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# **Environmental and Social Management Plan (ESMP) (Draft)**

## **for Yunnan Kunming Changshui Green Airport Development Project**

Presented to

**Asian Infrastructure Investment Bank  
Yunnan Airport Group Co., Ltd.**

Prepared by



Guangzhou Greenworld Engineering Technology  
Consultant Co., Ltd.

Hohai University  
April 2023

### Version and Revision & Remarks

<b>Revision</b>	<b>Date</b>	<b>Remarks</b>
01	March 23, 2023	First draft for review by AIB and Yunnan Airport Group Co., Ltd.
02	April 10, 2023	Disclosure for comments

## 1 Purpose

This *Environmental and Social Management Plan* (hereafter referred to as the "ESMP") is prepared for the Yunnan Kunming Changshui Green Airport Development Project in the People's Republic of China (hereafter referred to as the "Project"). The ESMP is based on the ESIA Report of the Project (prepared by the Consortium of Guangzhou Greenworld Engineering Technology Consultant Co., Ltd. and Hohai University, 2023), the *Feasibility Study Report of Yunnan Kunming Changshui Green Airport Development Project* (prepared by Civil Aviation Airport Planning and Design Research Institute Co., Ltd., 2022) and the *EIA Report of Yunnan Kunming Changshui Green Airport Development Project* (prepared by Beijing Zhongzi Huayu Environmental Protection Technology Co. Ltd., 2022).

The ESMP proposes appropriate mitigation measures for possible environmental and social impacts and specifies organizational responsibilities and management mechanisms for monitoring and complying with the environmental and social laws, regulations, and standards of the PRC and the environmental and social policy framework of the Asian Infrastructure Investment Bank (hereinafter referred to as "AIIB").

The ESMP contains the following contents:

- (1) Purposes;
- (2) Organizational responsibilities;
- (3) Mitigation measures;
- (4) Inspection and monitoring schemes;
- (5) Reporting;
- (6) Training and capacity enhancement; and
- (7) Estimated costs for the implementation of the ESMP.

The ESMP will be included as a separate attachment in all tender and contract documents. It is the responsibility of the Contractor to fulfill the requirements of the ESMP and to list the estimated costs in the Tender Documents. The results of environmental and social impact monitoring will be used to assess the effectiveness of mitigation measures and to determine whether additional improvement measures are required.

## 2 Responsibilities of ESMP Implementing Agency

Yunnan Provincial Government is the Project Implementation Entity (PIE), Yunnan Airport Group Co., Ltd. is the Project Implementation Agency (PIA), and Kunming Changshui International Airport Co., Ltd. is the Project Implementation Unit (PIU). A Project Implementation Office (PIO) is set under Yunnan Airport Group Co., Ltd., to be responsible for the daily implementation of the Project and communication with AIIB.

Due to the great difference in environmental and social management aspects and span between the construction period and the operation period, the Kunming International Aviation Hub Project Construction Headquarters (hereinafter referred to as the "Hub Headquarters") and Kunming Changshui International Airport Co., Ltd. are responsible for the environmental and social management during the construction period and the operation period respectively.

The environmental and social management process during the construction period of the Project is shown in Figure 1. During operation, the project facilities will be operated following the current institutional arrangement of Kunming Changshui International Airport Co., Ltd.

The Hub Headquarters has departments such as Finance Department, Procurement Department, Engineering Management Department, Safety and Quality Management Department and Land Operation Coordination Department, which are responsible for the coordination and management of various disciplines during the construction period. The Hub Headquarters will be fully responsible for supervising the implementation of the ESMP during the construction period, coordinating the operation of the grievance mechanism, and reporting to AIIB through the PIO.

The Hub Headquarters will appoint an environmental and social officer within the Land Operation Coordination Department to be responsible for: 1) coordinating with the Procurement Department to ensure that environmental and social mitigation measures are included in the tendering documents and construction contracts; 2) reviewing the Contractor's ESMP for the site, including but not limited to dust removal and noise reduction plan, HSE-compliant construction plan, site sewage management plan, etc.; 3) coordinating the operation of the grievance mechanism; 4) in case of any unforeseen environmental and social negative impacts in the ESIA and ESMP, organizing supplementary assessment and implementing corresponding mitigation measures and report to AIIB in a timely manner; 5) submitting environmental and social impact monitoring reports to AIIB regularly through the PIO.

The Engineering Management Department of the Hub Headquarters shall designate 1-2 environmental and social officers for each construction section according to the construction sections, to be responsible for the implementation of environmental protection measures and work safety measures in their respective construction sections, the inspection and acceptance of environmental protection works, coordination in the operation of the grievance mechanism, and the collection and filing of environmental and social monitoring data on the construction site.

The Contractor: 1) Ensure that sufficient funds and manpower are available to implement the mitigation measures and monitoring scheme in the ESMP throughout the construction stage; 2) Be responsible for the operation of the grievance mechanism during the construction stage.

The Construction Supervisor: 1) Ensure the provision of sufficient funds and human resources to supervise and guide the Contractor, and require the Contractor to implement mitigation measures

and monitoring promptly according to the requirements in the ESMP; 2) The Engineer is responsible for supervising and recording the implementation of environmental protection and work safety measures during the construction period every day, submitting monthly supervision reports to the Engineering Management Department, and organizing meetings to discuss the supervision results.

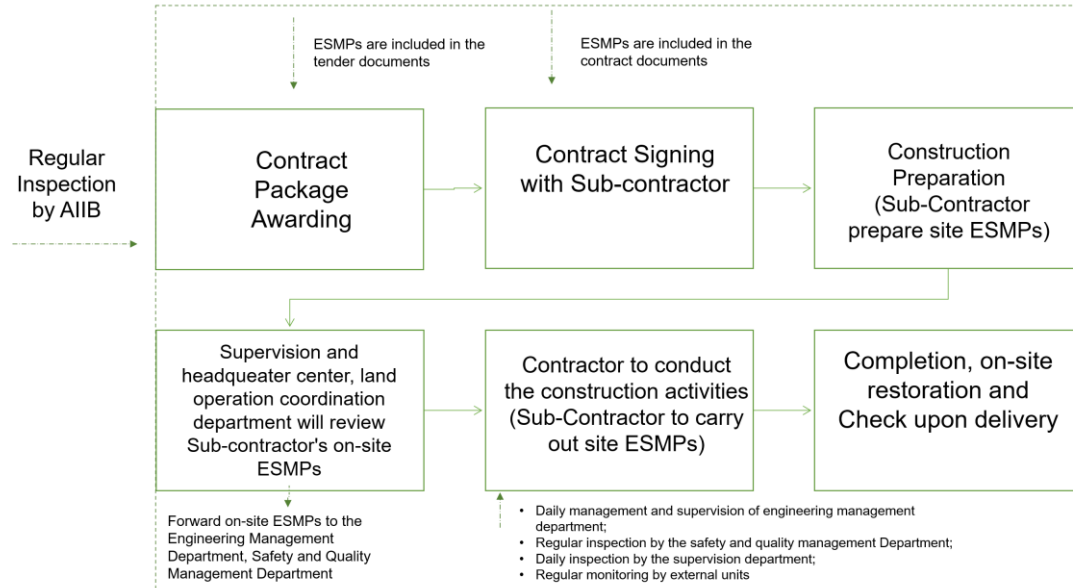


Figure 1 Construction Environment Management Process

### 3 Environmental and Social Impact Summary and Mitigation Measures

Based on the environmental and social impacts identified, mitigation measures were developed (Tables 1 and 2). The design unit and contractor shall incorporate mitigation measures into the design, tender documents, construction contracts and operational management, under the supervision of the project implementation unit and the supervising company. The effectiveness of these measures will be assessed on the basis of monitoring results by supervisors and external monitoring units to determine whether adjustments and improvements to these measures are needed.

#### 3.1 Environmental Impact and Mitigation Measures

**Table1 Environmental Mitigation Measures**

Category	Impact	Mitigation/Governance measures	Performance standard	Implemented by	Supervised by
<b>Design stage</b>					
<b>Climate change</b>	Greenhouse gas (GHG) emission	<ul style="list-style-type: none"> <li>Take into account energy efficiency, energy conservation and low GHG emissions in all structures and systems designs and equipment selection.</li> </ul>	Relevant energy saving standards	Design institute	Hub Headquarters
	Higher temperature	<ul style="list-style-type: none"> <li>Long life pavement design.</li> </ul>	/	Design institute	Hub Headquarters
	Extreme weather due to climate change	<ul style="list-style-type: none"> <li>Consider potential impacts from extreme weather events due to climate change in designing road surface and drainage system.</li> </ul>	/	Design institute	Hub Headquarters
<b>Construction stage</b>					
Exhaust gas	Construction dust	<ul style="list-style-type: none"> <li>Before the commencement of construction, a fence of not less than 2.5 m shall be set up at the construction site boundary;</li> </ul>	Integrated Emission Standard of Air Pollutants (GB16297-1996)	Contractor	Hub Headquarters

		<ul style="list-style-type: none"><li>• An on-line dust monitoring system shall be installed, and water sprinkling shall be carried out on the construction site to reduce dust during construction;</li><li>• Temporary access roads and main roads on the construction site shall be hardened and watered regularly, and other exposed sites shall be covered or provided with temporary greening;</li><li>• Materials stacked that are easy to generate dust shall be sealed. If the condition does not permit, measures such as enclosures, wind-break and dust control nets shall be taken;</li><li>• In the transport of materials prone to dust emission by truck, the materials shall be covered by tarpaulins and the speed shall be controlled to prevent materials from dropping and generating dust; during unloading, the drop shall be reduced as much as possible to reduce dust;</li></ul>			
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		<ul style="list-style-type: none"> <li>• A vehicle washing facility shall be provided at the gate of the construction site. Wheels of vehicles shall be washed or swept to avoid dirt brought by vehicles onto urban roads.</li> <li>• The construction site shall be cleaned and leveled in time, and dumping or throwing materials and construction waste from high places is not allowed;</li> <li>• Construction in the windy season and rainstorms in summer shall be avoided, and the construction duration shall be shortened as much as possible. Large earthwork operations such as excavation and backfilling shall be avoided in windy weather;</li> <li>• Information such as the person in charge of the construction site, environmental protection supervisors, main control measures for dust pollution, and the reporting telephone number shall be</li> </ul>			
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		publicized at the gate of the construction site.			
	Fuel exhaust	<ul style="list-style-type: none"> <li>The maintenance of construction machinery and vehicles shall be strengthened, high-quality fuels shall be selected, and the overload operation of construction machinery fueled by diesel shall be prohibited to reduce exhaust emissions.</li> </ul>	Integrated Emission Standard of Air Pollutants (GB16297-1996)	Contractor	Hub Headquarters
Wastewater	Domestic sewage	<ul style="list-style-type: none"> <li>The domestic sewage of construction personnel shall be collected and treated by environment-friendly mobile toilets or anti-seepage septic tanks and transported out regularly.</li> </ul>	Wastewater shall not be discharged out of the site	Contractor	Hub Headquarters
	Production wastewater	<ul style="list-style-type: none"> <li>During the construction period, sedimentation tanks shall be set up at the cleaning place for transport vehicles and beside the mixer. Construction wastewater shall be discharged into the sedimentation tanks. The supernatant obtained after sedimentation and clarification in the multi-stage sedimentation</li> </ul>	Wastewater shall not be discharged out of the site	Contractor	Hub Headquarters

		<p>tanks shall be reused for sand and gravel sprinkling or watering on the construction site to reduce dust. Production wastewater shall not be discharged out of the site, and the precipitated slurry shall be transported to the spoil yard after drying;</p> <ul style="list-style-type: none"><li>• Catch drains shall be set around the construction site to collect construction wastewater such as concrete curing water and leakage water discharged from the construction site, and the collected wastewater shall be discharged into the sedimentation tanks and used for watering for dust suppression after sedimentation;</li><li>• Fixed storage sites for construction materials and construction waste shall be set up. It is strictly prohibited to stack and discard those materials and waste at will. If necessary, fences or covers shall be set up to prevent</li></ul>			
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		<p>pollutants from being carried into surface water bodies by rainwater;</p> <ul style="list-style-type: none"> <li>• In the rainy season, the surface runoff shall be reused after being treated by sedimentation. The remainder after reuse shall be discharged after obtaining the permission of the relevant department. It is forbidden to discharge wastewater containing a large amount of sediment or untreated wastewater into the municipal pipe network and water bodies. Water retaining, interception, and drainage works shall be set up on the construction site.</li> <li>• Necessary anti-leakage and anti-seepage measures shall be taken for all temporary wastewater collection and treatment facilities on the construction site;</li> <li>• An emergency plan shall be formulated to stop construction immediately, and effectively collect and remove pollutants in</li> </ul>			
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		<p>case of a sudden rainstorm during construction, or that building materials, waste, oil, etc. accidentally enter the ditches;</p> <ul style="list-style-type: none"> <li>• During the construction period, all kinds of sewage and wastewater shall be effectively collected and classified for treatment in strict accordance with the requirements of the Construction Supervisor. Discharge of sewage and wastewater at will shall be strictly prohibited to avoid the formation of surface runoff;</li> <li>• During the construction period, the environmental supervision department shall supervise the construction to ensure that the airport construction sewage and waste are not discharged out of the site.</li> </ul>			
Solid waste	Construction waste	<ul style="list-style-type: none"> <li>• Construction waste primarily refers to the substantial amount of waste materials generated during ground excavation, demolition, road</li> </ul>	The disposal of hazardous waste shall be subject to the Standard for Pollution Control on Hazardous Waste Storage	Contractor	Hub Headquarters

	<p>construction, pipeline laying, material transportation, foundation works, and housing construction. These materials include sand, gravel, lime, concrete, wood, and waste mud, among others.</p> <ul style="list-style-type: none"> <li>• Special personnel shall be designated to be responsible for sorting construction waste and recycling any useful steel bars, timbers, cables, and other materials. Any construction waste or debris from demolished structures that cannot be reused shall be piled up at designated sites and regularly transported to the designated disposal location in the Airport New Town.</li> </ul>	(GB18597-2001, with its amendment in 2013); The disposal of general industrial solid waste shall be subject to the Standard for Pollution Control on the Non-hazardous Industrial Solid Waste Storage and Landfill (GB18599-2020).		
Domestic waste	<ul style="list-style-type: none"> <li>• Temporary waste containers shall be installed at the construction site, and domestic waste shall be sorted for management, and regularly cleaned and transported in accordance with the regulations of the local sanitation department.</li> </ul>		Contractor	Hub Headquarters

	Hazardous waste	<ul style="list-style-type: none"> <li>Develop waste management plan. Establish enclosed waste collection points on site, with separation of domestic waste and construction waste and hazardous wastes.</li> <li>Entrust a qualified third party to transport and properly dispose of hazardous waste.</li> </ul>		Contractor	Hub Headquarters	
Acoustic environment	Construction noise					
	Vibration					
Soil	Water Loss and Soil Erosion		<ul style="list-style-type: none"> <li>Potential soil erosion risks shall be minimized at all times during the construction of earthworks through effective engineering and construction management practices.</li> </ul>	/	Contractor	Hub Headquarters

		<ul style="list-style-type: none"> <li>• The topsoil shall be stripped and stockpiled for future use in land rehabilitation.</li> <li>• Spoil shall be reused on site to its fullest extent as fill. Excess spoil which cannot be used on site shall be transported to an approved disposal area for spoil.</li> <li>• Properly store petroleum products, hazardous materials and wastes on impermeable surfaces in secured and covered areas, and use the best management practice to avoid soil contamination.</li> </ul>			
Occupational health and safety	Occupational health and safety of construction personnel	The Contractor shall designate an EHS officer to be responsible for developing and implementing an occupational health and safety plan, keeping health, safety, and welfare records and reporting related accidents, incidents, and near misses regularly. The occupational health and safety plan shall provide sufficient measures to safeguard the well-being and safety of employees, including but not limited to:	No work safety accidents	Contractor	Hub Headquarters

		<ul style="list-style-type: none"> <li>• Wear appropriate personal protective equipment (e.g. protective goggles, masks, safety helmets, safety shoes, etc.);</li> <li>• Train workers to use correct methods to handle and dispose of materials during construction and demolition, and specify a maximum weight limit for single-person handling (if the limit is exceeded, mechanical assistance or teamwork is required);</li> <li>• Reasonably arrange the working hours;</li> <li>• Implement a good site clearance system, such as sorting scattered construction materials and demolished items;</li> <li>• Train workers to use anti-fall devices and ensure that they use them in daily work;</li> <li>• Paste warning signs in areas with safety risks;</li> <li>• Use temporary fall protection measures, such as handrails and toeboards, along the edges of</li> </ul>			
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		<p>scaffolds and other elevated work surfaces to prevent material from slipping and falling;</p> <ul style="list-style-type: none"> <li>• Plan and zone vehicle traffic, mechanical operations and pedestrian areas, control vehicle traffic by one-way traffic rules, set speed limits, and have trained traffic control persons wearing conspicuous vests or jackets directing traffic at the site;</li> <li>• Ensure personnel wear conspicuous vests when working or walking in the heavy machinery operating area to increase visibility;</li> <li>• Ensure mobile equipment is fitted with a reversing alarm.</li> </ul>			
Physical cultural resources	Incidental discovery of cultural relics during excavation in construction	<p>The Contractor shall establish the following procedures for discovering physical cultural resources incidentally:</p> <p>In the event that any cultural relics are found during construction, the construction personnel shall take the following steps: (1) Immediately stop construction in accordance with Article</p>	/	Contractor	Hub Headquarters

		<p>32 of the <i>Law of the People's Republic of China on the Protection of Cultural Relics</i>; (2) Secure and protect the site, and promptly notify the cultural relics management department of Kunming;</p> <p>(3) Revise the construction plan according to the opinions of the cultural relics management department of Kunming; and (4) Resume construction only after obtaining approval from the cultural relics management department.</p>			
Operation period					
Exhaust gas	Aircraft exhaust	<ul style="list-style-type: none"> <li>To control aircraft exhaust pollution, it is recommended that the airport avoids congested takeoff and landing schedules when designing flight density. This will help prevent the accumulation of high concentrations of atmospheric pollutants, such as CO and NO<sub>2</sub>, in the airport vicinity over a certain period of time.</li> <li>It is encouraged that airlines adopt aircraft models with lower pollution emissions.</li> </ul>	/	Airlines Kunming Changshui International Airport Co., Ltd.	Local ecology and environment bureau

		<ul style="list-style-type: none"> <li>Under weather conditions that are not conducive to the diffusion of atmospheric pollutants, such as calm or light winds, flight schedules shall be adjusted accordingly to minimize emissions and prevent pollution of the local atmosphere.</li> </ul>			
	Vehicle exhaust	<ul style="list-style-type: none"> <li>Yellow label vehicles and other high-emission old motor vehicles shall be prohibited from entering the airport area. All motor vehicles entering the airport area shall comply with the national emission standards for motor vehicle pollutants in CHINA 5.</li> <li>New energy equipment and vehicles shall be used at the airport so long as they meet the required technical standards and relevant management regulations for civil aviation airports. Moreover, charging facilities must be installed on site to facilitate the use of these vehicles.</li> </ul>	/	Kunming Changshui International Airport Co., Ltd.	

Sewage		<ul style="list-style-type: none"> <li>Sewage shall be collected and transported to the new sewage treatment station in the north working area via the sewage pipeline in the airfield area. During the dry season, sewage shall be treated and reused for road sprinkling, irrigating greening areas, and flushing toilets, without being discharged. And during the rainy season or in the event of a sewage treatment plant malfunction, some airport sewage shall be discharged into the south sewage treatment plant in the airport area for treatment.</li> </ul>	Reuse of Urban Recycling Water - Water Quality Standard for Urban Miscellaneous Water Consumption (GB/T 18920-2020)	Kunming Changshui International Airport Co., Ltd.	Local ecology and environment bureau
Solid waste	Aviation waste	<ul style="list-style-type: none"> <li>After being sealed and disinfected, aviation waste from areas other than the quarantine area shall be transported and disposed of together with domestic waste by KSEC Environmental Protection Technology Co., Ltd.</li> </ul>	/	Kunming Changshui International Airport Co., Ltd.	Local ecology and environment bureau
Wildlife management	Bird repelling	<ul style="list-style-type: none"> <li>Enhance pest control measures for vegetation and trees in the airport's terminal and</li> </ul>	/	Kunming Changshui International	Local ecology and environment

		<p>residential areas to prevent the creation of the food chain of birds.</p> <ul style="list-style-type: none"> <li>• Properly install bird net traps and rat and animal traps in the airfield area to prevent birds of prey from interfering with aircraft operations.</li> <li>• Set protective barriers for surface channels to prevent animals from entering the airfield area.</li> </ul>		Airport Co., Ltd.	bureau
Community health and safety	Noise	<b><u>Subject to Appendix 1: Noise Management Framework</u></b>			
Occupational health and safety	Noise	<ul style="list-style-type: none"> <li>• Ensure that staff who are exposed to noise disturbance wear personal hearing protection devices;</li> <li>• Implement a shift system to minimize the cumulative noise disturbance that workers experience.</li> </ul>	No work safety accidents	Ground Service Provider	Kunming Changshui International Airport Co., Ltd.
	Mobile equipment	<ul style="list-style-type: none"> <li>• Provide safety and access signs at locations such as passenger stairs, taxiways, and other areas where ground vehicles</li> </ul>	No work safety accidents	Ground Service Provider	Kunming Changshui International Airport Co., Ltd.

		<p>and aircraft have the potential to collide;</p> <ul style="list-style-type: none"><li>• Train the staff who are involved in aircraft support equipment operations to familiarize themselves with the safety procedures for passenger stairs and taxiways.</li></ul>			Ltd.
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## 3.2 Social Impact and Mitigation Measures

### **Reduce land acquisition risk**

- According to the Project's impact in terms of resettlement, a concise resettlement action plan is developed. During the implementation of the plan, emphasis shall be placed on utilizing the resettlement compensation to restore the income of vulnerable groups like female heads of households, households receiving subsistence allowances, and households enjoying the five guarantees (if any).

### **Reduce potential natural and social risks**

- Publicize the information about the Project, including but not limited to the brief introduction, the Employer, construction period, construction scope and construction impacts of the Project; form for submission of public comments, starting and ending time of submission of public comments, project emergency plan, etc.
- Ensure the operation on the construction site complies with the laws and regulations of the People's Republic of China on labor safety, including wearing safety helmets and other necessary personal safety protection equipment on the construction site, and wearing masks and providing thermometers and other protection equipment against COVID-19 and influenza;
- Reasonably arrange the construction hours to reduce the noise, dust, waste residue and tail gas emission caused by construction machines and material transportation vehicles in the construction activities of the Project;
- Standardize the domestic sewage discharge, land occupation for sludge drying and disposal of domestic waste during the construction period, and set up special construction waste residue placement and treatment camps;
- The construction of the Project will cause inconvenience to the travel of nearby residents in a short period of time, and a detour is required. Road safety warning signs and corresponding protective measures must be provided on the construction site of the Project to improve the construction efficiency of the Project;
- Reduce the frequency of construction vehicles passing through residential areas, and arrange construction in the early morning, night and other hours with less traffic.

### **Regularly carry out occupational health examinations related to airport noise**

According to the investigation, Dianzhong New Area held a seminar to discuss the scientific determination of noise contour range, and the airport also implemented various noise reduction methods. However, as the long wavelength of low-frequency noise emitted by aircraft makes the noise propagate widely, and the energy is immense, traditional solutions like sound barriers are relatively ineffective. To better mitigate the impact of noise on the production and daily life of the residents of the enterprises near the airport, YAG's Project Office, along with

the surrounding enterprises and community neighborhood committees, shall promote noise prevention information and enhance the implementation of noise reduction measures throughout the execution and operation of the entire project. To achieve this goal, the following actions are necessary: a. The occupational health examination program of enterprises around the airport shall include noise-related health examinations; b. The number of enclosed structures of residential houses, schools, and hospital buildings should be increased; c. Highly noise-sensitive points must be included in the emergency plan, the roles and responsibilities of all parties involved must be specified, and regular environmental accident drills shall be organized.

**Safeguard the labor rights and interests of women and give priority to providing jobs for women laborers in the project area**

- In the project construction process, emphasis ought to be placed on addressing the employment issue of unemployed female laborers, specifically, women aged 50 and above.
- The PIU may negotiate with recruitment enterprises to give priority to women during recruitment, provide them with job opportunities, increase the participation of women in the Project, avoid discrimination against female employees, and ensure that women get the same pay for the same job.
- It is essential to enhance the safeguarding of women's labor rights and interests and remain vigilant against violence based on gender. During Project implementation and operation, the Construction Contractor shall ensure the physical and mental well-being of female workers on the construction site, and that female workers receive regular mental health consults and training concerning their labor rights and interests.
- Based on the guidance and coordination of the AIIB Project Office, the Women's Federation, and the township and village/community women's federations, at least one person shall be assigned specifically to protect the rights and interests of women (the job may be undertaken by the environmental and social officer) within the PIA and the Project Construction Contractor during project implementation or operation, to prevent and curb sexual harassment that female employees may encounter at the workplace by taking effective measures considering the work and production characteristics of the unit.
- The Construction Contractor shall strengthen site supervision to prevent harmful behaviors, including but not limited to gender-based violence, sexual exploitation, abuse, and harassment, and establish a clear grievance channel.
- The grievance channel for the project site shall be unblocked, and include at least one female team member. Additionally, measures shall be taken to protect the safety of



the members of the grievance handling team, including preventing prejudice and retaliation towards the team members.

#### **Management of gender-based violence**

- Enhance the safeguarding of women's labor rights and interests and remain vigilant against violence based on gender;
- The Construction Contractor shall provide female laborers with regular mental health counseling and training concerning their labor rights and interests.
- Based on the guidance and coordination of the Project Office, the Municipal Women's Federation, and the township and village/community women's federations, an officer shall be assigned specifically to protect the rights and interests of women within the PIA and the Project Construction Contractor during project implementation or operation, to prevent and curb sexual harassment that female employees may encounter at the workplace by taking effective measures considering the work and production characteristics of the unit;
- The Construction Contractor shall enhance supervision of the construction site to prevent harmful behaviors such as gender-based violence, sexual exploitation and abuse, and sexual harassment, establish a clear grievance channel and a construction site grievance handling team with not less than two female members, and ensure the safety of the complaint team members, including preventing prejudice and retaliation towards the team members.

#### **Strengthen the management of migrant workers to prevent social risks such as HIV/AIDS and COVID-19**

Health and hygiene risks shall be taken into consideration during the construction of the project, given the need to import labor from other regions (provinces, cities, and counties). A large number of migrant construction workers will settle in the project area, increasing communication and interaction with local residents. This could potentially create social and health risks. Therefore, it is necessary to enhance safety and health publicity and carry out standardized education and management of construction personnel, to prevent social risks.

- Conduct education and publicity regarding public health and AIDS prevention in the project area, including preventive measures against epidemic and infectious diseases like AIDS, COVID-19, and influenza, and include these measures in the project's contract documents and thoroughly implement them.
- Carry out education and publicity on AIDS and other infectious diseases, as well as basic knowledge and skills in social communication for employees working on the construction site and locally recruited workers in the project area;
- Conduct physical examinations for migrant construction workers of the Project, and

establish a physical examination mechanism (including establishing a temporary infirmary and utilizing local medical resources), to ensure that only personnel who meet the required health standards are permitted to participate in the Project;

- Carry out various publicity activities on AIDS prevention, such as issuing brochures, hanging posters and making photo albums.
- Enhance the publicity and education on the local social and cultural customs for the migrant workers by inviting prestigious elders or knowledgeable community leaders to conduct publicity activities on the local culture and tradition, to promote a better understanding among the migrant workers and foster greater respect for the local social and cultural customs.

Meanwhile, to promote the extensive participation of project beneficiaries in project construction and supervision of the Project, as well as to foster communication and interaction between the residents and the Project Construction Contractor and the Project Owner, local laborers (including females) shall be employed during the construction period. The details are as follows:

- The proportion of local laborers in the Project's construction personnel shall be no less than 25%, and female and underprivileged populations must be included;
- Ensure that unskilled employment opportunities are given priority to disadvantaged groups including females;
- Provide labor remuneration not lower than the local minimum wage standard according to the actual situation of the work, and give certain subsidies for environmental supervision;
- Provide employment training opportunities for local workers recruited and hired.

**Use appropriate construction methods to minimize the impact of construction on the quality of life of residents in the project area**

- Safety shall be ensured during the construction period by means of making proper arrangements for construction time and site, developing a scientific construction plan, and carrying out enclosed operations to ensure the safety of nearby residents;
- In the early stage of construction, excavation and survey shall be properly carried out to ensure that there are no electrical, water, and gas lines beneath the construction site;
- The PIU shall ensure effective publicity prior to construction commencement, and take measures such as phased construction to mitigate disruption to the operations of nearby enterprises and shops;
- Measures shall be taken to reduce noise pollution and control the noise from construction sites and roads. Moreover, high-noise equipment shall be scheduled for

use during daytime hours whenever possible to prevent night-time construction. To minimize the adverse effects of noise on local residents and workers, low-noise equipment shall be selected;

- Access roads and construction roads shall be watered regularly to prevent dust pollution;
- No-honking signs shall be set up in the crowded areas where vehicles pass, and construction vehicles shall enter and leave the site at low speed without honking. Reasonable transportation routes shall be planned.
- Social sensitive points shall be as much as possible. Transport vehicles passing through sensitive points shall not honk, and shall keep a constant low speed. Construction at night should be avoided as far as possible.
- Regular publicity, education and training shall be carried out for construction personnel to prevent them from making loud noise and gathering during lunch breaks and at night.
- Post construction information on the outer side of the construction hoarding and near sensitive areas, including the project name, construction duration, construction content, etc., provide the name and contact information of the person in charge of the site area, and assign a special person to handle residents' complaints and give feedback.
- During the period when COVID-19 and influenza are prevalent, construction personnel and the construction site shall implement protective measures, including strict control of the flow of personnel on the site, and regular physical examinations and assessments of potential health hazards, to minimize any negative impact construction may have on community health and safety.

**Improve the labor security system and working conditions to safeguard the legitimate rights and interests of laborers**

- Clearly stipulate that the principles of equal opportunity and fair treatment shall be adhered to when employing staff for the Project, and any person shall not be discriminated for his/her characteristics unrelated to the inherent job requirements;
- Provide appropriate protection and assistance measures for women, the disabled, migrant workers, minors who have reached the legal age for employment, and other specific groups of workers, to overcome the shortcomings of project staff;
- Assist workers in establishing workers' organizations according to national laws. Workers have the right to establish and join workers' organizations selected by them and guarantee their collective bargaining from interference.
- Establish and clarify the complaint mechanism for handling labor complaints and

reports, clarify the supervision mechanism for labor protection, and protect individual privacy according to law when handling sexual harassment complaints;

- Clarify the protection policies related to industrial accidents of airport and department employees in the annual safety performance indicators of the Airport.

**Table 2 Social Management Plan**

	Specific measures or actions		Supervision departments	Implementation units	Source of fund	Monitoring indicator
Construction period	<b>Risks from land requisition and resettlement</b>	<p>a. Implement the Resettlement Plan according to the approved concise Resettlement Action Plan;</p> <p>b. Pay special attention to how vulnerable groups, such as female heads of households, households enjoying the minimum living guarantee, and households enjoying the five guarantees, use resettlement compensation to recover their incomes.</p>	YAG, Resettlement Plan preparation unit, external supervision unit	YAG, Resettlement Plan preparation unit, external supervision unit	Project funds	a. Implementation of the Resettlement Plan.
	<b>Potential natural and social risks</b>	<p>a. Publicize the information of the Project, including but not limited to the brief introduction, the Owner, construction period, construction scope and construction influences of the Project, form for public comments, starting and ending time for public comments, and project emergency response plan.</p> <p>b. Ensure the operation on the construction site complies with the laws and regulations of the People's Republic of China on labor safety, including wearing safety helmets and other necessary personal safety protection equipment on the construction site, and wearing masks and providing thermometers and other protection equipment against COVID-19 and influenza;</p>	YAG, Project Owner, social impact assessment report preparation unit and external supervision unit	Construction Contractor Contractor	Project funds	<p>a. Lawful Project Construction Information Disclosure Board, records of public comments for the Project, and Project Emergency Plan Bulletin Board;</p> <p>b. Environmental and safety measures that must be included in the bidding document and contract of the Project; and the implementation of COVID-19 pandemic prevention and control measures;</p> <p>c. Records of the number of cases of violation of labor safety related laws and regulations on the construction site and the specific conditions;</p> <p>d. Types and quantities of dust reduction measures taken on the construction site;</p>

	<p>c. Reasonably arrange the construction hours to reduce the noise, dust, waste residue and tail gas emission caused by construction machines and material transportation vehicles in the construction activities of the Project;</p> <p>d. Standardize the domestic sewage discharge, land occupation for sludge drying and disposal of domestic waste during the construction period, and set up special construction waste residue placement and treatment camps.</p> <p>e. The construction of the Project will cause inconvenience to the travel of nearby residents in a short period of time, and detour is required. Road safety warning signs and corresponding protective measures must be provided on the construction site of the Project to improve the construction efficiency of the Project.</p> <p>f. Reduce the frequency of construction vehicles passing through residential areas, and arrange construction in the early morning, night and other hours with less traffic.</p>				<p>e. Number of measures taken to address the nuisance problems raised by surrounding residents.</p> <p>f. Number of accident records and other complaints caused by the lack or absence of road safety signs or protective measures at the construction site or designated sites of the Project;</p> <p>g. Number and content of safety signs on the construction site;</p> <p>h. Number of workers trained on construction safety.</p>
<b>Health risks</b>	<p>a. Strengthen the education and publicity on health and AIDS, COVID-19 prevention, including the prevention of AIDS, COVID-19 and other infectious diseases, which shall be included in the contract documents;</p>	<p>Project Office, Project Owner, social impact</p>	<p>Construction Contractor Contractor</p>	<p>Project budget, government finance</p>	<p>a. Terms and conditions of the construction contract and its implementation;</p> <p>b. Training courses on public safety and AIDS and COVID-19 prevention and the number of trainees;</p>

	<p>b. Incorporate the education on public health and AIDS and COVID-19 prevention into the contract of the Project and the education of the personnel employed in the industrial park;</p> <p>c. Provide physical examination for construction workers of the Project (e.g. setting up temporary medical room and making full use of local medical resources);</p> <p>d. Carry out various publicity activities on AIDS and COVID-19 prevention, e.g. brochures, posters and photo albums;</p> <p>e. Invite prestigious elders or knowledgeable community cadres in the project area to carry out publicity activities on local social and cultural customs, e.g. brochures, posters and photo albums;</p> <p>f. Suggest the conclusion of labor agreements with temporary employees to protect their rights and economic benefits;</p>	<p>assessment report preparation unit and external supervision unit</p>			<p>c. Number of health clinics;</p> <p>d. Publicity of AIDS and COVID-19 prevention and control in the construction stage, including the number of brochures, posters and photo albums.</p> <p>e. Publicity and education on local social and cultural customs during the construction stage, including the number of brochures, posters and photo albums.</p>
<b>GBV management risks</b>	<p>a. Strengthen the protection of female laborers' rights and interests, and provide mental health consultation and training on the protection of female laborers' rights and interests for female laborers regularly;</p> <p>b. Strengthen the supervision of the construction site to avoid gender-based violence, sexual</p>	<p>YAG, Project Owner, social impact assessment report preparation unit and</p>	<p>Construction Contractor Contractor</p>	<p>Project budget, government finance</p>	<p>a. Gender ratio of laborers in the Contractor;</p> <p>b. Times of providing mental health consultation and labor rights and interests training for women; arrangement of special personnel by the Contractor of the Project for protecting women's rights and interests, and the specific measures taken to prevent and</p>

	<p>exploitation, sexual abuse, sexual harassment and other harmful behaviors;</p> <p>c. Establish clear channels for grievances and complaints, set up a grievance and complaint team (including two female members at least) on the construction site, and ensure the safety of the team members to protect them against prejudice and retaliation.</p>	external supervision unit			<p>stop female employees from sexual harassment in the workplace;</p> <p>c. Supervision measures of the Contractor to prevent sexual harassment, the establishment and staffing of the grievance and complaint team, and whether the grievance and complaint mechanism is smooth.</p>
<b>Threats to community security from migrant population</b>	<p>a. Give lectures on community safety publicity, and post nearby construction and traffic safety warning signs;</p> <p>b. Do a good job in community management, implement the shift system, and register the entry of migrants into the community in a timely manner to ensure the safety of personnel in the community;</p> <p>c. Pay special attention to the safety education and safety care of women and vulnerable groups, and increase their safety awareness.</p>	Project Office, Emergency Management Bureau, Human Resources and Social Security Bureau, township/sub district, community/village committee, women's organization in the project	Construction Contractor Contractor	Project budget and financial budget from government department	<p>a. Strengthen the safety management of the communities near the airport, and release the management information on the existing information release platforms;</p> <p>b. Give safety lectures, provide safety training, and ensure the participation rate of women;</p> <p>c. Strengthen the construction personnel information management and updating. The Contractor and communities shall do a good job in information communication to ensure the information security of the communities.</p>



			area			
	<p><b>Improve the labor force guarantee system and working conditions to safeguard the legitimate rights and interests of workers</b></p>	<p>a. Clearly stipulate that the principles of equal opportunity and fair treatment shall be adhered to when employing staff for the Project, and any person shall not be discriminated for his/her characteristics unrelated to the inherent job requirements, for example, no age limit on job applicants;</p> <p>b. Provide appropriate protection and assistance measures for women, the disabled, migrant workers, minors who have reached the legal age for employment, and other specific groups of workers, to overcome the shortcomings of project staff;</p> <p>c. Assist workers in establishing workers' organizations according to national laws. Workers have the right to establish and join workers' organizations selected by them and guarantee their collective bargaining from interference;</p> <p>d. Establish and clarify the complaint mechanism for handling labor complaints and reports, clarify the supervision mechanism for labor protection, and protect individual privacy according to law when handling sexual harassment complaints;</p> <p>e. Define the protection policies related to industrial accidents of airport and department</p>	<p>YAG, Project Owner, social impact assessment report preparation unit and external supervision unit</p>	<p>Construction Contractor Contractor</p>	<p>Cost of environmental management plan for the Project</p>	<p>a. Proportion of women, the disabled and other special groups among the workers employed and the proportion of each age group;</p> <p>b. Protection measures and regulations for women, the disabled and minors who have reached the legal age for employment;</p> <p>c. Number of training and education activities on workers' organizations;</p> <p>d. Frequency at which workers hold negotiations through the labor union.</p> <p>e. The establishment and smoothness of the grievance and complaint mechanism, preventive measures against sexual harassment, number and proportion of female workers in the construction stage, and feedback and suggestions;</p> <p>f. Specific grievance mechanisms, including the whistleblower policy and the mechanism for reporting sexual harassment and other issues;</p> <p>g. Relevant safety performance indicators and industrial accident related protection policies;</p>

		employees in the annual safety performance indicators of the airport;				
Operation period	<b>Potential natural and social risks during project operation</b>	<p>a. Require the airport to provide safety and health training and fully communicate with employees on all procedures;</p> <p>b. Require enterprises around the airport to incorporate the noise into the occupational health examination plan; increase the number of maintenance structures for residential buildings, schools and hospitals;</p> <p>c. Incorporate high noise sensitive points into the emergency plan, clarify the roles and responsibilities of each party concerned, and organize environmental accident drills regularly;</p> <p>d. Pay special attention to the proportion of women, the old and children attending lectures when carrying out information security related education and training;</p> <p>e. Construct public toilets within the operation scope of the airport according to the needs of tourists and nearby residents, set up toilet indication signs, arrange cleaning administrators for management, and beautify the green landscape around the airport.</p>	YAG, Finance Bureau, Urban-Rural Development Bureau, external supervision unit	Project Office, Finance Bureau and Urban-Rural Development Bureau	Project budget, government finance	<p>a. Provide training plans, training records or training effect evaluation records to guarantee the training effect and make sure employees know the airport management dynamics;</p> <p>b. The airport shall provide training policies for review, and develop and implement the human resources policies and social responsibility training plans;</p> <p>c. Promotional videos on occupational hazard factors for airport operation posts and the number of noise-related occupational health examinations;</p> <p>The number of building maintenance structures for residential buildings, schools, hospitals and other noise sensitive buildings to improve their sound insulation;</p> <p>d. The content and update frequency of the emergency plan, and the scale and frequency of environmental accident drills;</p> <p>e. Number of education and training related to special information security, number of participants, and proportion of female participants;</p>

						<p>f. Regularly check the training effect of trainees and carry out the indicator assessment;</p> <p>g. Layout of public toilets.</p>
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Table 3 Gender Action Plan Gender Action Plan 错误!文档中没有指定样式的文字。 2

Specific measures or actions		Monitoring index	Implementation subject	Target population
A. Increasing employment opportunities for women	<p>a. During the construction and operation of the project, priority will be given to providing unskilled jobs for women in villages and groups involved in the project area.</p> <p>b. For jobs with low physical requirements, the employment age range should be appropriately relaxed, and women aged 40 to 50 who are difficult to find non-agricultural employment opportunities should be preferred, such as cleaning, cooking, management and care.</p>	A.1 Priority will be given to providing project employment opportunities for women (baseline value of proportion of women workers during construction period is about 8%, target value is 15%).	AIIB Project Office, Contractor	Female employees of communities/villages around the project area and AIIB PMO
B. Empowering women for development	<p>a. Improve women's skills, knowledge and opportunities in employment and entrepreneurship through employment knowledge lectures, skills knowledge training courses and employment and entrepreneurship seminars.</p> <p>b. In the capacity building training for green airports and sustainable information disclosure, appropriate skills training contents shall be provided in combination with women's physical, psychological quality, education level, personal needs and other factors, and appropriate training time shall be set up to further ensure that women have the</p>	<p>B.1 Proportion of women participating in various trainings, including noise control, women's rights and interests publicity and education, employment skills training, etc. (baseline 20%, target 30%).</p> <p>B.2 Improve training for YAG women in project information disclosure and management</p>	Women's federations at all levels, human resources and social security bureaus, agricultural and rural bureaus, etc.	All women in the project area

	same opportunity to improve their skills as men.	(baseline 25%, target 50%).		
C. Increasing women's participation in decision-making	<p>a. Increase the proportion of women in decision-making on matters related to the community;</p> <p>b. Increase the proportion of women signing or "signing by both husband and wife" in signing compensation agreements for land acquisition or demolition.</p>	<p>C.1 Proportion of women participating in project mobilization, information disclosure, policy advocacy and consultation for women (baseline 20%, target 30%).</p> <p>C.2 Proportion of women signing compensation agreements for land acquisition or demolition (baseline 0%, target 100%).</p>	Community/village group, AIIB Project Office, Land Acquisition and Demolition Office, Contractor	Female and female employees in communities/villages around the project area
D. Reducing the risk of gender-based violence	<p>a. Strengthen the protection of female laborers' rights and interests, and provide mental health consultation and training on the protection of female laborers' rights and interests for female laborers regularly;</p> <p>b. Strengthen the supervision of the construction site to avoid gender-based violence, sexual exploitation, sexual abuse, sexual harassment and other harmful behaviors;</p> <p>c. Establish clear channels for grievances and complaints, set up a grievance and complaint team (including two female members at least) on the construction site, and ensure the safety of the team members to protect them against prejudice and retaliation.</p>	<p>D.1 Female workers have received 100% training on labor rights protection.</p> <p>D.2 Ensure that 100% of female workers and male workers are paid equal for equal work, and no gender-based violence occurs.</p> <p>D.3 Establishment of appeal and complaint channels and the number of female members.</p>	AIIB Project Office, Women's Federation, Contractor	All women in the project area

## 4 Environmental and Social Monitoring

### 4.1 Environmental Monitoring

The purpose of environmental monitoring is to monitor (i) the degree and severity of the actual environmental impact compared with the expected environmental impact, (ii) the implementation of environmental protection measures and their compliance with relevant regulations, (iii) the comprehensive effect of the environmental management plan of the Project; and (iv) the necessity of adjusting the Environmental Management Plan of the Project. The Project Monitoring Plan shall focus on the environmental conditions in the area affected by the Project.

There are two types of environmental monitoring: (i) monitoring the implementation of environmental mitigation measures; (See Figure 1 Environmental Management Process)

and (ii) environmental quality monitoring, to be implemented by a third-party environmental monitoring institution, including collection and analysis of air quality and noise data at designated monitoring locations to assess the compliance with applicable environmental quality and emission standards.

#### Construction period

The whole construction process shall be monitored in order to timely address the environmental problems caused by construction dust and construction noise in the construction process.

**Table 3 Schedule of Environmental Monitoring Plan during Construction Period**

<b>Monitoring item</b>	<b>Monitoring content</b>	<b>Monitoring time and frequency</b>	<b>Monitoring location</b>	<b>Monitoring factor</b>	<b>Executive standard</b>
<b>Atmospheric environment</b>	Construction dust	1 period/quarter, 2 days/period, 2 times/day	One monitoring point shall be set at the upwind site boundary and the downwind site boundary of the nearest village respectively.	TSP	Level II standard in <i>Ambient Air Quality Standard</i> (GB3095-2012)
<b>Noise</b>	Construction noise	1 period/month, 2 days/period, 2 times/day,	One monitoring point shall be set in the	Leq	Class II standard in <i>Environmental Quality</i>

		once in the day and once in the night	east, south, west and north of the construction site boundary and the site boundary near the village respectively.		<i>Standard for Noise (GB3096-2008)</i>
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### **Operation period**

The Environmental Monitoring Plan during the operation period is to track and monitor the implementation effect of environmental protection measures of the Project, and monitor the pollutant emission intensity to prevent pollution accidents and provide a scientific basis for airport environmental management.

**Table 4 Schedule of Pollutants Monitoring Plan during Operation Period**

<b>Category</b>	<b>Location of monitoring point</b>	<b>Monitoring factor</b>	<b>Recommended monitoring frequency</b>	<b>Standard</b>
<b>Noise</b>	12 automatic aircraft noise monitoring points;	WECPNL	Continuous	Standards for Class I and Class II areas in <i>Standard of Aircraft Noise for Environment Around Airport (GB9660-88)</i>
	Erjia Village, Sanjia Village, Sijia Village, Ayi Village, and Yunrui Community		Follow-up monitoring, once a year	
<b>Wastewater</b>	Inlet of sewage treatment station (new and existing stations)	Flow, COD, NH <sub>3</sub> -N, total nitrogen, and total phosphorus	Installing on-line monitoring equipment for automatic monitoring.	/
	Outlet of sewage	Flow, pH, water temperature,	Installing on-line monitoring	Standards for toilet flushing use and car

	treatment station (new and existing stations)	COD, NH <sub>3</sub> -N  Suspended solids, chroma, turbidity, smell, DO, BOD <sub>5</sub> , iron, manganese, total chlorine, total dissolved solids, anionic surfactant, and Escherichia coli	equipment for automatic monitoring.  Once/quarter	wash use in the <i>Reuse of Urban Recycling Water - Water Quality Standard for Urban Miscellaneous Use</i> (GB/T 18920-2020). For the sewage entering the south sewage treatment plant in the airport area in the rainy season or in case of accident, Class A standard in the <i>Wastewater Quality Standards for Discharge to Municipal Sewers</i> (GB/T31962-2015) shall be implemented.
<b>Ambient air</b>	Plant boundary	SO <sub>2</sub> , NO <sub>2</sub> , PM <sub>10</sub> , PM <sub>2.5</sub> and non-methane hydrocarbon	Once/year	Class II standard in Ambient Air Quality Standard (GB3095-2012) and its amendments;

### **Ecological monitoring**

The key monitoring areas for terrestrial ecology shall be the areas within and around the airport according to the ecological environment characteristics of the assessment area and project area of Kunming Airport Project, as well as the airport operation characteristics, and the monitoring content is the change of bird population. Besides, it is required to strengthen bird survey and information management; arrange field service personnel to receive the training on the theoretical knowledge of ornithology and ecology, and master the bird strike prevention knowledge and the basic knowledge of bird strike prediction; and on this basis, standardize the bird monitoring at the airport and make the bird monitoring records. With the gradual accumulation of bird observation data, the bird strike warning system can be developed to predict the bird strike for the airport in the future.

#### ① Monitoring objects

The monitoring objects are mainly the quantity, distribution and activity of bird populations in and around the airport, based on which, the investigation and observation shall be carried out, e.g. the research on the habitat environment, distribution characteristics, tweeting characteristics and daily activity intensity of birds. Meanwhile, it is required to monitor the activity rules of other animals in the airport area, intensively investigate the grass, insect, bird and animal situations, and master the change trend of each environmental factor in detail, so as to formulate the bird strike prevention plan more effectively.

## ② Monitoring method

Main basis for monitoring: *Technical Guidelines for Biodiversity Monitoring - Birds* (HJ 710.4-2014).

The long-term follow-up monitoring shall be adopted, i.e. follow-up monitoring during the construction period and 10 years after the formal operation of the Project.

- Monitoring in the airport: There is less human intervention in the airport, and birds are mainly interfered by aircrafts and some machines. Ten fixed bird monitoring points can be set in fixed areas that have no impact on the normal operation of the airport. The sample points shall cover the clearance area and airfield area of the airport.
- Monitoring around the airport: Different types of habitats around the airport, e.g. woodland, shrubland, grassland, garden plot, plowland, waters and wetland, shall be selected, and 3 monitoring line transects with a length of about 1~2 km shall be set for each type of habitat, to regularly monitor and record the species, quantities and flight height of birds and the impact on them.

## ③ Monitoring period and frequency

Monitoring period: from the beginning of the construction period to the end of 10 years after the Project is officially put into operation; monitoring frequency: 4 times a year;

- First time: March ~ May
- Second time: June ~ August
- Third time: September ~ November
- Fourth time: December to February of the following year

Monitor birds in different seasons and record their species, quantities, flight height and daily activity intensity, to systematically grasp the annual and interannual changes of bird species, populations and residence in and around the airport, so as to formulate the bird strike prevention plan in a more accurate manner.

## 4.2 Social monitoring

Monitoring and evaluation is an important link to ensure the Project is implemented according to its objectives, the project information is disclosed as required, the public can participate in the Project, and the social management action plan proposed in the design of social impact assessment report can receive attention and be implemented, and is also an important error correction mechanism and participation mechanism for the proposed Project. To this end, a supervision and evaluation mechanism is established for the proposed Project, including internal supervision and external monitoring and evaluation.

Internal supervision: Yunnan Airport Group Co., Ltd. monitors and evaluates the implementation of the proposed Project, the implementation of the social management action plan, the progress of information disclosure and public participation plan, the application of project funds, and the implementation of rules and regulations.



External independent monitoring and evaluation: An independent monitoring institution employed by YAG and approved by AIIB, with ten years or longer experience in social and resettlement monitoring and evaluation of projects financed by AIIB, the World Bank, ADB and other international financial organizations shall carry out the external monitoring of the implementation of the social management action plan. The independent monitoring and evaluation agency shall regularly track, monitor and evaluate the implementation activities of the social management action plan, put forward advisory opinions, and submit the monitoring and evaluation report to AIIB.

## 5 Report

YAG's Project Office shall regularly report the implementation of the Environmental and Social Management Planning Framework for the components within its jurisdiction, i.e. submitting one report in each quarter in the first year of the implementation of the Project, and thereafter submitting one report every six months. These reports shall be independent documents and a part of the project implementation report.

According to AIIB's assessment on the implementation of environmental and social measures, the environmental and social monitoring report shall be submitted every six months.

## 6 Institutional Strengthening and Training

During the implementation of the Project, Yunnan Airport Group Co., Ltd. will organize external experts to provide preliminary training on the implementation of the Environmental and Social Management Plan for the environmental and social officers of the project implementation organizations, the Contractor, the Supervisor and Kunming Airport. The training contents include AIIB's Environmental and Social Policies, good management practice for construction, monitoring and reporting, grievance mechanism, green airport construction, etc. The indicative training plan is given in Table 3 and will be tailored according to the demands of PIO, contractors and facilities operator.

**Table 3 Indicative training plan**

<b>Training Topic</b>	<b>Summary of Training Purpose and Content</b>	<b>Recipients/ Participants</b>	<b>Frequency or Target Date</b>
<b>Induction to AIIB ESP requirement, project ESMP</b>	Overview of ESMP, including pollution risks and controls, and preparation of site-ESMPs and training on implementation to staff of contractor(s); labor management; GBV prevention etc.	PIO, contractor, construction supervision company	<b>At beginning of project</b>
<b>Review of ESMP,</b>	ESMP monitoring,	PIO, contractor,	<b>1 year after project</b>

<b>and refreshers' training on SEMP</b>	supervision, reporting, procedures, and review of ESMP, including new changes and updates, effectiveness of the mitigation measures and any corrective actions required.	construction supervision company	<b>start or more frequently if required</b>
<b>GRM</b>	GRM roles and responsibilities, and procedures; information disclosure requirements.	PIO, contractor, construction supervision company	<b>Once prior, and once the first year of project operation</b>
<b>Environmental, health and safety</b>	i) Good practices to manage operation noise; ii) green airport development; iii) wastewater and solid waste management; iv) occupational and community health and safety etc.	Operation staff of Kunming Changshui Airport	<b>Once at first year of operation</b>
<b>Emergency preparedness and response drill</b>	<b>Organize drill on emergency conditions such as fire, natural disaster, epidemic, explosion, etc.</b>	<b>Operation staff of Kunming Changshui Airport</b>	<b>Included in the regular training program of Kunming Changshui Airport</b>

## 7 Cost Estimate

The cost of implementing and managing environmental and social mitigation measures is 86.76 million yuan, including: 1) The cost of measures during the construction period, including safe and civilized construction, such as construction enclosure, water sprinkling, construction material covering, drainage ditch, sound barrier, traffic signs, labor occupational health and safety measures, a total of 83.96 million yuan, to be borne by the contractor (as part of the construction contract); 2) 2 million yuan for environmental and social monitoring; 3) RMB 500,000 for capacity building and training. In the operation phase, the daily maintenance cost of the facility shall be borne by Kunming Changshui International Airport Co., LTD. 4) RMB 300,000 will be spent on training sessions for recruiting women and subsistence workers, organizing and implementing public participation, and complaining. Noise monitoring equipment and climate change investment are part of the project construction content, not included in the environmental and social management plan implementation costs.

## Appendix 1 Noise Management Framework

### 1. Basis for Preparation of Noise Management Framework

#### 1.1 Legal and Regulatory Framework

*Law of the People's Republic of China on Noise Pollution Prevention and Control* (2022) stipulates that:

- Article 52 The people's government of the place where a civil airport is located shall, according to the scope and extent of the impact of civil aircraft noise on the living environment around the airport determined based on the environmental impact assessment and monitoring results, designate the areas where the construction of noise-sensitive buildings are prohibited and restricted, and shall implement the control measures.

It is prohibited to construct any noise-sensitive buildings irrelevant to aviation in the construction prohibited area.

If it is really necessary to construct noise-sensitive buildings in construction restricted areas, the Employer shall provide building sound insulation design for noise-sensitive buildings according to the requirements of relevant standards for sound insulation design of civil buildings.

- Article 53 Civil aircrafts shall meet the noise requirements in the airworthiness standards stipulated by the competent civil aviation authority under the State Council.
- Article 54 The civil airport administration shall manage the noise of the aircrafts taking off and landing on the airport, and together with the air transport enterprise, general aviation enterprise, air traffic management department and other relevant units, take such measures as adopting low-noise flight procedures, optimizing take-off and landing runways, controlling aircraft operations and time periods, restricting the operation of high-noise aircrafts or taking sound insulation and noise reduction measures for surrounding noise-sensitive buildings, to prevent and reduce noise pollution of civil aircrafts.

The civil airport administration shall, according to national regulations, monitor the noise of civil aircrafts around the airport, keep the original monitoring records, be responsible for the authenticity and accuracy of the monitoring data, and regularly submit the monitoring results to the competent civil aviation and ecological environment departments.

*Civil Aviation Law of the People's Republic of China* (1996) stipulates that:

Article 55 Civil airport construction plans should fit in with city construction plans.

*Regulation on the Administration of Civil Airports* (Order No.553 of the State Council

of the People's Republic of China, April 13, 2009) stipulates that:

- Article 59 Civil aircrafts taking off and landing on civil airports shall comply with relevant national airworthiness standards for aircraft noise and turbine engine out-emission.
- Article 60 The airport administration shall, together with the air transport enterprise, air traffic management department and other relevant units, take technical means and management measures to control the impact of civil aircraft noise on the surrounding areas of the airport.
- Article 61 The local people's government of the place where the civil airport is located shall formulate the overall planning and urban-rural planning for use of the land in the surrounding areas of the civil airport, fully consider the impact of civil aircraft noise on the surrounding areas of the civil airport, and comply with the national environmental quality standards for noise.
- The airport administration shall report the impact of civil aircraft noise on the surrounding areas of the transport airport to the land and resources, planning and construction, environmental protection, and other competent departments of the local people's government.
- Article 62 The local people's government in the place where the civil airport is located shall designate the areas where the construction of noise-sensitive buildings are restricted in the surrounding areas of the civil airport, and shall implement the control measures. If it is really necessary to construct noise-sensitive buildings in such areas, the Employer shall take measures to reduce or avoid the noise impact generated by civil aircrafts during operation.

The local people's government in the place where the civil airport is located shall, together with the regional civil aviation administration, solve the problems caused by the noise impact of civil aircrafts taking off and landing on the civil airport.

## 1.2 Environmental Quality Standard for Noise

(1) *Standard of Aircraft Noise for Environment Around Airport* (GB9660-88)

Applicable area	Standard value ( <b>L<sub>w</sub>ecpn</b> )
Class I area	≤70 dB
Class II area	≤75 dB

Class I area means special residential areas, residential areas, and cultural and educational areas. Class II area means the living areas other than Class I area.

Generally, the standard limit for Class I area shall be implemented for facilities or

buildings with special requirements for acoustic environment, such as schools, hospitals, kindergartens and nursing homes. The standard limit for Class II area shall be implemented for general residential areas in cities and towns.

(2) *Environmental Quality Standards for Aircraft Noise in the Surrounding Area of the Airport* (Second Draft for Comments) (for reference)

Applicable area	Standard value of aircraft noise around the airport	
	Current standard (L <sub>wecpn</sub> )	Standard to be adopted (YL <sub>dn</sub> )
Class I land: urban and rural land sensitive to aircraft noise, including the land for residential buildings, education and scientific research, health and medical institutions and other similar land.	≤70	≤57
Class II area: urban and rural land relatively sensitive to aircraft noise, including the land for administrative office, culture and art, financial business and other similar land.	≤75	≤62
Class III area: urban and rural land relatively insensitive to aircraft noise, including the land for industrial production, logistics and warehousing, sports and entertainment, parks, squares and other similar land.	/	≤67
Class IV area: urban and rural land not sensitive to aircraft noise, including the land for agricultural production, mining production, transport facilities, public facilities and other similar land.	/	/

Note: 1) YL<sub>dn</sub>: annual average diurnal equivalent sound level; 2) The difference between L<sub>wecpn</sub> and L<sub>dn</sub> depends on the division of time periods and the number of flights in each time period, generally ranging from 13 dB to 14 dB. The conversion method of L<sub>wecpn</sub>= L<sub>dn</sub>+13 is adopted in the *Environmental Quality Standards for Aircraft Noise in the Surrounding Area of the Airport* (Second Draft for Comments).

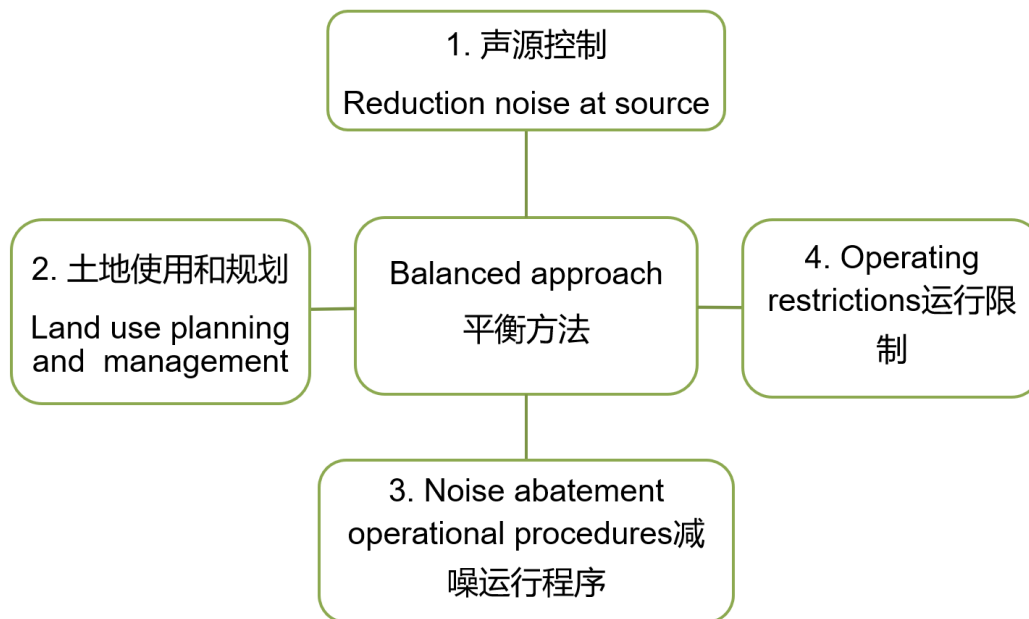
(3) Reference standards for noise control measures

- Refer to *Code for Design of Sound Insulation of Civil Buildings* (GB 50118-2010) for sound insulation of existing buildings;
- Refer to the *General Code for Building Environment* (GB 55016-2021) for sound insulation of new buildings;
- After the implementation of sound insulation measures: the indoor noise of residential, office and cultural, and educational buildings within the assessment scope of the airport in this phase meets the limit requirements of L<sub>d</sub> (07:00–22:00) 55 dBA in the daytime and L<sub>n</sub> 45 dBA at night in the EHS guidelines of the World Bank;
- After implementation of sound insulation measures: The indoor noise of residential, office and cultural, and educational buildings within the assessment scope of the

airport in this phase can also meet the limits of  $L_{den} \leq 45$  dB and  $L_{night} \leq 40$  dBA in the Guidelines for the Prevention of Environmental Noise for the European Region (2018) issued by WHO.

### 1.3 ICAO Balanced Approach to Aviation Noise Management

The ICAO's main overall policy on aircraft noise is the Balanced Approach to Aviation Noise Management, which was adopted by the 33rd session of the ICAO General Assembly (2001) and reaffirmed at all subsequent General Sessions (Reference: Appendix C of ICAO Resolution A39-1).



Appendix Figure -1 Four Basic Components of the Balanced Approach to Aviation Noise Management

With reference to the "balance approach" proposed by ICAO: 1) sound source control (using quieter aircraft); 2) reasonable planning and management of land around the airport; 3) use of aircraft noise reduction operation procedures; 4) restriction of aircraft operation at the airport, the aircraft noise control measures of the Project are formulated according to the following principles:

(1) Formulate the land use planning around the airport according to the aircraft noise prediction results, and implement the construction and development around the airport in strict accordance with the planning;

(2) Control the aircraft noise emission from the source, including selecting more optimized take-off and landing procedures, controlling the take-off and landing operations of high-noise aircraft, adjusting the take-off and landing ratios of different runways on the premise of

ensuring the stable operation of the airport, and reducing the utilization rate of runways close to sensitive points;

### (3) Treatment of Exceeding Standard

a. If the sensitive targets of residential buildings exceed LWECPN by more than 85 dB, relocation measures shall be taken, and sound insulation measures shall be taken for 75 dB–85 dB;

b. If the LWECPN of sensitive cultural, education, and health targets exceeds 80 dB, relocation measures shall be taken, and sound insulation measures shall be taken for 70 dB–80 dB.

Refer to Code for Design of Sound Insulation of Civil Buildings (GB 50118-2010) for sound insulation of existing buildings. Refer to the General Code for Building Environment (GB 55016-2021) for sound insulation of new buildings.

### (4) Follow-up monitoring

For sensitive receivers that have not exceeded the standard at this stage but are relatively greatly affected by aircraft noise at the airport, regular aircraft noise monitoring or overall assessment shall be carried out to understand the impact of aircraft noise at the actual airport.

### (5) Noise assessment

If the airport flight procedures and flight volume are greatly adjusted, or the follow-up monitoring results generally exceed the standard, the noise assessment shall be carried out again to determine the actual impact scope and degree of airport aircraft noise, and necessary prevention and control measures shall be taken in time.

## **2. Noise Control Measures during Operation Period**

There are 164 sensitive points within the noise assessment scope, including 114 villages and residential communities (97 villages and 17 residential communities), 44 schools (20 kindergartens and 24 schools), 4 hospitals, and 2 drug rehabilitation centers. Among them, 6 residential communities and 18 schools and hospitals are within the control scope of the previous EIA planning and were constructed after the approval of the previous EIA.

According to Article 52 of the Law of the People's Republic of China on Prevention and Control of Noise Pollution: If it is really necessary to build noise-sensitive buildings in restricted construction areas, the Employer shall carry out building sound insulation design for noise-sensitive buildings to meet the requirements of relevant standards for sound insulation design of civil buildings. The Employer shall bear the cost of sound insulation for the above 6 villages and settlements (Class II sensitive receptors) and 18 schools and hospitals (Class I sensitive receptors).

Excluding the new sensitive buildings approved in the previous EIA, after the implementation of the expansion project in this phase, the aircraft noise LWECPN of 26 villages

and settlements (Class II sensitive receivers) and 27 schools and hospitals (Class I sensitive receivers) in this phase exceeds the corresponding standard limits.

There are three implementation subjects of noise control measures involved in the expansion project in this phase:

- a) **New construction unit:** including 6 villages and settlements (Class II sensitive receptors) and 19 schools and hospitals (Class I sensitive receptors) construction units. According to Article 52 of the Law of the People's Republic of China on Prevention and Control of Noise Pollution: If it is really necessary to build noise-sensitive buildings in the restricted construction area, the construction unit shall carry out building sound insulation design for noise-sensitive buildings to meet the requirements of relevant standards for sound insulation design of civil buildings. The required funds are "self-raised" by the owners of the new building and are not included in the scope of the airport and other relevant responsible subjects.
- b) **The responsible subject of the previous expansion project (Kunming Changshui International Airport):** For the 5 villages (Heibo Village, Adi Village, Hongshapo Village, Shagou Village, and Ganluochong Village) and 13 schools and hospitals (Yunnan Vocational College of Agriculture, Kunming Guanghua School, Baihanchang Central School, Changshui Central School, Yunnan Vocational College of Judicial Police, Yunnan Horticultural School, Lizhi Primary School, Xiaochaoyang Kindergarten, Banqiao Middle School, Xingjie Primary School, Shagou Central School, Xiaoshao Township Hospital, and Xiaoshao Middle School) where sound insulation measures are required to be installed in the previous phase of the Project, relevant measures shall be implemented by the responsible unit of the previous period in this reconstruction and expansion, and repeated accounting of environmental protection investment is not considered this time. Kunming Changshui International Airport, as the actual operation department, is also the main responsible person for excessive noise.
- c) **Responsibility subject of the expansion project in this phase (Kunming Changshui Airport):** If the aircraft noise at the existing acoustic environment sensitive points (receptors) caused by the expansion project in this phase exceeds the standard, the responsibility subject of the expansion project in this phase, i.e. Kunming Changshui Airport, shall implement it;

**This assessment focuses on the noise control measures to be implemented by the responsible subject in b) and c).**



## 2.1 Land Use Planning and Control around the Airport

Land use planning around the airport is the primary prevention and control means to avoid conflicts caused by airport development. As the responsible subject, the implementation unit of the expansion project in this phase shall cooperate with the planning preparation department in the following aspects to carry out relevant work.

### (1) Establish a communication mechanism

The airport shall establish a regular communication mechanism with the municipal planning department to ensure that the planning department keeps abreast of the impact of aircraft noise on the airport and the area affected by aircraft noise in the airport development target year.

(2) The airport shall actively participate in the planning preparation and relevant feedback work.

In the stage of soliciting opinions on the planning preparation of the airport and its surrounding areas, the airport shall actively participate in the feedback and put forward adjustment suggestions for possible problems in the planning.

### (3) Conservation of data

The airport may set up a specialist to be responsible for the communication between the airport and the planning department, and be responsible for keeping relevant communication records, regularly sorting out and summarizing them, and forming a development planning document for the surrounding areas of the airport.

### (4) Controlled Range of Areas around the Airport

Different organizations have different requirements for land use planning around airports. For example, the Federal Aviation Administration of the United States of America (FAA) has proposed the compatibility standards in Part 150 Airport Noise Compatibility Plan in accordance with the United States Aviation Safety Noise Reduction Act (49 United States Code, Part 2101 and subsequent sections), but China has not carried out systematic legislative work on land use planning around airports. At present, the planning of land use around the airport is mainly based on the Environmental Standard for Aircraft Noise around Airport (GB9660-88) and the Reply on the Interpretation of Relevant Items of Environmental Standard for Noise in the Surrounding Area of Airports (State Environmental Protection Bureau HH (2004) No. 163), with Lwecpn 70 dB and 75 dB as the main control values.

In this assessment, it is suggested to use Ldn as the main index for the planning of land around the airport for the following reasons:

- First, Ldn and the current Environmental Quality Standard for Noise (GB3096-2008) are of the same noise system. It can more intuitively reflect the impact degree of

aircraft noise in the surrounding area of the airport;

- Secondly, Ldn has good compatibility with the EHS Guidelines of the World Bank, WHO Environmental Noise Guidelines for the European Region (2018), and other airport noise assessment standards of major economies of the world;
- Thirdly, the planning and control of the surrounding land of the airport for Ldn can be used for reference.
- Fourthly, Ldn is the recommended index of the Environmental Quality Standard for Aircraft Noise in the Surrounding Area of the Airport (Draft for Comments), which also gives the planning control standard for land around the airport applicable to Ldn in China, and is more perfect than the current planning control index. It is also scientific and reliable to some extent. The only problem is that the Environmental Quality Standards for Aircraft Noise in the Surrounding Area of the Airport (Draft for Comments) is still in the research stage, and no statutory norms and standards have been formed.

After comprehensive consideration, since there is no existing reference basis for the current planning and control of land use around the airport in China, for the development of the airport and from the perspective of better protecting the people around the airport from the impact of aircraft noise, the aircraft noise control standards proposed in the Environmental Quality Standards for Aircraft Noise in the Surrounding Area of the Airport (Draft for Comments) are selected in this phase to propose the guidance scope for the planning of land use around the airport.

According to the Environmental Quality Standards for Aircraft Noise in the Surrounding Area of the Airport (Draft for Comments), the planning and control of land around the airport in 2030 of Kunming Changshui International Airport is divided into the following contents:

**1) Area with Ldn  $\leq$  57 dBA**

The scope of Ldn 57 dBA area of Kunming Changshui International Airport in 2030 is shown in the following figure:

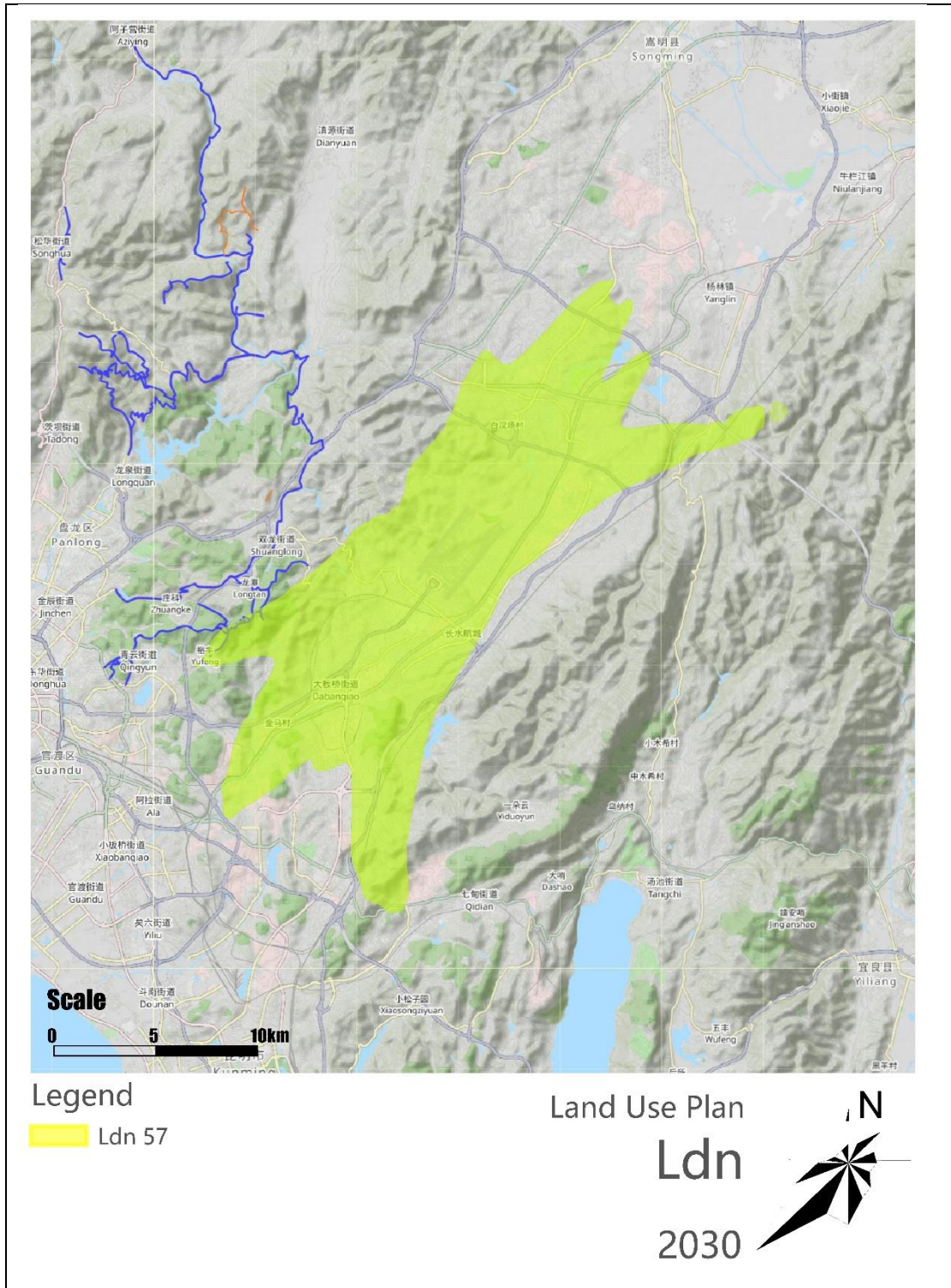


Figure-2 Distribution of Aircraft Noise Ldn 57 dBA Impact Area of Kunming Changshui Airport in 2030

Area with  $Ldn \leq 57$  dBA, i.e. Class I area, and the area beyond the impact scope of Ldn 57 dBA is also planned. Buildings and land types that are relatively sensitive to noise, such as residences, hospitals, and schools, can be planned.



## 2) Area with 57 dBA < Ldn ≤ 62 dBA

It is a Class II area, which can be planned as sensitive buildings and land for administrative office, culture, commerce, etc. The regional distribution of area with Ldn 57–62 dBA of Kunming Changshui Airport in 2030 is shown in the following figure;

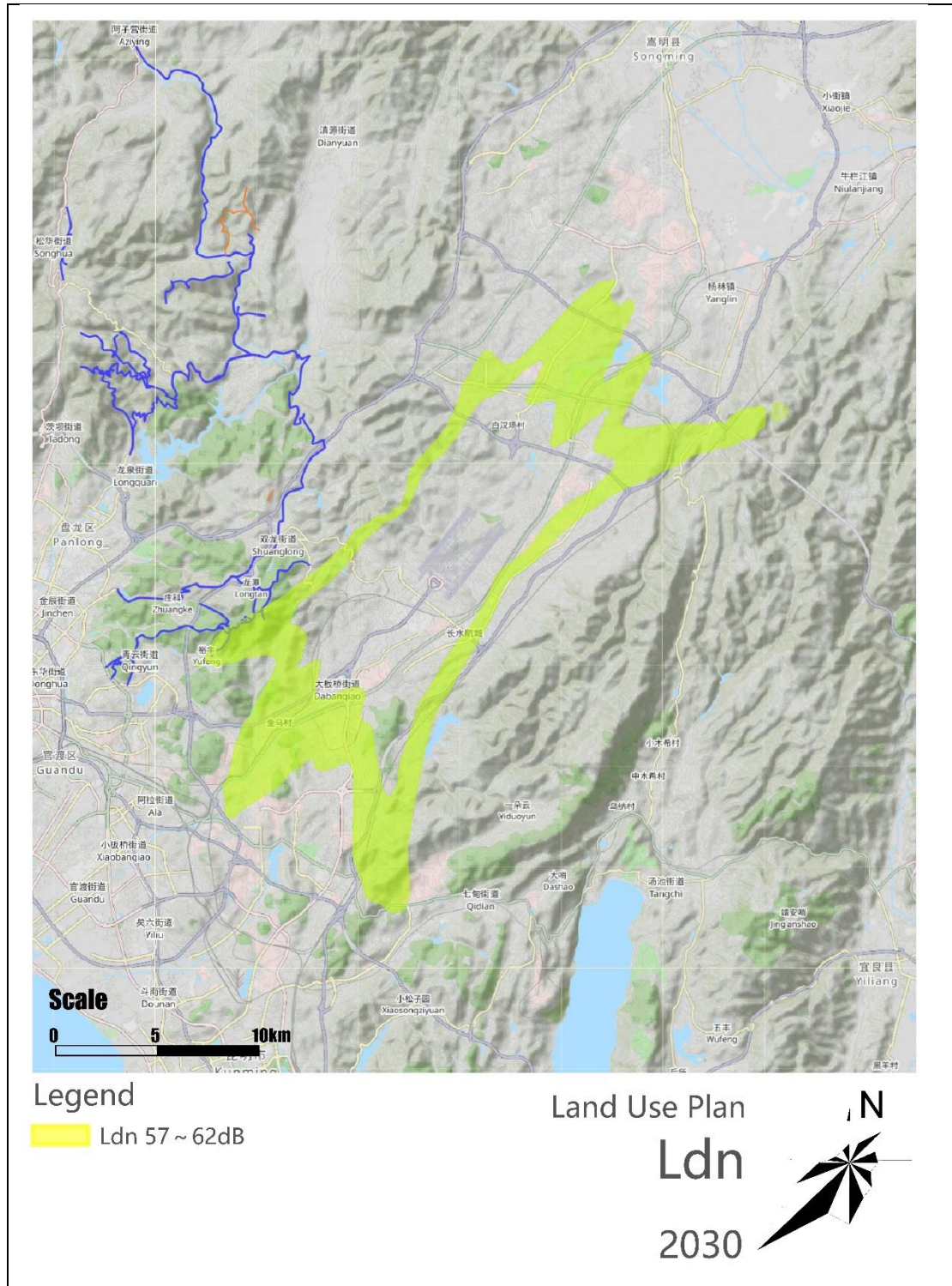


Figure-3 Distribution of Aircraft Noise Ldn 57–62 dBA Impact Area of Kunming Changshui Airport in 2030

### 3) Area with $62 \text{ dBA} < \text{Ldn} \leq 67 \text{ dBA}$

It is a Class III area that can be planned as buildings or lands that are less sensitive to noise such as industry, storage, and entertainment. The regional distribution of area with  $\text{Ldn}$  62–67 dBA of Kunming Changshui International Airport in 2030 is shown in the following figure;

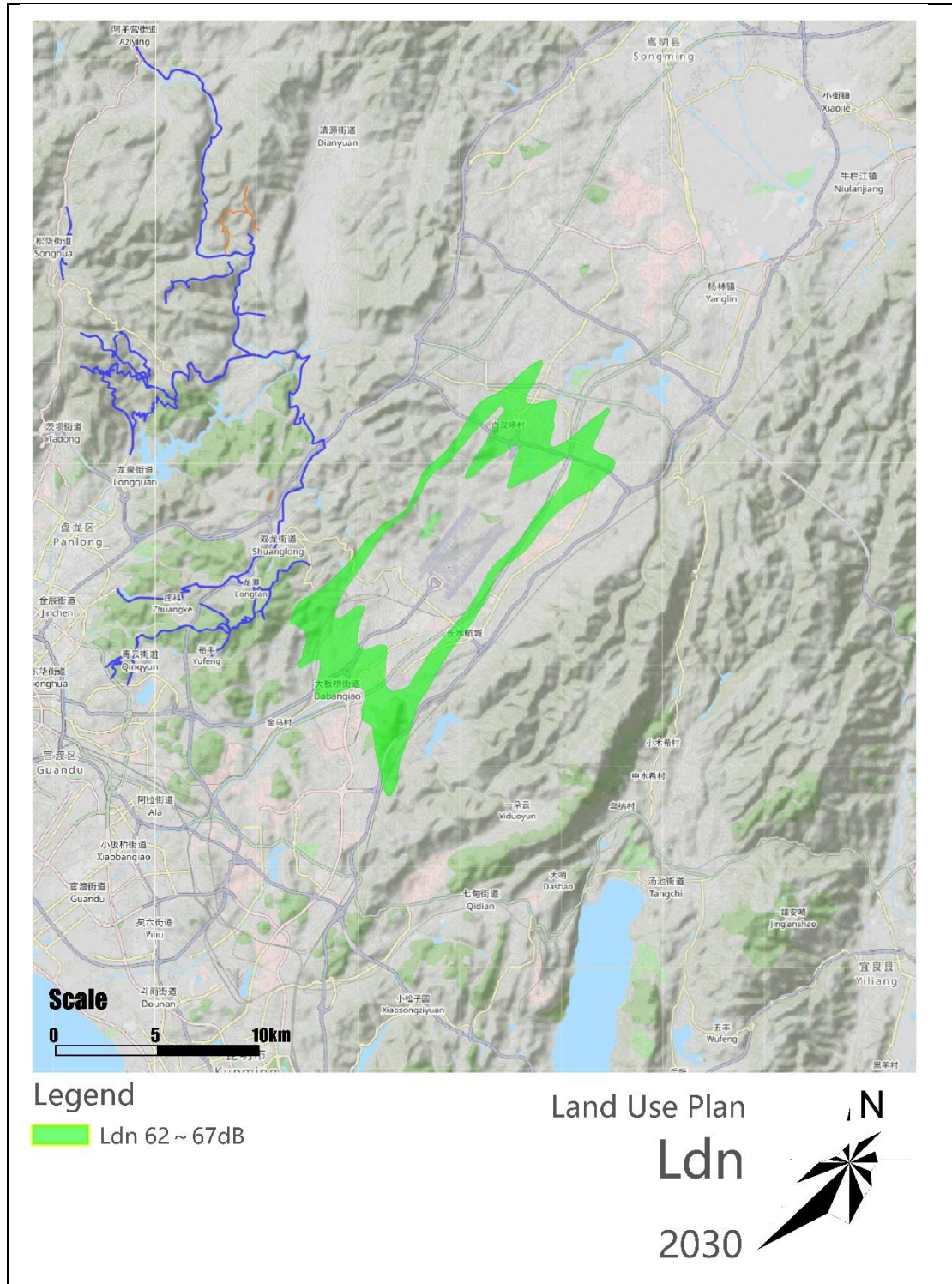
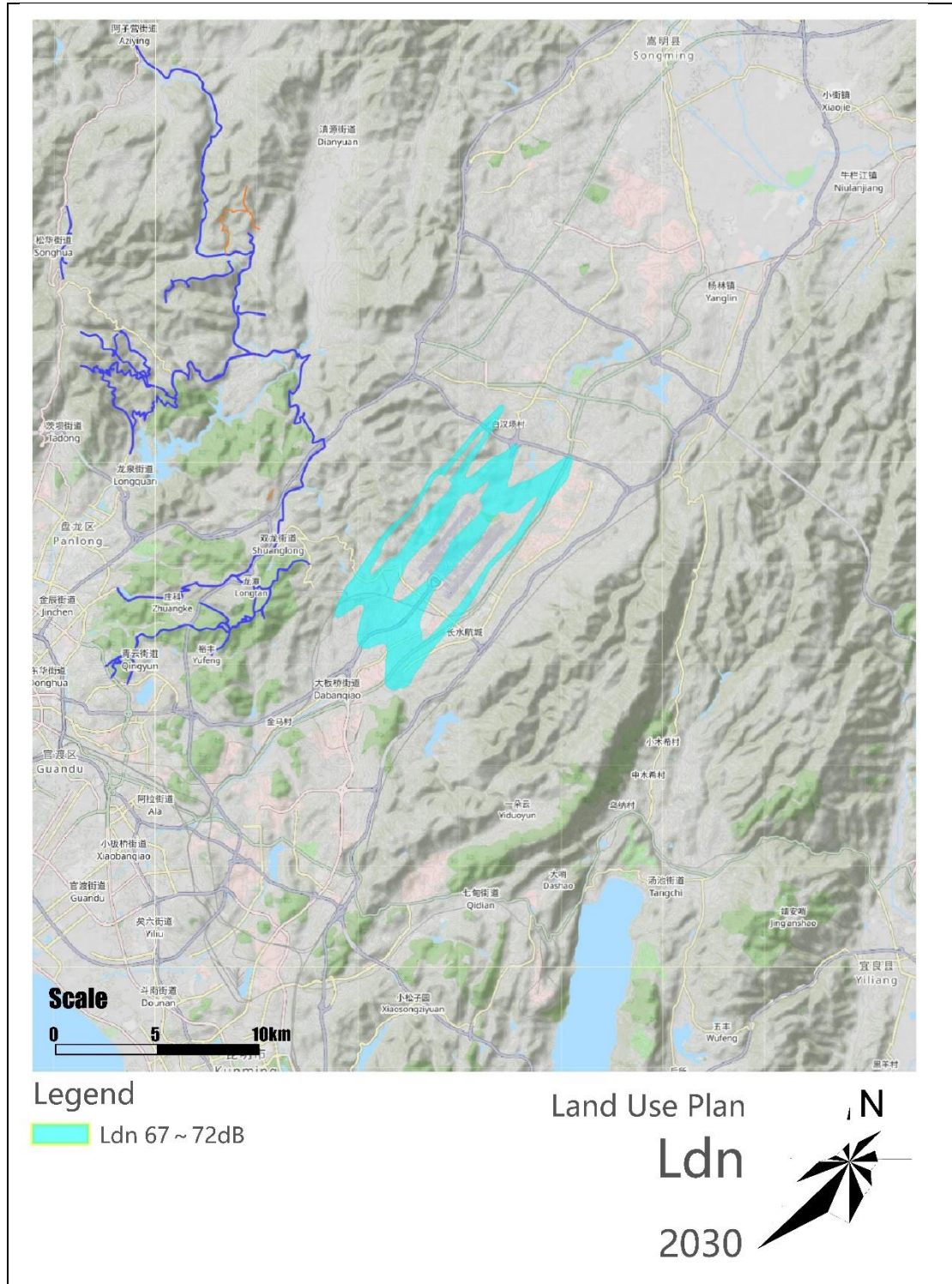


Figure-4 Distribution of Aircraft Noise  $\text{Ldn}$  62–67 dBA Impact Area of Kunming Changshui Airport in 2030



#### 4) Area with Ldn > 67 dBA

It is a Class IV area that can be planned as land types that are not sensitive to noise, such as agriculture, mining, and transportation, in addition to the airport land. The regional distribution of area with Ldn > 67 dBA in Kunming Changshui International Airport in 2030 is shown in the following figure:



**Figure-5 Distribution of Aircraft Noise Ldn>67 dBA Impact Area of Kunming Changshui Airport in 2030**

In addition, if the planning department needs to plan noise-sensitive buildings within the noise impact range according to economic development and other factors, sound insulation treatment shall be carried out according to the General Code for Building Environment (GB 55016-2021) to ensure that the indoor noise of new buildings can meet the noise standard limits corresponding to their functional areas and the daytime L<sub>d</sub> (07:00-22:00) 55 dBA in the World Bank EHS Guidelines. The nighttime L<sub>n</sub> 45 dBA limit is required by the Environmental Noise Guidelines for the European Region (2018) L<sub>den</sub> ≤ 45 dB and L<sub>night</sub> ≤ 40 dBA limits issued by WHO.

**a) Sound insulation measures**

(1) Targets of sound insulation measures

Among the acoustic environmental protection targets, a total of 23 villages enter the aircraft noise contour line WECPNL 75-85 dB, of which 5 villages (Heibo Village, Adi Village, Hongshapo Village, Shagou Village, and Ganluochong Village) are sensitive points required by the previous EIA to set sound insulation windows, and the remaining 18 villages need to install soundproof windows for this reconstruction and expansion.

Among acoustic environmental protection targets, 26 schools and hospitals enter the aircraft noise contour line (WECPNL) within 70-80 dB, including 12 schools and hospitals (Yunnan Vocational College of Agriculture, Kunming Guanghua School, Baihanchang Central School, Changshui Central School, Yunnan Vocational College of Judicial Police, Lizhi Primary School, Xiaochaoyang Kindergarten, Banqiao Middle School, Xingjie Primary School, Shagou Central School, Dabanqiao Xiaoshao Community Health Service Station in Guandu District, and Guandu Xiaoshao Middle School) that are required to set sound insulation windows for the previous EIA. Soundproof windows have been installed in Kunming No.17 Middle School, No.1 Kindergarten of Airport Economic Zone, No.2 Kindergarten of Airport Economic Zone, and Kunming Airport No.1 Primary School in Yunnan Province; the remaining 10 schools and hospitals need to be equipped with soundproof windows for this reconstruction and expansion.

(2) Cost standard for sound insulation measures

The area of doors and windows for residents is calculated as 25 m<sup>2</sup> per household, and that for schools is calculated as 50 m<sup>2</sup>, with RMB 1,200 per square meter.

(3) Cost estimate of sound insulation measures

The cost estimate of noise prevention and control for the expansion project of Kunming Changshui Airport in this phase is listed in the following table. The total cost of sound insulation is RMB 134.40 million, including RMB 29.79 million left over from the previous period and RMB 104.61 million increased this time.

**Table-1 List of Investment Estimation for Sound Insulation Measures**

S/N	Type	Noise range	Description	Predicted Noise Value (dB)	Number of Households (No.)	Soundproof Window Area (m <sup>2</sup> )	Unit Price of Soundproof Window (RMB)	Proposed Measures	Investment estimate (RMB ten thousand)	
									Newly added this time	Legacy of the previous period
1	Village	80-85	Dacunzi	81.1	343	8575	1200	Class III Soundproof window 40 > RW ≥ 35	1029	
2			Xiaokanglangxiao Village	84.9	118	2950	1200		354	
3			Xiaokanglangda Village	83.8	167	4175	1200		501	
4			Fuxing Village	81.2	165	4125	1200		495	
5			Xinqiao Village	84.3	54	1350	1200		162	
6			Xichong Village	83.4	79	1975	1200		237	
7			Getenggou	80.1	32	800	1200		96	
8			Yangguan Zhuang	83.7	100	2500	1200		300	
9			Ganluochong	80.8	39	975	1200			117
10		75-80	Xialiqi	75.2	92	2300	1200	Class IV soundproof window 35 > RW ≥ 30	276	
11			Yijia	75.5	499	12475	1200		1497	
12			Wujia	76	470	11750	1200		1410	
13			Dadongchong	75.9	98	2450	1200		294	
14			Gaoshitou	77.9	80	2000	1200		240	
15			Caojiachong	75.8	28	700	1200		84	
16			Yangtianchong	76.8	54	1350	1200		162	
17			Yunqiao Village	75.7	274	6850	1200		822	



<b>18</b>			Baihanchang	78.1	500	12500	1200		1500	
<b>19</b>			Baizhongqing	79.9	66	1650	1200		198	
<b>20</b>			Heibo Village	79.6	176	4400	1200			528
<b>21</b>			Adi Village	79.8	169	4225	1200			507
<b>22</b>			Hongshapo	77.9	108	2700	1200			324
<b>23</b>			Shagou Village	77	134	3350	1200			402

S/ N	Type	Noise range	Description	Predicted Noise Value (dB)	Soundpro of Window Area (m <sup>2</sup> )	Unit Price of Soundpro of Window (RMB)	Proposed Measures	Investment estimate (RMB ten thousand)	
								Newly added this time	Legacy of the previous period
1	Schools and hospitals	70- 75	Xichong No.2 Kindergarten	72.2	250	1200	Class IV soundpro of window 35 > RW ≥ 30	30	
2			Aibeier Kindergarten	71.1	400	1200		48	
3			Morningstar Kindergarten	74.1	250	1200		30	
4			Xichong Kindergarten	72.5	300	1200		36	
5			Xichong Primary School	72.8	1000	1200		120	
6			Qinglong School	71.7	450	1200		54	
7			Mingzhu School	74.7	600	1200		72	
8			No.4 Primary School of Kunming Economic and Technological Development Zone	70.7	1200	1200		144	
9			Airport Experimental School of Kunming No.3 Middle School	71.2	2000	1200		240	
10			Changshui Chenxing Kindergarten	74.6	250	1200		30	
11			Kunming Airport Economic Zone No.1 Kindergarten	72.1	Hollow double- layer sliding soundpro of window				

					installed			
<b>12</b>			Yunnan Kunming No. 17 Middle School	71.8	Hollow double-layer casement soundproof of window installed			
<b>13</b>			Airport Economic Zone No.2 Kindergarten	71	Hollow double-layer casement soundproof of window installed			
<b>14</b>			Kunming Airport No.1 Primary School	70.8	Hollow double-layer casement soundproof of window installed			
<b>15</b>			Lizhi Primary School	75	148	1200		18

16			Xingjie Primary School	74.6	419	1200		50	
17			Banqiao Middle School	74.8	444	1200		53	
18			Changshui Central School	74.7	242	1200		29	
19			Xiaoshao Middle School, Guandu District	74.8	296	1200		36	
20	Schools and hospitals	75-80	Xiaozhaoyang Kindergarten	75.1	944	1200	Class III Soundproof window 40 > RW $\geq 35$	113	
21			Shagou Central School	79.8	312	1200		37	
22			Yunnan Vocational College of Judicial Police	79.9	4165	1200		500	
23			Dabanqiao Xiaoshao Community Health Service Station, Guandu District	77.7	60	1200		7	
24			Baihanchang Central School	75.7	426	1200		51	
25			Kunming Guanghua School	76.5	752	1200		90	
26			Yunnan Vocational College of Agriculture	77.1	977	1200		117	
Subtotal									10461
Total									<b>13440</b>

According to different materials, the sound insulation capacity of ventilation and soundproof windows can reach 25–32 dB(A), which can meet the requirements of 30 dB(A) for sound insulation and noise reduction in this phase on the premise of ensuring that the materials meet the standards.

After some sound insulation and noise reduction measures are taken, the indoor noise of residential, office and cultural, and educational buildings within the assessment scope of the airport in this phase meets the limit requirements of Ld (07:00-22:00) 55 dBA in the daytime and Ln 45 dBA at night in the EHS guidelines of the World Bank.

After the implementation of sound insulation measures in this phase, the out-of-standard indoor noise of residential, office and cultural, and educational buildings within the assessment scope of the airport in this phase can also meet the limit requirements of Lden  $\leq$  45 dB and Lnight  $\leq$  40 dBA in the Environmental Noise Guidelines for the European Region (2018) issued by WHO.

## 2.2 Environmental Relocation involving Excessive Noise

### (1) Implementation target

In addition to the land occupation and demolition area of the Project, 3 villages (Ganhaizi, Huaqing, and Changpo villages) in the acoustic environmental protection target are within 85 dB of the aircraft noise contour line, of which Ganhaizi is the environmental protection relocation point in the previous environmental impact assessment. Among the schools and hospitals, only Fuxing Primary School is located within 80 dB of the aircraft noise contour line. According to the principle of environmental protection relocation measures, it is proposed to take relocation measures for residents exceeding 85 dB in this phase.

### (2) Demolition standard

The compensation standard for noise relocation shall be implemented according to the relevant regulations issued by the local government. The following accounting only includes the cost of homestead relocation, and other expenses involved shall be determined through negotiation between the local government and the Employer. The compensation for village relocation is calculated at RMB 3,500/m<sup>2</sup> per 450 m<sup>2</sup>/household, and the compensation for school relocation is calculated at RMB 4,000/m<sup>2</sup>.

### (3) Investment cost for environmental protection relocation

The estimation of environmental protection and demolition costs is listed in the following table;

Table-2 Investment Estimation for Environmental Protection Relocation Measures

S/N	Type	Description	Predicted value (dB)	Number of Households (No.)	Area (m <sup>2</sup> )	Unit Price (RMB)	Investment Estimate (RMB 10,000)	
							Current	Previous

							period	period
1	Village	Ganhaizi	85.6	125		3500		19688
2		Huaqing Village	90.8	162		3500	25515	
3		Changpo Village	89.8	303		3500	47723	
4	School	Fuxing Primary School	81.5	/	300	4000	120	
Subtotal							73358	19688
Total current period							<b>93046</b>	

The total cost of environmental protection and demolition is RMB 930.46 million, including RMB 196.88 million left over from the previous period and RMB 733.58 million increased this time.

#### (4) Source of funds

Due to various reasons, the relocation of the village (Ganhaizi) to be relocated in the previous project has not been implemented yet, and the relevant measures will be implemented by the responsible unit for demolition in the previous phase in this reconstruction and expansion. Repeated accounting of environmental protection investment will not be considered this time.

Two new villages (Huaqing Village and Changpo Village) and one school (Fuxing Primary School) will be relocated for environmental protection in this reconstruction and expansion. The local government will be responsible for the relocation and resettlement, with a cost budget of RMB 733.58 million.

### Summary of Noise Exceedance and Prevention Measures Related to East Runway 2

As a whole, it is difficult to quantify the noise impact of a runway on a single sensitive point in the actual operation stage of the airport, but it can be roughly distinguished according to the runway layout and the relative position between the sensitive point and the runway;

#### (1) Sensitive points related to East Runway 2 with excessive noise

According to the characteristics of aircraft noise and the operation mode of Kunming Changshui International Airport in Yunnan Province, the noise impact scope of the take-off and landing aircraft on the east runway 2 is mainly concentrated in the areas 1.5 km on both sides and 10 km within both ends of the runway. At the sensitive points close to the runway, the correlation with the runway noise impact is relatively large, and with the increase of distance, the correlation decreases accordingly.;

According to the location relationship between sensitive points and East Runway 2, the impact degree is divided into the following three categories:

#### A. Main impact: The noise impact mainly comes from the East Runway 2;

B. Partial impact: The noise impact mainly comes from other runways, but is also affected by the superposition of East Runway 2;

C. No significant correlation: The noise impact mainly comes from other runways and is basically not affected by East Runway 2;

The correlation between the noise exceeding points in this phase and the noise impact of East Runway 2 is listed in the following table.

Table-4 List of Correlation Analysis between Noise Exceeding Standard Points and Noise Impact of East Runway 2 in Current Period

S/N	Description	WECPNL values in 2030 (dB)	Relative to East Runway 2	Impact correlation
1	Dacunzi	81.1	SW	C
2	Xiaokanglangxiao Village	84.9	SW	C
3	Xiaokanglangda Village	83.8	SW	C
4	Fuxing Village	81.2	SW	C
5	Xinqiao Village	84.3	SW	C
6	Xichong Village	83.4	NW	C
7	Getenggou	80.1	NW	C
8	Yangguanzhuang	83.7	N	A
9	Ganluochong	80.8	SW	C
10	Xialiqi	75.2	SW	C
11	Yijia	75.5	SW	C
12	Wujia	76.0	SW	B
13	Dadongchong	75.9	SE	A
14	Gaoshitou	77.9	SE	A
15	Caojiachong	75.8	SE	A
16	Yangtianchong	76.8	SW	C
17	Yunqiao Village	75.7	NE	A
18	Baihanchang	78.1	NW	C
19	Baizhongqing	79.9	NW	C
20	Heibo Village	79.6	SW	C
21	Adi Village	79.8	S	A
22	Hongshapo	77.9	S	B
23	Shagou Village	77.0	S	B
24	Xichong No.2 Kindergarten	72.2	SW	B
25	Aibeier Kindergarten	71.1	SW	C
26	Morningstar Kindergarten	74.1	SW	C
27	Xichong Kindergarten	72.5	SW	C
28	Xichong Primary School	72.8	SW	C
29	Qinglong School	71.7	SW	B
30	Mingzhu School	74.7	SW	C
31	No.4 Primary School of Kunming Economic and Technological Development Zone	70.7	SW	B
32	Airport Experimental School of Kunming No.3 Middle School	71.2	SW	B
33	Changshui Chenxing Kindergarten	74.6	NE	A
34	Lizhi Primary School	75.0	SW	C
35	Xingjie Primary School	74.6	SW	C



36	Banqiao Middle School	74.8	SW	C
37	Changshui Central School	74.7	NE	A
38	Xiaoshao Middle School, Guandu District	74.8	NW	C
39	Xiaozhaoyang Kindergarten	75.1	SW	C
40	Shagou Central School	79.8	S	A
41	Yunnan Vocational College of Judicial Police	79.9	SW	B
42	Dabanqiao Xiaoshao Community Health Service Station, Guandu District	77.7	NW	C
43	Baihanchang Central School	75.7	NW	C
44	Kunming Guanghua School	76.5	N	A
45	Yunnan Vocational College of Agriculture	77.1	NW	B
46	Ganhaizi	85.6	S	A
47	Huaqing Village	90.8	W	C
48	Changpo Village	89.8	N	A
49	Fuxing Primary School	81.5	SW	C

It can be seen from the above table that there are 21 points where the noise exceeds the standard due to the operation noise of East Runway 2, of which 9 points are partially affected, that is, 12 points where the noise exceeds the standard are mainly affected from East Runway 2;

(2) Summary of Noise Control Measures Related to East Runway 2

According to the implementation principles of noise control measures, the noise control measures related to East Runway 2 are summarized in the following table;

Table-5 List of Correlation between Noise Control Measures and Noise Impact of East Runway 2 in Current Period

S/N	Description	WECPNL values (dB)	Control measures	Investment Estimate (RMB 10,000)		Impact correlation
				Add	Previous period	
1	Yangguanzhuang	83.7	Soundproof window	300	/	A
2	Wujia	76.0		1410	/	B
3	Dadongchong	75.9		294	/	A
4	Gaoshitou	77.9		240	/	A
5	Caojiachong	75.8		84	/	A
6	Yunqiao Village	75.7		822	/	A
7	Adi Village	79.8		/	507	A

8	Hongshapo	77.9	Overall relocation	/	324	B	
9	Shagou Village	77.0		/	402	B	
10	Xichong No.2 Kindergarten	72.2		30	/	B	
11	Qinglong School	71.7		54	/	B	
12	No.4 Primary School of Kunming Economic and Technological Development Zone	70.7		144	/	B	
13	Airport Experimental School of Kunming No.3 Middle School	71.2		240	/	B	
14	Changshui Chenxing Kindergarten	74.6		30	/	A	
15	Changshui Central School	74.7		/	29	A	
16	Shagou Central School	79.8		/	37	A	
17	Yunnan Vocational College of Judicial Police	79.9		/	500	B	
18	Kunming Guanghua School	76.5		/	90	A	
19	Yunnan Vocational College of Agriculture	77.1		/	117	B	
20	Ganhaizi	85.6		/	19688	A	
21	Changpo Village	89.8		47723	/	A	
22	Total			51371	21694	/	

Due to the close distance between East Runway 1 and East Runway 2, it is difficult to divide the separate impacts of the two runways in detail.; After the completion of the East Runway 2, it will be used as the main take-off and landing runway to replace some of the original functions of the East Runway 1. The sensitive points originally affected by the East Runway 1, such as Ganhaizi, Changshui Central School, Yunnan Vocational College of Judicial Police, Kunming Guanghua School, Yunnan Vocational College of Agriculture, Adi Village, Hongshapo Village, Shagou Village, etc., will also be included in the Excessive Noise Contribution Value of the East Runway 2.

### 2.3 Aircraft Noise Monitoring System

#### (1) Monitoring content

① Monitor and analyze the L<sub>Amax</sub>, L<sub>EPN</sub> and T<sub>d</sub> of the noise of a single aircraft of different models of different airlines operating in Kunming Airport, and determine the models that need to be eliminated and adjusted by airlines during their operation period.

② Provide the contribution of different airlines to the aircraft noise of Kunming Airport and their responsibilities.

③ Monitor and analyze the monthly and annual variation trends of boundary noise within the control range of aircraft noise at different levels in the airport.

④ Monitor and analyze the compliance of aircraft noise at main petition points.

⑤ Check the fixed-point monitoring results in combination with the actual flight trajectory and aircraft noise.

⑥ Monitor and analyze the control effect of different measures in combination with the implementation of aircraft noise control measures at Kunming Airport.

(2) Setting and Investment of Monitoring Points

According to the airport noise contour map, combined with the aircraft flight path and the distribution of surrounding sensitive points, a noise monitoring system is set up, including a total of 12 aircraft noise monitoring points, as listed in the following table:

Table-6 List of Setting of Points of Aircraft Noise Monitoring System

S/N	Monitoring Point	Longitude (E°)	Latitude (N°)	Objective Setting
1	Xiaokanglangxiao Village	102.89065361	25.09643270	Sensitive point
2	Xinqiao Village	102.8866939	25.09240424	Sensitive point
3	Lingyuan Village	102.95306861	25.17952467	Sensitive point
4	Banqiao Middle School	102.8708345	25.04905296	Sensitive point
5	The Seventh Compulsory Isolation Drug Rehabilitation Center in Yunnan Province	102.91027665	25.06908401	Sensitive point
6	Getenggou	102.96260655	25.14400746	Sensitive point
7	Kunming Guanghua School	102.99752355	25.15798252	Sensitive point
8	Adi Village	102.9009741	25.04993263	Sensitive point
9	Shagou Village	102.89480001	25.04287064	Sensitive point
10	Yunnan Vocational College of Agriculture	102.9754635	25.16928395	Sensitive point
11	Baihanchang	102.9549619	25.17072683	Sensitive point

12	Heibo Village	102.877 2531	25.0810 6521	Sensitive point
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The estimated total investment is RMB 24 million, of which RMB 14 million is included in the project investment.

#### 2.4 Management Measures

The current aircraft noise management measures to be taken in accordance with the above regulations are as follows:

① The Kunming Municipal People's Government, with reference to the 2030 aircraft noise contour map, jointly formulates the prohibited and restricted construction areas for noise-sensitive buildings around Kunming Airport with planning, land and environmental protection authorities, and implements control.

② Under the guidance of the noise control zone, the relevant district and municipal planning departments shall formulate the land use plan in the aircraft noise control zone of the airport and actively promote the implementation of the plan.

③ When the project is constructed in the noise control area, the aircraft noise impact assessment shall be carried out, and the opinions of the airport shall be sought at the same time. If the project is incompatible with the aircraft noise where it is located, and the Employer is still willing to build the project, the Employer shall bear all legal responsibilities arising therefrom.

④ During building sound insulation measures, the Employer shall negotiate with the owner and the school to jointly take sound insulation measures to solve the interference of aircraft noise to life and study.

⑤ The airport shall disclose the monitoring results of conventional aircraft noise in a timely manner, and set up a noise-related complaint acceptance agency.

### 3 Summary of Noise Control Measures and Costs

#### (1) Summary of Noise Control Measures

According to the current management regulations of environmental protection in China, Kunming Changshui International Airport is the main responsible party for WECPNL exceeding the standard of aircraft noise at sensitive points around the airport. The target year of noise control measures in this phase is 2030.

Kunming Changshui International Airport, as the responsible subject, shall regularly file the monitoring results with the local environmental protection department according to the daily monitoring mechanism. According to the operation conditions of the airport, including changes in data such as air traffic volume, the compliance of aircraft noise at the above sensitive points of the Management Committee of Central Yunnan New Area and the opinions on whether to

implement sound insulation and relocation shall be submitted.

According to the Minutes of the Fourth Site Meeting of the People's Government of Yunnan Province in 2009 on Accelerating the Construction of Kunming New Airport (General Office of the People's Government of Yunnan Province, Issue 71, June 10, 2009), the Management Committee of Central Yunnan New Area, as the main body implementing noise control measures, shall timely implement relevant measures according to the feedback from the airport. Ensure that all measures are in place by 2030.

According to the types of noise control measures and different implementation subjects, implementation objects and responsible objects, the summary of noise control measures in the current period is as follows.

**Table-7 Summary of Noise Control Measures in the Current Period**

Type of measures	Noise control measures	Objects	Quantity	Responsible subject	Implementer	Notes	Cost Estimate (RMB 10,000)	Source of fund
Management Measures	Restriction on take-off and landing of high-noise models	Airlines	/	Kunming Changshui International Airport	Kunming Changshui International Airport		/	/
	Continuous approach instead of conventional approach	Airlines	/	Kunming Changshui International Airport	Kunming Changshui International Airport		/	/
	Optimization of runway utilization	Airport	/	Kunming Changshui International Airport	Kunming Changshui International Airport		/	/
	Restriction on percentage of take-off and landing at night	Airport	/	Kunming Changshui International Airport	Kunming Changshui International Airport		/	/
Planning control	Ldn≤57	Land around the airport	/	Natural Resources and Planning Bureau of Central Yunnan New Area	Natural Resources and Planning Bureau of Central Yunnan New Area		/	/
	57dB<Ldn≤62dB	Land around the airport	/	Natural Resources and Planning Bureau of Central Yunnan New Area	Natural Resources and Planning Bureau of Central Yunnan New Area		/	/
	62dB<Ldn≤67dB	Land around the airport	/	Natural Resources and Planning Bureau of	Natural Resources and Planning Bureau of		/	/

				Central Yunnan New Area	Central Yunnan New Area			
	Ldn≥67dB	Land around the airport	/	Natural Resources and Planning Bureau of Central Yunnan New Area	Natural Resources and Planning Bureau of Central Yunnan New Area		/	/
Sound insulation measures	Settlement	5	Kunming Changshui International Airport	Management Committee of Central Yunnan New Area	Legacy of the previous period	1878	/	
					Newly added after the previous EIA	/	Self-raised	
					Add	9657	Pooled funds	
	School	12	Kunming Changshui International Airport	Management Committee of Central Yunnan New Area	Legacy of the previous period	1101	Pooled funds	
					Available	/	Pooled funds	
					Newly added after the previous EIA	/	Self-raised	
					Add	10461	Pooled funds	
					18	Kunming Changshui International Airport	New building construction subject	Newly added after the previous EIA

				Area			
Relocation	Settlement	1	Kunming Changshui International Airport	Management Committee of Central Yunnan New Area	Legacy of the previous period	19688	Pooled funds
		2	Kunming Changshui International Airport	Management Committee of Central Yunnan New Area	Add	73238	Pooled funds
	School	1	Kunming Changshui International Airport	Management Committee of Central Yunnan New Area	Add	120	Pooled funds

Notes: 1. Considering the different sources of funds for noise control measures and the differences in budget and price levels at different stages, in order to ensure that noise prevention and control measures can be implemented in place, it is suggested that the investment in new noise control measures and the investment in remaining measures in the previous period should be managed as a whole (hereinafter referred to as **pooled funds** for noise control ) according to the fund management specifications of Yunnan Provincial Department of Finance on the expansion project of Kunming Changshui Airport in this phase. Special personnel shall be assigned for supervision.

2. The new construction subject refers to the buildings or facilities built by enterprises or individuals within the scope of airport noise impact assessment after the approval of the previous EIA. According to Article 52 of the Law of the People's Republic of China on the Prevention and Control of Noise Pollution: If it is really necessary to build noise-sensitive buildings in the restricted construction area, the construction unit shall carry out building sound insulation design for noise-sensitive buildings, which shall meet the requirements of relevant standards for sound insulation design of civil buildings. The required funds shall be "self-raised" by the main body of the new building and shall not be included in the scope of the airport and other relevant responsible subjects;



(2) Summary of Investment in Noise Control Measures

The noise control of Kunming Changshui Airport in this phase includes the installation of soundproof windows, relocation and installation of aircraft noise monitoring systems. According to the source of funds, it can be divided into two categories: new expenses in this phase and remaining expenses in the previous phase. Considering the different sources of funds for noise prevention and control measures and the differences in budget and price levels at different stages, in order to ensure that noise control measures can be implemented in place, it is suggested that the investment in new noise control measures and the investment in remaining measures in the previous period should be managed as a whole (hereinafter referred to as pooled funds for noise control ) according to the fund management specifications of Yunnan Provincial Department of Finance on the expansion project of Kunming Changshui Airport in this phase. Special personnel shall be assigned for supervision.

The costs are summarized as follows:

**Table-8 Summary of Investment in Noise Control Measures**

S/N	Item	New cost (RMB 10,000)	Legacy cost (RMB 10,000)
1	Installation of soundproof window	10461	2979
2	Relocation	73358	19688
3	Noise monitoring system	2400	/
Total		86219	22667