

Bhutan Trust Fund for Environmental Conservation Implementation Completion Report

Section I: Project information

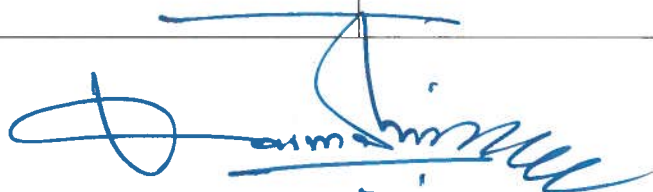
Project title:	Introducing Environmental Science in Formal Education in Bhutan in Classes XI and XII
Grant Number:	MB187Y17
Grantee:	Curriculum Development Centre, Royal Education Council.
Project period:	July 2017 to December 2018
Total fund:	Nu. 5.326 million.

Section II: Project accomplishment

Project goal: Build an Environment Knowledge Based Society for the 21 st Century by enhancing the environmental knowledge, skills and values and attitude of Bhutanese school children through the introduction of Environmental Science as a subject in classes XI and XII inspired by the principle of GNH.		
Outcome I: The professional capacity of 110 science teachers in secondary schools developed to teach ES curriculum effectively.		
Project output <i>(List down the outputs as in the Results Framework)</i>	Output achievement <i>(Explain and indicate the tangible results against each output)</i>	Outcome achievement <i>(Explain how the collective achievements of output/s have contributed to the accomplishment of the outcome/s)</i>
Output 1.1 <i>Preparation of training kit for ES course delivery and confirmation of resource persons and participants.</i>	Orientation resource kit developed. The powerpoint slides were developed based on the contents of the Resource kit.	REC initiated a feedback mechanism where schools and teachers were asked to indicate problematic areas in teaching and learning. These data was used to determine the topics that were to be included in the resource book. Resource book was developed and the training kit was derived from the contents of the resource book.
Output 1.2 <i>Orientation of science teachers on the teaching of ES in classes XI and XII.</i>	The target was to orient 110 science teachers to effectively teach ES. However, 118 (plus 3 participants from Private school whose TA/DSA was borne by the school) science teachers were oriented from the BTFEC fund. Further 9 more participants attended the programme, funded by UWICER.	Participants were selected based on the nominations from schools. Resource persons were identified by the core implementing team



		<p>depending on the relevancy.</p> <p>REC was able to partner with Ugyen Wangchuk Institute for Conservation and Environmental Research (UWICER) both in terms of providing resource persons for the delivery of orientation programme and sponsoring phenology network teachers for the orientation.</p>
<p>Outcome II: 110 secondary schools supplied with 5 titles of environmental science reference books and enriched the ES teaching and learning in secondary schools</p>		
<p>Output 2.1 <i>Identify and select ES related reference books, national and global.</i></p>	<p>ES reference book selection workshop was conducted. Towards the end of the workshop, duly signed minutes of the meeting and a list of recommended books were submitted to the project implementing team.</p>	<p>Expressions of interest were invited for the supply of ES reference books through REC's website and various national media outlets.</p> <p>REC has a standard operating procedure for the selection of teaching and learning materials. Practicing teachers from nearby schools, who were also writers for ES textbooks, since they are very thorough with the demands of the curriculum, were invited to select the books.</p> <p>Judging by the quality of the content of the submitted reference books, the project implementing team had to solicit support from Sherubtse College and UWICER. REC sought recommendation for books and samples for the selection process. All financial rules and regulations, procurement rules and regulations were followed for the task.</p> <p>REC retendered the second phase of the supply of ES reference books. This time</p>
<p>Output 2.2 <i>Procure and supply reference books to schools (25 books per school for 110 schools – 5 titles x 5 copies each).</i></p>	<p>The proposed target was to supply 2750 reference books (25 each to 110 schools). However, through the project fund alone, REC procured and supplied 4131 books (1381 more than the target). NBC donated 836 books which were distributed. 1650 UWICER copyrighted books were printed and distributed.</p>	

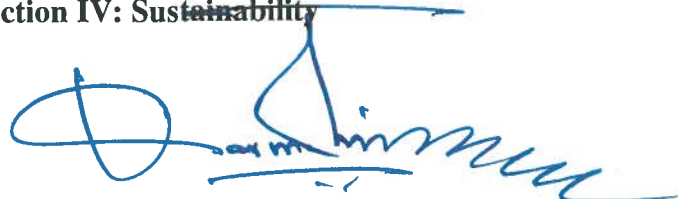


		<p>we mentioned the titles of the books and invited bidding for the cost of the books. Based on it, supply orders were dispatched. During the course of the project implementation, we were able to partner with National Biodiversity Centre (NBC), Thimphu, who donated ES related books. These books were also distributed to the school. Similarly, upon request, UWICER granted REC one time printing rights of their publications. However, the project fund was insufficient to print the books. Therefore, a certain amount was re-appropriated from other activities at REC and the books were then printed for distribution.</p>
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Section III: Project beneficiaries

List of beneficiaries as indicated in the project document	How it has benefitted
1. 130 teachers	The professional capacities of the science teachers were developed to teach environmental science effectively. Some of the teachers, who were teaching ES in schools did not come from science backgrounds. All the participants were oriented on content, assessment, pedagogy, and practical work.
2. Students	They are the indirect beneficiaries of the project. As of today there are 5761 students spread from classes IX to XII.
3. Schools offering ES	Till the project was implemented, schools did not have any centralized distribution of reference books. Teachers, during the orientation, shared their concerns regarding the same and how it negatively impacted teaching and learning process. Now the schools have at-least 51 ES reference books that they can rely on for information.

Section IV: Sustainability



Explain how the sustainability of the project is ensured

Environmental Science (ES), as a subject, has been formally introduced into the mainstream curricula as an optional subject from classes IX to XII. The curriculum is designed in such a way that children develop the knowledge and understanding of physical, social and cultural environment along with their associated environmental issues. Learners also engage in various investigations through the process of inquiry. However, we had previously observed that any introduction of a subject is laden with problems in implementation that is the curriculum designers' intentions are not completely understood by the curriculum enactors. Thus, the orientation programme filled the voids for effective implementation of the curriculum.

The provision of ES reference books further facilitates students' inquiry process. Although web based information soliciting is possible, schools do not have adequate infrastructure to support such learning. Reference books are vital, at this time, for students to gather more and relevant information to learn beyond what is there in the textbooks.

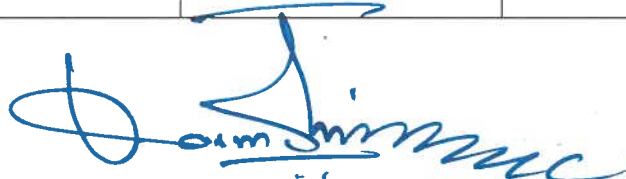
Investing in youth and their education is the greatest sustainability practice one can think of. As His Majesty the Fourth Druk Gyalpo commanded "the future of the country lies in the hands of the younger generation". The current population trend of Bhutan and elsewhere is also called "youth bulge", where the majority of the population lies within the youth range. Economists and leaders both recognize that adequately educating the youth provide an opportunity to resolve the social, environmental, and political issues that currently dominates the world scenario.

Section V: Major factors affecting the project implementation

Factors	Description
Deviation from proposed plan (Activity/budget)	The project implementation team did not deviate from the proposed activities. However, a sum of Nu.0.345 m (Nu. 345,000) was re-appropriated from the second outcome to the first. The changes in the approved figures did not have any adverse effects on the targets set for the second outcome.
Delay in fund approval and disbursement process from BTFEC	The funds were released on time according to the Budget Utility Plans (BUP) upon submission of semi-annual work plan and budget.
Delay in fund release from DPA	The funds were released on time according to the requisition submitted through BUP.
Change in policy if any	Procurement policies, especially with regards to reference books needs to be revamped. RUB has a different modalities for procuring library/ reference books which ensures that the required books are purchased.
Any other	

Section VI: Fund utilization status

Total approved budget	Total budget disbursed from BTFEC	Total budget utilized	Total budget balance
Nu. 5.236 million	Nu. 5.236 million	Nu. 5,235,685.00	Nu. 315.00

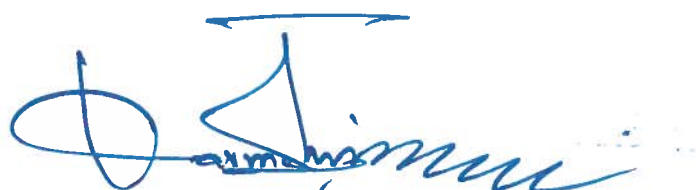


Section VII: Recommendation to BTFEC

1. Teacher orientation programmes should be conducted only during vacations; July to August and December to January, which conflicts with BTFEC's semi-annual reporting. REC suggests that semi-annual reporting be shifted from December to February, especially if teachers are going to be the primary beneficiaries of the project.
2. Procurement of materials, if the whole amount does not exceed Nu. 50,000.00 be relaxed without having to follow the official procurement procedure.
3. Getting the required books was a challenge through open bidding process. Royal University of Bhutan and her affiliated colleges gather recommended books and procure them directly from firms outside Bhutan. For similar projects, at a later date, if BTFEC could also approve the same modality, assurance can be ascertained that the required books are procured.

Titles of the books distributed

SI No	Title of Books	Author	No. of Copies	Unit price
1	Principles of Environmental Science(Inquiry and Applications)	W P Cunningham & M A Cunningham	550	679.83
2	Environmental Science	G.Tyler Miller, JR	550	519.87
3	ENVIRONMENT	Raven, Hassenzahl, Gift & Berg	550	1046.25
4	Know all about Reduce, Reuse, Recycle	Yoofisaca Syngkon Nongpluh Guy C Noronha	550	295
5	Frank Environmental Education for Class XII	Reeta David	550	399
6	Environmental Education	MP Mishra	415	295
7	Environmental Education for undergraduate course	DK Asthana & Meera Asthana	416	445
8	Frank Environmental Education for Class XII	Reeta David	550	399
9	A field guide to common molluscs of Bhutan	National Biodiversity Centre	136	Donated by NBC
10	A field guide to common dragonflies and damselflies of Bhutan	NBC	136	Donated by NBC
11	Common moths of Bhutan	NBC	136	Donated by NBC
12	Common bees and wasps of Bhutan	NBC	136	Donated by NBC



13	Common ladybeetles of Bhutan	NBC	292	Donated by NBC
14	Swallowtails of Bhutan	© UWICER printed by REC	550	
15	Butterflies of Bhutan	© UWICER printed by REC	550	
16	Skippers of Bhutan	© UWICER printed by REC	550	

List of ES reference books recipients

Sl#	Dzongkhag	School
1	Bumthang	Jakar HSS
2		Sonam Kuenphen
3		Chhume central school
4		Tang Central School
5	Chhukha	Chukha central school
6		Pakshika Central School
7		Arekha MSS
8		Chapcha MSS
9		Chumigthang
10		Darla MSS
11		Kamji central school
12		Wangchu MSS
13	Dagana	Daga Central School
14		Drujeygang Central School
15		Dagapela MSS
16		Gesarling Central School
17		Lhamoyzingkha CS
18		Tsangkha MSS
19	Gasa	Bjishong Central School
20	Gelephu Thromde	Gelephu HSS
21	Haa	Gongzim Ugyen Dorji central school
22	Lhuntse	Minjey MSS
23		Tangmachu Central School
24	Mongar	Gyelpozhing Central School
25		Mongar HSS
26		Yadi Central School
27		Chaskhar Central School
28		Drametse Central School
29		Kidheykhar Central School
30	Paro	Shaba MSS
31		Shari HSS
32		Tenzin HSS

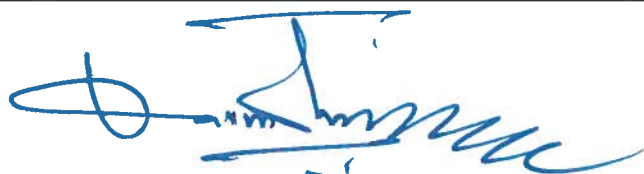
33		Utpal HSS
34		Karma Academy
35		Yoezerling HSS
36		Betikha MSS
37		Khangkhu MSS
38		Lango MSS
39	Pema Gatshel	Nganglam central school
40		Pemagatshel MSS
41		Yelchen Central School
42		Yurung central school
43	P/Ling Th	Phuentsholing (HSS)
44		Phuentsholing MSS
45		Sonamgang MSS
46	Punakha	Dashiding HSS
47		Punakha central school
48		Ugyen Academy
49		Dechentsemo Central School
50		Kabesa MSS
51		Khuruthang MSS
52		Tashidingkha Central School
53	Samdrup Jongkhar	Karmaling CS
54		Orong central school
55		Garpawoong MSS
56		Gomdar Central School
57		Jomotsangkha CS
58		Martshala Central School
59		Minjiwoong Central School
60		Phuntshothang MSS
61	Samtse	Peljorling HSS
62		Samtse HSS
63		Tendruk central school
64		Dorokha Central School
65		Gomtu MSS
66		Norbugang CS
67		Yoeseltse MSS
68	Sarpang	Sarpang central school
69		Norbuling Central School
70		Pelrithang MSS
71	S/Jongkhar Thromde	Samdrupjongkhar MSS
72	Thinphu Dzongkhag	Wangbama Central School
73		Khasadrapchu MSS
74		Yangchengatshel MSS
75		Kuzhugchen MSS

76		Dechencholing HSS
77		Motithang HSS
78		Nima HSS
79		Yangchenphug HSS
80	Thimphu Thromde	Babesa MSS
81		Rinchen HSS
82		Changangkha MSS
83		Loseling MSS
84		Lungtenzampa MSS
85		Jampeling Central School
86		Jigme Sherubling central school
87		Rangjung central school
88	Trashigang	Tashitse HSS
89		Dungtse central school
90		Radi MSS
91		Uzorong Central School
92		Baylling central school
93		Kunzangling central school
94	Trashiyangtse	Ramjar MSS
95		Tsenkharla Central School
96		Sherubling central school
97		Taktse Central School
98	Trongsa	Samcholing MSS
99		Tshangkha Central School
100		Damphu central school
101		Mendregang Central School
102	Tsirang	Damphu LSS
103		Tsirangtoe CS
104		Bajo HSS
105		Gaselo central school
106	Wangdue Phodrang	Phobjikha central school
107		Samtengang Central School
108		Buli central school
109		SonamThang Central School
110		Yebilaptsa Central School

List of participants and resource persons for the Orientation programmes

ES Orientation cohort I- Gelephu LSS (21st to 27th Dec 2017)

Sl.no	EID	Name	School	Phone
1	201201595	Sangay Tenzin	Jakar HSS	17698360



2	201101663	Tashi Wangchuk	Ura CS	17921659
3	20150105178	Jamyang Tshulthrim	Chukha CS	17998966
4	20160106595	Choki Gyeltshen	Chaskhar CS	17945067
5	200701304	Sonam Norbu	Gedu HSS	17806418
6	200801603	Dorji Dukpa	Drukjeygang CS	17546572
7	201301717	Deo Narayan Regmi	Lhamoyzingkha CS	17823193
8		Yonten Chopel	Daga CS	17986192
9	20130101731	Nidup	GUDHSS	17689730
10	200601204	Pema Jurmey	Shari HSS	17723677
11	200901763	Kezang Dorji	Bitekha MSS	17647442
12	11107002436	Kezang Phutsho	Tenzin HSS	17551427
13	200901620	Deepak Raj Chetri	Sonamgang MSS	17732144
14	20130101765	Wangchuk	Kabesa CS	17801346
15	201001360	Jamyang Drukda	Punakha CS	17767214
16	20140104086	Kinzang Gyeltshen	Dorokha CS	17989363
17	20170308893	Sangay Wangchuk	Gomtu MSS	17715181
18	200701214	Choki Dorji	Tsirangtoe CS	17421679
19	201202230	Norbu Wangdi	Kuzhugchen MSS	17549213
20		Wangchuk Dema	Dr. Tobgyel School	17987397
21	8607022	Kamal Hingmang	Yangchenphug HSS	17605775
22		Suban Rai	Dechencholing HSS	17979391
23	200901588	SONAM TOBGAY	Lungtenzampa MSS	17647140
24	200701332	Lam Dorji	Taktse CS	17415603
25	20140104069	Bidhur Gurung	Lhuntse HSS	17923861
26	20160106590	Ugyen Lhamo	Sherubling CS	17535372
27	200501317	Chheku Wangdi	Mendrelgang CS	17657997
28	200701412	Sonam Dorji M	Bajothang HSS	
29	201001649	Tshering Penjor	Phobjikha CS	17720380
30	201101597	Lungten Dorji	Zhemgang CS	17771468
31	20140104025	Ugyen Dorji	Buli CS	17676177
32	200601515	Tenzin Nima	Jampeling CS	17277047
33	201505078	Sonam	Ugyen Academy	17988046
34	20140103989	Pempa Tshering	Jakar HSS	17459919
35	20160907475	Lhaten	Chumey CS	77379616
36	200401364	Pema Chopel	Chapcha MSS	17451262
37	201001458	Kinzang Tenzin	Pakshikha CS	17995849
38	200307375	Tenzin Dorji	Wangchu MSS	17463206

39	201001214	Letho Dorji	Drukjeygang CS	17821008
40	200701227	Chimi Dorji	Dagapela MSS	17663474
41	20140104039	Tshering Dendup	Chundu AFPS	17850600
42	201001219	Tshering Lham	GUDHSS	17641084
43	200801215	Tshering Lham	Phuntsholing MSS	17886969
44	9910082	Sumitra Pokhrel	Phuentsholing HSS	17838044
45	200708003	Shekhar Nath Mishra	Dashiding HSS	17280738
46	200407295	Lhamo Yangchen	Khuruthang MSS	77397900
47		Norbu	S. Jongkhar MSS	17630104
48	20140103993	Ugyen Wangmo Tenzin	Peljorling HSS	17560922
49	201202058	Ugyen Tobgay	Sarpang CS	77203995
50	01011602	Annalee Moes	Nima HSS	17706641
51	9407249	C B Mongar	Yangchenphug HSS	77608780
52	200601442	Tashi Dawa	Dechencholing HSS	17618390
53	200207357	Ten Gyelmo	Changangkha MSS	77310678
54	201001364	Tenzin Tharchen	Samcholing MSS	17729098
55	20170308908	Eka Dawa	Tshangkha CS	17479068
56	201101524	Tshering Yangdon	Gaselo CS	17614938
57		Sangay Bidha	Samtengang CS	77429929
58	20140104139	Tashi wangchuk	Zhemgang CS	17299315
59	20140303725	Kelzang Dorji	Yebilapta CS	17771846
60	201101275	Duptho Gyeltshen	Gongthung MSS	17776223
61	9606012	Abhijit Baksi	Gelephu HSS	17740446
62	200901622	Sonam Choden	Bajothang HSS	17639977

ES Orientation Cohort II – S/Jongkhar PS (19th to 25th Jan, 2018)

Sl. No	Name	EID	School	Contact #
1	Kuenzang Thinley	20140103984	Sonamthang CS	17854638
2	Ngajay Tshering	20140303617	Minjiwoong CS	17822033
3	Sonam Dendrup	201202225	Autsho CS	17582055
4	Wangdi	201001533	Pelrithang MSS	17648520
5	Tashi Dorji	200901603	Udzorong CS	17508995
6	Ugyen Phuntsho	201201599	Babesa MSS	17634330
7	Yesel Zangpo	200901484	Pemagatshel MSS	17766055
8	Kencho Galey	20140303840	Rangjung CS	17881229
9	Kinga Dorji	20170308884	Gomdar CS	77347038
10	Pasang Lhamo	200907226	Khangkhu MS	17965099
11	Sherab Chezang	201001639	Tangmachu CS	17394146

12	Sonam Zangmo	9501066	Phuntsholing HSS	17625550
13	Namgay	20170107643	Yurung CS	17985271
14	Tshering Dolma	20130101767	Tashidingkha CS	17680683
15	Kinley Tandin Dorji	20170107696	Garpawoong MSS	17545752
16	Kinzang Choden	20160306895	Tendruk CS	17322660
17	Ngawang Tenzin	201202240	Minjey MSS	17483488
18	Pema Tshering	20160106597	Rangjung CS	17987568
19	Sangay Penjor	201001641	Tendruk CS	17909445
20	Thinley Wangchuk	20131705	Gesarling CS	17824943
21	Tshering Dema	9908166	Loselling MSS	17801090
22	Kuenzang Dechen	200601277	Shaba HSS	17496108
23	Migma Tshering	20150105220	Nganglam CS	17866778
24	Sonam Namgay	200901607	Kidyekhar CS	
25	Sonam Zangpo	20160106615	Tashitse HSS	17586381
26	Tashi Yangzom	2008280	Khasadrapchu MSS	17498593
27	Tshewang Namgyel	20140104165	Yurung CS	17763774
28	Cheki Wangmo		Samtse	17602405
29	Phurpa Tshering	20160106596	Jigme Sherubling CS	17384582
30	Nim Dorji	20160106617	Tsenkharla CS	17778915
31	Sherab Tenzin	201001560	Samtse HSS	17711758
32	Tenzin Dema	201202216	Nganglam CS	17782453
33	Tshering Tobgay	201101429	Bajothang HSS	17909676
34	Tshering Tobgye	201001380	Yadi CS	
35	Dorji Dema	200701269	Lango MSS	
36	Ram C Dahal		Royal Academy	17853065
37	Norbu Gyeltshen		S/ Jongkhar MSS	17695431
38	Pema Wangchuk	200707288	Darla MSS	17936723
39	Sangay Bidha	20160306888	Kunzangling CS	16925907
40	Sangay Wangchuk	200801516	Phuntshothang MSS	17954796
41	Tshelthrim Pelden	200501389	Trashigang MSS	17646106
42	Dechen Wangdi	2013010691	Baylling CS	17564600
43	Kinga Tshering	201101416	Dungtse CS	17951475
44	Norbu	201101441	Jomotsangkha MSS	17708697
45	Sherab Chopel	20140303569	Baylling CS	17882691
46	Sonam Wangchuk	200601182	MotithangHSS	17869866
47	Ugyen Chopel	201001531	Drametse CS	17727088
48	Kinley Pema		Dungsam Academy	77471822
49	Karma Tobjay	20170107609	Bjishong CS	17426316
50	Karna Bdr. Subba	201001523	Wangbama CS	17502697
51	Pema Wangdi	20130101698	Ramjar MSS	17706246
52	Rinzin Lhamo	200801548	Tashitse HSS	17693389
53	Sangay Khando	20160106600	Gyelpozhing CS	17545752

54	Tashi Pemo	20170107647	Karmaling HSS	17991107
55	Kuenzang Dechen	201202246	Martshala CS	77795036
56	Karma Tshering	20170107610	Bartsham CS	17494965
57	Pema Lhendup	201202129	Kamji CS	17716962
58	Sherab Wangmo	201001217	Pelrithang MSS	17974702 77214753
59	Tshering Samdrup	200901546	Mongar HSS	17725386
60	Yeshe Wangdi	201001532	Jomotsangkha MSS	17794689
61	Dorji Wangchuk	200801604	Dechentshemo CS	17522320
62	Jimge Tshering	200901716	Yelchen CS	17715395
63	Kencho Dorji	201001372	Yoeseltse MSS	17664487
64	Ngawang Jamba	20140103968	Orong CS	17320828
65	Sonam Yeshe	200501429	Norbuling CS	17922060
66	Tashi Jamsho	201202228	Mendrelgang CS	17838704
67	Yeshey Nidup	201001632	Radhi MSS	17779578
68	Yenten Jamtsho	200207455	Mongar HSS	17680718

Resource Persons for the Orientation Programme

Sl.no	Name	Agency	Remarks
1	Wangpo Tenzin	Dean, REC	Gelephu Only
2	Bhoj Raj Rai	REC	
3	Surjay Lepcha	REC	
4	Karma Jamtsho	Nganglam CS	
5	Chenga Tshering	UWICE	
6	Tashi Choden	UWICE	
7	Tshetup Tshering	UWICE	
8	Karma Tenzin	REC	
9	Wangchuk	REC	S/ Jongkhar only
10	Geewanath Sharma	REC	S/ Jongkhar only

Submitted by:

a) Name: Karma Tenzin

b) Date: 18th July, 2018

c) Signature:

