

**NMHS-FINAL TECHNICAL REPORT (FTR)**

Demand-Driven Action Research Project Grant

NMHS Reference No.:	NMHS/MG-2016/ 009/8505-6	Date of Submission:	0	1	0	8	2	0	1	9
			d	d	m	m	y	y	y	y

**ENHANCING LIVELIHOOD OF HIMALAYAN  
COMMUNITIES THROUGH ACTION RESEARCH AND  
TRANSFORMING WILD PRODUCE INTO HIGH VALUE  
PRODUCT**

**Project Duration: from (31.03.2016) to (31.07.2019)**

**Submitted to:****Er. Kireet Kumar**

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**NMHS-Final Technical Report (FTR) template**

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

0	1	0	8	2	0	1	9
d	d	m	m	y	y	y	y

**Part A: Project Summary Report**

**1. Project Description**

i.	Project Reference No.	Ref no: NMHS/MG-2016/009/8505-6					
ii.	Type of Project	Small Grant		Medium Grant		Large Grant	
iii.	Project Title	<b>“Enhancing livelihood of Himalayan communities through action research and transforming wild produce into high value product”</b>					
iv.	State under which Project is Sanctioned	<b>Uttarakhand</b>					
v.	Project Sites (IHR States covered) (Maps to be attached)	<b>4 blocks</b> of Chamoli district (Karanprayag, Joshimath, Ghat Block & Pokhri Block) and <b>1 block</b> from Rudraprayag District (Ukhimath)					
vi.	Scale of Project Operation	Local		Regional		Pan-Himalayan	
vii.	Total Budget/ Outlay of the Project	Rs.2,49,96,000/-					
viii.	Lead Agency	<b>Uttarakhand State Council for Science &amp; Technology (UCOST), Vigyan Dham, Jhajra, Dehradun</b>					
	Principal Investigator (PI)	Dr. Rajendra Dobhal					
	Co-Principal Investigator (Co-PI)	NA					

ix.	Project Implementing Partners	Himalayan Action Research Centre (HARC) 744, Indranagar, New Forest , Phase 2, Dehradun 428006
	Key Persons / Point of Contacts with Contact Details, Ph. No, E-mail	Dr. Rajendra Dobhal Director General UCOST Vigyan Dham, Jhajra Dehradun Phone no.: Email: <a href="mailto:dg@ucost.in">dg@ucost.in</a> <a href="mailto:ucost@ucost.in">ucost@ucost.in</a>
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## 2. Project Outcome

- Sustainable use of wild berries, fruits and nuts increases directly among **3000 rural communities**, thereby increasing biodiversity of the region and income from the produce
- Minimum **8 product developments** from wild berries, wild fruits and nuts which will going to play an important role in livelihood enhancement of local community.
- **One Handbook** developed which contain all information about 8 wild produce includes, fruits, berries and nuts based on action research and interventions

**2.1. Abstract** (not more than 500 words) [it should include background of the study, aim, objectives, methodology, approach, results, conclusion and recommendations).

### **Background:**

Underutilized wild edible produce have local and regional importance, but generally lack national recognition and appreciation. According to the study it has been found that they have much more nutritional value than cultivated ones as well as have more resistance towards climate change. This study has depicted how to connect livelihood in hilly areas with a local partnership between the stakeholders and local institutes. Promoting value-addition of wild edible species and developing marketable products is the initial step for the development of secondary industries to support Himalayan people for generating additional employment opportunities

### **Objectives/ Aim:**

- To undertake action research and convert low value wild produce into high value products.
- To use traditional knowledge and promote high value products thereby benefiting both rural communities specially women and consumers
- To establish successful community model that is replicable and promote sustainable use of natural and wild products of Himalayan region against climate change

### **Methodology:**

The complete scope study was carried out in 4 blocks of Chamoli and one block of Rudraprayag District of Uttarakhand. After scope study, procurement of wild produces was carried out on the basis of standard operating procedures (SOPs) designed under this project by gathering the secondary and practical information. Through involving local community in collection, procurement, processing and value addition, we tried to create a strong bond between local people and the forest, which will going to lead them towards better livelihood against the adverse effect of climate change. The product designing and development was carried out in women cooperative centre, equipped by modern machineries and instruments and this complete intervention was carried by cooperative members under the supervision of technical experts. Linkage with several research institutes related to product designing, research, processing and preservation was also done to improve the quality and presentation of the high value product. Under this intervention, high value products were successfully developed and launched by HARC Alaknanda women cooperative.

### **Results:**

Through this intervention, **19 high value products** were successfully developed and launched by HARC Alaknanda women cooperative under the brand name "**Mountain Beam**". Standardized process related to harvesting, collection, transportation, semi-processing, value addition was accomplished with the complete involvement of stakeholders in the form of Standard Operating Procedures, while conducting this action research. In this action research, local relationship and linkage among the stakeholders were developed and strengthened for sustainable development and intervention in Himalayan region of Uttarakhand.

### **Conclusion:**

By this action research, local relationship and linkage among the stakeholders were strengthened for sustainable development and intervention of replicable model in Himalayan region of Uttarakhand. Detailed knowledge on such practices, will somewhat help in reducing migration from Himalayan terrain as community will able to get better livelihood opportunity through these wild edible produces.

### **Recommendations:**

Value addition of wild produces is the one of the best way to restore the biodiversity and generating better livelihood options leading food and economic security of Himalayan people. This study has set up a replicable model for sustainable income generation and individual entrepreneurs in Himalayan region.

## **2.2. Objective-wise Major Achievements**

<b>S. No.</b>	<b>Objectives</b>	<b>Major achievements (in bullets points)</b>
1	To undertake action research and convert low value wild produce into high value products.	<ul style="list-style-type: none"><li>• <b>19 high value products were developed</b> from wild produces</li><li>• <b>3 cosmetics products</b> were designed through the support of external agency</li><li>• Launching of high value products by Honorable chief minister of Uttarakhand <b>Mr. Trivendra Singh Rawat.</b></li><li>• <b>Approx 40 lakh</b> was earned by cooperative through development and sales of High value product.</li><li>• Development of <b>Mountain Beam Brand.</b></li><li>• SOPs developed for each wild produce helping in the sustainability of the action</li></ul>
2	To use traditional knowledge and promote high value products thereby benefiting both rural communities specially women and consumers	<ul style="list-style-type: none"><li>• Development of ownership among the community related to harvesting and value addition</li><li>• Awareness among the masses related to importance and conservation of wild produces.</li><li>• Approximately <b>Rs 20, 00, 000/-</b> livelihood was generated of selected stakeholders through harvesting collection and procurement of wild produce.</li></ul>
3	To establish successful community model that is replicable and promote sustainable use of natural and wild products of Himalayan region against climate change	<ul style="list-style-type: none"><li>• Incorporation of <b>9 developed products</b> into the business plan of the HARC Alaknanda cooperative</li><li>• Up-gradation of existing products of cooperative through this intervention like, amla squash, Bael squash, pickles related to processing and packaging</li><li>• 60 women cooperatives were trained in machinery handling in CFC centre</li></ul>

### 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	Access benefit sharing (ABS) framework developed addressing legal aspects	ABS framework developed for 19 high value products	<b>19 high value products</b> with final design, branding and market chain out of which <b>9 were adapted by HARC Alaknanda cooperative</b>	No deviation
2	By products of 8 wild berries, fruits and nuts developed, 100 villages linked with women cooperative	Complete work on 9 wild produces from 36 selected villages	Taxonomical identification of <b>9 wild produces</b> and complete post harvest methodology, including value addition was developed and documented	It was targeted for 100 villages but the target achieved with final beneficiaries were <b>4097 House Holds from selected 36 villages</b>
	At least 8 by products developed, developed technologies customized and community model developed	<b>19 high value products</b> with complete nutritional study containing complete designing, storage study and packaging study	<b>19 high value edible products and final designing of 3 high value cosmetic products</b> from the wild produces.	No Deviation
	Customized techniques for product development and storage developed	Bar cutting and packaging machine was customized for standard and cost effective cutting and packaging of bars (apricot, walnut and granola bar)	Development of cost effective bar cutting and packaging machine with good efficiency	No deviation
	Marketing linkages established for developed products in collaboration with	Market linkages for 19 high value products were developed	<b>12 market linkages developed</b> with different vendors. along <b>with 3</b>	No Deviation

	women cooperative.	through various national and regional vendors and along with the online portal for selling high value products was also developed	<b>cooperate linkages</b> were developed for customized gift packs	
	5 customized techniques on drying, oil extraction, decortications, longer shelf life, colour and quality retention developed	<b>3 technologies were introduced</b> in the centre Quality drying system developed, oil extraction machine and bar cutting and packaging machines	Machines established and successfully running gin the centre	Natural preservative was exchanged with food grade preservative due to failure of natural preservative

(\*) 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/ Brief Details	Remarks/ Enclosures
1.	New Methodology developed	Cold press oil extraction, quality washing and cleaning of fruits and berries, quality and systematic drying methodology	-
2.	New Models/ Process/ Strategy developed	3 bar cutting and packaging	-
3.	New Species identified	-	-
4.	New Database established	-	-
5.	New Patent, if any		
	I. Filed (Indian/ International)	Nil	-
	II. Granted (Indian/ International)	Nil	-
	III. Technology Transfer(if any)	Nil	-
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	Apricot and plum chutney was developed by following traditional methodology of the region	2 high value product developed through traditional methodology
2.	Diffusion of High-end Technology in the region	<ol style="list-style-type: none"> <li>1) Quality washing of fruits and berries through ozone gas and through transonic waves (washing machine) was introduced for quality cleaning of the raw produces</li> <li>2) Development of quality drying technique including low temperature drying (dehydrator) and high temperature drying (baking oven) for raw material and value addition.</li> <li>3) Quality cold press machine for apricot oil extraction</li> </ol>	<p>1 washing machine</p> <p>1 drying unit (including 40 tray capacity dehydrator and baking oven)</p> <p>1 oil press machine which works on cold pressing technique</p>
3.	Induction of New Technology in the region	1) Bar cutting and packaging machine was customized for standard and cost effective cutting and packaging of bars (apricot, walnut and granola bar)	
4.	Publication of Technological / Process Manuals	<ol style="list-style-type: none"> <li>1) Publication of manual showing post harvest technology for apricot, Mehal, walnut, plum and peach</li> <li>2) Publication of handbook on wild edible plants containing complete information about selected 9 wild produces.</li> </ol>	<p>5 manuals</p> <p>1 handbook</p>
	Others (if any)	Nil	Nil



#### 4. New Data Generated over the Baseline Data

S. No.	New Data Details	Status of Existing Baseline	Additionality and Utilisation New data
1	NA	Reports of two districts attached	NA

#### 5. Demonstrative Skill Development and Capacity Building/ Manpower Trained

S. No.	Type of Activities	Details with number	Activity Intended for	Participants/Trained			
				SC	ST	Woman	Total
1.	Workshops	3	Promotion of high value products and for participation in poster presentation				-
2.	On Field Trainings	5	Training related to harvesting and collection of wild produces in different villages during the season time				201
3.	Skill Development	3	2 trainings related to apricot and mehal post-harvest technology and one training related to apricot and plum chutney development	-	-		27
4.	Academic Supports	-	-				
	Others (if any)	1	Exposure for better	-	-	18	18

## 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)	40 SHGs. were involved in sustainable procurement, semi processing	-	201 farmers were trained
2.	Climate Change/INDC targets	-	-	-
3.	International Commitments	-	-	-
4.	Bilateral engagements	3		
5.	National Policies	-	-	-
6.	Others collaborations			

## 7. Project Stakeholders/ Beneficiaries-and Impacts

S. No.	Stakeholders	Support Activities	Impacts
1.	Gram Panchayats	-	-
2.	Govt Departments (Agriculture/ Forest )	-	-
3.	Villagers	4097 HH as the beneficiaries of the project	Rs.21,00,000/- of income was generated
4.	SC Community	-	-
5.	ST Community	-	-
6.	Women Group	40 SHGs. were involved in procurement, transportation, semi processing	-
7.	Others (if any)	4097 HH as the beneficiaries of the project	21,00,000 of income was generated

## 8. Financial Summary (Cumulative)

S. No.	Financial Position/Budget Head	Funds Received	Expenditure/ Utilized	% of Total cost
I.	Salaries/Manpower cost	70,40,555	66,56,600	94.55
II.	Travel	28,78,879	28,78,879	100.00
III.	Expendables & Consumables	Nil	Nil	Nil
IV.	Contingencies	11,60,000	15,48,662	133.51
V.	Activities & Other Project cost	93,96,606	96,69,787	102.91
VI.	Institutional Charges	4,50,000	4,50,000	100.00
VII.	Equipments	27,30,000	27,29,917	100.00
	Total	<b>2,36,56,040</b>	<b>2,39,33,845</b>	<b>101.17</b>
	Interest earned	4,81,197 #		
	Grand Total	<b>2,41,37,237</b>		

# This is the total interest earned during the total project period (2016-2019), the two year interest earned was already submitted (**Rs.3,78,680/-**) to funding agency and last year interest earned is **Rs.1,02,517/-** (2018-19).

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

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

S.No.	Name of Equipments	Cost (INR)	Utilisation of the Equipment after project
1.	Automatic Conveyor Sealer	73020	This was clearly mentioned in the proposal that after completion of the project entire machines and equipment's will be transferred to proponent agency (HARC Alaknanda cooperative). For future processing and value addition
2.	Cold Storage	809375	
3.	Fruits & Vegetable Dehydrator	528710	
4.	Stainless Steel Trays	37760	
5.	Inkjet Batch Coding Machine	249245	
6.	Nut Decorticator	94110	
7.	Oil Press machine	450701	
8.	Fruits & Vegetable washing machine	371482	
9.	Weighing Scale	14014	
10.	Vacuum Packaging Machine	101500	

\*\*Details should be provided in details (*ref Annexure III &IV*).

## 10. Quantification of Overall Project Progress

S. No.	Parameters	Total (Numeric)	Remarks/ Attachments/ Soft copies of documents
1.	IHR States Covered	1	-
2.	Project Site/ Field Stations Developed	1	-
3.	New Methods/ Modeling Developed	4	-
4.	No. of Trainings arranged	7	-
5.	No of beneficiaries attended trainings		
6.	Scientific Manpower Developed (Phd/M.Sc./JRF/SRF/ RA):	5	Details attached in DBT
7.	SC stakeholders benefited	-	-
8.	ST stakeholders benefited	-	-
9.	Women Empowered	97	-
10.	No of Workshops Arranged along with level of participation	1	-
11.	On field Demonstration Models initiated		(attach maps about location & photos)
12.	Livelihood Options promoted	3	-
13.	Technical/ Training Manuals prepared	5	-
14.	Processing Units established	1	Equipment photo attached
15.	No of Species Collected	18	(Attached Hand book)
16.	New Species identified	9	-
17.	New Database generated (Types):	-	-
	Others (if any)	-	-

## 11. Knowledge Products and Publications:

S. No.	Publication/ Knowledge Products	Number		Total Impact Factor	Remarks/ Enclosures
		National	International		
1.	Journal Research Articles/ Special Issue:	1	-	-	-
2.	Book Chapter(s)/ Books:	1	-	-	
3.	Technical Reports	5	-	-	Enclosure
4.	Training Manual (Skill Development/ Capacity Building)	5	-	-	SOP's attached
5.	Papers presented in Conferences/Seminars	1	-	-	-
6.	Policy Drafts/Papers	-	-	-	-
7.	Others:	-	-	-	-

\* 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	The project finding will help in generating better livelihood opportunities through utilization of traditional knowledge and to an extent reduce the migration from the Himalayan terrain by developing high value added products.
Replicability of Project	The project is a baseline for livelihood generation from wild produces available in marginal land through processing and value addition. Such practice can be easily replicable in different IHR region as having extremely rich biodiversity.
Exit Strategy	Under this project certain high value product value chain was developed and cooperative women were trained in material handling, procurement, semi processing, value addition and packaging. Direct link of stakeholders with cooperative was build for systematic running of process. Cooperative was also regularly trained in machinery handling. As per market demand 9 products out of 19 developed, were incorporated in the business plan of the HARC cooperative. Thus the development of such bankable plan had made this project finding sustainable for the existing region. Along with that as HARC Kaleshwar centre, equipped with updated machineries is a perfect example of incubation cum growth centre for farmers, entrepreneurs and other clients.

(PROJECT PROPONENT/ COORDINATOR/ HEAD OF THE INSTITUTION)

(Signed and Stamped)  
  
**Dr. Rajendra Dobhal**

**Director General**  
**State Science and Technology Council**  
**Dehradun**

Place: Dehradun

Date: 26/08/2018