

# Environment and Social Safeguards Compliance Report

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March 2016

## BHU: Air Transport Connectivity Enhancement Project

Prepared by Department of Air Transport, Ministry of Information and Communication for the Royal Government of Bhutan and the Asian Development Bank.

## **CURRENCY EQUIVALENTS**

(As of 15 March 2016)

Currency unit	–	Bhutanese Ngultrum
Nu 1.00	=	\$ 0.015
\$1.00	=	Nu 67.39

## **ABBREVIATIONS**

ADB	:	Asian Development Bank
ATCEP	:	Air Transport Connectivity Enhancement Project
BBSC	:	Bhutan Broadcasting Service Corporation
BCCA	:	Bhutan Civil Aviation Authority
CSC	:	Construction Supervision Consultant
DCA	:	Department of Civil Aviation
DoAT	:	Department of Air Transport
DOL	:	Department of Livestock
ICAO	:	International Civil Aviation Organization
IEE	:	Initial Environmental Examination
EMP	:	Environmental Management Plan
MOIC	:	Ministry of Information and Communications
NEC	:	National Environment Commission
PC	:	Project Coordinator
PIU	:	Project Implementation Unit
RGOB	:	Royal Government of Bhutan
RP	:	Resettlement Plan

## **GLOSSARY OF TERMS**

Dzongkhag	:	District
Geog	:	Block
Gup	:	Village Head man
Tsogpa	:	Village Community Member

## **NOTE**

In this report, "\$" refers to US dollars.

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## **EXECUTIVE SUMMARY**

1. This document reports on the environmental and social safeguards compliance of the Air Transport Connectivity Enhancement Project (ATCEP). It covers the pre-construction, construction and operational phases of the Project. The project was financed by ADB through a grant (No.0295-BHU) worth US\$6.92 million approved on 21 June 2012. It was aimed at improving the capacity and security of the three existing domestic airports of Bumthang, Yonphula and Gelephu, building on civil works already carried out by the Royal Government of Bhutan. Civil works under ATCEP for Bumthang and Gelephu airports were completed in April 2015. However, civil works improvements are still ongoing for the Yonphula domestic airport and are expected to be completed by mid-October 2016.

2. The Ministry of Information and Communication (MOIC) is the Executing Agency (EA) while the Department of Civil Aviation (DCA) is the Implementing Agency (IA) for the Project. Since the bifurcation of the DCA into two separate entities namely, the Bhutan Civil Aviation Authority (BCCA) and the Department of Air Transport (DoAT); the role of IA now has been taken over by the DoAT. The Project is supervised by the Construction Supervision Consultants (CSC) – composed of the association between the Leading Edge Aviation Planning Professionals (LEAPP), an international firm, and Gyaltsen Consultancy, a national firm.

3. Overall, environmental and social safeguards mitigation measures have been implemented in compliance with ADB's Safeguards Policy Statement (2009), the grant covenants and the proposed mitigation measures described in the Environmental Management Plan (EMP and contract specifications. A few issues are pending and yet to be fully compliant. The key completed and pending safeguards issues are described below, categorized into RGOB and ADB financed components:

### **A. RGOB Financed Airports Construction Project:**

#### **1. Bumthang Domestic Airport**

4. Relocation of Brown Swiss Farm from Department of Livestock: In principle, the DoAT acquired the entire Brown Swiss Farm Complex at Batapalathang under the Department of Livestock (DOL), Ministry of Agriculture and Forest for the construction of Bumthang airport between 2010- 2011. However, some of the farm structures are still occupied by the Farm Management as per the agreement between the DoAT and the DOL. It was agreed that the farm relocation will be conducted in a gradual and phased manner. The Farm is being relocated to a place known as Lebi which is 1km from the current location. The management is currently constructing cattle or dairy sheds, which are expected to be completed by November 2016. It also plans to tender out the construction of office and staff quarters within this financial year, before the end of June 2016. Overall, the complete relocation of the farm is expected to take 3 years, probably until the end of 2019.

5. Reconstruction of bridge: For the safety of aircraft takeoff and landing, the pedestrian suspension bridge connecting Batpalathang to Wangdicholing was demolished in 2011. It was one of the important linkages for the community particularly for children going to school and for sick community residents visiting the hospital, both which are located at Wangdicholing, which currently have to use an alternative bridge further away. A new suspension or vehicular bridge was planned to be constructed to the north of the airport by the Dzongkhag, but this did not materialize yet due to the fact that the final airport boundaries have not yet been defined due to a proposed airport extension. The final airport boundary demarcation is therefore crucial for

Bumthang Dzongkhag Administration to identify the location of the new bridge and start construction. In this regard, a joint field visit is planned between the Dzongkhag and the DoAT to finalize the airport boundary as well as identify a preliminary location for the bridge. The final location of the bridge and airport demarcation decision will have to wait for the recommendations on the study on Bumthang airport improvements to accommodate larger aircrafts, commissioned by the Government of Bhutan to international aviation experts. The study is expected to be finalized in June 2016. Upon confirmation of bridge location, Dzongkhag plans to tender out the bridge construction.

6. Compensation of one affected household: One household (headed by Ms. Tshering Dema) has still not been compensated for land acquired by DOAT. This is due to negotiation between her and the government on cash versus land for land compensation, which took over a year to resolve. She is still owed Nu.21,017.70 for acquisition of 0.10 acre. DOAT committed to ensure she is compensated before June 2016.

## **2. Gelephu and Yonphula Domestic Airport**

7. There are no pending environmental and social safeguard issues for Gelephu and Yonphula airports. The land acquisitions, and the subsequent compensation and land substitutions to the affected persons have been completed prior to implementation of the ADB financed ATCEP. The land acquisition was not undertaken in anticipation to ADB financing.

## **B. ADB Financed Air Transport Connectivity Enhancement Project**

### **1. Bumthang and Gelephu Domestic Airports:**

8. Monitoring environment quality: The Initial Environmental Examination (IEE) study had recommended the Project to carry out the ambient air, noise, and water quality monitoring during the construction period. However, the Project faced some challenges in complying with this requirement due to lack of capacity and the technical know-how. The National Environment Commission (NEC) which is one of few agencies in Bhutan with expertise to conduct such monitoring was requested for support. However, it still could not be carried out due to the NEC being very busy and having manpower constraints. To address this issue an ADB staff consultant was recruited to provide support and collect post construction monitoring data for Bumthang and Gelephu airport and during construction data for Yonphula airport which is currently still under construction. This monitoring data that was collected will be included in the semi-annual monitoring report for July – December 2016.

9. Land acquisition: No private land and structures were acquired as the construction activities of Bumthang airport were carried out within the airport boundary. For the construction of the new terminal building at Gelephu airport, 0.67acres private land had to be acquired from one affected person. To this end, a resettlement plan was prepared and the affected person was provided with land substitute close to the new township of Gelephu, located north of the airport. The implementation of the resettlement process followed the RP, SPS, and government requirements

### **2. Yonphula Domestic Airport:**

10. Construction of protection walls: Under the Project, major earthworks such as removal of hills on the sides of the runway and pavement works have generated huge quantities of spoil. The spoil has been used to extend the runway by almost 90m towards northwest, north and

northeast sides of the runway. In order to prevent spoil spillage downslope, concrete walls were built. This helped to stop majority of the spillage except in a few areas. The barrier wall at the northwest end of the runway has collapsed due to excessive weight of the spoil that was dumped in the area. The Project will construct a second wall below the collapsed one to stop spoil spillage towards the settlement. However, to stop debris spillage completely, the project needs to construct dry boulder walls in all critical areas. This will be undertaken by the contractor as part of the EMP before the next monsoon season.

11. Relocation of Chorten/Stupa: The Khasum Yulay Namgyal Chorten/stupa located on the hillock at southeast end of the runway had to be relocated prior to the removal of the hill. It has been relocated more than 150m further towards southeastern side, on the hill top overlooking the valley. The relocation was carried out in consultation with the community of Yonphula.

12. Relocation of footpath: The new perimeter fence that is going to be erected around the Yonphula airport will block the traditional foot path that traversed the runway of the airport, constructed by Indian Military in 1960s; which is now being rehabilitated under the ATCEP. This blockage of footpath will force people from nearby villages to detour to reach the market center at Yonphula, a process that will take an additional hour. Therefore an alternative footpath is planned to be constructed along the edges of the perimeter fence on the southeastern end of the runway. This footpath will connect the Samdrup Jongkhar-Trashigang highway to the Yonphula settlement via Yulay Namgyal Chorten/Stupa. This construction will be done before the end of 2016.

13. Yonphula Pond: At the request of the community of Yonphula and the Geog Administration of Kanglung, Yonphula airport will include a small pond of religious and cultural significance within the airport boundary to maintain its cleanliness and sanctity. The airport management will provide once in a year access to the pond for the community to perform their yearly ritual ceremony. It is held in the month of May corresponding to the fourth month of Bhutanese Calendar.

14. Water supply tank: The community water supply tank of Yonphula located within the airport boundary will not be relocated, as previously identified in the environmental monitoring report, as it poses no hurdle to the airport operation. If required it will be relocated in future. However, the water pipeline from the source to the above mentioned tank has been recently realigned and relocated to give way for the runway extension. There are no issues of water supply disruption.

### **C. Unanticipated Safeguard Issue:**

15. Bumthang airport management has constructed the 350m long by 4m high gabion wall (river protection structure) on the left bank of Chamkhar Chhu/River through the RGOB funding. The construction started on 20 October 2015 and the major river training works were completed on 16 January 2016. This gabion blocks the river from flowing through its three natural flow channels that branches out of the main channel. These branches act as a buffer during the peak flow season preventing flood damages downstream. Now, with the permanent river training structure in place, the Chamkhar Chhu is forced to flow only through its main channel. During peak rainy season, there are high chances of erosion on the right bank particularly around the base of the historic Chakhar Lhakhang<sup>1</sup>. If no measures are put in place before the onset of monsoon, the flood water may erode base of the Lhakhang and ultimately damage or destroy it.

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<sup>1</sup> Chakhar Lhakhang is an important historical asset being the palace of Sindhu Raja.

The Bumthang Dzongkhag Administration has notified the DoAT through Bumthang Airport Management to implement an immediate temporary right bank protection measure by stacking the boulders around the base of Lhakhang, which was agreed by DOAT. Therefore, DoAT will carry out the temporary bank protection works before the start of the 2016 rainy season. The permanent river training work will be carried out by the Bumthang Dzongkhag by 2017.

16. No unanticipated safeguard issues were identified for the Yonphula and Gelephu airports improvement works.



## I. INTRODUCTION

### A. Purpose of the Report

1. The Air Transport Connectivity Enhancement Project (ATCEP) was financed by the Asian Development Bank (ADB) through a grant (No.0295-BHU) worth US\$ 6.92 million approved on 21 June 2012. ATCEP was designed to increase the capacity and security of the three domestic airports of Bumthang, Gelephu and Yonphula. More details on the investments included under ATCEP are provided in section 1.5 below. ATCEP will be referred to as the “Project” henceforth.

2. The objective of this environmental and social safeguards compliance report is to assess compliance of the Air Transport Connectivity Enhancement Project (ATCEP) with the Asian Development Bank’s (ADB’s) Safeguards Policy Statement (SPS), 2009. This type of report is prepared annually and disclosed on ADB’s website as per the requirements of the loan agreement. Furthermore this compliance report also fulfills ADB’s SPS requirement on safeguards compliance audit for projects with existing facilities/activities when preparing an Additional Financing (AF) project.

3. During project preparation, it was assessed that ATCEP did not lead to significant environmental impacts. It was categorized as “B” for environment. An Initial Environmental Examination (IEE), which included an Environmental Management Plan (EMP) was prepared during project preparation and disclosed on ADB in 2012.<sup>2</sup>

4. At the time of approval by ADB, the project was categorized as “C” for Involuntary Resettlement impacts, as no impacts were identified at the time. However, after the finalization of the detailed designs, minor land acquisition (0.67 acre), impacting one household was identified for the civil works related to the Gelephu airport enhancement. The project was thus subsequently re-categorized as “B” for Involuntary Resettlement and a Resettlement Plan (RP) was prepared and disclosed on ADB website.<sup>3</sup> The project is categorized as “C” for Indigenous Peoples’ impacts.

5. The report: (i) evaluates the progress of the implementation of the environmental management plan (EMP), (ii) evaluates the progress of the implementation of the resettlement plan and other social impacts and mitigation measures; (iii) detects non-compliances and recommends corrective actions, and (iv) identifies unanticipated impacts and recommends necessary mitigation measures.

### B. Scope and Methodology

6. This report is prepared based on field investigations and observations and the review of following documents:

- The grant agreement signed between RGOB and ADB
- The project administration manual (PAM),
- The Contract Agreements signed between the Contractors and the DoAT
- The Safeguard Policy Statement (SPS) 2009,
- IEE report for ATCEP
- The Resettlement Plan for ATCEP

<sup>2</sup> <http://www.adb.org/sites/default/files/project-document/59942/44239-013-bhu-iee-01.pdf>

<sup>3</sup> <http://www.adb.org/sites/default/files/project-document/148765/44239-013-rp-01.pdf>

- Annual monitoring reports on Social and environment safeguards for Air Transport Enhancement Connectivity Project concerning improvement of Bumthang, Yonphula and Gelephu domestic airports, and
- Consultation with affected individual, communities and key stakeholders.

### **C. Project Description**

7. The Air Transport Connectivity Enhancement Project (ATCEP) was financed by the Asian Development Bank (ADB) through a grant (No.0295-BHU) worth US\$ 6.92 million approved on 21 June 2012. The project's investments are designed to enhance the safety and security of the three airports as well as improve their overall capacity. Civil works financed by ADB include securing the airport perimeter; expanding the terminal space, air craft parking apron, and taxiway; improving the runways and installing aeronautical communication and navigation aid equipment. These improvements are targeted to meet the requirements of current and anticipated aviation activities in the country, and support safety records.

8. Overall, the project supports the government's plan to develop a safe, reliable, and efficient air transport system that connects urban and rural centers in order to help overcome the current limitations of road transport and improve accessibility to less-developed regions of the country. The project will also contribute to the development of the tourist industry, stimulate private sector development, and generate employment opportunities for the poor.

9. The civil works for the Project started on 7 February 2014 and are expected to be completed by mid-October 2016. The Project investments are designed at improving capacity of the Bumthang, Yonphula and Gelephu domestic airports by expanding on the initial developments undertaken by the Royal Government of Bhutan (RGOB). The details of activities initiated by the RGOB and additional investments financed by ADB are provided in Table 1 and Figure 1 illustrates the project locations.

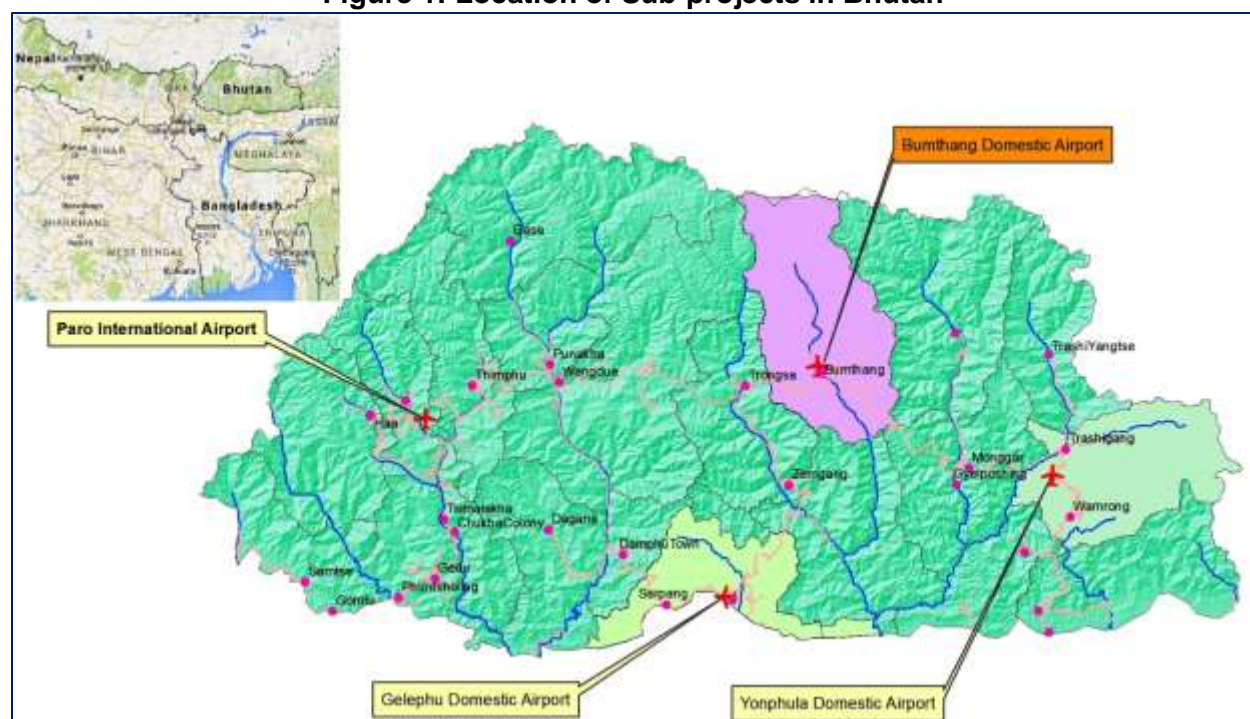
### **D. Project Implementation Arrangement**

10. The Ministry of Information and Communication (MOIC) under the RGOB is the executing agency (EA) while the Department of Civil Aviation (DCA) is the implementing agency (IA) of the Project. However, DCA is now bifurcated into two separate entities namely: the Bhutan Civil Aviation Authority (BCCA) and the Department of Air Transport (DoAT). The newly formed DoAT inherited the role of project implementation agency from the erstwhile DCA. The project has a Project Implementation Unit (PIU), headed by Project Director who is in turn supported by the respective Project Coordinators (PC) of sub-projects of Bumthang, Yonphula and Gelephu domestic airports. The Project Coordinators also act as the environmental/social focal person to monitor the environmental and social safeguards implementation.

11. The Project hired the Construction Supervision Consultants (CSC) for construction supervision and monitoring. The CSC constitutes both international and national consultants. The Leading Edge Aviation Planning Professional (LEAPP) and the Gyaltsen Consultancy represents international and national firms respectively. The CSC also includes environmental and social safeguard specialists to look after implementation and monitoring of the safeguards measures associated with the Project.

**Table 1: List of RGOB and ADB financed Activities of three domestic airports**

<b>Domestic Airport</b>	<b>Activities Already carried out by RGOB</b>	<b>Additional Activities financed by ADB under ATCEP – G0295-BHU</b>
Bumthang	1. Runway construction 2. Passenger Terminal Building Construction	1. Install perimeter fence 2. Provide new access road 3. Construct apron and taxiway 4. Construct car park
Yonphula	1. Existing Runway Improvement 2. Passenger Terminal Building construction	1. Remove hills beside runway 2. Reshaping runway 3. Provide asphalt on runway 4. Provide access road 5. Provide new car park 6. Extend apron for ATR craft 7. Remove and reconstruct perimeter fence 8. Relocate stupa
Gelephu	1. Runway construction 2. Passenger Terminal Building Construction	1. Install perimeter fence 2. Construct drainage system 3. Construct flood protection system 4. Construct new terminal building

**Figure 1: Location of Sub-projects in Bhutan**

## **E. Project Implementation Status**

12. The construction works for Bumthang airport improvement began sometime in April 2014 and was completed on 10 April 2015. While Gelephu airport works commenced in June 2013 and was completed on 15 April 2015.

13. The airport improvement and rehabilitation works of Yonphula domestic airport which started on 16 April 2015 is still ongoing and is expected to be completed by October 2016. See table 2 below for more details.

**Table 2: Project Implementation Status**

<b>Airports</b>	<b>Description of Activities</b>	<b>Implementation Status</b>
Bumthang	<ol style="list-style-type: none"> <li>1. Install perimeter fence</li> <li>2. Provide new access road</li> <li>3. Construct apron and taxiway</li> <li>4. Construct car park</li> </ol>	Completed on 10 April 2015
Gelephu	<ol style="list-style-type: none"> <li>1. Install perimeter fence</li> <li>2. Construct drainage system</li> <li>3. Construct flood protection system</li> <li>4. Construct new terminal</li> </ol>	Completed on 15 April 2015
Yonphula	<ol style="list-style-type: none"> <li>1. Remove hills beside runway</li> <li>2. Reshaping runway</li> <li>3. Provide asphalt on runway</li> <li>4. Provide access road</li> <li>5. Provide new car park</li> <li>6. Extend apron for ATR craft</li> <li>7. Remove and reconstruct perimeter fence</li> <li>8. Relocate stupa</li> </ol>	<p>Item 1 - Removal of Hills besides runway is complete and Item 8 - Relocation of stupa have been carried out.</p> <p>Rest of the construction activities are ongoing and expected to be completed by mid-October 2016.</p>

## II. SUMMARY OF ENVIRONMENTAL MONITORING

### A. Summary of Inspection Activities

14. The airport managers of the three domestic airports of Bumthang, Yonphula and Gelephu have been designated as the Project Coordinators (PCs). The PCs are the environmental safeguards focal persons at the site level, and responsible for monitoring the implementation of the EMP by the contractor. They are supported by the environment specialist of the CSC.

15. EMP implementation records in the form of monthly or quarterly checklists were maintained by the contractor and cross checked by the environment safeguards focal person at the site level. These were reviewed by the environment specialist of the CSC. Based on these checklists and site observations, the environmental specialist prepared annual monitoring reports and submitted them to the overall environment safeguards coordinator under DOAT who further forwarded the reports to ADB for disclosure on the ADB website.

### B. Noise Monitoring

16. ADB recruited and fielded the Staff Consultant<sup>4</sup> in the month of December 2015 to carry out noise level monitoring for the Project, since the CSC and the DoAT lacked the capacity and technical know-how to conduct the required survey<sup>5</sup>. The details of noise level surveys are provided in table 3. Bhutan's noise level limit as per the Environmental Discharge Standard 2010 published by the National Environmental Commission (NEC) is provided in table 4.

**Table 3: Result of Noise Level Monitoring (dBA) of three domestic airports**

Airport	Pre-Construction		During Construction		Post Construction	
	Ld (Day)	Ln (Night)	Ld (Day)	Ln (Night)	Ld (Day)	Ln (Night)
Bumthang	71.55 dB(A)	40.11 dB(A)	NA	NA	55.58 dB(A)	54.77 dB(A)
Yonphula	61.46 dB(A)	32.25 dB(A)	55.24 dB(A)	43.85 dB(A)	TCO	TCO
Gelephu	52.49 dB(A)	33.42 dB(A)	NA	NA	52 dB(A)	45 dB(A)

Source: IEE Report 2012 and Ambient Noise Level Monitoring Survey December 2015

Note: NA – Not Available; and TCO-To be Carried Out after the completion of construction activities if required.

**Table 4: Noise Level Limits, Environmental Standard 2010, NEC**

Location	Day	Night
Industrial Area	75 dBA	65 dBA
Mixed Area	65 dBA	55 dBA
Sensitive Area	55 dBA	45 dBA

<sup>4</sup> Karma Chogyel, Staff Consultant and National Environmental Expert

<sup>5</sup> Availability of expertise and equipment for monitoring of air and water quality and noise levels is very limited in Bhutan. The National Environment Commission (NEC) is one of the few agencies that have expertise in this field.

17. Noise levels of Bumthang and Gelephu for post-construction stage are well within the national limits of mixed area. For an ongoing Yonphula airport improvement work site, despite being at the height of construction activities, noise level is also within national limits.

### C. Air Quality

18. The ambient status of five major air pollutants viz. Total Suspended Particulate Matter (TSPM); PM10, Sulphur Dioxide (SO<sub>2</sub>), Oxides of Nitrogen (NO<sub>x</sub>) and Carbon Monoxide (CO) representing the quality of pollution level have been assessed by monitoring air quality of Project sites at Bumthang, Yonphula and Gelephu airports.

**Table 5: Ambient Air Quality Monitoring Results**

Airport	Monitoring Stage	Parameter (measured in µg/m <sup>3</sup> )				
		TSPM	PM10	SO <sub>x</sub>	NO <sub>x</sub>	CO
Bumthang	Pre-Construction	NA	76.83	BDL	BDL	BDL
	Construction	NA	NA	NA	NA	NA
	Post-Construction	23.15	64.15	BDL	BDL	BDL
Yonphula	Pre-Construction	NA	26.75	BDL	BDL	BDL
	Construction	71.05	87.75	BDL	BDL	BDL
	Post-Construction	TCO	TCO	TCO	TCO	TCO
Gelephu	Pre-Construction	NA	32.5	BDL	BDL	BDL
	Construction	NA	NA	NA	NA	NA
	Post-Construction	43.7	40.6	BDL	BDL	BDL

Source: IEE Report 2012 and Ambient Air Quality Monitoring Survey December 2015

Note: NA – Not Available; and TCO-To be Carried Out after the completion of construction activities if required.

**Table 6: NEC's Ambient Air Quality Standards (Maximum Permissible Limits in µg/m<sup>3</sup>)**

Parameter	Industrial Area	Mixed Area*	Sensitive Area**
<b>Total Suspended Particulate Matter</b>			
24 Hour Average	500	200	100
Yearly Average	360	140	70
<b>Respirable Particulate Matter (PM 10)</b>			
24 Hour Average	200	100	75
Yearly Average	120	60	50
<b>Sulfur Dioxide</b>			
24 Hour Average	120	80	30
Yearly Average	80	60	15
<b>Nitrogen Oxides</b>			
24 Hour Average	120	80	30
Yearly Average	80	60	15
<b>Carbon Monoxide</b>			
8 Hour Average	5000	2000	1000
1 hour Average	10000	4000	2000

\* **Mixed Area** means area where residential, commercial or both activities take place,

\*\* **Sensitive Area** means area where sensitive targets are in place like hospitals, schools, sensitive ecosystems.

19. The air quality monitoring results of the Project indicate that both Total Suspended Particle (TSP) and Respirable Particulate Matter (PM10) concentration are within limits specified

in the Environmental Discharge Standard, 2010 by National Environment Commission (Refer Table 6 for Environmental Discharge Standards of Bhutan). Other pollutants such as SO<sub>2</sub>, NO<sub>x</sub>, and CO were found to be below detectable limits

#### D. Water Quality

20. Water samples were collected in Chamkhar Chhu/River of Bumthang and the small pond northwest end of runway in Yonphula airport on December 16-30 to check the quality of the water. Water analysis results are compared with Environmental Discharge Standard 2010, NEC. The water test results are summarized and presented in Table 7.

21. In general Chamkhar Chhu/River water can be considered fairly good as per the classification provided in the Environmental Discharge Standards, NEC 2010 except that it has high content of ammonia (1.19mg/l) which is an indication of water pollution from waste water. The source of waste water could be from the nearby Brown Swiss Cattle farm and leakage of household sewage water.

22. Water quality in the small Pond at Yonphula has markedly deteriorated from the pre-construction level. The water is murky and high in turbidity (245FAU). The ammonia content (0.72mg/l) in the water indicates water pollution from waste water generated from the construction area. There are no human settlements other than the temporary construction camps for the airport construction works. To reinstate the pond water, the silt laden waste water from the construction zone shall be immediately stopped from entering the pond. The contractor shall be responsible for cleaning the pond by dredging and de-silting. Figure 2 and 3 illustrate conditions of pond during pre-construction and construction stages.

**Table 7: Results of Water Quality Analysis**

Parameters	Unit	Standard 2010, NEC (A)	Water Sample 1 (Chamkhar chhu)			Water Sample 2 (Yonphula pond)		
			PRC	CON	POC	PRC	CON	POC
Temperature	°C	-	12.0	NA	3.8	20	5	TCO
pH		6.5-8.5	8.0	NA	7.2	7	7.5	TCO
Turbidity	FAU	-	4	NA	4	10	245	TCO
Color	CU	5	NA	NA	3	NA	>1000	TCO
Smell		UNO	UNO	NA	UNO	UNO	UNO	TCO
Copper	mg/l	0.05	NA	NA	0.08	NA	0.25	TCO
Chlorine	mg/l	50	NA	NA	0	NA	0.06	TCO
Chromium	mg/l	0.05	NA	NA	0	NA	0	TCO
Iron	mg/l	-	NA	NA	0.08	NA	>6.0	TCO
Phosphate	mg/l	0.5	1.0	NA	0.05	1.0	0.45	TCO
Ammonia Nitrogen	mg/l	0.05	NA	NA	1.19	NA	0.72	TCO
Silica	mg/l	-	NA	NA	>4.0	NA	2.82	TCO
Nitrate NO <sub>3</sub>	mg/l	10	0	NA	0.12	0	0	TCO
Fluoride	mg/l	1	NA	NA	0	NA	0	TCO
Sulphate	mg/l	25	NA	NA	10	NA	6	TCO
Total Hardness	mg/l	-	NA	NA	58	NA	0	TCO
Total Alkalinity	mg/l	-	NA	NA	38	NA	10	TCO

Source: IEE Report 2012 and Water Quality Monitoring survey December 2015

Note: PRC-Pre-Construction; CON – Construction; and POC – Post Construction Stages; NA – Not Available; UNO - Unobjectionable and TCO – To be carried out

**Figure 2: Pond at Yonphula partially filled with silt from the construction runoff**



*Photo dated: 20 December 2015*

**Figure 3: Pond at Yonphula prior start of airport improvement works**



*Photo dated: 10 August 2011*



#### IV. SUMMARY OF SOCIAL AND RESETTLEMENT MONITORING

##### A. Loss of Private Land and Structures

23. The following provides an overview of the key social impacts related to the loss of land, structures and community infrastructure related to the investments designed to enhance the operational capacity and security of the three domestic airports. Social impacts related to the RGOB original investments and ADB additional civil works are both highlighted below.

##### 1. Bumthang Domestic Airport Construction Project

##### a. RGOB's Domestic Airport Construction Project

24. **Land acquisition:** Under the RGOB financed component of Bumthang airport construction and river protection works, a total of 3.99 acres of agricultural land belonging to 10 households of Wangdicholing and Dekiling has been acquired by the DoAT in 2011. Except for cash compensation of one household, the land substitution and cash compensation for the rest has been completed. The cash compensation was carried out by Bumthang Dzongkhag from its budget not by DoAT.

25. The cash compensation of Nu.21,017.70 (Twenty one thousand seventeen and seventy chetrum) only, is to be received Ms.Tshering Dema for loss of 0.10acre of land for airport development works. It was delayed since the affected land owner demanded land substitution rather than cash compensation. Under the land act of Bhutan (2009), anyone losing 0.10 acre or less is not entitled for land substitution. However, Bumthang Dzongkhag now has no budgetary provision for the payment of cash demanded by affected owner. Therefore, DOAT agreed to oversee this issue to ensure the affected household is compensated before June 2016.

**Figure 4: Details of 0.10 acre of land acquired**

ཁྱེད་ཀྱི་མིང་།	ཁྱེད་ཀྱི་མིང་།	ཁྱེད་ཀྱི་མིང་།	ཁྱེད་ཀྱི་མིང་།	ཁྱེད་ཀྱི་མིང་།	ཁྱེད་ཀྱི་མིང་།	ཁྱེད་ཀྱི་མིང་།	ཁྱེད་ཀྱི་མིང་།
ལྷ་མཚོ་མཚོ།	7404	75/132	1374/100	ལྷ་མཚོ།	0.30	0.20	ལྷ་མཚོ་མཚོ།

*Explanatory note of Clip: 0.10 acre of land acquired from the total holding of 0.30 acre under the Plot No. J14/22 and Thram/Land Registration no 1505 at Chamkhar, Bumthang owned by Mrs. Tshering Dema.*

26. **Impact on agricultural land due to erosion by Chamkar Chhu:** Under RGOB funded airport development project, the DoATh has carried out river diversion and river training works on the left bank adjacent to the Bumthang airport. These river diversion and river training works forced river to flow more towards the right bank affecting prime agriculture land of Dekiling and Wangdicholing. This is issue was highlighted and documented in the IEE report, 2012 and recommendation for adequate river training works along the affected banks near Dekiling and Wangdicholing townships was made.

27. However, DoAT carried out river training works for only about 500m on the Wangdicholing side leaving the rest unprotected against flooding and erosion. Subsequently,

Bumthang Dzongkhag had to carry out the remaining river training works by themselves. About 920m river protection works between Chamkhar town and Wangdicholing has been completed so far. It aims to complete the remaining river training works along Dekiling and other critical areas in 2017. In order to avoid further damage during the 2016 monsoon season, DOAT through the contractor will undertake temporary protection measures while waiting that the remaining river training works and related protection is completed by the Dzongkhag. With the completion of river training works, the issue of bank erosion will be resolved.

**Figure 5: River Diversion near Chakhar**



**Figure 6: River training works on Dekiling Side**



28. **Impacts on structures:** Brown Swiss Farm Complexes: The construction of Bumthang airport did not require demolition of any structures from the Brown Swiss Farm complex. The structures such as office buildings, cattle sheds, feed stores, seed stores, silos and staff quarters belonging to Brown Swiss Farm and National Feed and Fodder Development Programme under the Department of Livestock have been partially taken over by the DoAT in a phased manner to allow for the relocation of the farm. The complete relocation of farm will take another 3 years as per the Brown Swiss Farm Management. Currently Brown Swiss Farm is constructing the dairy shed for cattle at Lebi and it is expected to be by November 2016. And with the sanction of new budget, the management plans to tender out the construction of office and staff quarter complex starting within June 2016. Figure 7 shows the new Brown Swiss Farm location.

**b. From ATCEP Financing**

29. **Impacts on land:** There were no land acquisitions for Bumthang as the planned ATCEP components were implemented within airport property boundaries.

30. **Impacts on structures:** There was no impact on structure on Bumthang under ATCEP financing.

**Figure 7: Location of New Brown Swiss Farm Location at Lebi, Bumthang**



Source: Google earth imagery February 2016 and Field investigation December 2015

## **2. Yonphula Domestic Airport**

### **a. Under RGOB Financing**

31. **Land acquisition:** No private agriculture land has been acquired in Yonphula under the RGOB's domestic airport improvement except for the 2.89 acres of institutional land belonging to Bhutan Telecom (BT) and Bhutan Broadcasting Services Corporation (BBSC). Land substitutions have been provided to both the affected parties.

32. **Impacts on structures:** The RGOB's domestic airport improvement works at Yonphula did not require the demolition or relocation of any structures.

### **b. Under ATCEP financing**

33. **Impacts on land:** There were no land acquisition and resettlement issues for Yonphula airports as the planned Project components were implemented within airport property boundaries.

34. **Impacts on structures:** There were no impacts on structures under the ATCEP financing besides for impact on the stupa (see section 36 below):

## **3. Gelephu Domestic Airport**

### **a. Under RGOB Financing**

35. **Land acquisition:** Under RGOB component of the Gelephu airport construction project has acquired about 235.48 acres of registered private land belonging to 135 persons. The cash

compensation and land substitution has been completed prior to the start of ADB financed ATCEP.

36. **Impacts on structures:** Similarly Gelephu airport construction needed to demolish at least 10 permanent and semi-permanent structures; 4 under Gelephu and 6 under Bhur geog as shown table 12. The compensations for loss of structures were paid as prescribed in the Resettlement Plan.

**Table 8: Details of Structures to be demolished under Bhur and Gelephu Geogs**

S. No	Village/ Geog	Owner Name	Structures			
			House	Toilet	Tank	Kitchen
Gelephu Geog						
1	Lekithang	Kinzang Dorji	Semi-permanent	-	Water/cowshed	-
2	-do-	Thuji	Semi-permanent	-	-	-
3	-do-	Dubala	Permanent	Toilet	Water tank	-
4	-do-	Chodrup (Duba)	Permanent	-	Water tank	-
Bhur Geog						
5	Juprey	Bishnualal Neopany	Semi-permanent	-	-	kitchen
6	Majuwa	Garja Man Karki	Semi-permanent	-	-	kitchen
7	-do-	Tek Badhur Layo	Semi-permanent	-	-	-
8	-do-	Lal Bhir Thapa	Permanent	-	-	-
9	-do-	Damber Singh Rana	Semi-permanent	-	-	-
10	-do-	Tshering Choki Rabgay	Semi-permanent	-	-	-

Source: IEE Report for ATCEP, March 2012

#### **b. Under ATCEP financing**

37. **Land acquisition:** In the case of Gelephu airport, 0.67 acres of private land belonging one household was acquired for the construction new airport terminal building. The resettlement plan was prepared for the acquisition this private land. The affected person was provided with the land substitution as per the Resettlement plan and is satisfied by the new land location. This was confirmed during an interview between the affected person and the CSC social expert. The implementation of the resettlement process followed the RP, SPS, and government requirements

38. **Impacts on structures:** There was no impact on structures under ATCEP financing.

### **B. Protection and Relocation of Community, Religious and Heritage Structures**

#### **1. Bumthang Domestic Airport**

##### **a. RGOB's Domestic Airport Construction Project**

39. **Demolition of Pedestrian Suspension Bridge at Batpalathang:** For the safety of aircraft during takeoff and landing, the pedestrian suspension bridge (see Figure 8) which connected Batpalathang to Wangdicholing had to be demolished. The construction of either pedestrian or vehicular bridge to the north of airport was planned under Dzongkhag program through RGOB funding. Despite having secured funding, the Dzongkhag so far has not been



able to construct the bridge because of the proposed extension of airport boundary. The final location of the bridge and airport demarcation decision will have to wait for the recommendations on the study on Bumthang airport improvements to accommodate larger aircrafts, commissioned by the Government of Bhutan to international aviation experts. The study is expected to be finalized in June 2016. Until the Bumthang airport finalizes its planned extended boundary the bridge location cannot be confirmed. Therefore, DoAT and Bumthang Dzongkhag. Upon finalization of bridge location, the Dzongkhag aims to tender out the bridge construction tender.

**Figure 8: Pedestrian Suspension Bridge demolished under RGOB airport component**



**b. Under ATCEP:**

40. There were no impacts on community, heritage and religious structures under ATCEP.

**2. Yonphula domestic Airport**

**a. Under RGOB Project**

41. There were no issues under RGOB supported airport project.

**b. Under ATCEP**

42. **Yulay Namgyal Chorten Stupa relocation:** Under ATECP, the runway extension required the removal of part of the small hill at the entrance to airport. This activity necessitated

the relocation of the stupa which was on that hillock. It was built in 1959, a year before the construction of the Yongphula airport by the Indian Military. As recommended in the EMP, the Stupa has been relocated to a new location in consultation with the community and Lam Jigme Tenzin (Chief Abbot) of Yonphula Monastery. The new location is approximately 180m from the southeast end of the runway on a hillock overlooking the Drangme Chhu valley. New chorten is similar in size and style as the one old one as shown in the Figures 9 and 10.

**Figure 9: Old Chorten (2012)**



**Figure 10: New Chorten (2015)**



43. **Pond:** The issue of inclusion of pond within airport's perimeter fence was raised by the community of Yonphula through their geog administration of Kanglung. Initially, the community wanted the pond to be outside the airport perimeter so that they can have easy access to perform for their annual ritual. But subsequently they changed their mind and requested DoAT to include the pond within the airport boundary to maintain its sanctity and cleanliness. In a recent stakeholder consultation meeting held on 10 March 2016 at Yonphula airport terminal building, it was decided that the pond will be included within the airport boundary. DOAT will provide the community access to the pond once in a year to perform their annual ritual ceremony, which is usually held in the month of May corresponding to the fourth month of the Bhutanese calendar.

44. **Footpath:** The communities of Yonphula and nearby villages used part of the airport to commute to and from their village to a market centre at Yongphula. This route was used even before the construction of airfield by Indian Army in 1960s. But with the erection of perimeter fence around the Yonphula airport boundary people will close access to the footpath, which will force people to do a detour around the airport to reach the market center. This detour can take an additional 2 hours walk time including the return travel. This will ultimately increase travel time to sell their products as well as buying the essential items from market center. In a recent public consultation meeting held on 10 March 2016 at Yonphula airport terminal with DOAT, the Kanglung Gup (Block Head), the community of Yonphula and the Supervision Consultants, it was agreed that the project would construct an alternative footpath outside the southeastern perimeter fence. It will connect Yonphula settlement with the villages on southeast side via Yulay Namgyal Chorten.

45. **Community water tank:** The community water tank of Yonphula is located within the airport boundary. Since it does not pose any hazard for aircrafts, the Project will not relocate the water tank. In the future, if required, it will be relocated in consultation with the community. However, for now, only the water pipeline from the source to this tank has been relocated to make way for the runway extension.

# 1. Gelephu domestic Airport

## a. Under RGOB

46. There were no impacts to any of the religious, historical, and cultural assets under the RGOB's domestic airport construction of Gelephu.

## b. Under ATCEP

47. No impacts on community, cultural and heritage structures were recorded for Gelephu airports.

**Table 9: Summary on impacts on private land, structures and community properties**

Airports	Private Land	Structures	Community Properties	Pending actions
<b>Bumthang</b>				
<b>RGOB</b>	3.99 acres of agricultural land belonging to 10 households of Wangdicholing and Dekiling. All paid/provided land for land but for Ms. Dema	Structures for Brown Swiss Farm and National Feed and Fodder Development Programme under Department of Livestock	Pedestrian Suspension Bridge at Batpalathang destroyed and not rebuilt – cannot be rebuilt by Dzonghag until DOAT finalize airport perimeters	Ms.Tshering Dema still needs to be compensated  The complete Brown Swiss Farm relocation will take at least 3 years probably until 2019. As now only dairy shed is under construction which is expected completed by November 2016. The tendering process for construction of office and staff quarters will be carried out within June 2016.  DOAT to expedite finalization of airport perimeter and support reconstruction of pedestrian/vehicular bridge
<b>ATCEP</b>	No impact	No impact	No impact	Nothing
<b>Gelephu</b>				
<b>RGOB</b>	235.48 acres private land has been acquired all landowners have been	10 structures affected. Owners have been compensated	No impact	Nothing

Airports	Private Land	Structures	Community Properties	Pending actions
	compensated.			
<b>ATCEP</b>	0.67 acres acquired. Compensations have been paid.	No impact	No impact	Nothing
<b>Yonphula</b>				
<b>RGOB</b>	2.89 acres of institutional land belonging to Bhutan Telecom and Bhutan Broadcasting Services Corporation (BBSC). Alternative land has been provided	No impact	Sacred pond: community requested the project to include the pond within the airport's boundaries and provide access to it for their ritual	Allow community residents to access pond for their ritual. This should be monitored and reported on in Safeguards Monitoring Report.
<b>ATCEP</b>	No impact	No impact	Yulay Namgyal Chorten Stupa relocation because of runway extension. The stupa has been relocated  <b>Footpath:</b> Footpath to and from village to market has been severed by new airport boundaries. No alternative has been provided.	Alternative to original footpath needs to be provided

### C. Health and Safety under ATCEP

48. Overall the project employed about 120 labourers (roughly 40 persons each for three airports). The labourers were mostly from India, as Bhutanese nationals were not interested in construction work. Immaterial of their nationality, the project provided free health care services for all construction workers. For minor injuries, contractors at all construction sites of BDA, YDA and GDA had first aid provisions. For emergencies and serious medical conditions, the labourers had free access to following health facilities:

- Wangdicholing General Hospital, Bumthang for labourers working for BDA
- Basic Health Unit at Yonphula for minor treatment and Trashigang General Hospital for serious health conditions for labourers working at YDA
- Gelephu Regional Hospital for worker of GDA improvement works.



49. Apart from the free medical facilities, the labourers were provided with adequate shelter, safe drinking water, waste disposal facilities and proper pit toilets. They were also provided with safety and protective gears such as helmets, boots, and facemasks.

#### **D. HIV/AIDS and Trafficking Prevention Program under ATCEP**

##### **1. Bumthang and Gelephu Domestic Airports**

50. HIV/AIDS and human trafficking awareness and prevention program were conducted by the following Health officials of Bumthang and Gelephu:

- A doctor from Wangdicholing General Hospital, Bumthang on July 2014
- Health Official from Health Information and Service Center (HISC), Gelephu in February 2014

##### **2. Yonphula Domestic Airports**

51. No HIV/AIDS awareness and prevention program has been held at Yonphula to date.

#### **E. Labour and Employment under ATCEP**

52. Issues of child labour and labour conditions and their wellbeing were regularly monitored by the Regional Labour Officers (Bumthang, Gelephu and Trashigang) of the Ministry of Labour and Human Resources. There were no reports of labour abuses, particularly related to unfair payments, discrimination and forced or child labor for all three domestic airports improvement works.

## VI. CONSULTATIONS

### A. Public/Stakeholder Consultations during Implementation of ATCEP

53. Public and stakeholder consultations were carried out during the implementation of the air transport connectivity enhancement project. The important consultations that were carried out for three airports improvement works are provided in table 10:

**Table 10: Summary of consultations by airports during ATCEP implementation**

Airport	Stakeholders	Issues	Response by DoAT
Bumthang	Bumthang Dzongkhag	Issue of airport Boundary finalization was discussed since 2012, for reconstruction of pedestrian/ vehicular bridge construction which was demolished under RGOB funded airport project in 2011)	Extended airport boundary not defined till date.
Yonphula	Kanglung Gewog Administration and Community of Yonphula	Issue of relocation of Yulay Namgyal Chorten discussed between Project and Yonphula Community.	Relocation was carried out.
		Issue of inclusion/Exclusion of pond within airport boundary was discussed with community on 29 <sup>th</sup> Oct 2015.	DoAT decided to include pond within the airport boundary and provide access as required by the community.
Gelephu	Mr.Geden (Land Owner)	Acquisition and substitution of 0.67acre of private land for the construction of new airport terminal building at Gelephu discussed with the affected land owner in April 2014.	Land substitution provided close to Gelephu extended municipal area.

### B. Follow up Stakeholder Consultations

54. As part of the final safeguard compliance monitoring, follow up stakeholder consultations were carried out for Bumthang and Yonphula domestic airports. No consultation was required for Gelephu airport as there were no pending issues to be consulted. The summary of follow up consultations held at Bumthang and Yonphula airports is provided in table 11. Photographic evidence of the stakeholder consultations are provided in Annex 5 and 7.

**Table 11: Follow up public consultations for Bumthang and Yonphula airports**

Date	Participants	Issues Discussed	Action to be Taken
<b>Bumthang Airport</b>			
8.03.2016	Mr. Yeshe Dorji (Bumthang District Engineer), Ms.Tashi Lhamo (Bumthang Airport Manager);  Consultants:	The construction of 350m long by 4m high gabion wall on the left bank of Chamkhar Chhu/River prevent river from flowing through its natural three bifurcated channels into the floodplain	DoAT to undertake temporary right bank protection measures by staking boulders along the base of Chakhar Lhakhang as soon as possible

Date	Participants	Issues Discussed	Action to be Taken
	Mr.John Pashen, Team Leader; Mr.Robert Heywood (Pavement Specialist); Mr.Shanti Ram Katel (Contract Specialist)	<p>north end of the airport runway. River flow is now restricted to the main channel and during peak monsoon, river will swell and may erode the base of Chakhar Lhakhang. To stop the bank erosion and the ultimate destruction of historic Chakhar Lhakhang by the flood water, Dzongkhag has urged the DoAT to implement temporary flood protection measures with boulder stacking around the base of Chakhar Lhakhang. The permanent river protection work is to be carried out by the Bumthang Dzongkhag.</p> <p>Discussion during site visit revealed that the river training work was carried since 15 October 2015 and the major work was completed on 19 January 2016. It was planned and implemented by DOAT through RGOB funding after completion of ATCEP.</p>	<p>before the onset of rainy season as requested by the Bumthang Dzongkhag Administration.</p> <p>The permanent river training works with gabion walls construction will be carried out by Bumthang Dzongkhag by 2017.</p>
	Mr.Tenzin owner of Chakar Lhakhang and Ms. Pem Tshoki (Resident near Chakhar Lhakhang)	<p>Initial boulder staking at the left bank by DoAT in 2011-2012 has led to Chamkar Chhu /river diversion which has claimed some part of right bank at the base of Chakhar Lhakhang</p> <p>Now the permanent river protection structure that has been constructed recently by DoAT blocks all three bifurcated river channels and directing river along the main channel. The river during rainy season will overflow the bank and further erode base of Chakhar Lhakhang.</p>	-do-

Date	Participants	Issues Discussed	Action to be Taken
	<p>Mr. Yeshe Dorji (Bumthang District Engineer), Ms.Tashi Lhamo (Bumthang Airport Manager);</p> <p>Consultants: Mr.John Pashen, Team Leader; Mr.Robert Heywood (Pavement Specialist); Mr.Shanti Ram Katel (Contract Specialist)</p>	<p>Dzongkhag has budget provision for construction of Suspension as well as vehicular bridge over Chamkhar Chhu. But the planned bridge construction has been stalled due to location uncertainty. Only after finalization of extended airport boundary, the bridge location can be finalized. Airport boundary finalization was raised with DoAT by the Dzongkhag.</p>	<p>Airport boundary to be finalized through joint site visit by Director of DoAT and Dasho Dzongdag of Bumthang Dzongkhag within March 2016.</p> <p>Upon confirmation of bridge location tendering for construction of bridge will be done before June 2016.</p>
8.03.2016	<p>Brown Swiss Farm: Mr.Tshewang Penjor, Manager, Dorji Samdrup, Livestock Production Supervisor; Ms.Tashi Lhamo, Airport Manager</p>	<p>Final and complete relocation of Brown Swiss Farm and Office Complex.</p> <p>Brown Swiss Farm at new location, Lebi is under construction. Cattle or Dairy shed construction is under way and it is expected to be completed by November 2016.</p> <p>Farm office and staff quarters construction is planned for upcoming financial year which begins by July 2016.</p>	<p>DoAT will allow the Brown Swiss Farm to operate till the successful completion of their farm infrastructure at Lebi.</p> <p>Dairy shed which under construction is expected to be completed by November 2016.</p> <p>Farm office and quarters construction will be tendered by July 2016.</p> <p>Complete farm relocation will take place only by the end of 2019 which is 3 years from now.</p>
<b>Yonphula Airport</b>			
11.03.2016	<p>Kanglung Geog: Mr.Kinzang Dorji (Gup) Yonphula Community led by Tshogpa;</p> <p>YDA: Mr. Tshuelthrim Drakpa, Airport Manager;</p>	<p>Discussion was held whether to include or exclude pond within the airport boundary. In this regard, the Gup and the community of Yonphula requested the airport management to include the pond within the airport</p>	<p>DoAT and Yonphula airport management decided to include the pond within the airport boundary.</p> <p>Airport management will allow the</p>

Date	Participants	Issues Discussed	Action to be Taken
	CSC: Mr.John Pashen, Team Leader; Mr.Robert Heywood (Pavement Specialist); Mr.Shanti Ram Katel (Contract Specialist);	<p>boundary to maintain the cleanliness and sanctity.</p> <p>The community also requested management for once in a year access to the pond for their yearly ritual which is held in the month of May. The specific date of access was to be decided by Buddhist astrologers.</p> <p>The airport management agreed to include the pond within airport and also provide the community with access to the pond once in a year.</p>	<p>community once in a year access to the pond for the ritual ceremony which is held in the month of May corresponding to the fourth month of Bhutanese calendar.</p>
		<p>Issue of an alternative footpath outside the airport boundary was discussed. People were interested to have footpath connecting the relocated Yulay Namgyal chorten outside the airport boundary and connecting it to their settlement. This will give them access to the chorten as well as lead them to their settlement.</p> <p>People were satisfied with the relocation of community chorten.</p>	<p>Airport management agreed to have footpath outside the perimeter fence on the east end of the runway connecting the Samdrup Jongkhar – Trashigang highway to their settlement via Chorten.</p> <p>Construction Supervision consultant will process for the additional work of building footpath for the contractor.</p>
		<p>Relocation of water tank which lies within Yonphula airport boundary was discussed. The airport management confirmed that the water tank will remain within the airport boundary. Only the water pipelines have been relocated which is affected due to airport extension works. The community requested an access to the water tank for</p>	<p>DoAT/Yonphula airport management will allow Yonphula community to service and maintained their water tank which is located within the airport boundary whenever necessary.</p>

Date	Participants	Issues Discussed	Action to be Taken
		repair and maintenance. The airport management agreed to allow the community to maintain and service the water tank that lies within the airport.	

### C. Unanticipated Safeguard Issue

55. BBS<sup>6</sup> television recently broadcasted an issue on Chamkhar Chhu diversion and the likely impact on Chakhar Lhakhang (Refer Figure 11 News clip from BBS Website). Although the issue of bank erosions of Dekiling and Wangdicholing agriculture lands were highlighted in the IEE report 2012, the issue of bank erosion at the base of Chakhar Lhakhang is a new issue.. Hence, it is an unanticipated issue that came up recently as a result of the construction of 350m long by 4m high gabion wall on the left bank of Chamkhar Chhu. The river training work was carried out after the completion of the ADB assisted ATCEP project components for Bumthang airport. The construction was started on 15 October 2015 and as of 19 January 2016 major works under the contract have been completed. It was planned and implemented by DoAT through RGOB funding. This river training structure blocks the river from flowing into three natural channels that branches out of the main channel. These branches act as a buffer during peak flow season preventing flood damages downstream. If no measures are put in place there is likely chance of erosion of the right bank at the base of Chakhar Lhakhang. Figure 12 illustrates the River training works carried out by DoAT

56. As a follow up of the BBS news report, Bumthang Dzongkhag Administration through its letter No.JKD/DES-12/2015-2016/4987 dated 12 February 2016 notified the Airport Management to carry out the temporary river bank protection measures along the base of Chakhar Lhakhang. However, the DoAT could not implement the protection measures due to objection from the Department of Forests and Park Services (DFPS) as it did not have the required clearance for the job.

57. On 8 March 2016, the joint verification site visit was carried out to assess the nature, extent and possible impact of river diversion activities by the DoAT. The following officials took part in discussion and subsequent field visit:

- (i) Mr.Yeshi Dorji, District Engineer, Bumthang Dzongkhag Administration
- (ii) Ms.Tashi Lhamo, Airport Manager, BDA
- (iii) Mr.Namgay, Technician, BDA (Supervisor for river training works)
- (iv) Mr.John Pashen, Team Leader, CSC
- (v) Mr.Robert Heywood, Pavement Specialist, CSC
- (vi) Mr.Shanti Ram Katel, Procurement & Contract Specialist, CSC
- (vii) Mr.Karma Chogyel, Environmental & Social Safeguard Specialist, ADB

58. The site visit confirmed that the three natural river channels that branches out of the main one are completely blocked by the recent gabion wall construction. The river will now flow only through its main channel, and during the monsoon season when the river swells above the limits; there are high chances of erosion of the bank around the base of Chakhar Lhakhang. This may ultimately damage or destroy the historical Chakhar Lhakhang located right on top of the vertical cliff. In view of the imminent danger to the lhakhang, the district engineer of

<sup>6</sup> BBS – Bhutan Broadcasting Service

Bumthang reiterated the urgent need for temporary bank protection measures before the onset of Monsoon season. The permanent river bank protection works will be carried out by the Dzongkhag itself by 2017.

59. DoAT on its part will ensure the implementation of temporary river bank protection works and securing required clearances from DFPS before the onset of the rainy season. It will award the additional work to the same contractor who carried out the river training works on the left bank as the contract is still open with the DoAT.

**Figure 11: Clip from BBS Website (<http://www.bbs.bt/news/?p=57008>)**

English | Dzongkha
Friday, February 19, 2016

## Chamkharchhu tributary diversion poses threat to centuries-old Lhakhang and nearby settlement

Cheten Dupchu, Bumthang  
Feb 7 2016



**Ever since two tributaries of Chamkharchhu in Bumthang were merged in 2011, the historic Chakhar Lhakhang and nearby dwellings have become vulnerable to flooding. Without a protection wall, the locals fear there are chances of the river breaking its banks in summer and wrecking havoc.**

A tributary flowing near Bumthang Domestic Airport was diverted to the one that flows near the centuries-old Chakhar Lhakhang.

Chakhar Lhakhang's owner, Tenzin said the river poses a huge threat to the Lhakhang.

FOLLOW US!





Figure 12: Location of blockage of the Chamkhar Chhu channels on the left bank





## **VII. COMPLIANCE WITH GRANT AGREEMENT, PROJECT ADMINISTRATION MANUAL, WORK CONTRACT AGREEMENT AND EMP**

### **A. Compliance with Grant Agreement and Project Administration Manual**

60. The environmental and social safeguard requirements are explicitly provided in the Grant Agreement (GA) between the ADB and the Royal Government of Bhutan (RGOB); whereas the Project Administration Manual (PAM) describes how the project shall be implemented. Summary safeguard compliance status with GA and PAM is provided in the following sections. The detailed safeguard compliance with the GA and PAM are provided in Annex 1 and 2.

#### **1. Environment**

61. The Project complied with the environmental provision set forth under the grant agreement (GA) and the project administration manual (PAM). IEE and EMP were prepared in accordance with the ADB's Safeguard Policy Statement (SPS) 2009. The National Environment Commission (NEC) granted the project approval before the award of the works contract. All relevant provisions from the EMP were incorporated into the works contract.

#### **2. Social – Involuntary Resettlement**

62. The Project is classified as category B in accordance with ADB's Safeguard Policy Statement (SPS) 2009.

63. No private land had to be acquired for Bumthang and Yonphula airport works since the construction activities were undertaken within the respective airports boundaries. So there were no involuntary resettlements or resettlement plan required to be prepared. Hence only due diligences were carried out.

64. For Gelephu domestic airport 0.67acre of private land was acquired for the construction of new terminal building. Accordingly a resettlement plan was prepared and implemented.

65. Overall, the Project complied with safeguard measures for prevention of involuntary resettlement provisions of the GA and PAM.

#### **3. Labour Standards and Occupational Health and Safety (OHS)**

66. The project complied with the relevant national and international labour standards as required by the GA and PAM for Bumthang and Gelephu airports works. For Yonphula, it is being complied with as the construction works are ongoing.

67. Occupational health and safety provisions such as first aid kits, emergency medical services, safe drinking water, adequate shelter, toilet facilities, cooking fuel, etc. were provided. No child labour were engaged for the project activities. The specific clauses on labour and OHS are incorporated into works contract.

#### **4. HIV/AIDS**

68. The project has carried out HIV/AIDS awareness workshops for construction workers at BDA and GDA. However, the awareness campaign for Yonphula airport construction workers is yet to be carried out.

69. Therefore, the HIV/AIDS awareness provisions of GA and PAM which is required to be implemented by the Project is partly complied with.

## **5. Safeguard Monitoring and Reporting**

70. The safeguard monitoring and reporting were carried out as required by the GA and PAM. The monitoring was done at different levels – by ADB safeguard specialists, the project coordinators, and the CSC. The ADB monitored the project through fielding of missions at various stages of its implementation from inception to interim and at the completion stage.

71. Respective project coordinators at Bumthang, Gelephu and Yonphula airports improvement works acted as a focal person for safeguard monitoring and monitored the project regularly. They were supported by respective site engineers of the CSC who carried out daily monitoring on the effective implementation of the resettlement plan and the environmental management plan. On top of site engineers, the CSC also included social and environmental safeguard specialists. The safeguard specialists monitored the project twice a year and; prepared and submitted the annual safeguard monitoring report to ADB (Refer <http://www.adb.org/projects/44239-013/main#project-documents> for the safeguard monitoring reports).

72. The project complied with the provision of safeguard monitoring requirements of GA and PAM for Bumthang and Gelephu airports improvement works. And it is being complied with for Yonphula airport works.

## **B. Compliance with Work Contract Agreement**

73. The contractor is obliged to comply with the safeguards clauses included in the contract agreement. The contractors of Bumthang and Gelephu airports improvement works have complied with safeguard provisions on environment, social, OHS and Health and HIV/AIDS listed in the contract agreement.

74. The contractor for Yonphula airport improvement works is complying with the safeguard clauses of the contract agreement. However, HIV/AIDS awareness workshop is yet to be carried out for its labourers.

75. The details on compliance with the works contract agreement is provided in Annex 3.

## **C. Compliance with EMP**

76. The Environmental Management Plan (EMP) for the project was provided in Chapter IX of the IEE report of 2012 which was also made as an integral part of the contract document. As per the EMP, environmental management activities were categorized to be implemented during the pre-construction, construction and operational stages. The summary of EMP compliance status for each airport is provided in the following sections. The detail EMP compliance status is provided in the Annex 4.

### **1. Preconstruction Phase**

77. The Project complied with the EMP by implementing the environmental management activities of the preconstruction phase.

## **2. Construction Phase**

### **a. Bumthang and Gelephu Airports**

78. The activities such as transportation of construction materials; vegetation clearance and tree felling; earthworks and excavations; waste disposal; Labour and OHS; HIV/AIDS; and acquisition of structures have been carried out as stated in the EMP. Therefore, these activities under the EMP have been fully complied with by the Project.

79. Air, noise, and water quality monitoring activities were not implemented during the construction stage owing to the lack of technical expertise and the know-how required for the job. The project could only implement measures to minimize pollution at the sources. Therefore, these activities of the EMP are partly complied with. With support from an ADB staff consultant air, noise and water quality data was collected for post construction stage for Gelephu and Bumthang airport and during construction stage for Yonphula airport was collected in December 2015. This data will be included in the environmental monitoring report for July to December 2016.

### **b. Yonphula Airport**

80. The activities such as transportation of construction materials; vegetation clearance and tree felling; earthworks and excavations; spoil disposal; and monitoring of ambient air, noise and water quality are being carried out as stated in the EMP. The ambient air, noise and water quality monitoring have been carried out for Yonphula airport during construction stage by independently hired National Environmental Expert. Therefore, the activities prescribed under the EMP are being complied with.

## **3. Operational Phase**

### **a. Bumthang and Gelephu Airports**

81. The major environmental issues during operations revolve mainly around ambient air and noise level; waste; and safety of the aircraft operations. Air safety and waste management are in place. Due to low air traffic volume which is twice a week to Bumthang and once to Gelephu, the issue of noise and air pollution is considered insignificant. Hence the noise and air pollution abatement measures recommended in EMP were found to not be necessary at this stage.

### **b. Yonphula Airport**

82. Yonphula airport is undergoing a major improvement program. It may take almost another year for it to become operational. Therefore, operational safeguard compliance is not applicable at this stage.

## IX. CONCLUSION AND RECOMMENDATIONS

83. According to field observations and investigations as well as review of the project related documents, the overall environmental and social safeguards measures have been satisfactorily implemented for Gelephu airport. For Yonphula airport since the construction works are ongoing, the safeguard issues are in the pipeline to be implemented. Although civil works for Bumthang airport has been completed, there are few pending issues that need to be addressed.

84. The key safeguards issues that are pending have been outlined in the report and are highlighted in the main sections in the table 12. These issues are summarized and grouped into two separate tables as below for clarity and better understanding. Table 12 provides pending issues from the RGOB's funded airport construction component and table 13 relates to issues of the ADB financed ATCEP. For all the issues specific recommendations along with timeline for implementations are made. The project shall implement all recommended measures within the specified timeline to achieve complete safeguards compliance.

**Table 12: Suggested recommendations and their implementation status for RGOB components**

No	Issues highlighted in IEE/EMP & RP	Recommendations	Implementation Status	Way Forward
<b>Environmental, Social and Resettlement Issues</b>				
<b>1. Bumthang airport:</b>				
1.1	Pedestrian suspension bridge over Chamkhar Chhu connecting Batapalathang and Wangdicholing was demolished as it was hazardous for aircraft takeoff and landing at Bumthang airport.	And alternative pedestrian bridge was planned by the Dzongkhag to be constructed to the north of runway of Bumthang airport over Chamkhar Chhu.	Construction of an alternative bridge never materialized owing to the DoAT's planned airport boundary extension further to the north. The airport boundary till date is not finalized.	Dzongkhag administration and DoAT will make joint field visit to finalize the airport boundary as well as find the suitable bridge location. Dzongkhag plans to float bridge construction tender.
1.2	For the establishment of Bumthang domestic airport, DoAT has to acquire the structures belonging to Brown Swiss cattle farm of the Department of Livestock	Department of Livestock agreed to handover its Brown Swiss Farm complexes in phased manner till the completion of its new farm at Lebi (1Km from Batapalathang towards east).	Part of the structures of the farm has been already taken over by DoAT. And further discussion on takeover of the remaining structures has been carried out. The farm relocation to a new site is also under the process. Dairy shed is being construction and it is expected to be	DoAT shall allow the Farm to fully establish its new farm at Lebi before finally taking over the entire structures.  DoAT will take over the farm structures completely only after 2019.

No	Issues highlighted in IEE/EMP & RP	Recommendations	Implementation Status	Way Forward
			completed by Nov. 2016. The office and farm staff quarters construction tender will be out within June 2016. The complete relocation of the farm will at least 3 years, until 2019.	
1.3	Under the RGOB financed component of Bumthang airport construction and river protection works, a total of 3.99 acres of agricultural land belonging to 10 households of Wangdicholing and Dekiling has been acquired by the DoAT.	The land substitution and cash compensation is to be carried out as per the land act 2009 and guidelines of the Property Assessment and Valuation Agency (PAVA) 2009	Except for cash compensation of Nu.21,017.70 for acquisition of 0.10 acre of land belonging Ms. Tshering Dema, the rest of land substitutions and cash compensation has been completed.	DoAT shall take lead in paying the pending cash compensation as Bumthang Dzongkhag has budgetary constraint. Compensation shall be paid within the current financial period.

**Table 13: Suggested recommendations and their implementation status for ATCEP components**

No	Issues highlighted in IEE/EMP & RP	Recommendations in EMP & RP	Status	Way forward
<b>1. Environmental Yonphula Airport</b>				
1.1	Erosion and slope stability is critical for Yonphula airport as it is located on the ridge top with fragile side slopes particularly toward northeast side of the airport.	Slope protection measures using civil and bioengineering methods has been recommended in the EMP	For the slope protection and to stop debris spillage, the concrete check walls are constructed along the runway edges. However, the section of wall collapsed during heavy debris pressure. Bioengineering works are yet to be carried out.	The Project will construct second wall along the failed structure to prevent debris spillage towards the settlement. The wall construction will be completed before the start of rainy season (before June 2016). Bioengineering activities shall be carried out by the contractor before onset of monsoon

No	Issues highlighted in IEE/EMP & RP	Recommendations in EMP & RP	Status	Way forward
				(June 2016) for proper growth of vegetation.
1.2	Siltation and water quality of Pond at Yonphula	EMP recommends contractor to prevent the flow of silt laden water from the construction site into the pond.	Water quality of the pond has markedly deteriorated from the pre-construction level. The siltation has led to shrinkage and drying of pond. These are indicative of non-compliance to the EMP recommended measures.	Contractor will prevent further siltation of the pond. Silt inside the pond has to be removed through dredging under the supervision of Environmental safeguard Specialist. These activities shall be carried out before the onset of monsoon (June 2016) and finally after completion of excavation works (October 2016).
1.3	Air and water quality and noise level monitoring	Monitoring during construction and post construction has been recommended	Was done by ADB staff consultant in December 2015	Continued support to be provided by ADB staff consultant
<b>2. Social and Resettlement Issues for Yonphula</b>				
2.1	Perimeter boundary fencing of Yonphula airport closes access to foot path/ trail which is shortest route to Yonphula market center for the communities of nearby villages.	Opening of an alternative foot trail for the affected community was recommended.	Stakeholder consultation was conducted on 10 <sup>th</sup> March 2016 to discuss and finalize the alignment of new foot path. The community wants the footpath that connects Yonphula settlement with Tashigang highway via Yulay Namgyal chorten outside perimeter fence.	The Project will ensure that the construction of footpath is carried out as agreed with the community. The footpath construction will be completed within October 2016.

No	Issues highlighted in IEE/EMP & RP	Recommendations in EMP & RP	Status	Way forward
2.2	Inclusion of pond within perimeter of Yonphula airport boundary. The pond is cultural and spiritual significance to people of Yonphula. Ritual ceremony performed at the pond once a year.	IEE and RP do not specify any recommendations for inclusion or exclusion of the pond. At the time of feasibility study, pond was to remain outside the perimeter fencing and hence there was no issue with it.	As follow up to the request of pond inclusion by Kanglung Geog, the stakeholder consultation was conducted on 10 <sup>th</sup> March 2016 to discuss whether to include or exclude the pond. It was finally decided that the pond will be included within airport boundary and the provide an access to the pond once a year during the month of May to perform their ritual ceremony.	Pond will be included within the airport boundary as requested by the community of Yonphula and Geog administration of Kanglung. The community will be provided access to the pond every year in the month of May for the ritual ceremony. This will be monitored and reported on in Safeguards Monitoring Report
2.3	HIV/AIDS Awareness and Prevention Program	IEE and RP recommends the project to carryout HIV/AIDS awareness program for the construction workers	Social safeguard monitoring report highlighted the non-compliance as the awareness program was not carried out as recommended.	Project will facilitate and invite the health official from the nearest health center to provide HIV/AIDS awareness education. This shall be carried out within a month of this reporting.

## ANNEX 1: COMPLIANCE TO SAFEGUARDS PROVISIONS IN AGREEMENTS UNDER THE PROJECT

The environmental and social safeguard requirements are explicitly provided in the Grant Agreement 0295-BHU between ADB and Royal Government of Bhutan (RGOB) through the Ministry of Information and Communication and Department of Air Transport (DoAT). These loan agreement provisions and compliance status are provided in Table 14.

**Table 14: Status of Compliance to Environmental/Social Provisions of the Loan Agreement**

No.	Environmental & Social Provisions	Compliance Status
1.	<p><b>Schedule 3. Item 5.</b>  <u>Conditions for Award of Contract</u>  The Recipient shall not award any work contracts until:</p> <ul style="list-style-type: none"> <li>a) the National Environment Commission of Bhutan has granted the final approval of the IEE; and</li> <li>b) the Recipient has incorporated the relevant provisions from the EMP into the Works contract</li> </ul>	<p>Complied.</p> <p>Environmental clearances (issued after approval of required environmental assessment document) have been obtained from NEC for all 3 airports</p> <p>Environmental Management Plan (EMP) is a part of bidding document.</p>
2.	<p><b>Schedule 3. Item 6.</b>  The Recipient shall not award any Works contract which involves involuntary resettlement impacts, until the Recipient has prepared and submitted to ADB the final resettlement plan based on the Project's detailed design, and obtained ADB's clearance of such resettlement plan.</p>	<p>Complied.</p> <p>The Project prepared the Resettlement Plan and obtained ADB's necessary clearance for resettlement Plan in 2014</p>
3.	<p><b>Schedule 3. Item 7.</b>  The Recipient shall not award any Works contract which involves impact on indigenous peoples until the Recipient has prepared and submitted to ADB the final indigenous peoples' plan, and obtained ADB's clearance of such indigenous peoples' plan.</p>	<p>Complied.</p> <p>There are no records of indigenous people living within the designated project area.</p>
4.	<p><b>Schedule 4. Item 1.</b>  <u>Implementation Arrangement</u>  The Recipient and the Project Executing Agency shall ensure that the Project is implemented in accordance with the detailed arrangements set forth in the PAM.</p>	<p>Complied.</p> <p>The project is being implemented in accordance with the PAM</p>
5.	<p><b>Schedule 4. Item 2.</b>  <u>Environment</u>  The Recipient shall ensure or cause the Project Executing Agency to ensure that the preparation, design, construction, implementation, operation and decommissioning of the Project and all Project facilities comply with (a) all applicable laws and regulations of</p>	<p>Being complied.</p> <ul style="list-style-type: none"> <li>• Relevant laws and regulations on environment, and</li> </ul>



No.	Environmental & Social Provisions	Compliance Status
	the Recipient relating to environment, health and safety; (b) the Environmental Safeguards; and (c) all measures and requirements set forth in the IEE, the EMP, and any corrective or preventative actions set forth in the Safeguards Monitoring Report.	<p>occupational health and safety are being adhered to</p> <ul style="list-style-type: none"> <li>• The requirements of IEE and EMP are partly complied and being implemented.</li> </ul>
6.	<p><b>Schedule 4. Item 3.</b>  <u>Land Acquisition and Involuntary Resettlement; Indigenous People</u>  The Recipient shall ensure that the Project does not have any Indigenous Peoples Safeguards and Involuntary Resettlement Safeguards impacts. In the event that the Project does have any such impact, the Recipient shall take all steps required to ensure that the Project complies with the applicable laws and regulations of the Recipient and with ADB's Safeguard Policy Statement.</p>	<p>Being complied.</p> <p>All land acquisition and resettlement activities have been implemented as per provisions of Land Act of Bhutan (revised in 2009).</p>
7.	<p><b>Schedule 4. Item 4.</b>  <u>Human and Financial Resources to Implement Safeguard Requirements</u>  The Recipient shall make available or cause the Project Executing Agency to make available necessary budgetary and human resources to fully implement the EMP, any resettlement plan and any indigenous peoples' plan.</p>	<p>Complied.</p>
8.	<p><b>Schedule 4. Item 5.</b>  <u>Safeguards – Related Provisions in Bidding Documents and Works Contracts</u>  The Recipient shall ensure or cause the Project Executing Agency to ensure that all bidding documents and contracts for Works contain provisions that require contractors to:</p> <ol style="list-style-type: none"> <li>a) comply with the measures relevant to the contractor set forth in the IEE, the EMP, any resettlement plan and any indigenous peoples' plan (to the extent they concern impacts on affected people during construction), and any corrective or preventative actions set forth in the Safeguards Monitoring Report;</li> </ol>	<p>Complied.</p> <p>Requirements for complying with the IEE, EMP and RP were included in the bidding documents for all three airports.</p>
9.	<p><b>Schedule 4. Item 5.</b>  <u>Safeguards – Related Provisions in Bidding Documents and Works Contracts</u>  <ol style="list-style-type: none"> <li>b) make available a budget for all such environmental and social measures;</li> </ol></p>	<p>Complied.</p>

No.	Environmental & Social Provisions	Compliance Status
10.	<p><b>Schedule 4. Item 5.</b>  <u>Safeguards – Related Provisions in Bidding Documents and Works Contracts</u></p> <p>c) provide the Recipient with a written notice of any unanticipated environmental, resettlement or indigenous peoples risks or impacts that arise during construction, implementation or operation of the Project that were not considered in the IEE, the EMP, any resettlement plan and any indigenous peoples' plan;</p>	<p>Although planned and implemented by the DoAT itself after completion of ATCEP components, the issue of Chamkhar Chhu/ river diversion and its likely impacts on Chakhar Lhakhang is classified as an unanticipated safeguard issue for the project.</p> <p>There were no unanticipated impacts for Gelephu airport.</p> <p>No unanticipated issue for Yonphula airport.</p>
11.	<p><b>Schedule 4. Item 5.</b>  <u>Safeguards – Related Provisions in Bidding Documents and Works Contracts</u></p> <p>d) adequately record the condition of roads, agricultural land and other infrastructure prior to starting to transport materials and construction; and</p>	<p>Complied for Bumthang and Gelephu airports improvement.</p> <p>Being complied for Yonphula airport works.</p>
12.	<p><b>Schedule 4. Item 5.</b>  <u>Safeguards – Related Provisions in Bidding Documents and Works Contracts</u></p> <p>e) reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon the completion of construction.</p>	<p>Complied for Bumthang and Gelephu airport improvement works.</p> <p>Being complied for Yonphula airport works.</p>
13.	<p><b>Schedule 4. Item 6.</b>  <u>Safeguards Monitoring and Reporting</u></p> <p>a) submit semiannual Safeguards Monitoring Reports to ADB and disclose relevant information from such reports to affected persons promptly upon submission;</p> <p>b) if any unanticipated environmental and/or social risks and impacts arise during construction, implementation or operation of the Project that were not considered in the IEE, the EMP, any resettlement plan and any indigenous peoples' plan, promptly inform ADB of the occurrence of such risks or impacts, with detailed description of the event and proposed corrective action plan; and</p>	<p>Complied.</p> <p>Since the scope of project was small with minimal social impacts only annual monitoring reports were prepared and submitted.</p> <p>No unanticipated safeguards issues for Gelephu and Yonphula airports.</p> <p>DoAT's Chamkhar Chhu/ river diversion works and the likely impacts on the historical</p>

No.	Environmental & Social Provisions	Compliance Status
	c) report any actual or potential breach of compliance with the measures and requirements set forth in the EMP, any resettlement plan or any indigenous peoples' plan promptly after becoming aware of the breach.	chakhar lhakhang is an unanticipated safeguard issue which was not reported to the ADB as required. Hence the noncompliance. There were no breaches in compliance with the EMP and RP
14.	<b>Schedule 4. Item 8.</b> <u>Labour Standards</u> The Recipient and the Project Executing Agency shall ensure that (a) civil works contractors comply with all applicable labor laws and regulations, do not allow employment of child labor for construction and maintenance activities, encourage the employment of the poor, particularly women, and provide appropriate facilities for women and children in construction campsites; (b) people directly affected by the Project are given priority to be employed by the Project; (c) contractors do not differentiate wages between men and women for work of equal value; and (d) specific clauses ensuring these will be included in bidding documents.	Complied for Bumthang and Gelephu airport improvement works.  Being complied for Yonphula airport works.
15.	<b>Schedule 4. Item 9.</b> <u>Health</u> The Recipient and the Project Executing Agency shall ensure that contractors provide adequately for the health and safety of construction workers and further ensure that bidding documents include measures on how contractors will address this, including information and awareness raising activities for construction workers on sexually transmitted diseases, HIV/AIDS, and human trafficking.	Complied.

## ANNEX 2: COMPLIANCE TO PROJECT ADMINISTRATION MANUAL

The Project Administration Manual<sup>7</sup> (PAM) describes how the DoAT will implement the project and deliver the results on time, with quality, within budget, and in accordance with RGOB and Asian Development Bank (ADB) policies and procedures. The PAM is mandatory and serves as the main document describing implementation details. The status of implementing the safeguards requirements set out in PAM is provided in Table 15.

**Table 15: Compliance to PAM**

SNo.	Details	Compliance
1.	<p><b>Section VII Safeguards</b> a) Environment</p> <p>An Initial Environmental Examination (IEE) report including an Environment Management Plan (EMP) covering generic and site specific issues has been prepared in accordance with the ADB's <i>ADB's Safeguard Policy Statement, 2009</i>. The EMP will be attached to the bidding documents and made mandatory for implementation by the respective contractor. Hence, EMP implementation and its related costs will be the responsibility of the contractor while monitoring and technical guidance will be provided by the environmental specialist under the supervision consultant's team. DCA's project coordinator of the respective domestic airports will also be responsible for ensuring proper implementation and monitoring of the EMP by the contractor and supervision consultant respectively. Any updates to the EMP, if required, will be made by the environmental specialist under the supervision consultants and reviewed and approved by the overall environment safeguards coordinator of DCA. An initial coordination cum training workshop will be conducted by ADB before the start of construction works for DCA, contractors, and supervision consultant to agree on modalities for implementing the EMP and carrying out necessary monitoring and reporting activities.</p>	<p>Complied.</p> <p>Environmental conditions are made mandatory and included as clauses under civil contract agreement. Generic EMP prepared under PPTA study has been updated during detailed design. The updated EMP has been appended as annex to the contract agreement and made legally binding.</p> <p>Project coordinators of three domestic airports have been assigned a role to oversee the effective implementation of the EMP during project implementation.</p> <p>CSC's Environmental Specialist supported the project coordinators in monitoring and reporting on environmental safeguards.</p>
2.	<p><b>Section VII Safeguards</b> b) Social – Involuntary Resettlement</p> <p>The project is classified category C in accordance with ADB's Safeguard Policy Statement (2009). The civil works for the project will be undertaken within the airport boundaries. There will be no acquisition of private land or property. A due diligence was</p>	<p>Complied.</p>

<sup>7</sup> <http://www.adb.org/sites/default/files/project-document/73165/44239-013-bhu-pam.pdf>

SNo.	Details	Compliance
	undertaken to find out about the status of compensation paid to the affected people for land acquired by DCA during the previous development undertaken by the government. For these, all the affected people have either been paid cash compensation or provided with land for land.	
3.	<p><b>Section VII</b>  <b>Safeguards</b>  c) Social – Indigenous People</p> <p>As the civil works will be undertaken within the airport boundary, there will be no acquisition of private land or property. There are no indigenous people present in the project area. As there will be no physical or economic displacement, no impact on indigenous people is envisaged.</p>	Not Applicable.
4.	<p><b>Section VIII</b>  <b>Gender and Social Dimension</b>  <u><b>Gender Consultation and Participation</b></u></p> <p>The project will have no direct interface with the community as it is confined within the airport boundaries. However gender participation was ensured during the course of the socio economic study by undertaking the process of gender analysis to assess the possible gender impacts. Women from the project influence area are mainly engaged in agriculture and home based income generation activities. Focus group discussions were undertaken with women belonging to different socio economic groups. Majority of women felt positively about the possible benefits including employment opportunities during construction and from growth in tourism. Equal benefits for women are expected to be attained under the project. Provisions in bidding documents require contractors to ensure that all civil works comply with all applicable labor laws; do not employ child labor for construction or maintenance; encourage the employment of the poor, particularly women; and do not differentiate wages between men and women, particularly for work of equal value.</p>	Complied.
5.	<p><b>Section VIII</b>  <b>Gender and Social Dimension</b>  <u><b>HIV and AIDS</b></u></p> <p>Bhutan continues to have low HIV prevalence. The Royal Government of Bhutan acted early and initiated HIV/AIDS prevention activities in the country. DCA will</p>	<p>Complied.</p> <p>The contractors organized an awareness program on</p>

SNo.	Details	Compliance
	<p>ensure that all civil works contractors (i) carry out awareness programs for labor on the risks of sexually transmitted diseases/ AIDS and human trafficking; and (ii) disseminate information at worksites on the risks of sexually transmitted diseases and HIV/AIDS as part of health and safety measures for those employed during construction. Contracts for the project will include specific clauses on these undertakings, and compliance will be strictly monitored by DCA, with the support of construction supervision consultants during project implementation.</p>	<p>HIV/AIDS, STD and human trafficking in partnership with the local hospital officials of Bumthang and Gelephu respectively.</p> <p>Being complied for Yonphula airport.</p>
6.	<p><b>Section VIII</b>  <b>Gender and Social Dimension</b>  <u><b>Health</b></u></p> <p>DCA shall ensure that contractors provide adequately for the health and safety of construction workers and further ensure that bidding documents include measures on how contractors will address this, including an information and awareness raising campaign for construction workers on sexually transmitted diseases, HIV/AIDS, and human trafficking. Contractors will carry out HIV/AIDS awareness activities for laborers at work sites, which will be monitored by the supervision consultants.</p>	Complied
7.	<p><b>Section VIII</b>  <b>Gender and Social Dimension</b>  <u><b>Labour</b></u></p> <p>DCA shall ensure that (i) civil works contractors comply with all applicable labor laws and regulations, do not employ child labor for construction and maintenance activities, and provide appropriate facilities for women and children in construction campsites; (ii) people directly affected by the project are given priority to be employed by the contractor; (iii) contractors do not differentiate wages between men and women for work of equal value; and (iv) specific clauses ensuring these will be included in bidding documents. The construction supervision consultants monitor the provisions.</p>	Complied
8.	<p><b>Section IX</b>  <b>B. Monitoring</b>  <b>Compliance Monitoring</b></p> <p>Compliance with covenants will be monitored through ADB's Project Administration Missions – including project inception mission to discuss and confirm the</p>	Complied.

SNo.	Details	Compliance
	timetable for compliance with the loan covenants; project review missions to review the borrower's compliance with particular loan covenants and, where there is any noncompliance or delay, discuss proposed remedial measures with the Government; and mid-term review mission if necessary to review covenants to assess whether they are still relevant or need to be changed, or waived due to changing circumstances.	
9.	<p><b>Section IX</b>  <b>B. Monitoring</b>  <b>Safeguard Monitoring - Environment</b></p> <p>The respective project coordinator of the three domestic airports will also be the environmental safeguards focal persons at the site level, and will monitor implementation of the EMP by the contractor with the support of the environment specialist of the supervision consultants.</p> <p>EMP implementation records in the form of monthly or quarterly checklists will be maintained by the contractor and cross checked and verified by the environment safeguards focal person at the site level. These will also be reviewed by the environment specialist of the supervision consultants. Based on these checklists and site observations, the environmental specialist will prepare an annual monitoring report and submit it to the overall environment safeguards coordinator under DCA. After review and approval by DCA, the report will be forwarded to ADB for disclosure on the ADB website in accordance with the requirements of ADB's SPS 2009.</p>	<p>Complied.</p> <p>The Project Coordinator of the three airports also played the role of environmental focal person who were supported by the CSC environment specialist.</p> <p>Complied.</p> <p>Annual safeguards monitoring reports have been prepared for the three airports and disclosed on the ADB website.</p>
10.	<p><b>Section IX</b>  <b>B. Monitoring</b>  <b>Safeguard Monitoring - Resettlement</b></p> <p>This will be carried out by the supervision consultants. If there are any IR impacts during project implementation such issues should be included in the semiannual safeguards monitoring report. Semiannual monitoring reports will be submitted to EA and ADB.</p>	<p>Complied. Annual safeguards monitoring reports including social and resettlement issues have been prepared for the three airports and disclosed on the ADB website.</p>

### ANNEX 3: COMPLIANCE TO THE CIVIL WORKS CONTRACT AGREEMENT

The contractor is obliged to comply with the safeguards clauses included in the contract agreement. Table 16 below provides an update on the status of safeguards compliance by the civil works contractor.

**Table 16: Compliance to the safeguards Clauses of the Civil Work Contract**

S.No.	Conditional Clauses	Compliance
1.	<p><b>Section 4 – Particular Conditions of Contract</b></p> <p><b>Additional Clauses</b>  <b><u>3.Quarries and Spoil Disposal</u></b>  Any quarry operated as part of this Contract shall be maintained and left in a stable condition without steep slopes and be either refilled or drained and be landscaped by appropriate planting. Alluvial/river materials taken from a river shall be removed over some distance so as to limit the depth of material removed at any one location, not disrupt the river flow or damage or undermine the river banks.</p> <p>The Contractor shall not deposit excavated material on land in Government or community or private ownership except directed by the Project Manager in writing or by permission in writing of the authority responsible for such land in Government ownership, or of the community or private owner or responsible representative of the community or owner of such land in private ownership, and only then in those places and under such conditions as the authority, owner or responsible representative may prescribe.</p>	<p>Not Applicable to the project as no new quarries were required to be established under this project. All construction materials are purchased from already established RGOB quarries and mines.</p> <p>Complied for Bumthang and Gelephu airport improvement works. Excavated materials were disposed off safely in the designated dump yards identified in the EMP and as directed by the CSC during construction.</p> <p>Being complied for Yonphula airport works. Spoil generated from removal hills besides runway and the excavation works of runway (from east end) are used for extension and leveling of the runway (to northwest end). Wherever there are potential dangers of spoil spillage into private properties the concrete walls (check dams) are constructed. Small section of check dam to northeast of runway failed due immense load of debris. It is recommended the contractor to repair the damaged section prior to start of rainy season.</p>



S.No.	Conditional Clauses	Compliance
2.	<p><b>Section 4 – Particular Conditions of Contract</b></p> <p><b>Additional Clauses</b>  <b><u>4.Traffic Diversion</u></b>  The Contractor shall include the necessary safety procedures regarding traffic diversion or temporary road closures that are needed in execution of the works. The Contractor shall include in his costing of works, any temporary works or diversion that are needed during the construction period.</p> <p>All traffic diversion or temporary road closures should be designed for the safety of both the motoring public and the men at work. It shall ensure the uninterrupted flow of traffic for traffic diversions and minimum inconvenience to the public for temporary road closures during the period concerned. As such, adequate warning signs, flagmen and other relevant safety precautionary measures shall be provided as approved by the Project Manager to warn motorists well ahead of the intended diversion or road closure. For temporary road closures, the Contractor shall be fully responsible for informing and seeking approval from all the relevant authorities and providing adequate closure notices in accordance with the timing laid out by the relevant authorities or regulations.</p> <p>All traffic devices used shall be designed in accordance with prevailing DOR Guidelines or as instructed by the Project Manager.</p>	<p>Complied for Gelephu and Bumthang airport improvement works.</p> <p>Being complied Yonphula airport works.</p>
3.	<p><b>Section 4 – Particular Conditions of Contract</b></p> <p><b>Additional Clauses</b>  <b><u>6.Employment of Local Personnel</u></b>  The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labour with appropriate qualifications and experience from sources within the project area.</p>	<p>Complied for Gelephu and Bumthang airport improvement works.</p> <p>Being complied Yonphula airport works.</p>
4.	<p><b>Section 4 – Particular Conditions of Contract</b></p> <p><b>Additional Clauses</b>  <b><u>7.Reinstatement and Compensation for Damage to Persons or Property</u></b>  The Contractor shall reinstate all properties whether public or private which are damaged in consequence of the execution and maintenance of the works to a condition as specified and at least to that obtaining</p>	<p>No damages to Persons or Properties are recorded during construction so far for all 3 airports.</p>

S.No.	Conditional Clauses	Compliance
	<p>before his first entry on them.</p> <p>If in the opinion of the Project Manager the Contractor shall have failed to take reasonable and prompt action to his obligations in the matter of reinstatement, the Project Manager will inform the Contractor in writing of his opinion, in which circumstance the Employer reserves the right to employ others to do the necessary work of reinstatement and to deduct the cost thereof from any money due or which shall be due from the Employer to the Contractor.</p>	
5.	<p><b>Section 4 – Particular Conditions of Contract</b></p> <p><b>Additional Clauses</b>  <b><u>16.Materials and Other Objects found in Excavation</u></b></p> <p>All materials and things of archaeological, religious and cultural significance obtained from excavations or found on or under the Site or under any additional site which the Contractor may be allowed to occupy shall remain the property of the Employer and shall not be used in the Works or sold or otherwise disposed of without the Written authority of the Employer unless otherwise expressly provided in the Specification. No additional excavations are to be made upon the Site beyond those shown on the Drawings or described in the Specification without the previous written authority of the Project Manager. Provided always that the Employer shall make no charge against the Contractor for materials excavated by the Contractor on the Site and used in the Works.</p>	<p>No archaeological, religious and cultural significant items have been found during excavation.</p>
6.	<p><b>Section 4 – Particular Conditions of Contract</b></p> <p><b>Additional Clauses</b>  <b><u>17.Protection from Weather, Storage</u></b></p> <p>The Contractor shall carefully protect all work and materials that may be affected by weather from injury thereby. The Contractor shall provide storage to the satisfaction of the Project Manager for materials to be incorporated in the Works or to be delivered to the Employer. Such storage shall be of a kind that will prevent loss of, or damage to, the materials. The Contractor shall take particular care to ensure the security of stores containing materials the loss of which would be likely to cause significant delay to the completion of the works or part thereof</p>	<p>Complied for Gelephu and Bumthang airport improvement works.</p> <p>Being complied Yonphula airport works.</p>

S.No.	Conditional Clauses	Compliance
7.	<p><b>Section 4 – Particular Conditions of Contract</b></p> <p><b>Additional Clauses</b>  <b><u>18.Use of Child Labour</u></b>  The Contractor and his Sub-Contractors shall not employ any child who has not attained the age of eighteen years in any work as a labourer.</p> <p>During continuance of the contract, the Contractor and his Sub-contractors shall abide at all times by all labour laws, including child labour related enactment, and rules made hereunder.</p>	<p>Complied for Gelephu and Bumthang airport improvement works. There has been no child labor.</p> <p>Being complied Yonphula airport works.</p>
8.	<p><b>Section 4 – Particular Conditions of Contract</b></p> <p><b>Additional Clauses</b>  <b><u>19.Local Custom</u></b>  The Contractor shall make himself aware of local customs and practices and observe them as far as possible, bearing in mind his obligations under the Contract.</p>	<p>Complied for Gelephu and Bumthang airport improvement works.</p> <p>Being complied Yonphula airport works.</p>
9.	<p><b>Section 4 – Particular Conditions of Contract</b></p> <p><b>Additional Clauses</b>  <b><u>20.First AID and Lifesaving apparatus</u></b>  The Contractor shall provide on the Site such lifesaving apparatus as may be appropriate and an adequate and easily accessible first aid outfit or such outfits as may be required in any government ordinances, factories, acts etc., subsequently published and amended from time to time.</p> <p>In addition an adequate number of persons permanently on the Site shall be instructed in their use, and the persons so designated shall be made known to all employees by the posting of their names and designations in a prominent position on Site.</p>	<p>Complied for Gelephu and Bumthang airport improvement works. First aid kits were available in the construction site.</p> <p>Being complied Yonphula airport works.</p>
10.	<p><b>Section 4 – Particular Conditions of Contract</b></p> <p><b>Additional Clauses</b>  <b><u>21.Maintenance of other Services and Structures</u></b>  The Contractor shall ascertain the location of all watercourses, irrigation channels, sewers, drains, water pipes, electricity and telecommunication cables, and other services and structures which may be encountered during the execution of the works. He shall take proper care, temporarily support or divert and subsequently reinstate all such services and</p>	<p>Being complied.</p> <p>This is relevant only for Yonphula airport where a footpath is required to be reinstated.</p>

S.No.	Conditional Clauses	Compliance
	<p>structures as necessary and to the satisfaction of the Project Manager.</p> <p>As soon as any such service or structure is encountered, on, over, under, in or through the site during the performance of the Contract, the Contractor shall make a record of the location and description of such service or structure and shall send the same forth to the Project Manager.</p> <p>Any damage to such service or structure caused due to the negligence of the Contractor or his Sub-contractors shall be reinstated by the Contractor at no extra cost to the Employer.</p> <p>Where permanent diversion or support of such service or structure is rendered necessary as the unavoidable result of the execution and maintenance of the works in accordance with the Contract, the Project Manager, after consultation with the Employer, will instruct the Contractor as to the diversion or support to be provided and the Contractor shall be paid the actual cost plus ten percent extra to this as his overhead and profit.</p>	<p>No such services or structures were impacted for the Gelephu and Bumthang Airport</p>
11.	<p><b>Section 4 – Particular Conditions of Contract</b></p> <p><b>Additional Clauses</b>  <b><u>24. Health and Safety</u></b></p> <p>The Contractor shall take due care and ensure that medical staff, first aid room are available at the camps, housing and on the Site at all times throughout the period of the Contract and that suitable arrangements are made for the prevention of epidemics and for all necessary welfare and hygiene requirements.</p>	<p>Complied for Gelephu and Bumthang airport improvement works. First aid kits were available on site. Being complied Yonphula airport works.</p>
12.	<p><b>Section 4 – Particular Conditions of Contract</b></p> <p><b>Additional Clauses</b>  <b><u>25. Prevention of HIV/AIDS</u></b></p> <p>The Contractor shall make his staff and labor aware of the dangers of HIV/AIDS and educate them in measures to prevent the transmission of these and other sexually transmitted diseases.</p>	<p>Complied. In cooperation with the local hospital the contractor arranged for awareness raising program on HIV/AIDS and human trafficking of women for Bumthang and Gelephu.</p> <p>Being complied for Yonphula airport.</p>

S.No.	Conditional Clauses	Compliance
13.	<p><b>Section 4 – Particular Conditions of Contract</b></p> <p><b>Additional Clauses</b>  <b><u>26. Obligation of the contractor</u></b></p> <p>The Contractor shall pay compensation for all temporary use of private or community/village lands and for any loss of livelihood arising therefrom.</p>	<p>Complied for Gelephu and Bumthang airport improvement works.</p> <p>Being complied Yonphula airport works.</p>
14.	<p><b>Section 4 – Particular Conditions of Contract</b></p> <p><b>Additional Clauses</b>  <b><u>27. Environmental Management Plan</u></b></p> <p>The Contractor shall be responsible to the implementation of Environmental Management Plan (EMP) and comply with the requirements of EMP in the execution of the Works. In addition the Contractor shall abide by the terms and conditions set forth in the environmental clearance provided by the relevant authority.</p>	<p>Complied for Gelephu and Bumthang airport improvement works. The contractor implemented the EMP and requirements of the environmental clearance.</p> <p>Being complied Yonphula airport works.</p>
15.	<p><b>Section 4 – Particular Conditions of Contract</b></p> <p><b>Additional Clauses</b>  <b><u>28. Routine Maintenance of Road and Reinstatement of Damages</u></b></p> <p>The Contractor at own cost shall be responsible to the reinstatement of the damages to completed works (pavement, pavement surfacing, shoulder or any other works) caused due to contractor's poor routine maintenance of drains, drainage channels, culverts, shoulders; lacking clearance of obstructions such as landslides etc. other than those occurred due to earthquake. The obligations to this requirement shall remain during construction and defects liability period in accordance with the provision of the contract.</p>	<p>Complied for Gelephu and Bumthang airport improvement works.</p> <p>Being complied Yonphula airport works.</p>

### ANNEX 4: COMPLIANCE TO ENVIRONMENTAL MANAGEMENT PLAN

The environmental management plan (EMP) for the project was provided in Chapter IX of the IEE report and also attached to the contract documents. As per EMP, environmental management activities were categorized to be implemented during the pre-construction, construction and operational stages. The following Table 17 lists out the status of activities during the pre-construction and construction stage as of December 2015.

**Table 17: Status of Compliance to the Environmental Management Plan**

S. No	Activity	Mitigation Measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance
<b>Preconstruction Stage</b>				
1.	Slope Protection Design	Potential slope erosion will be mitigated by designing slope erosion controls such as benching, retaining and breast walls, and bioengineering (plantation of locally available plant species) for Bumthang and Yongphula airports.	Complied	
<b>Construction Stage</b>				
2.	Construction material and its transportation	<ul style="list-style-type: none"> <li>• Environmental friendly quarrying to be carried out through benching and controlled blasting will be implemented for Yonphula airport improvement works</li> <li>• Topsoil to be collected and used for bioengineering by planting local or native plant species</li> <li>• Only required forest or vegetation clearance will be carried out.</li> <li>• For Bumthang native plants such as local bamboos (Yushinia spp.) and salix (shrub species) are suitable while for Yongphula plantation of Artemisia and Berberis spp.</li> <li>• Regular maintenance of transport vehicles has to be carried out to reduce the exhaust fume pollution.</li> <li>• Construction materials have to be covered during transportation to minimize dust</li> </ul>	<p>Complied for Gelephu and Bumthang airport improvement works.</p> <p>Partly complied for Yonphula airport works</p>	The civil works are ongoing for Yonphula airport. Slope particularly facing north-east has to be stabilized through implementation of civil as well as bioengineering measures as recommended by CSC engineer and environmental specialist. There is an imminent danger of mass slope failure and subsequent landslides which will

S. No	Activity	Mitigation Measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance
		pollution.		affect part of Yonphula and Kanglung.
3.	<p>Excavation, filling, leveling works of runway extension and access road constructions</p> <ul style="list-style-type: none"> <li>Excavation, filling, and leveling works for Bumthang and Yonphula airports are complete under RGOB funding project.</li> <li>For Gelephu airport, the excavation, filling and leveling works are underway and will be the major one till the project is over.</li> </ul>	<p>An effective plan for both structural and non-structural controls will help in restricting soil erosion on construction site. Erosion controls can directly reduce the amount of sediment transported off-site, thereby reducing the need for sediment controls. Some of the structural and non-structural controls that can be adopted are as follows:</p> <p>Structural controls include:</p> <ul style="list-style-type: none"> <li>Bioengineering of exposed slopes;</li> <li>Construction of strong and effective boulders and log barriers will be erected particularly for Yonphula disposal sites.</li> <li>Construction of sediment basins, which allow sediment to settle out of the urban runoff.</li> </ul> <p>Non-structural erosion controls include:</p> <ul style="list-style-type: none"> <li>Planning and designing the development within the natural constraints of the site;</li> <li>Minimizing the area of bare soil exposed at one time (phased grading);</li> <li>Planning for stage construction; and</li> <li>Avoiding the unnecessary clearing of the vegetation, that is not required at all.</li> </ul> <p>In addition to the above measures, material stockpiles, borrow areas, access roads and other land-disturbing activities will be located away from critical areas such as steep slopes, highly erodible soils and other susceptible areas prone to soil</p>	<p>Complied for Gelephu and Bumthang airport improvement works.</p> <p>Partly complied for Yonphula airport works</p>	<p>Spoil and debris management is critical for Yonphula airport improvement works. Project has constructed concrete check walls to stop debris spilling downhill into the private land. However, the section of check/retaining wall facing towards northeast of runway has collapsed which needs urgent repairing to avoid further slope and landslides with upcoming monsoon season.</p> <p>The runoff from the construction zone at Yonphula airport seems to be unabated as indicated by the state of small pond to</p>

S. No	Activity	Mitigation Measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance
		erosion. The top soils, which are removed by the clearing activity during construction, will be stockpiled and then reapplied to the site for bioengineering purposes. Dust pollution will be controlled by sprinkling water on exposed at least twice a day		northwest end of runway is silted and with high turbidity.  Bioengineering works still pending
4.	Waste Disposal	<p>In general waste will be managed by reduction of waste generation at source, re-use and recycling. However, the specific mitigation measures are proposed to alleviate the impacts caused by the construction, excavated materials, chemical and municipal solid wastes:</p> <ul style="list-style-type: none"> <li>• Construction and demolition waste materials from existing structures will be segregated so that waste materials could be re-used. For example, waste timber could be reused for construction of temporary labour camps. Concrete waste could be used filling and leveling the ground during construction of access roads.</li> <li>• Excavated material will be stockpiled safely away from the streams and river beds to prevent soil erosion and ultimate water pollution. As much as possible excavated materials will be re-used for filling. It is possible to do in Bumthang and Gelephu airport due to existence of relatively flat topography with gentle undulations.</li> <li>• Chemical waste from the machineries will be collected and stored properly. Spent engine oil from the equipment will be sent to India for recycling and re-use.</li> <li>• The contractor will provide rubbish or dustbin</li> </ul>	<p>Complied for Bumthang and Gelephu airport improvement works.</p> <p>Being complied for Yonphula airport sub-project as the works ongoing.</p>	<p>No concrete waste was generated in any of the airports. Excavated material was reused for filling the apron and car parking area in Bumthang airport. All maintenance of equipment and machinery was done in the nearby workshop for Bumthang Airport; hence there was no issue of chemical waste. Dustbins were provided in all airports. Non-biodegradable waste was disposed in the municipal waste bin for Bumthang and Gelephu Airport.</p>



S. No	Activity	Mitigation Measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance
		to temporarily store the municipal wastes (or solid waste). The municipal waste will be transported and dumped at the municipal disposal site. Since there is no municipal disposal site at Yongphula, the contractor will incinerate the non-biodegradable waste.		
5.	Water Environment (Surface water resources)	<ul style="list-style-type: none"> <li>Discharge of sediment laden construction water (e.g. from areas containing dredged spoil or pumped water from foundations) directly into surface water courses will be forbidden. The sediment laden construction water will be discharged into settling ponds or tanks prior to final discharge. This applies particularly to the Bumthang airport construction works along the river banks. Application of the measure for Gelephu airport stands true only during wet season.</li> <li>Carry out water quality monitoring on the Chamkhar Chhu River, Bumthang and Lake near Yongphula airport. Pre-construction data baseline water quality data (<b>Table IV-6 of IEE Report</b>) will be the reference to assess potential subsequent impact of construction or future operation on the local water resources.</li> <li>Washing of vehicles or any construction equipment in the Chamkhar Chhu River or any other stream shall be strictly forbidden. The airport authorities in future shall install the waste water treatment plant particularly for Bumthang Airport to prevent the waste water from entering the river directly. The guiding principle of these operations shall be to prevent any surface water pollution at source;</li> </ul>	<p>Complied for Gelephu and Bumthang airport.</p> <p>Partly complied in the case of Yonphula airport improvement works.</p>	<p>No sediment laden construction water was produced for Gelephu and Bumthang airport. Water quality monitoring for Chamkar chhu/River of Bumthang and Pond at Yonphula has not been carried out during construction stage as prescribed in the EMP. The lack of capacity and specific resources are the main reasons for not being able to carry out water quality monitoring.</p> <p>Since Yonphula airport work is still ongoing, ADB has fielded its Staff Consultant (National</p>

S. No	Activity	Mitigation Measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance
		<ul style="list-style-type: none"> <li>• Dumping of construction waste into storm water drainage will be avoided to minimize the siltation of Lake near Yongphula airport.</li> <li>• Stormwater will be equally diverted towards the western side of runway to reduce the volume of the flow and further erosion downstream</li> </ul>		<p>Environmental Expert) to carry out the water quality monitoring of pond at Yonphula in December 2015. Water quality analysis results are provided in table 10 of this report.</p>
6.	Air environment	<p>The level and significance of dust generation and nuisance can be effectively mitigated through:</p> <ul style="list-style-type: none"> <li>• Regular spraying the work area; covering trucks where the haulage of material involves transport on public roads; timely and regular cleaning of public roads as required. Water for this measure for Bumthang airport construction will be used from Chamkhar Chhu. For Yongphula and Gelephu, since there is no sufficient water nearby the construction sites, the water has to be transported using tankers.</li> <li>• The absolute level of construction-related ambient air pollution can be minimized by proper site management and construction organisation by good maintenance of the vehicle fleet and by immediately excluding over-aged or worn out vehicles and machinery from the construction site.</li> <li>• The operation of the asphalt plant is a potential source of harmful emissions, which may affect the human and the natural environment and the health of the workforce.</li> </ul>	Partly complied.	<p>Dust has been controlled through spraying of water in Gelephu airport. For Bumthang airport this was not an issue as the area is wet and marshy.</p> <p>Baseline air quality of the project areas have been established, however follow up monitoring have not been carried out.</p> <p>Therefore, in order to fulfill the EMP requirement, ADB fielded its Staff Consultant to carryout air quality</p>

S. No	Activity	Mitigation Measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance
		<p>The site of the asphalt plant will be at a minimum distance of 100 m from any watercourse or settlement.</p> <ul style="list-style-type: none"> <li>In addition air quality will be monitored throughout construction phase. Parameters to be measured are dust, PM10 (Suspended particulate), smoke of asphalt plant, Nox and Sox (as indicated in the <b>Table IV-3 of IEE Report</b>).</li> </ul>		<p>monitoring of at least ongoing airport improvement construction works of Yonphula.</p> <p>Results of ambient air quality monitoring of Yonphula airport (as December 2015) is presented in the table 8.</p>
7.	Noise Environment	<ul style="list-style-type: none"> <li>Strictly limiting the working hours to weekdays and to the relatively least sensitive daytime periods.</li> <li>The potential negative impact of construction noise on the workforce should be generally mitigated by providing the workforce with appropriate noise protection gear such as ear plugs and by using construction equipment that produces less noise.</li> </ul>	Complied.	Given the small scale of works, noise was not an issue for all three airports.
8.	Tree cutting/Site Clearance including vegetation removal	<ul style="list-style-type: none"> <li>Right-of-ways should be clearly marked to avoid removal of vegetation unnecessarily.</li> <li>Necessary actions such as tree marking must be carried out in accordance with the forestry rules before felling of trees for the project roads. All paperwork and approvals must be obtained well ahead in time to prevent delays in construction.</li> <li>The DOFPS will prepare a survey and inventory of the commercial timber present on public lands prior to construction of any given airports, in accordance with the official</li> </ul>	Partly complied.	<p>Tree felling and vegetation clearance were done according to Forest and Nature Conservation Rules 2006.</p> <p>However, compensatory plantation particularly for Yonphula and Gelephu is still pending. It is</p>

S. No	Activity	Mitigation Measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance
		<p>procedures of the DFPS as contained in the Forest and Nature Conservation Rules (FNCR 2006). Natural Resources Development Corporation Limited (NRDCL) will be authorized to market the timbers with commercial value.</p> <ul style="list-style-type: none"> <li>Compensatory plantation (of 1:5) will be carried out for trees lost for the construction of three airports. The compensatory plantation is proposed to be carried out under the banner of the Greenbelt Development Plan. The Greenbelt Development Plan will be developed during the detailed design phase.</li> </ul>		<p>recommended that plantation works in Yonphula be combined with bioengineering package for stabilization of slopes northeast of the runway. The development of greenbelts for Bumthang and Gelephu airport await clearer future expansion plans and final boundary demarcation. On the other hand Gelephu airport is already surrounded by dense tree cover.</p>
9.	Wildlife Habitat	<ul style="list-style-type: none"> <li>Due to the type of the planned development and the fact that the development of a new commercial area is intended, no effective measures can be proposed for the mitigation of the impact on wildlife. However, the availability of similar habitat in nearby areas (both Bumthang and Gelephu) will reduce the predicted impacts of wildlife.</li> <li>The construction activities will be carried out only during day time.</li> <li>The Master Plan or zoning plans may determine the protection or development of</li> </ul>	Partly complied	<p>Green zone development through compensatory plantation is still pending particularly for Yonpula and Gelephu airport. This will be done once the final greenbelt development plan has been prepared based on the final</p>

S. No	Activity	Mitigation Measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance
		<p>some areas with significance or potential for wildlife protection, e.g. alongside the Chamkhar Chhu River in Bumthang and Forest areas in the vicinity Gelephu airport areas.</p> <ul style="list-style-type: none"> <li>Greenbelt development programme with a compensatory plantation (of 1:5) will replace to some extent the lost wildlife habitat. The Greenbelt Development Plan will be developed during the detailed design phase. However, the main purpose of greenbelt is shield the noise and air pollution from spreading unabated out of airport sites.</li> </ul>		airport boundary expansion plan.
10.	Community Structures	<ul style="list-style-type: none"> <li>In order to reduce impacts of demolition of Suspension bridge, the new one is being proposed to be built by the Chhoekhor geog administration to north of Bumthang airfield. The bridge was not able to be built on time because of the budget constraint faced by the Chhoekhar geog. It will be built as soon as the additional budget is sanctioned by the government.</li> <li>Alternative footpath will be constructed along the southeastern perimeter of the Yongphula airport boundary to mitigate the closure of the existing walkway (which used the part of the existing airfield).</li> <li>Any future airport up-gradation and expansion works will consider the importance of the community water supply system within airport boundary. The community will be consulted if the shifting water supply line and tanks are to be carried out.</li> </ul>	Partly complied	Suspension bridge demolished as part of the RGOB funded airport construction project has not been rebuilt at Bumthang over Chamkhar Chhu/River. Instead, Bumthang Dzongkhag Administration is planning to build a motorable bridge but the Dzonkhag has not been able to finalize the bridge location due to planned airport boundary expansion.

S. No	Activity	Mitigation Measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance
				Alternative footpath construction and water tank relocation at Yonphula are still pending because the construction at Yonphula is ongoing.
11.	Brown Swiss cattle Farm and Feed & Fodder Development Programme at Bathpalathang	<ul style="list-style-type: none"> <li>• Under the RGOB funding the National Brown Swiss Development Programme has been developing the 60 acres of new pasture land at Lebi. It require at least 2 years for full pasture development. Therefore, any permanent shifting of farm animals to a new site has to be carried out only after full development period.</li> <li>• Similarly prior to transfer of farm animals to a new site, the construction of farm infrastructure such as staff quarter, attendant quarters, cattle sheds, silo pits, slurry tank, feed store and office building has to be completed.</li> <li>• Current dirt road or 1.5 km approach or access road to new farm at Lebi needs to be developed properly.</li> <li>• The office of National Feed and Fodder Development Programme (NFFDP) and the germplasm bank for temperate fodders has been shifted to Renewable Natural Resource (RNR) - Research and Development Center (RDC), Jakar. The germplasm bank has been shifted to new site.</li> </ul>	Complied	DoAT has allowed the Brown Swiss cattle farm of the Department of Livestock to carryon occupying their erstwhile space till their alternative farm space at Lebi is complete.
12.	Health and Safety of Construction workers	<ul style="list-style-type: none"> <li>• The construction workers will be provided with adequate and appropriate shelters which are wind and rainproof.</li> </ul>	Complied.	Workers were provided with adequate shelter;

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		<ul style="list-style-type: none"> <li>• Access to healthcare will be ensured with provision of first aid at the work sites. And in the event of major accidents emergency services of the district hospitals of Bumthang, Trashigang and Gelephu will be availed.</li> <li>• Adequate water supply, pit toilets and solid waste disposal sites have to provided</li> <li>• Monitoring of the sanitary conditions within the worker's camps is the responsibility of the DCA, who would regularly carry out surprise checks to inspect the camps.</li> <li>• To minimize the risk of new infections and the spread of HIV/AIDS/STI a specific tailor-made campaign should be carried out under the Project. This would comprise of conducting HIV/AIDS/STI sensitization sessions at the campsite including the distribution of information materials / brochures at the camp.</li> </ul>		provided first aid; given free access to health facilities as recommended by EMP; provided safe drinking water; access to sanitary facilities toilets and proper waste disposal; and health experts were invited to educate and create awareness of the issues of communicable diseases such as HIV/AIDS/STI, tuberculosis etc.
13.	Religious, Historical, cultural and Archeological Sites	<p>As far as possible, the destruction and demolition of important religious and cultural asset like important chorten at Yongphula airport will be avoided.</p> <p>However, if it is unavoidable, then prior to the demolition of chorten, a thorough public consultation with the local community (particularly with monastic community headed Lam Jigme Tenzin), Kanglung Geog Administration and Trashigang Dzongkhag will be carried out during the detailed design stage. The demolition and relocation issues will be jointly decided. Based on consensus the relocation of the chorten will be carried out with the assistance of the project.</p>	Complied	Chorten is safely relocated in consultation with local community to the extreme southeastern end of the runway.

S. No	Activity	Mitigation Measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance
<b>Operational Stage</b>				
14.	Air Environment	<p>The extent of air pollution will be minimal due to limited traffic of both air and vehicular. However, following mitigation measure can still be applied:</p> <ul style="list-style-type: none"> <li>• Shut down of aircraft engines to the maximum extent possible during taxiing and idling period.</li> <li>• Allowing aircrafts with ICAO certified engines to land and takeoff, as far as possible</li> <li>• Appropriate greenbelt development with thick plantation cover is one of the preferred methods to mitigate air pollution as plant serve as a sink for pollutants and also check flow of dust and also reduce the noise pollution. Greenbelt development plan will be developed during the detailed design phase.</li> </ul>	Being complied	Greenbelt plantation around Bumthang and Gelephu airports as recommended in EMP to minimize future air pollution is yet to be carried out.
15.	Noise Environment	<p>The ICAO Balanced Approach concept provides airports with an agreed methodology to be used to address and manage aircraft noise problems in an environmentally responsive and economically responsible way. The Balanced Approach to noise management encompasses four principal elements:</p> <ul style="list-style-type: none"> <li>• Reduction of noise at source;</li> <li>• Land use planning and management;</li> <li>• Noise abatement operational procedures;</li> <li>• Operating restrictions on aircraft.</li> </ul> <p>The DCA will be responsible to actively address these issues in a noise management policy and programme. Under the framework for future effective noise management at all airports and</p>	Being complied.	Currently only the Bumthang airport is operational with only 2 flights a week. Hence the noise levels are very low and it has not been found to be necessary to have greenbelt to mitigate noise yet.



S. No	Activity	Mitigation Measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance
		airport authority shall carry out: <ul style="list-style-type: none"> <li>• Airport authority will have a wide range of environmental management tasks, including the preparation and implementation of a noise management programme for the systematic reduction of operational noise impact of the airport</li> <li>• Assign a noise study based on ICAO Annex 16 procedures ('Aircraft Noise'), which also is a requirement for the later certification of the airport according to the 'Manual on Certification of Aerodromes';</li> <li>• By importing aircraft that make less noise such as plane with turbo-fan rather than turbojet.</li> <li>• To further reduce effect of noise and vibration, the DCA could implement the noise reduction barrier through plantation of trees (greenbelt) that absorbs the noise.</li> </ul>		
16.	Surface Water	In general the amount wastewater will be reduced through proper and efficient use of water. Depending on the wastewater generation, the wastewater treatment plant will be installed. The capacity treatment plant and its design will be developed during the detailed design.	Complied for Bumthang and Gelephu airports  Being complied for Yonphula airport improvements	Soak pit and septic tanks were constructed at Bumthang and Gelephu for treatment of sewage and wastewater generated from the airport activities.  Construction workers at Yonphula are provided with pit toilet for sewage waste disposal.

S. No	Activity	Mitigation Measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance
17.	Safety	<p>Details of the safety arrangements proposed for domestic are not yet available, but it is evident that the present arrangements of domestic airports would not meet the relevant ICAO standards. To comply with the relevant ICAO safety standards for the operation of an international airport it is thus recommended to</p> <ul style="list-style-type: none"> <li>• Establish an emergency (response) plan and take all required decisions in terms of organisation, equipment, staffing, training and operational framework conditions in compliance with ICAO recommendations provided in ICAO Annex 14 (I) to ensure safe airport operations;</li> <li>• Set up an effective program for the safe transport of dangerous goods in accordance with recommendations provided in ICAO Annex 18;</li> <li>• Establish and implement a best practice management plan in accordance with ICAO's revised Standards and Recommended Practices (SARPS) on airport wildlife control of 2003 particularly for prevention of bird strike.</li> </ul>	Being complied.	DoAT is in the process of improving the domestic airports to meet the relevant ICAO standards.
18.	Noise impacts on protected areas and habitats and protected species	<p>The DCA will be responsible to actively address these issues in a noise management policy and programme. Under the framework for future effective noise management at all airports and airport authority shall carry out:</p> <ul style="list-style-type: none"> <li>• Airport authority will have a wide range of environmental management tasks, including the preparation and implementation of a noise management programme for the systematic reduction of operational noise impact of the</li> </ul>	Partly complied	<p>Bumthang and Gelephu airports can allow operations of turbofan plane as jet planes are not safe for these airports.</p> <p>This will change as DoAT is already looking to extending</p>

S. No	Activity	Mitigation Measures	Compliance attained (Yes, No, Partial)	Comment/Reasons for Partial or Non-Compliance
		airport <ul style="list-style-type: none"> <li>Assign a noise study based on ICAO Annex 16 procedures ('Aircraft Noise'), which also is a requirement for the later certification of the airport according to the 'Manual on Certification of Aerodromes';</li> <li>By importing aircraft that make less noise such as plane with turbo-fan rather than turbojet.</li> </ul>		runways to accommodate jet plane in near future.
19.	Noise impacts on Religious, Historical, Cultural and Archeological sites	DCA will actively implement effective noise management programme through import of aircraft with less noise, reduction of noise at source and certify airports based on the noise study as per ICAO Annex 16 procedures ('Aircraft Noise'). To further reduce effect of noise and vibration, the DCA could implement the noise reduction barrier through plantation of trees (as part of the greenbelt development plan) that absorbs the noise. Greenbelt development plan will be developed during the detailed design phase.	Partly complied	Bumthang and Gelephu airports can allow operations of turbofan plane as jet planes are not safe for these airports.  This will change as DoAT is already looking to extending runways to accommodate jet plane in near future.

**ANNEX 5: PHOTOGRAPHS OF BUMTHANG DOMESTIC AIRPORT****Figure 13: Completed Access Road****Figure 14: Car park and Fire station****Figure 15: Completely Paved Runway****Figure 16: Completed Perimeter****Figure 17: Joint field visit for Chamkhar Chhu/River diversion investigation****Figure 18: Chamkhar Chhu River Training works**

**ANNEX 6: PHOTOGRAPHS OF GELEPHU DOMESTIC AIRPORT****Figure 19: Gelephu Airport Runway****Figure 20: Old Gelephu Airport Terminal****Figure 21: New Terminal Building of Gelephu Airport built under ATCEP**

*Source: Social Safeguard Monitoring Report, 2015.*



**ANNEX 7: PHOTOGRAPHS OF YONPHULA DOMESTIC AIRPORT****Figure 22: Yonphula Airport's ongoing Construction Works****Figure 23: Public Consultation at Yonphula Airport Terminal Building**