	Lead Agency	G.B. Pant National Institute of Himalayan Environment, Kosi-Katarmal, Almora								
	Principal Investigator (PIs)	Dr. S.C. Arya, Scientist- D (April 2020 – June 30, 2020) Dr. R.C. Sundriyal (August 01 – March 31, 2020) Dr. D.S. Rawat (March 31, 2016 – July 31, 2018)								
	Co-Principal Investigator (Co-PI)	Dr. R.C. Prasad, Scientist- G Er. R.K. Singh, Scientist- E								
ix.	Project Implementing Partners	Mahila Haat, Almora (NGO)								
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2. Project Outcome

2.1. Abstract

Sustainable utilization and management of the natural resources in the Central Himalayan region has become a top priority with the increasing population pressure, environmental degradation and changing climatic conditions. In this project a sustainable approach for livelihood improvement of poor Himalayan people through efficient management of natural resources and to sustain crop yield over a period of time using simple, low-cost, eco-friendly, and replicable technology packages has been implemented.

To execute this project after an extensive survey, a total of eight villages were selected that form a cluster and represented typical environmental and socio-economic characteristics of Lesser Himalayan region. Selection of beneficiary was carefully planned with community stakeholder's consultation. A need assessment study in the project area was conducted before project implementation.

Based on identified problems, an appropriate land use practice has been suggested and demonstrated in the project area. Farmers were encouraged to adopt ten technology packages to increase crop yield and optimum use of available land, water and other resources. In the beginning farmers were reluctant to adopt these technology packages due to lack of financial resources as 90% farmers of the study area are marginal land holders. Project activities provided technical and materialistic support to marginal farmers for adopting various technology packages for enhancing the livelihood and to increase the farm land productivity. Most of the selected technologies were demonstrated on the land of selected beneficiaries with active participation of farmers.

The technologies transferred under on-farm sector included protected cultivation of vegetables, integrated fish farming, waste land development through multipurpose tree, fodder and fruiting tree plantation, yield enhancement of low productive agricultural lands and abandoned agricultural land through high value cash crops, off-season vegetable cultivation, poultry farming, vermi-composting and planting compact bio-gas system. Off-farm technology transfer included bio-briquetting and making decorative items using the abundantly available pine tree needle leaves/cones, which is otherwise a forest fire hazard and causes great loss to biodiversity. Adoption of these simple, environmentally friendly and low-cost technologies increased the

income of target marginal farmers from 16.6 to 39.5 percent, and also provided an alternative for diversifying agriculture in the study area.

Abandoned and low yielding agriculture land has become profitable through technology transfer. Farmers were constantly motivated for collective farming of high value cash crops (ginger, onion, garlic and turmeric) on their abandoned and low productive agriculture lands. About 12 ha less productive and economically non-profitable agricultural land turn to be profitable through high value cash crop cultivation. About 2.5 ha abandoned agricultural land was brought under crop cultivation. Development of 5 ha waste land has initiated successfully. Dovetailing with various schemes/programmes of line departments improved the livelihood of people and farmers' attitude towards technology adoption has changed.

Use of dry chir pine needle by community has been found a holistic approach to save pine forest from fire. Pine processing unit has been successfully established at the institute. Quality of handmade paper produced in this processing unit is good enough to make various valuable products. Various products i.e. file, folder, carry bags etc are being produced at Pine Processing Unit. The bio-briquetting technology has great potential for converting hazardous dry pine needle into a fuel for household use (cooking and heating) in an affordable efficient and environment manner. 90 households have started making briquettes from chir pine needle after receiving technical and materialistic support under the project. Most of the beneficiaries are also using bio-briquettes at home mainly for heating purposes. Bio-briquetting has also provided an additional source of livelihood to beneficiaries. Thus, utilization of dry chir pine needle has not only enhanced the livelihood of farmers but also improved the environmental health of the region.

The project was designed in a way that it aims to bring changes in life of poor Himalayan people over a period of time through implementation of low-cost eco-friendly and replicable technology packages. Participatory and interactive approaches have been successful in the study area. The successes of these demonstrations have increased the majority of farmers to adopt these technologies.

2.2. Objective-wise Major Achievements

S. No.	Objectives	Major achievements (in bullets points)
1.	Manage natural resource sustainability in targeted villages by introducing innovative approaches and practical models by participatory management.	• Major problems related to natural resource management and livelihoods were ascertained. Thereafter an appropriate land-use practice was suggested and implemented in the project area for optimum utilization of the available resources. • Ten technology packages (8 on-farms and 2 off-farms) were successfully transferred to the farmers' fields through participatory approach. • Less productive cultivated land (12 ha) of 305 households has become profitable through adoption of high value cash crops (onion, garlic, potato and turmeric) cultivation in place of traditional crops (paddy, wheat, etc.) • About 3 ha abandoned cultivable land of 21 households was successfully rehabilitated through cash crop (ginger) production. The ginger crop was chosen as it is not damaged by wild and domestic animals. • Beneficiary farmers were motivated to cultivate Kiwi fruits on their abandoned cultivable lands as climatic conditions of the study area are suitable for Kiwi cultivation. Kiwi was chosen due to its high market value and it is not damaged by monkey. About 2 ha abandoned cultivable lands of 36 families was developed through kiwi cultivation • About 5 ha waste land was developed through plantation of multipurpose trees and fodder species such as Tejpatta *(Cinnamomum tamala*), Bhimal *(Grewia optiva*), Falyat *(Quercus glauca*), Quiral *(Bauhinia variegata*) etc. These species have multiple values (i.e., Fodder, Fuelwood, Fibre, Fruit and Fertilizer- the 5 F). • Thus, all together 22 ha less productive waste land was put into productive use through various cash crops/fodder /fuel trees plantations.
2.	To extend technical help and packages for demonstrating on-farm and off-farm activities for improving livelihood and environmental health	• Various low cost eco-friendly and replicable on-farm and off-farm technology packages for sustainable income generation were identified and successfully transferred to the farmer's field e.g., polyhouse, fish farming, cash crop cultivation, poultry farming, beekeeping, horticulture, vermi-composting, vegetable cultivation, bio-briquetting of pine needle, and making decorative items of pine cone and needles.

3.	Increase capacity of community for integrated and adaptive natural resources management at village level by developing knowledge and skills and strengthening local institutions.	• Pine processing unit has been successfully established at the institute. Various products i.e. file, folder, carry bags etc are being prepared from dry Chir pine needles at the unit. More than 4000 file and folders, 500 carry bags were supplied to various government departments. Also, earned Rs. 86,500 by selling file covers and meeting folders. Pine needles were also utilized to make bio-briquettes. About 20% population adopted bio-briquetting from Chir pine needle after receiving training and materialistic support under the project. Women groups earned Rs. 60,000/- by selling the bio-briquette in the local market.
4.	Empower local communities, particularly women and weaker section, by promoting local governance mechanisms that enable rural people to advocate for change that better their lives	• 8 women SHGs were formulated and strengthened through specialized trainings on various technologies. Project partner NGO provided a shop for marketing of Chir Pine bio-briquettes made by women SHGs. • Efforts were made to connect women and marginal farmers with different schemes of various line departments (State/Central Govt.). • Technical and material support provided to poor and marginal families for adopting income generating technologies.
5.	Create public awareness for implementation of integrated natural resource management strategies through enabling policy and institutional frameworks	• Trainings and workshops (Total-32) were organized to create public awareness about the project objectives. A total of 808 people (Male- 400 and Female- 408) trained under these programmes. • For wider disseminations, exhibitions were organized at many places across the Uttarakhand state. National and Regional media (print and digital) regularly covered the project activities and broadcasted many success stories. • Knowledge products (booklets/technical manuals/articles/success stories) for dissemination were prepared on various issues i.e. utilization of dry Chir pine needle for livelihood enhancement, cash crop cultivation, traditional crop cultivation, bee keeping etc. • Short documentaries were made on project activities and Pine Processing Unit.

2.3. Outputs in terms of Quantifiable Deliverables*

S. No.	Quantifiable Deliverables*	Monitoring Indicators*	Quantified Output/ Outcome achieved	Deviations made, if any, and Reason thereof:
1.	Development of 4 village clusters (470 Households) for optimal yield model of land management.	Improvement in yield from the land (kg/ha)	• Productive capacity of about 12 ha. economically unprofitable agriculture land of 305 households was enhanced through high value cash crops. Per unit production of cash crops was quite high (onion- 115 qt/ha, garlic 38 qt/ha, potato-136.7qt/ha turmeric-50 qt/ha) in comparison to traditional crops (paddy-15.6 qt/ha, wheat-18.4 qt/ha and finger millet-10.8 qt/ha) • About 3 ha abandoned cultivable land was brought under cultivation through ginger cultivation. The production of ginger from rehabilitated land was about 83.2 qt/ha. • Development of 5 ha waste land was achieved through multipurpose tree species plantation involving local community. 60% plants survived after three years of plantation by the end of the project. • Kiwi cultivation was introduced in 2 ha cultivable waste lands.	None
2.	Establishment of up-scaled models for conservation and management of resources using tested technologies	Beneficiary population (Nos.)	• The technologies transferred under on-farm sector to beneficiaries farmers included protected cultivation of vegetables (41 farmers), integrated fish farming (02), poultry farming (284), horticulture (237), yield enhancement of low productive agricultural lands through high value cash crops cultivation (305), abandoned land rehabilitation through cash crop cultivation (21), waste land	None

			development through plantation of multi-purposes tree and fodder species (200), vegetable cultivation (348), Bee keeping (13), vermi-composting (20) and compact bio-gas system (05 farmers). • Off-farm technology beneficiaries include: bio-briquetting (90 farmers) and making decorative items from chir pine needle and cone (31), knitting and sewing (32 farmers) • Through this project people have benefited by adopting various technologies.	
3.	Pilot plant for use of pine needle for various products involving village women and farmers	Quantity of pine needle collected and processed to products (Kg/ day; No of products)	• Handmade paper sheets of 498-533 GSM were successfully prepared at the Pine Processing Unit. • Various products i.e. file cover, folder, carry bags, diary etc. were prepared from chir pine needles. • About 7000 kg pine needle (Pirul) was processed at the Pine Processing unit during the project period. • More than 4000 file covers and folders and 500 carry bags were produced. • Use of Pine needles (otherwise a big cause of forest fire) in making various eco-friendly products was one of the major achievements of the project.	
4.	Guidelines for community (women) empowerment for middle Himalaya	Women participation in training and production (Nos.)	• 278 women were trained on various on-farm and off-farm technology packages. • 90 Women were involved in bio-briquetting from Chir Pine needles that helped then in some earnings (Rs. 60,000/-) and reduced their drudgery. • 585 persons were benefitted from different schemes (seed	

			distribution, poultry, goat farming, vermi-composting etc.). • Policy Guideline document for women empowerment has been prepared (Annexure-I)	
5.	Development of training manuals and field application manual.	Policy guidelines and knowledge products published out of the projects (Nos.) Persons trained (Nos.)	• 808 persons were trained (51% women and 23% SC) Rural Technology Complex and in demonstration sites on various natural resource management and livelihood enhancement technology packages. • One technical manual on cash crop (ginger) cultivation was published (Annexure- II). • One technical manual on " Environment-friendly use of Pine needles (Pirul) for livelihood enhancement and income generation by rural people and avoidance of forest fire" was published (Annexure- III). • One booklet on "Utilization of chir pine needle for livelihood enhancement" was published (Annexure- IV). • Popular articles on Finger millet cultivation (Annexure- V). • Popular article on the scope of beekeeping in the Himalayan region (Annexure- VI). • One research paper on “A sustainable approach for livelihood enhancement in central Himalaya has been submitted to NMHS-PMU (Annexure- VII).	

(*) As stated in the Sanction Letter issued by the NMHS-PMU.

2.4. Strategic Steps with respect to Outcomes (in bullets)

S. No.	Particulars	Number and Brief Details	Details of Attachment/ Supporting Document
1.	New Methodology developed:	1. Making handmade paper from chir pine needle (Pirul): Chir Pine needles (Pirul) were utilized to make handmade paper and various finished products. 2. The paper obtained is environment-friendly and rapidly bio-degradable	Technical Manual (Annexure- III)
2.	New Models/ Process/ Strategy developed:	1. A Pine processing unit has been established at Rural Technology Complex of the institute. The unit has started producing file covers, folders from dry pine needles by involving local communities and attracted attention of State and Central Government agencies. 2. During the reporting period more than 4000 file covers and file folders were made using chir pine needles as a raw material and supplied to different agencies	Photos of Pine Processing Unit (Photo Plates 16-18 & Appendix- 6)
3.	New Species identified:	-	-
4.	New Database established:	-	-
5.	New Patent, if any:	-	-
	I. Filed (Indian/ International)	-	-
	II. Granted (Indian/ International)	-	-
	III. Technology Transfer (if any)	**On-farm technology packages** • Protected cultivation of vegetables, integrated fish farming, poultry farming, horticulture, yield enhancement of low productive agricultural lands through high value cash crops cultivation, abandoned land rehabilitation through cash crop cultivation, waste land development through plantation of multi-purposes tree and fodder species, vegetable cultivation, Bee keeping, vermi-composting and compact bio-gas system **Off-farm technology packages** • Bio-briquetting, making decorative items from chir pine needle and cone and knitting and sewing	Photo Plates 3, 5, 7 & 8-14 Photo Plate 4, 6 & 15
6.	Others (if any):		

3. Technological Intervention

S. No.	Type of Intervention	Brief Narration on the interventions	Unit Details (No. of villagers benefited / Area Developed)
1.	Development and deployment of indigenous technology	• Waste land development was initiated using native multipurpose tree and fodder species. We identified many species such as Tejpatta *(Cinnamomum tamala*), Bhimal *(Grewia optiva*), Falyat *(Quercus glouca*), Quiral *(Bauhinia variegata*) etc that can be successfully grown in the study area. About 60% plantation has survived.	60 households (332 persons) benefitted/About 05 ha waste land area was developed in the 8 target villages.
2.	Diffusion of High-end Technology in the region	• Various low cost eco-friendly and replicable on-farm and off-farm technologies packages for sustainable income generation were identified and successfully transferred to the farmer's field in the project area.	Beneficiaries farmers of on-farm activities include 668 persons from the 8 target villages/17 ha area has been developed (less productive cultivated lands-(12 ha, abandoned cultivable lands (5 ha, abandoned cultivable lands). Beneficiaries of of-farm activities include bio-briquetting (90 HH) and making decorative items (32 HH).
3.	Induction of New Technology in the region	• Making Handmade paper from dry chir pine needles to prepare products such as file covers, file folders, carry bags, envelops, marriage cards etc.	40 women of the target villages were benefitted.
4.	Publication of Technological / Process Manuals	1. अदरक की उन्नत खेती: पर्यावरण एवं आजीविका संवर्धन का एक साधन (Annexure- II) 2. Environment-friendly use of Pine needles (Pirul) for livelihood enhancement and income generation by rural people and avoidance of forest fire (Annexure- III) 3. चीड़ की पत्तियां: आजीविका का एक उत्तम साधन (Annexure- IV)	808 persons who received trainings were benefitted. Also, these knowledge products were circulated among other stakeholders.
5.	Others (if any)	-	-

4. New Data Generated over the Baseline Data

S. No.	New Data Details	Status of Existing Baseline	Additionality and Utilisation New data
1.	The field survey conducted in 2016-17 revealed that as many as 1119 persons of 247 families have permanently migrated to distant places since 1991.	As per 2011 census the project area (8 villages) is home to about 470 households with a total population of about 1977. Female constitutes about 53.9% and SC population constitutes about 25.9% of the total population. The population increased continuously during 1951 to 2001, and thereafter registered a decline in 2011.	Most of these persons were migrated in search of better economic opportunities
2.	The literacy has increased significantly since 1951 when it was mere 12.24 %.	The area has a literacy rate of 72.78%, which is higher for male (84.63%) than female (62.66%).	-
3.	A survey conducted in 2017 revealed that number of populations engaged in agriculture and allied activities have been declined from 87.44% to 77.73%.	As per 87.44% of the total working population is engaged in agriculture and allied activities as per 2011 census.	Causes of such decline has been ascertained based on the HH surveys.
4.	Now cash crops are being cultivated in 12.71 ha land. Per unit production of cash crop was quite high in comparison of traditional crop	Before project intervention farmers were cultivating high value cash crops (onion, garlic, potato, turmeric) in 2 ha area.	Economic analysis revealed that cultivation of cash crops is more cost effective than traditional crops
5.	Farmers have started cultivating cash crops such as ginger and turmeric along with paddy during “kharif” season and garlic, onion and potato along with wheat during ‘rabi’ season	The traditional cropping pattern on rainfed land is a two years cycle made up of two phases i.e dhansar and maduasar. In the “dhansar” phase, paddy is cultivated during the rainy season (“kharif”), followed by wheat in the “rabi” season. The “maduasar” phase then starts with finger millet in the next “kharif” season followed by a fallow period during the next “rabi” season.	Agricultural activities have become profitable through cash crop cultivation
6.	Technology adoption for diversification in farming sector has increased the income of marginal farmers from 16.6 to 39.5 percent	About 89.6% farmers of the study area are marginal land holder. Data collected on income of farmers revealed that marginal land holding farmers are mainly dependent on secondary (construction) and tertiary sector (trade, transport and other services) as 70 to 80% of their total income comes from these sectors.	Diversification in farming sector is necessary to bring the change in income of marginal land holders.

5. Demonstrative Skill Development and Capacity Building/ Manpower Trained

S. No.	Type of Activities	Details with number	Activity Intended for	Participants/Trained			
				SC	Woman	Others	Total
1.	Workshops	6 Workshops organized at Rural Technology Complex of the Institute for smooth functioning of project activities. These workshops involved all stakeholders including vaillge community, farmers, Gram Panchayats, Van panchyats, Govt departments, partner NGO, project personnel, scientists of GBPNIHE and other institutions.	Awareness creation, problem identification need assessment, beneficiaries selection, technology adoption, developing linkages with line departments	60	70	50	180
2.	On Field Trainings	Total 8 training and capacity building programs were organized on various on-farm (protected cultivation, waste land development, yield enhancement of low productive agriculture lands, integrated fish farming, poultry faming etc), and off-farm (bio-briquetting and making decorative items from chir pine needle and cone) technology packages	Demonstration and transfer of technologies to beneficiaries	40	60	74	174
3.	Skill Development	Skill of 16 person was developed and knowledge of 580 persons for sustainable use and management of natural resources and livelihood enhancement was augmented.	-	86	278	90	454
4.	Academic Supports	-	-	-	-	-	-
5.	Others (if any)	-	-	-	-	-	-

6. Linkages with Regional & National Priorities (SDGs, INDC, etc)/ Collaborations

S. No.	Linkages/ Collaborations	Details	No. of Publications/ Events Held	Beneficiaries
1.	Sustainable Development Goal (SDG)	SDG 5- Gender Equality	Publications: 01 Events Held: 26	408
		SDG 7- Affordable and Clean Energy	Publications: 02 Events Held: 16	90
		SDG 8- Decent Work and Economic Growth	Publications: 01 Events Held: 33	653
		SDG 13- Climate Action	Publications: 02 Events Held: 33	4 Village Clusters
		SDG 15- Life on Land	Publications: 01 Events Held: 03	4 Village Clusters
2.	Climate Change/INDC targets	-	-	-
3.	International Commitments	-	-	-
4.	Bilateral engagements	National Handmade Paper Institute, Jaipur provided training to project staff on various technical aspects of making of handmade paper from Pine needles. File paper test results (Annexure- VIII).	01 (One-week training programme)	Project staff
5.	National Policies	Policy guideline document on women empowerment has been prepared under the project (Annexure- I).	01 (workshop)/01 policy document	Women of Himalayan region
6.	Others collaborations	• Linkages with government departments to improve the livelihood of people • NGO (Mahila Haat) was chosen as project partner for community mobilization and organization to stop forest fire, formation of SHGs, assisting in model development, development of market linkages & ensure sustainability of project activities after completion	Workshops (06)	Village community No. of people: 585 (Male: 281 Female: 304 SC: 124)

7. Project Stakeholders/ Beneficiaries and Impacts

S. No.	Stakeholders	Support Activities	Impacts
1.	Gram Panchayats (GPs)	Trainings were provided to Gram Panchayats (GPs) on various natural resource management and livelihood enhancement technologies. Capacity of GPs was enhanced to improve their functioning.	GPs helped in identifying model demonstration sites, selection of beneficiaries and establishment of various models
2.	Govt Departments (Agriculture/ Forest)	Farmers contact with various line departments were established during meetings and workshops organized for various stakeholders. Line Departments provided all possible help to farmers for their livelihood enhancement through various schemes	Awareness was created among villagers about various govt schemes. Many farmers have taken benefits of various schemes of different departments.
3.	Village people	1. Village people were motivated to adopt technologies to increase farm yield and optimum use of natural resources 2. Village people were trained on various on-farm and off-farm technology packages. 3. Nines suitable technology packages for sustainable income generation were identified and successfully transferred to the farms. 4. About 96% households have benefitted from project activities	• Farmers' attitude towards technology adoption have changed. Their skill enhanced generation through trainings and workshops/capacity building. • Farmers have started earning income from technology adoption mainly from protected cultivation of vegetables, high value cash crops, poultry and integrated fish farming. • Overall income generation through adoption of various technologies in the project villages has been given in Table 6.
4.	SC Community	Special training programmes and workshops were organized for capacity building of SC community. There are many activities such as fishery, poultry, organic vegetable cultivation, bio-briquetting that holds potential for creating sustainable livelihoods for weaker section in the study area. Project provided materialistic support to SC community for adopting these technologies.	Technology interventions have provided various livelihood options to the beneficiaries.
5.	Women Group	Women were trained on various income generating technologies. Women SHGs were formed and given training and support for increasing their functioning and efficiency. They are also linked with various line departments to improve their livelihood through various government schemes	• Women have become more aware and their technical knowledge has increased to make agricultural activities profitable. • SHGs are doing a variety of activities for their livelihood enhancement. Project helped them to adopt various technology models for enhancing the livelihood. • Self-replication of technologies among the neighbouring farmers.

8. Financial Summary (Cumulative)

S. No.	Financial Position/Budget Head	Funds Received	Expenditure/ Utilized	% of Total cost
I.	Salaries/Manpower cost			
II.	Travel			
III.	Expendables &Consumables			
IV.	Contingencies			
V.	Activities & Other Project cost			
VI.	Institutional Charges			
VII.	Equipments			
	Total			
	Interest earned			
	Grand Total			

* Please attach the consolidated and audited Utilization Certificate (UC) and Year wise Statement of Expenditure (SE) separately, *ref*. (Annexure IX).

9. Major Equipment/ Peripherals Procured under the Project** (if any)

S. No.	Name of Equipments	Cost (INR)	Utilisation of the Equipment after project
1.	Rag chopper	175000.00	Installed in pine processing unit
2.	Hammer mill	85000.00	-do-
3.	Boiler wood fire	525000.00	-do-
4.	Digester	475000.00	-do-
5.	Beater Machine	1575000.00	-do-
6.	Agitator	150000.00	-do-
7.	Auto Vat	165000.00	-do-
8.	Screw press	150000.00	-do-
9.	Calendar Machine	450000.00	-do-
10	Sheet Cutting Machine	375000.00	-do-
11	Tau Suki	180000.00	-do-
12	GI Sheet	10000.00	-do-
13	Hydraulic press	600000.00	-do-
14	Grinder 7	175000.00	-do-

**Details should be provided in details (Annexure IX).

10. Quantification of Overall Project Progress

S. No.	Parameters	Total (Numeric)	Details of Attachments/ Supporting Documents
1.	IHR States Covered	01	
2.	Project Site/ Field Stations Developed	1 (four village clusters)	Fig. 1, 2 & 3
3.	New Methods/ Modeling Developed	01	Technical Manual (Annexure II, III & IV) (Photo Plates 16-18 & Appendix- 6)
4.	No. of Trainings arranged	26	List of trainings (Appendix 3)
5.	No of beneficiaries attended trainings	808	List of trainings (Appendix 3) (Photo Plates 4-7)
6.	Scientific Manpower Developed (Phd/M.Sc./JRF/SRF/ RA):	8	List of project personnel worked during the project period (Annexure- IX)
7.	SC stakeholders benefited	186	List of beneficiaries (Appendix 7)
8.	ST stakeholders benefited	-	None
9.	Women Empowered	408	Policy guideline document (Annexure-I)
10.	No of Workshops arranged along with level of participation	06	Photo Plates 1-3
11.	On-field Demonstration Models initiated	180 (attach maps about location & photos)	Photo Plates 4-7
12.	Livelihood Options promoted	10	Photo Plates 8-15 / (Annexure- X)
13.	Technical/ Training Manuals prepared	03	Appendix 5 (Annexure II, III & IV)
14.	Processing Units established	01	Appendix 6, Photo Plates 16-18
15.	No of Species Collected	-	-
16.	New Species identified	-	-
17.	New Database generated (Types):	-	-
18.	Others (if any)	-	-

11. Knowledge Products (KPs) and Publications

S. No.	Knowledge Products (KPs)/ Publication	Number		Total Impact Factor	Remarks/ Enclosures
		National	International		
1.	Journal Research Articles/ Special Issue:	1	-	-	In press
2.	Book Chapter(s)/ Books:	1	-	-	Annexure- V
3.	Technical Reports	01	-	-	FTR
4.	Training Manual (Skill Dev./ Capacity Building)	03	-	-	Annexure- III, II, IV
5.	Papers presented in Conferences/Seminars	-	-	-	-
6.	Policy Drafts/Papers	01	-	-	Annexure- I
7.	Others:	02	-	-	Annexure- XI & XII

*Please append the list of KPs/ publications (with impact factor and further details) with due Acknowledgement to NMHS.

12. Recommendation on Utility of Project Findings, Replicability and Exit Strategy

Particulars	Recommendations
Utility of the Project Findings:	• Technologies packages implemented in the project can be easily, cheaply and practically applied, with local variations in other rural remote areas. • The Pine Processing Unit has great potential for converting hazardous dry pine needle into useful products. Production of multiple items such as file cover, bags, folders, visiting cards from handmade paper has also brought new income avenues for the community. Strong industrial base for rural development can be developed around this project across the state. It will create jobs as well as remove hazardous pine needle from the forest floors. It will not only stop the people migrating from rural to urban areas but also gain community support for conserving pine forests in the state. • Bio-briquetting can be used as a fuel for household use (heating and cooking), in an affordable efficient and environment friendly manner. Bio-briquetting has provided an additional source of income to many marginal families. Therefore bio-briquetting from Chir pine needle needs to be promoted in other areas of Himalayan region in order to save precious biodiversity of the area from forest fire. It can be made popular among urban people as it is smokeless. • The farmers need to be provided diversification technology packages in farming sector which is necessary to make farming system sustainable that is highly vulnerable at present. Our experience in the study area shows that small farmers cannot depend on single activity but they should have supplementary income source as well. There are many small enterprises such as fishery, poultry, dairy, organic vegetable cultivation that holds. potential for creating sustainable livelihoods for small and marginal farmers. • Waste land can be an opportunity to create and sustain livelihoods of the people through appropriate technical intervention. • The rehabilitation of abandoned and low productive land, aimed at increasing production together with efficient resource utilization is necessary in the present scenario. The project has taken initiatives to develop abandoned and neglected lands of the study area through high cash crop cultivation. This way abandoned and neglected lands can be rehabilitated and less profitable agricultural land can be making profitable Interest of new generation in farming sector can be increased by making agricultural activities profitable.

Replicability of the Project:	To replicate the project in other parts of Indian Himalayan region, a participatory approach needs to be adopted by involving village community, village institutions line departments of the district, NGO and R&D institutions. Awareness should be created through print and digital media to popularize the project results to other areas. The district administration and line departments need to provide help for the smooth implementation of the programme. Collaboration with a local NGOs is essential for smooth functioning of the project and ensure sustainability of activities after completion
Exit Strategy:	Farmers are able to replicate these models in other areas as they were well trained on these technologies. Project has provided specialized trainings to village institutions on various natural resource management and livelihood enhancement technologies. A local NGO (Mahila Haat) has been workings a project partner since the inception of the project. Partner NGO has taken responsibility of providing support for sustainability of all activities initiated under the project. The NGO will help villagers in replication of technology models. Van Panchyat Sarpanches have taken responsibly of monitoring plantation activities initiated for waste land development under the project the interactions with various line agencies/ govt. institutions have conducted in order to get support for organizing capacity building / skill development training programs for the target groups in near future. All project activities have been implemented through participatory basis involving all stakeholders (i.e. Individual beneficiary, SHGs, Van Panchayat's, Gram Panchayat's, NGOs, line departments, R&D institutions, govt departments and programmes (MGNREGA, ILSP, Ajivika *etc*.) and markets. Thus, in long run each institution or agency will take the responsibility to execute and implement the programme and ensure sustainability in future.

(**PROJECT PROPONENT/ COORDINATOR**)

(Signed and Stamped)

(**HEAD OF THE INSTITUTION**)

(Signed and Stamped)

Place: ……
Date: …../……/…….