INITIAL ENVIRONMENTAL EXAMINATION (IEE)

August 2023

LAO PEOPLE'S DEMOCRATIC REPUBLIC:
SUSTAINABLE RURAL INFRASTRUCTURE AND WATERSHED MANAGEMENT SECTOR PROJECT (SRIWMSP)

SUBPROJECTS: LUANG PRABANG PROVINCE

NAM NAN RIVER 1 AND 3 IRRIGATION SYSTEMS SUB-PROJECT
NAM NAN RIVER 2, 4 AND 5 IRRIGATION SYSTEMS SUB-PROJECT

Prepared by the Ministry of Public Works and Transport for the Asian Development Bank.

CURRENCY EQUIVALENTS

(as of August 2023)

Currency unit - Lao Kip (K)
K1.00 = $0.0000555
$1.00 = K 18,000

ABBREVIATIONS

ADB	-	Asian Development Bank
CSA	-	Climate Smart Agriculture
DALAM	-	Department of Agricultural Land Management
DOI	-	Department of Irrigation
DoNRE	-	Department of Natural Resources and Environment
DoPF	-	Department of Planning and Finance
DRDC	-	Department of Rural Development and Cooperatives
DTEAP	-	Department of Technical Extension and Agro-Processing
EARF	-	Environmental Assessment and Review Framework
EHS	-	Environmental Health and Safety
EIA	-	Environmental Impact Assessment
EMP	-	Environmental Management Plan
EPL	-	Environmental Protection Law
GRM	-	Grievance Redress Mechanism
IEE	-	Initial Environmental Examination
MAF	-	Ministry of Agriculture and Forestry
MOF	-	Ministry of Finance
MOIC	-	Ministry of Industry and Commerce
MoNRE	-	Ministry of Natural Resources and Environment
NAPA	-	National Adaptation Program of Action
NFSCC	-	National Food Security and Commodities Committee
NPMO	-	National Project Management Office
PIC	-	Project Implementation Consultants
PPIU	-	Provincial Project Implementation Unit
PSC	-	Project Steering Committee
SAEMR	-	Semi Annual Environmental Monitoring Report
SPS	-	Safeguards Policy Statement, 2009
UNFCCC	-	United Nations Framework Convention on Climate Change
UXO	-	Unexploded Ordnance
VDC	-	Village Development Committee

WEIGHTS AND MEASURE

ha	-	Hectare
m	-	Meter
km	-	Kilometer
l/s	-	Liters per second
masl	-	Meters above sea level
mm	-	Millimetre
oC	-	Degree Centigrade
dBA	-	Decibel
mg/l	-	Milligram per liter
oC	-	Degree Centigrade
dBA	-	Decibel
mg/l	-	Milligram per liter

NOTE

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

This initial environmental examination (IEE) is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

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1.1 INTRODUCTION

1. This IEE for the Nam Nan 1 and 3 Irrigation and Nam Nan 2, 4 and 5 Irrigation Sub-Projects in Luang Prabang Province presents an assessment of the environmental impacts and the detailed Environmental Management Plan (EMP) for the subproject based on detailed engineering design. The preparation of this IEE is guided by the Environmental Assessment and Review Framework (EARF) of the Sustainable Rural Infrastructure and Watershed Management (SRIWSM), ADB Safeguard Policy Statement (SPS, 2009), ADB Operational Manual Section F1/BP (2013), Access to Information Policy (ADB AIP, 2018), IFC-World Bank Environment, Health and Safety (EHS) Guidelines, the Government of Lao PDR's Environmental Protection Law (2013), and other Government environmental laws, policies, rules and regulations applicable for irrigation projects.

2. The Nam Nan 1 and 3 Irrigation and Nam Nan 2, 4 and 5 Irrigation Sub-Projects in Luang Prabang Province are the second batch of subprojects of the SRIWSM. The SRIWSM is expected to have a net positive impact on subproject catchments as it will reduce the risk from dry season cropping of the irrigation command areas. It will also support a potential increase in income from higher crop values. This will reduce the pressure on land conversion for upland cropping. Such land conversion is identified as a major driver of forest loss as crops are grown on steep, bare ground subject to high rates of soil erosion in the wet season.

1.2 DESCRIPTION OF SUB-PROJECTS

3. The Nam Nan 1 and 3 Irrigation Sub-Project is combination of two headworks as weirs called Pang Weir and Va Weir along the Nam Nan basin. This subproject covers 6 villages, namely Nafay, Sibounheuang, Paphai, Thad, Phon and Nakhern Villages. The headwork of Pang weir is located at the E=175091.48206678, N=2161613.85752000. The headwork of Va weir is located at the E=172467.07726371, N=2158906.29593822 as referred to in the mapping system of WGS1984 UTM Zone 48N.

4. There are three headworks under the Nam Nan 2, 4 and 5 Irrigation Sub-Projects. The specific location of each headwork is as follows: Nam Nan 2 - Xieng Weir is about 2 km to the north from Nan District Centre. Nam Nan 4 - Khern Weir is located in the southwest of Nan District about 1 km Nam Nan 5 - Khae Weir is also located in the same direction with Nam Nan 4 and about 3 km from the Nan District centre.

1.3 ENVIRONMENTAL POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

5. The law governing the protection of the environment, including the assessment and management of projects in Lao PDR is the Environmental Protection Law (EPL), which was issued in 1999 and amended in 2013. The *Decree on Environmental Assessment, No.21/PM, January 2019* is the country's principal environmental legislation regarding Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA). The Decree was enacted to implement Part III of the Law on Environment Protection, in relation to Environmental Protection and Environmental Assessment.

6. The project screening is the first step of the environmental assessment stated in Article 8 of the said Law. By using the list of the project and activities that have to conduct the IEE or EIA No. 8056/MoNRE, dated 17 December 2013, irrigation facilities (Item 3.52) fall under Category 1 so an IEE is required by Government. The requirements for the securing of the requisite Environmental Compliance Certificate (ECC) from PoNRE Luang Prabang have been complied with and the ECC has been issued on 24 May 2022.

1.4 DESCRIPTION OF THE ENVIRONMENT

7. The sub-project area is located in Nan District about 75 km from the Luang Prabang city center by the road number 4. Nan District is bounded on the North by Xieng Ngern District and Luang Prabang City, Maed District- and Vientiane Province to the South, Phoukhounm District to the East and Xayabouly Province to the West.

8. Nan District has a mountainous topography with elevations of 273 AMSL to 1,800 AMSL. The Nam Nan River is the longest waterway in the province and covers most of the Nan District. Nam Nan River has a year-round water flow as the district receives an annual average rainfall of 1000-2000mm. As per the water assessment conducted on the Nam Nan River, the dry season discharge of the waterway was measured at 0.8 m^3/s which is sufficient to supply the irrigation system during the dry season.

9. The meteorological condition in Nan District is typical of the other districts in the northern part of Laos with the average temperature of 26^0C with 5.0^0C and 40.0^0C degrees for the lowest and highest temperature.

10. A survey on the presence of unexploded ordnance (UXO) was commissioned by the PAFO Luang Prabang Province. The survey revealed that there are no UXO remaining in the area. Local residents also reported no known occurrence of UXO in the vicinity of the proposed developments.

1.5 ENVIRONMENTAL IMPACTS

11. In general, the benefits of the subproject outweigh the anticipated negative environmental impacts. Most of the environmental impacts are expected to occur during the construction phase and could be mitigated through implementation of appropriate mitigating measures. The following paragraphs describe the expected negative impacts that have to be considered during project design and implementation.

1.6 INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

12. During the preparation of the IEE Public/Stakeholder consultations were held in the village meeting halls of villages of 7 villages with the Provincial Agriculture and Forestry Office (PAFO) and Project Consultants from July 15 to July 21, 2022. Stakeholders who participated during the public consultation process included villagers, local government officers and staff. In general, consultees were of the view that the project would result in more benefits than negative impacts.

1.7 GRIEVANCE REDRESS MECHANISM

13. A Grievance Redress Mechanism (GRM) was developed in compliance with the National regulations of the Government of Lao PDR (GoL) and with ADB Safeguards Policy Statement (2009). The GRM will provide the means to resolve grievance and complaints in a timely and satisfactory manner. The details of the PGT, GRM Focal Contact Persons and Construction Manager will be prominently displayed in the respective construction areas for the reference of the affected communities/persons. Complaints and grievances can be directly filed, both written and verbal, to the concerned entities. The procedures for the GRM are outlined in Section 8 of this IEE.

1.8 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

14. The EMP has been prepared, outlining the institutional responsibilities and management arrangements to ensure effective implementation and monitoring of mitigation measures. Throughout the construction period, the contractors will submit monthly environmental compliance progress reports to the PAFO with a copy furnished to the PGT.

15. The implementation of the EMP during the operational phase of the subproject will be undertaken by the PAFO, with verification by the PGT who will report to ADB the project's adherence to the EMP, information on project implementation, and environmental compliance through semi-annual integrated safeguards monitoring reports. The monitoring parameter during the operational phase is outlined in the EMP.

2 INTRODUCTION

16. The Sustainable Rural Infrastructure and Watershed Management Sector Project (SRIWSM) aims to improve rural incomes from market-driven diversified farm output, watershed health, and community nutrition in the four northern provinces of Houaphan, Louang Prabang, Xayabouli, and Xengkhouang. The Project is aligned with the following impacts: market-driven and safe agricultural products developed, and rural areas integrated into the national economy. SRIWSM will have the following outcome: high value agricultural production, natural resources management, status of women and community nutrition improved. There are four outputs as follows: Output 1: Market-oriented agricultural production increased; Output 2: Watershed ecological services protected; Output 3: Command area irrigation reliability improved; and Output 4: Nutrition awareness and facilities improved.

17. There are a total of 18 subprojects to be implemented under Outputs 2 and 3, of which four representative subprojects (RSPs) and a further 14 additional subprojects (ASPs) in subsequent stages of the sector Project. SRIWSM aligns and integrates with the Partnerships for Irrigation and Commercialization of Smallholder Agriculture (PICSA) in all four provinces for Output 3 funded by the International Fund for Agricultural Development (IFAD), and the Lao PDR Emission Reductions Program (ERP) through Implementation of Governance, Forest Landscapes and Livelihoods Program funded by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), in the three provinces of Houaphan, Xengkhuang and Xayabuly for Output 1 and in the province of Houaphan for Output 2.

18. The Ministry of Agriculture and Forestry (MAF) is the Executing Agency and the Provincial Agriculture and Forestry Offices (PAFOs) are the Implementation Agencies. Within the MAF, the Department of Irrigation (DOI) is responsible for, among other things, the development of irrigation infrastructure in Laos.

19. This IEE for the Nam Nan 1 and 3 Irrigation and Nam Nan 2, 4 and 5 Irrigation Sub-Projects in Luang Prabang Province presents an assessment of the environmental impacts and the detailed Environmental Management Plan (EMP) for the subproject based on detailed engineering design. The preparation of this IEE is guided by the Environmental Assessment and Review Framework (EARF) of the SRIWSM, ADB Safeguard Policy Statement (SPS, 2009), ADB Operational Manual Section F1/BP (2013), Access to Information Policy (ADB AIP, 2018), IFC-World Bank Environment, Health and Safety (EHS) Guidelines, the Government of Lao PDR's Environmental Protection Law (2013), and other Government environmental laws, policies, rules and regulations applicable for irrigation projects. The Rapid Environmental Assessment (REA) checklist is presented in Appendix A.

2.1 METHODOLOGY

20. This Initial Environmental Examination (IEE) is prepared according to the Environmental Assessment and Review Framework (EARF) of the SRIWSM, ADB Safeguard Policy Statement (SPS, 2009), ADB Operations Manual Section F1/P, Access to Information Policy (ADB AIP, 2018), International Finance Corporation - World Bank Environment, Health and Safety (EHS) Guidelines, and the GoL Environmental Protection Law (2013), and other environmental laws, policies, rules and regulations applicable for system projects. The potential impacts have been analyzed and mitigation measures identified following site visits to the locations of the subproject component facilities and service area in June 2022. The visits included an assessment of the proposed sites, discussions with Provincial and District officials and village representatives.

2.2 PROJECT CATEGORY

21. The requisite screening was carried out during the preparation phase of the SRIWSM using the ADB Rapid Environmental Assessment (REA) checklist. The SRIWSM was classified Environment Category B requiring the preparation of IEE and EMP. This IEE confirms the sub-project remains Category B. The potential adverse environmental impacts are site-specific, reversible, and can be readily mitigated via an environmental management and monitoring plan (EMP).

3 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

3.1 ENVIRONMENTAL SAFEGUARDS POLICIES, ADB

22. The environment safeguards requirements of ADB are presented in the following guidelines:

- Safeguard Policy Statement (2009);
- Operations Manual Section F1/P[1]; and
- Access to Information Policy (2018).

23. The Safeguards Policy Statement (SPS, 2009) of the Bank governs the environmental and social safeguards of ADB's operations. When a project has been identified for ADB financing, it is screened and categorized to determine the following:

- Significance of potential impacts or risks of the project to the environment;
- Level of assessment and institutional resources required to address the safeguard issues; and
- Information disclosure and consultation requirements.

24. The Environmental Safeguard Requirements 1 (SR1) of the SPS outlines the environmental safeguards requirements that borrowers/clients have to comply with. These requirements include assessing impacts, planning and managing impact mitigations, preparing environmental assessment reports, disclosing information and undertaking stakeholder consultations, establishing a grievance redress mechanism, and monitoring and reporting. It also includes specific environmental safeguard requirements pertaining to biodiversity conservation and sustainable management of natural resources, pollution prevention and abatement, occupational and community health and safety, and conservation of physical cultural resources.

[1] *Operations Manual Bank Policies (BP) issued on 1 October 2013, based on ADB Safeguard Policy Statement, 2009.*

25. Every project is initially categorized for potential environmental impacts and risks:

- Category A – if a proposed project is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented; impacts may affect an area larger than the sites or facilities subject to physical works. A full-scale environmental impact assesses (EIA) including an EMP is required.
- Category B – if a proposed project's potential environmental impacts are less adverse and fewer in number than those of category A projects; impacts are site-specific, few if any of them are irreversible, and impacts can be readily addressed through mitigation measures. An IEE, including an EMP is required.
- Category C – if a proposed project is likely to have minimal or no adverse environmental impacts. No EIA or IEE is required although environmental implications need to be reviewed.
- Category FI – is assigned to projects that involve investment of ADB funds to or through a financial intermediary.
- There are eleven basic principles in the ADB safeguards policy on environment, which are summarized in Table 1 below.

TABLE 1. ENVIRONMENTAL SAFEGUARD POLICY PRINCIPLES IN SPS (2009)

ENVIRONMENT POLICY PRINCIPLE	REQUIREMENT
Screening and categorization	Use of a screening process for each proposed project to determine the extent and type of environmental assessment commensurate with the significance or potential impacts and risks.
Environmental assessment	Conduct of an environmental assessment for each proposed project to identify potential impacts and risks to environment and people.
Alternatives examination	Examine alternatives to project's location, design, technology, and components and their potential environmental and social impacts. Also consider the "no project" alternative.
Environmental mitigation and monitoring plans	Prepare an EMP that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators.
Consultation and GRM	Carry out meaningful consultation with affected people and facilitate their informed participation early in the project preparation process and ensure that their views and concerns are taken into account. Establish a GRM to receive and facilitate resolution of the affected people's (AP's) concerns regarding the project's environmental performance.
Public disclosure	Disclose the environmental assessment, including the EMP, in a form and language understandable to AP and other stakeholders.
EMP implementation and monitoring	Implement the EMP and monitor its effectiveness. Document the monitoring results, including corrective actions and disclose the monitoring reports.
Protection of critical habitats	Do not implement project activities in areas of critical habitats unless (i) there are no measurable adverse impacts on the critical habitat, (ii) there is no reduction in the population of any recognized endangered or critically endangered species and (iii) any lesser impacts are mitigated. If a project is located within a legally protected area, additional programs to promote and enhance the conservation aims of the protected area will be implemented.
Pollution prevention and control technologies	Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank's Environmental, Health, and Safety (EHS) Guidelines.
Occupational health and safety	Provide workers with safe and healthy working conditions and prevent accidents, injuries and diseases in the workplace. Minimize adverse impacts and risks to the health and safety of local communities.
Preservation of physical cultural resources	Conserve physical cultural resources and provide a "chance find" procedure and conservation approach for materials that may be discovered during project implementation.

AP = affected people, EHS = Environmental, Health, and Safety; EMP = environmental management plan, GRM = grievance redress mechanism.

26. Aside from the SPS (2009), ADB also prescribes the Access to Information Policy (2018), which requires consultations, participation, and disclosure of information to enhance stakeholders' trust in, and ability to engage with, ADB. The policy promotes transparency, accountability, and participatory development. It establishes the disclosure requirements for documents produced or to be produced through ADB assistance. The IEE, EMP, and the environmental monitoring reports (EMRs) of the project are to be disclosed on the ADB website in accordance with the AIP (2018). As a Category B project, the draft IEE report should be available to interested stakeholders before project approval and posted on the ADB's website upon Board approval of the project, in compliance with the SPS (2009) and the AIP (2018).

3.2 LEGAL AND INSTITUTIONAL FRAMEWORK ON ENVIRONMENTAL MANAGEMENT IN LAO PEOPLE'S DEMOCRATIC REPUBLIC

3.2.1 Environmental Impact Assessment

27. The law governing the protection of the environment, including the assessment and management of projects in Lao PDR is the Environmental Protection Law (EPL), which was issued in 1999 and amended in 2013.

3.2.2 Law on Environmental Impact Assessment of Development Projects

28. ***Decree on Environmental Assessment, No.21/PM*, January 2019.** The decree is the country's principal environmental legislation regarding IEE and EIA and was enacted to implement Part III of the *Law on Environment Protection* in relation to environmental protection and assessment. MONRE is the central authority to coordinate with the local agencies and administration to disseminate and enforce this decree. Key features of the decree are:

- Development project must undertake environmental assessment (EA) in accordance with the regulation of the concerned line ministry.
- Projects must prepare environmental management and monitoring plans (EMMPs), and social management and monitoring plans (SMMPs).
- Large-scale or complex project with significant impact need to conduct EIA.
- Small-scale projects or with minor environmental impact need to conduct IEE.
- Investment projects not listed in the Ministerial Decree MONRE/8056 are not subject to the requirements

3.2.2.1 <u>Project Screening</u>

29. The project screening is the first step of the environmental assessment stated in Article 8 of the said Law. Investment projects are categorized according to a schedule to the EIA Decree into:

- Category 1: small scale investment projects with minor environmental and social impacts, for which initial environmental examination is required;
- Category 2: Large scale investment projects which are complicated or create significant environmental and social impacts, for which environmental impact assessment is required.

30. For irrigation projects, those with a command area of between 100 and 2,000 hectares are in category 1, and those with a command area greater than 2,000 hectares are in category 2. The implication is that an irrigation project with a command area less than 100 hectares and with negligible environmental impacts would not qualify as either. In the EIA Decree, where a project is of a type that is not in either category, an investment application is submitted to the MONRE for further screening.

31. By using the list of the project and activities that have to conduct the IEE or EIA No. 8056/MoNRE, dated 17 December 2013, irrigation facilities (Item 3.52) fall under Category 1 so an IEE is required by the Government.

3.2.2.2 Public Consultations

32. Stakeholder consultation is an integral part of the domestic EIA process. The guidelines in the conduct of stakeholder and community consultations, as part of the environmental and social assessment process, are outlined in the *Ministerial Instruction on Public Involvement* (2012). The guidelines provide the principles and process of engaging and consulting with project stakeholders and project-affected persons (PAPs) in project preparation, design, and implementation. It aims to ensure that stakeholders and PAPs are adequately consulted and provided with the opportunity to articulate their feedback and suggestions on project design and implementation to avoid or mitigate potential impacts on their livelihood and environment.

33. The requirements for the securing of the requisite Environmental Compliance Certificate (ECC) from PoNRE Luang Prabang have been complied with and the ECC has been issued on 24 May 2022. Appendix B shows the Environmental Compliance Certificate for the irrigation sub-projects in Luang Prabang.

3.2.3 Law on Forestry No. 08/NA (2019)

34. This Forestry Law determines the principles, regulations and measures for the management, protection, development, utilization and inspection of forests and forestland, promoting tree plantations, regenerating and increasing forest resources; aims to make forest resources rich, increase forest cover, as a source for tourism and for sustainable use in people's livelihoods; ensures the protection of soil quality, air quality, water sources, biodiversity, and environmental protection in a green and sustainable manner; and contributes to the socio-economic development of the country.

35. The Forest Law classifies forests into: (i) conservation forests; (ii) protection forests; and (iii) production forests. Conservation Forests are forests classified for the purposes of conserving nature, preserving and propagating plant species, aquatic animals and wildlife species, protecting forest ecosystems and others of natural, historical, cultural, touristic, environmental and educational value and for scientific research experiments.

36. Conservation Forests consist of national, provincial, district and village conservation forests which as specified in a specific regulation. Conservation Forests are rich in biodiversity, have unique natural scenery, are of outstanding importance at national, regional and global levels and may be proposed as wildlife conservation areas, national parks, regional or world heritage sites.

37. Protection Forests are forests classified for the function of maintaining water sources, river banks and road sides, for preventing soil erosion and improving soil quality, strategic areas for national defense and security, safeguarding against natural disasters and providing environmental protection and other functions. Protection Forests comprise national, provincial, district and village protection forests, as specified in a specific regulation.

38. Production Forests are forests including natural forests and planted forests designated for the supply of wood and NTFPs as commodities to fulfil the requirements of national socio-economic development and people's livelihoods.

3.2.4 Decree on Protected Area No. 134/G (May 2015)

39. This decree determines the principles, regulations, and standards related to the establishment, allocation, protection, development, utilization, and inspection of protected areas in order to make the areas become abundant and sustainable by focusing on environmental protection, watershed protection, prevention from erosion, protection of soil quality, protection of strategic zones for national defence and security, adaptation and reduction of climate change, solutions to global warming, contributing to the improvement of the living condition of people of all ethnic groups and the development of the national economy.

40. The government allows the use of protected areas only in an allocated zone which must be used in accordance with related regulation to ensure that there are no negative impacts on forests, quality of soil, and the natural and social environment. The use of protected areas for public benefit are for research and testing, recreation and tourism, source of medicines, and for protection of the watershed, biodiversity, natural and historical environmental and cultural resources. The use of protected areas for the public benefit is permitted by MONRE. Local people who reside in and around protected areas and contribute to the protection and regeneration of forest and non-timber forest products (NTFPs) in the protected areas have the right to use the forest and forest products as determined in the allocation plan of the protected area and related regulation.

3.2.5 Law on National Heritage No. 08/PDR (2005)

41. This law provides the regulations and measures for the administration, use, protection, conservation, restoration, and rehabilitation of national cultural, historical, and natural heritage. Any individual is prohibited from causing damage to the national cultural and historical heritage, such as archaeological and anthropological sites, encroaching onto historical sites, occupying land in national heritage conservation areas, and changing the original condition of any heritage.

42. Under the law, the protected area of heritage sites is divided into three zones:

- Zone 1, or the central area where the heritage is located and which must be protected and where no construction is permitted;
- Zone 2, or the area surrounding the central area where some activities are permitted to increase the value of zone 1, provided that no damage is caused to the surrounding area; and
- Zone 3, or the administrative area where construction is permitted to serve zones 1 and 2 for the accommodation of tourists.

3.2.6 Law on Water Resources (2017)

43. This law prescribes the regulations related to the protection, administration, exploitation, use, and development of water and water resources, protection against damage to water or water resources, and rehabilitation of affected areas to assure quality and quantity of water to respond to the people's living requirements. It also prescribes the protection of natural and social environment, river basin management, and flood management. The law covers water diversion, abstraction, impoundment, wastewater discharge, construction along river banks, return of water after use into natural water sources, emergency response during drought, flood, and reservoir safety including irrigation systems.

3.2.7 Decree on Pesticide Management (2017)

44. This Decree defines the principles, regulations and measures regarding the use of pesticides, management and monitoring of pesticide activities to ensure the quality, efficiency and safety for humans, animals, plants and environment with the aim of allowing the agricultural and forest production to be carried out in line with clean, green and sustainable agriculture, capable to ensure regional and international integration, and contribute to the national socio-economic development.

3.2.8 Law on Irrigation (2012)

45. This law establishes guidelines, rules, and measures for the management and monitoring of irrigation operations it requires that all sizes and types of irrigation construction be carried out effectively and in compliance with technical and regulatory standards, with the goal of ensuring water supply, preventing droughts and floods, avoiding damage to agricultural production, enhancing food security, promoting production and reducing poverty.

3.2.9 Wildlife and Aquatic Law No. 07/NA (2008)

46. The law prescribes the regulations to promote sustainable regeneration and utilization of wildlife and aquatic life, without any harmful impact on natural resources or habitats. It restricts anthropogenic pressure on decreasing species and the extinction of wildlife and aquatic resources by encouraging people to understand and recognize the significance of managing, monitoring, conserving, protecting, developing, and utilizing wildlife in a sustainable manner.

3.2.10 Law on Construction No. 197/NA (November 2009)

47. This law prescribes the requirements of all construction activities, including requirements for public works and transportation sector, water supply and sanitation, irrigation and flood protection, among others. Individuals or organizations intending to construct, install, repair, or demolish any structure are required to obtain a permit for construction of the project (Article 31) prior to implementation. Article 34 also specifies the requirements on safety during project execution, such as provision of tools for workers (helmets, shoes, gloves, and glass) and measures to be implemented in case of natural calamities at the construction site.

3.2.11 Labor Law (2013)

48. This law defines the principles, regulations, and measures on administration, monitoring, labor skills development, recruitment, and labor protection. Section IV of the law prescribes the regulations related to labor protection, safety, and the rights of employees.

3.2.12 Law on Handling Petitions 012/NA (December 2014)

49. The *Revised Law on Handling Petitions 012/NA* or the *Grievance Redress Law* was approved by the National Assembly on 5 December 2014 and by the President in 2015. The law provides the objectives, principles, and process of applying and handling different types of grievances, petitions, and complaints that may be raised by citizens.

3.3 ENVIRONMENTAL STANDARDS

50. The national environmental standards in Lao PDR are based on the Environmental Protection Law No. 29/NA (December 2012) and Decree on National Environmental Standards issued by the government on 21 February 2017. The standards on water, soil, air, and noise are set under the decree as basis for environmental monitoring and pollution control. The limits set in these national standards are aligned with international standards such as the World Health Organization (WHO) noise guidelines shown in Table 2.

TABLE 2. NOISE STANDARDS IN LAO PDR AND WHO GUIDELINE VALUES

AREA	LAO PDR NOISE STANDARDS			WHO/EHS NOISE LEVEL GUIDELINES	
	06H00 – 18H00	18H00 – 22H00	22H00 – 06H00	DAYTIME 07H00 – 22H00	NIGHTTIME 22H00 – 07H00
Quiet areas: hospitals, libraries, kindergarten, and schools	50	45	40	55	45
Residential areas: hotels and houses	55	55	45		
Commercial and service areas	70	70	50	70	70
Small industrial factories located in residential areas	70	70	50		

EHS = Environment, Health, Safety, Lao PDR = Lao People's Democratic Republic; WHO = World Health Organization.

3.4 INTERNATIONAL CONVENTIONS

51. Lao PDR is signatory to a number of international conventions, such as:

- *Stockholm Conventions on Persistent Organic Pollutants (POPs)*: Lao PDR signed the Stockholm Convention in 2002 and ratified it in June 2006. The MONRE (previously the Water Resources and Environment Administration or WREA) serves as contact for the Stockholm Convention. A National Implementation Plan (NIP) was prepared with assistance from UNIDO.
- *Basel Convention* on the Control of Transboundary Movement of Hazardous Wastes and their Disposal. Lao PDR became a signatory to the Basel Convention on 21 September 2010.
- *RAMSAR Convention on Wetlands*. Lao PDR is a contracting party to the Ramsar Convention to which it acceded in 2010. It has two sites designated as wetlands of international importance, i.e., Being Kiat Ngong wetlands in Champasak and the Xe Champone wetlands in Savannakhet. Lao PDR pursues an active policy in biodiversity conservation and has taken initiatives to support wetlands conservation and sustainable use.
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Lao PDR was a signatory to CITES, which entered into force on 1 July 1975.
- *Kyoto Protocol and the United Nations Framework Convention on Climate Change (UNFCC).* The latter was ratified by Lao PDR in 1995 and the Kyoto Protocol in 2003. The national strategy of Lao PDR on climate change builds on the country's commitment to the UNFCC.
- Rotterdam Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade. Lao PDR became the 157th party to the Rotterdam Convention on 10 September 2010.
- *Vienna Convention for the Protection of the Ozone Layer*. Lao PDR became a signatory to the Vienna Convention on 19 November 1998.

4 DESCRIPTION OF THE SUB-PROJECT

52. The Nam Nan 1 and 3 and Nam Nan 2, 4 and 5 Irrigation Sub-Projects are the second batch of subprojects of the SRIWSM. The SRIWSM is expected to have a net positive impact on subproject catchments as it will reduce the risk from dry season cropping of the irrigation command areas. It will also support a potential increase in income from higher crop values. This will reduce the pressure on land conversion for upland cropping. Such land conversion is identified as a major driver of forest loss as crops are grown on steep, bare ground subject to high rates of soil erosion in the wet season. Figure 1 shows the location of the Sub-Projects in Luang Prabang Province. Plate 1 provides the imagery of the locations of the proposed sub-projects in Luang Prabang Province.

4.1 NAM NAN 1 AND 3 IRRIGATION SUB-PROJECT

4.1.1 Existing Conditions

53. The Nam Nan River 1 and 3 Irrigation System is combination of two overflow headworks as weirs called Pang Weir and Va Weir along the Nam Nan basin. This system covers 6 villages, namely Nafay, Sibounheuang, Paphai, Thad, Phon and Nakhern Villages. The command area is associated with 10 villages, Na Fai, Si Boun Heuang, Si Moung Khun, Na Lao, Pa Phai, Thath, Phon, Na Kheun, and Phon Hin.The headwork of Pang weir is located at the E=175091.48206678, N=2161613.85752000. The headwork of Va weir is located at the E=172467.07726371, N=2158906.29593822 as referred to in the mapping system of WGS1984UTM Zone 48N. The Nam Nan River 1 and 3 Irrigation System is an existing irrigation scheme in Nan district with suitable area for crop and animal husbandry production bordering the riverbank. The scheme consists of a hillside area along a creek, which supports rice paddy and garden production and has an area of more than 200 hectares. The elevation of the scheme is 297.3 m to 367.3 m above mean sea level and is a gravity feed scheme.

54. The irrigation scheme has open fields, gardens, and farmlands of which 30% of the area is affected by the lack of a reliable on-scheme water supply. The irrigated area for the scheme is situated on the left side of the Mekong River while the land for paddy field and cropping areas are along the Road Number 4. Most areas are capable to grow high value crops and has a high potential for rice plantation. The rice and crops can grow for both wet and dry season with three to four cropping a year.

55. Heavy rains and flooding during the monsoon season have caused severe damage to the irrigation infrastructure. The population growth rate in the project area is high, while the food production area is limited. Years with limited rainfall and resulting low yields of paddy rice production create food security challenges for the local population. In these years there is increased pressure on the upland forests and natural streams to supplied food. The project is included in the comprehensive agricultural development 2020 to 2025 strategy of the province under the national economic development plan.

4.1.2 Proposed Development

56. The proposed Nam Nan River 1 and 3 Irrigation System Sub-Project would involve the rehabilitation and upgrading of two existing weirs/headworks and the ancillary canals and structures. Improvements to the irrigation scheme will ensure a reliable supply of water to all parts of the irrigation scheme. The improvements will expand the production area by many hectares and increase the production area in the dry season and will provide favourable conditions for economic and social development, improved food security, and assist in mitigating poverty through increased and diverse agricultural production. The proposed development will also include the provision of fish passages in the headworks/weirs.

FIGURE 1. LOCATION MAP OF THE LUANG PRABANG PROVINCE SUB-PROJECTS

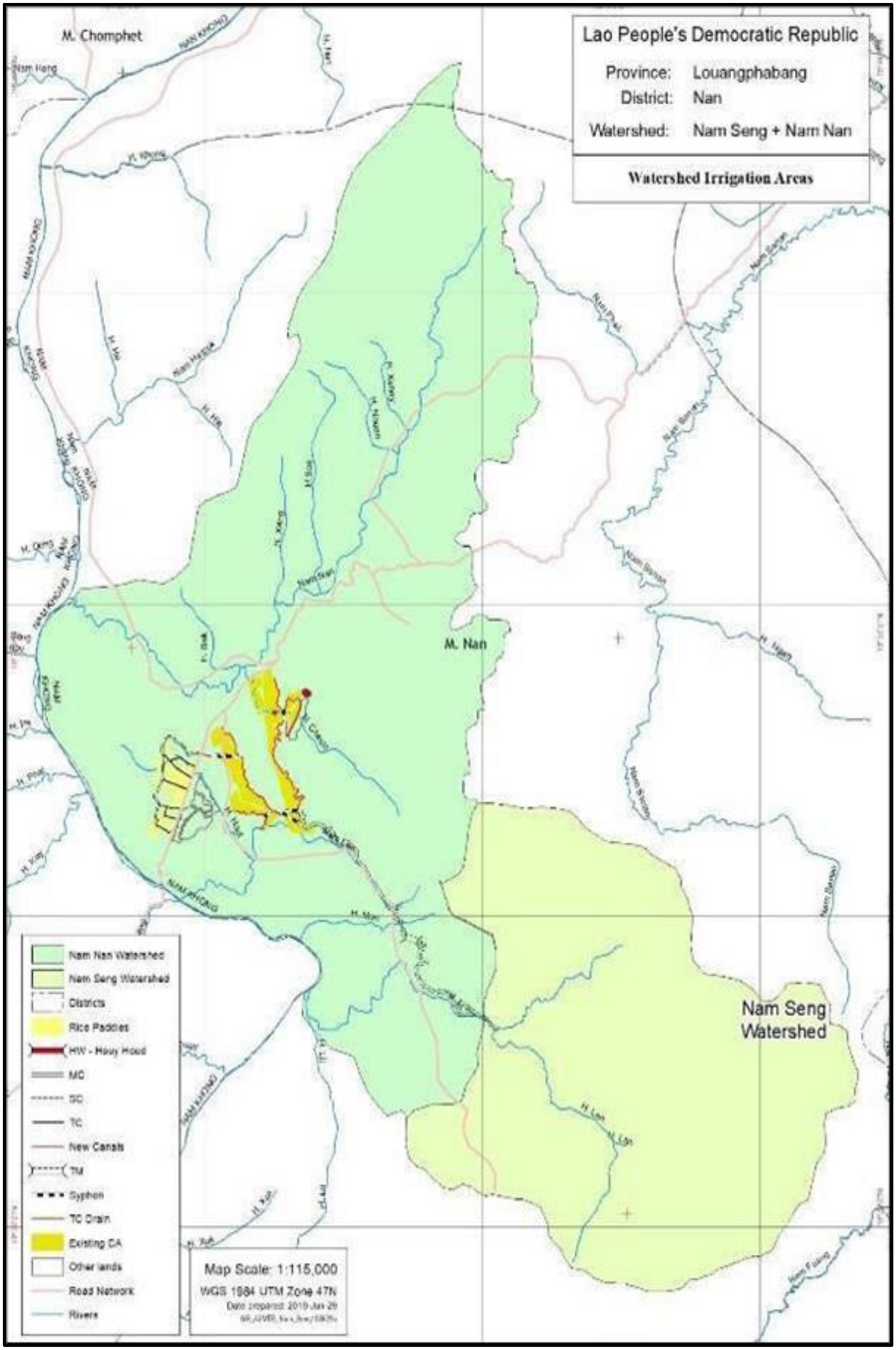
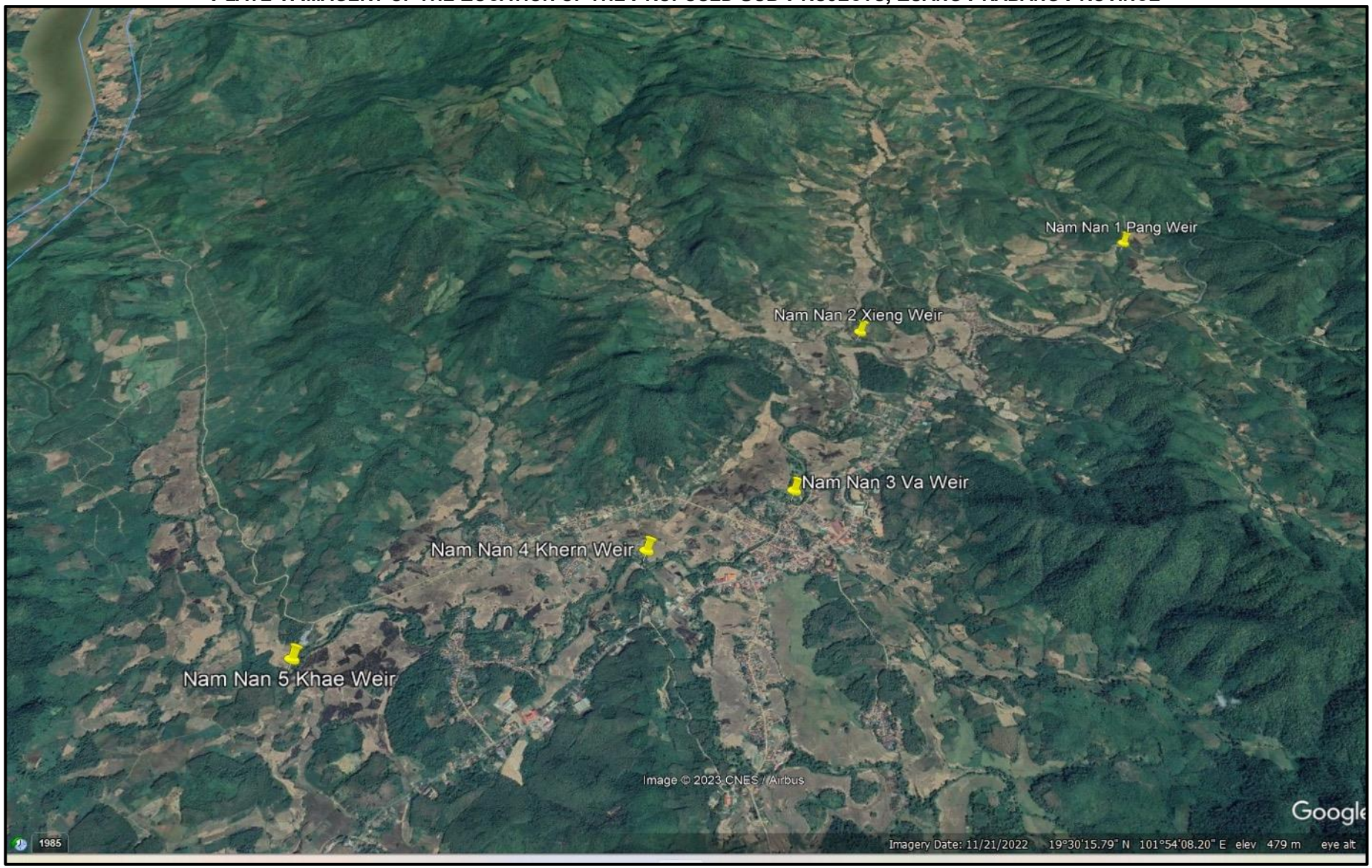


PLATE 1. IMAGERY OF THE LOCATION OF THE PROPOSED SUB-PROJECTS, LUANG PRABANG PROVINCE



57. The proposed Nam Nan River 1 and 3 Irrigation System Sub-Project has been designed as a gravity fed system consisting of two overflow headworks and a canal distribution system to service 200 hectares. The canal layout is based on the original schemes and considers the irrigated area and construction cost. The hydraulic calculations for the structures along the canal were undertaken to ensure that the supply of water through the structures will meet the irrigation water needs and also considers ease of management. The main and secondary canals will be constructed of concrete for ease of maintenance. The canal design is based on the experience of the previous irrigation projects to ensure the efficiency of water use, and to minimize the loss of production area. The summary results for Nam Nan 1 – Pang Weir and Nam Nan 3 – Va Weir are presented in Tables 3 and 4.

TABLE 3. SUMMARY OF DETAILS, PROPOSED NAM NAN RIVER 1 – PANG WEIR IRRIGATION

ITEMS	UNITS	AMOUNT
WATER SUPPLY		
Watershed area	km^2	94.95
Volume of rainfall	mm/ year	1,349.00
Volume of streamflow	m^3/s	3.01
Volume of streamflow	$106.m^3$/year	62.10
IRRIGATION HEADWORKS		
Overflow headwork is in good working condition		1.00
CANAL SYSTEM		
Total length of main canal (MC)	m	2,890.00
Total length of second canal (RSC)	m	155.00
BUILDING SYSTEM		
MAIN CANAL (MC)		
Forest drain		4.00
Gutter		4.00
Bridge to cross canal		3.00
Water division		1.00
Pipe on the right side		13.00
End of canal		1.00
SECOND CANAL (RSC)		
Water pipe on the right side		2.00
Bridge to cross canal		1.00
End of canal		1.00

TABLE 4. SUMMARY OF DETAILS, PROPOSED NAM NAN RIVER 3 – VA WEIR IRRIGATION

ITEMS	UNITS	AMOUNT
WATER SUPPLY		
Watershed area	km^2	155.6
Volume of rainfall	mm/ year	1,349
Volume of streamflow	m^3/s	4.93
Volume of streamflow	$106.m^3$/year	101.76
IRRIGATION HEADWORKS		
New Design Overflow Headwork		1.00
Width of water overflows the wall of weir	m	40.00
Height of weir	m	1.50
Length of basin to reduce the erosion	m	10.00
Fish Ladder		1.00
CANAL SYSTEM		
Total length of main canal (MC)	m	3,465.00
BUILDING SYSTEM		
Pipe under road		4.00
Tart Ton Building		1.00
Gutter		1.00
Bridge to cross canal		6.00
Water division		3.00
Pipe on the left side		14.00
End of canal		1.00
End of canal		1.00

58. The main canal and sub canals are Betong Stone canals to reduce water loss and maintenance. The design is based on the experience of previous irrigation projects to ensure the quality of the structure and the efficiency of water use as well as to reduce the loss of agricultural production area.

59. The main canal and sub-canals at the second level are designed to have a rectangular cross-section as a Betong Stone canal. Figures 2 to 8 presents the typical cross sections of the canals and canal elements.

FIGURE 2. TYPICAL CROSS SECTION OF CANALS AND CANAL ELEMENTS

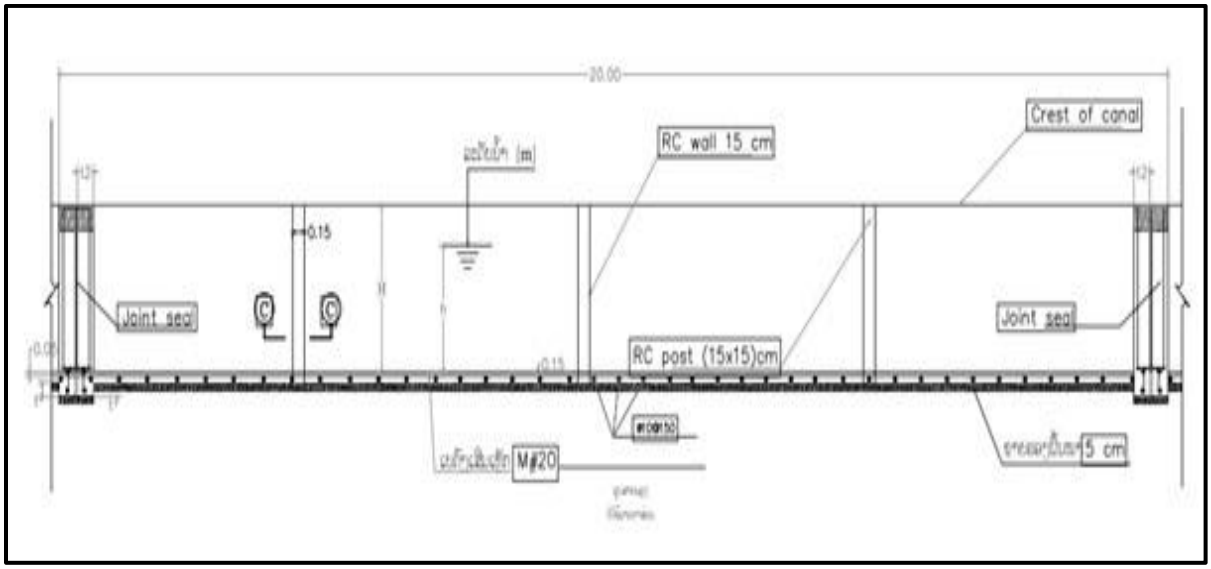


FIGURE 3. TYPICAL CROSS SECTION OF CANALS AND CANAL ELEMENTS

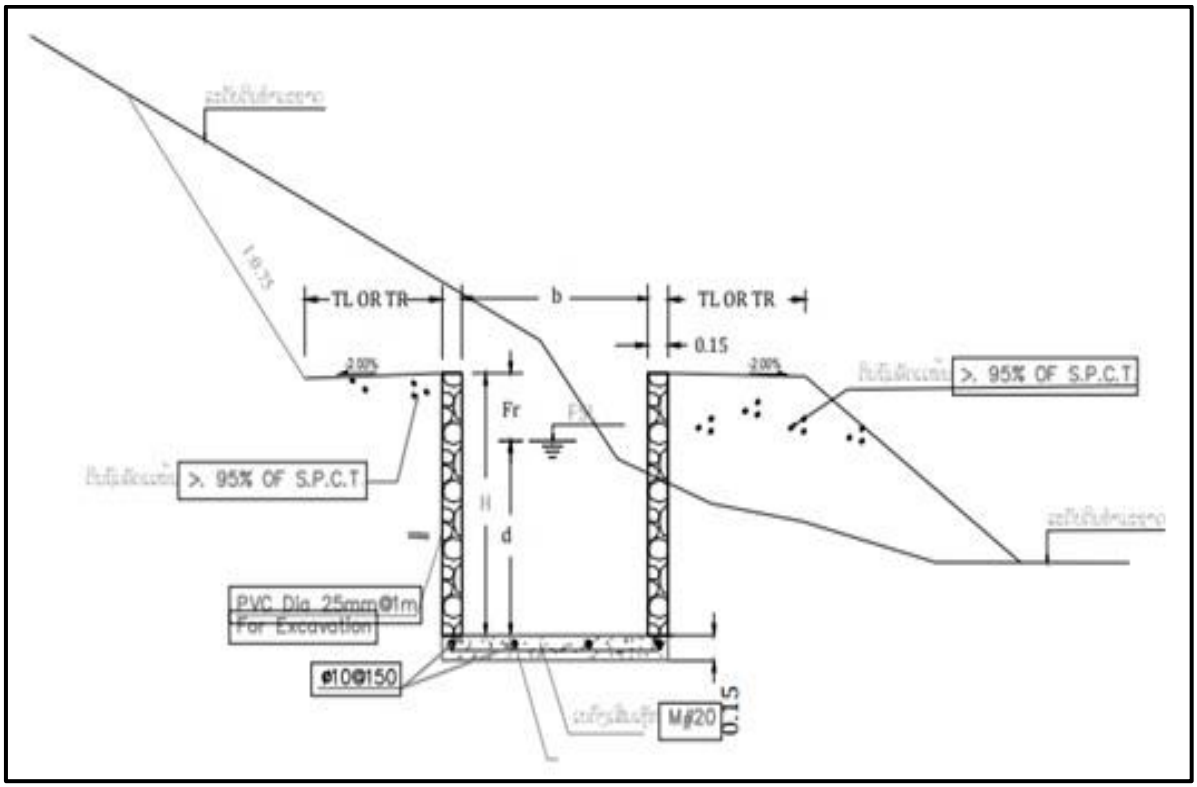


FIGURE 4. TYPICAL CROSS SECTION OF CANALS AND CANAL ELEMENTS

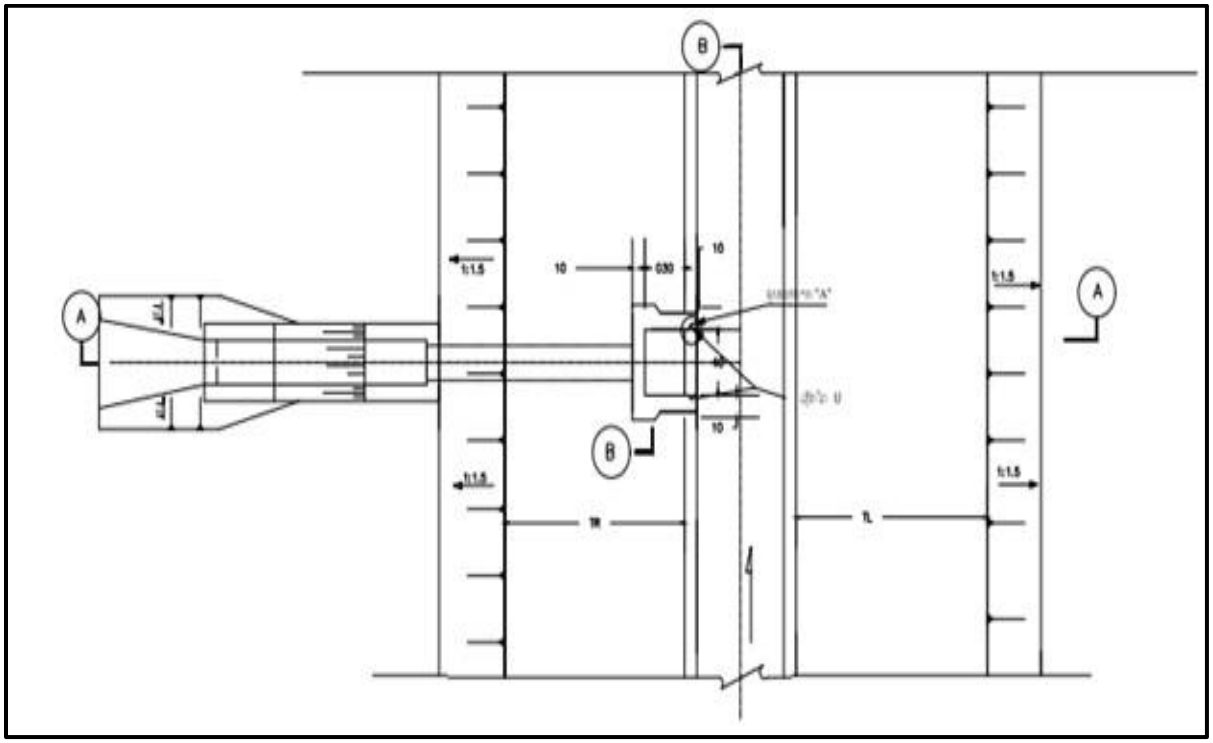


FIGURE 5. TYPICAL CROSS SECTION OF CANALS AND CANAL ELEMENTS

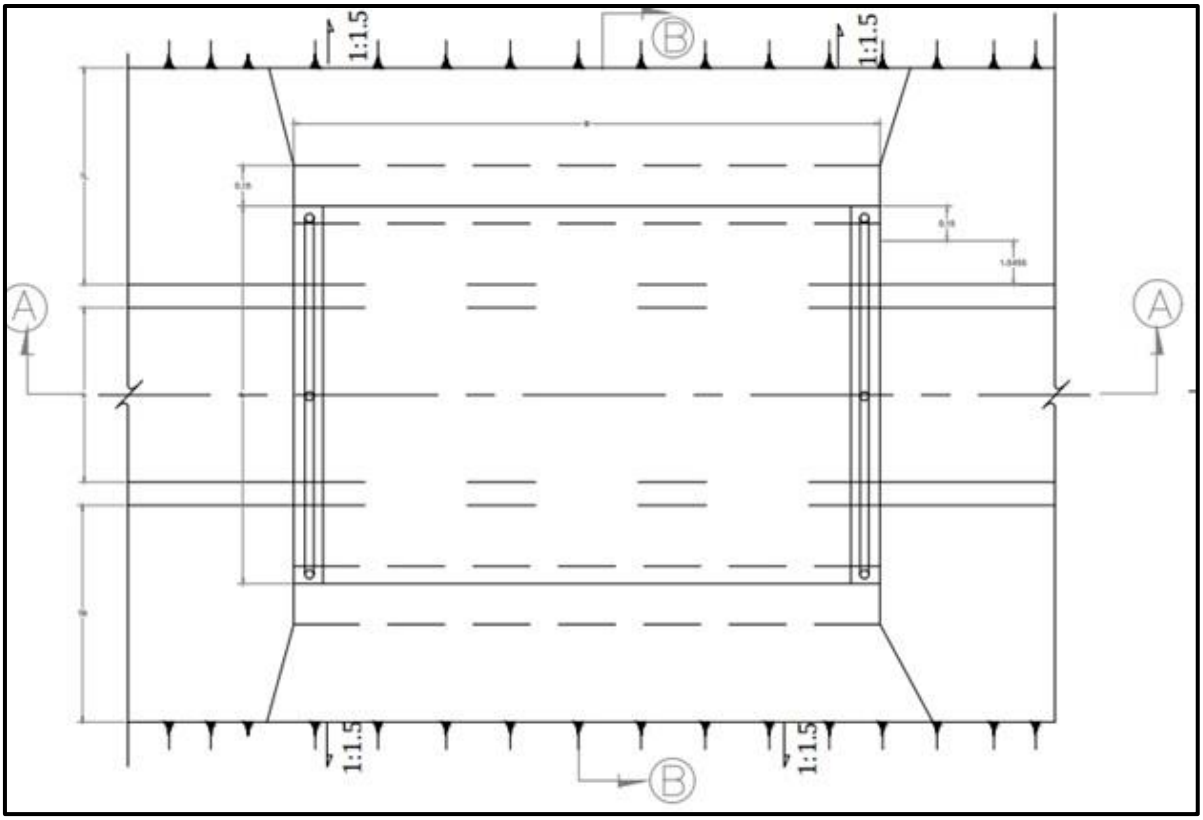


FIGURE 6. TYPICAL CROSS SECTION OF CANALS AND CANAL ELEMENTS

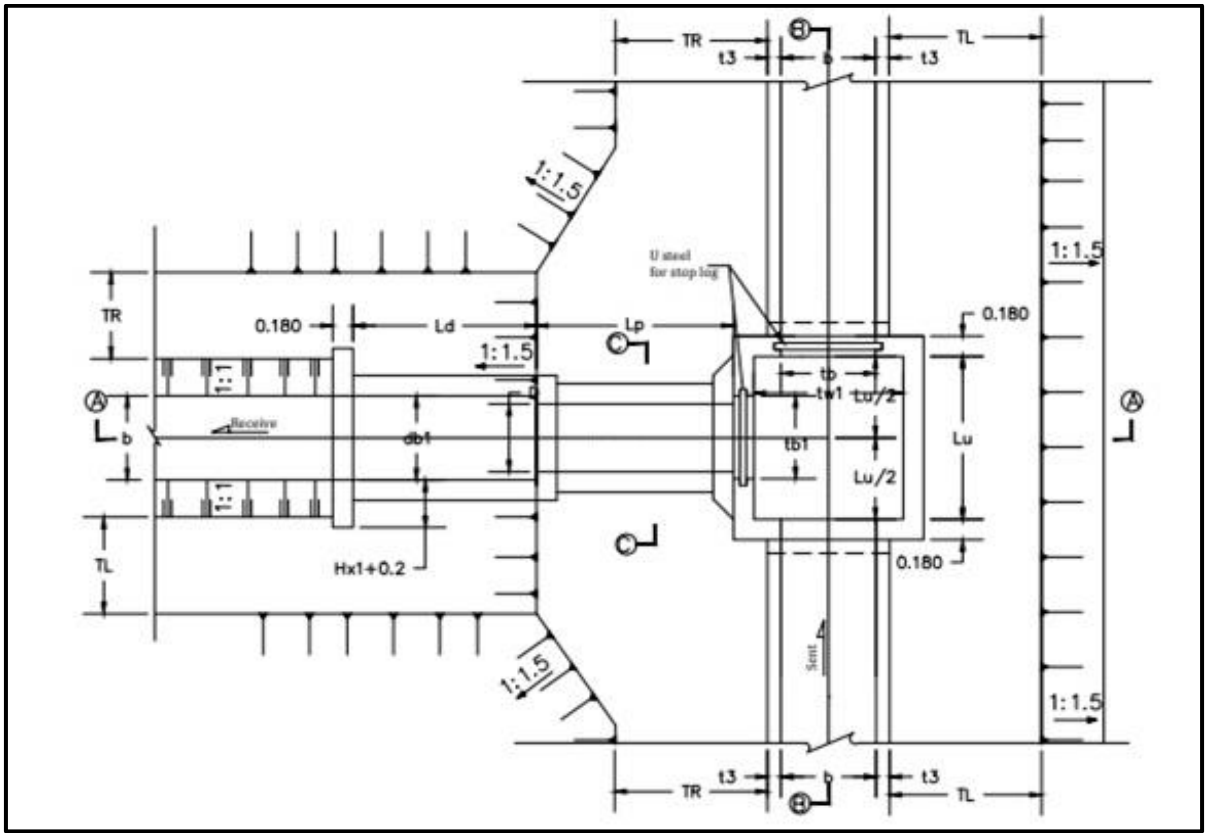


FIGURE 7. TYPICAL CROSS SECTION OF CANALS AND CANAL ELEMENTS

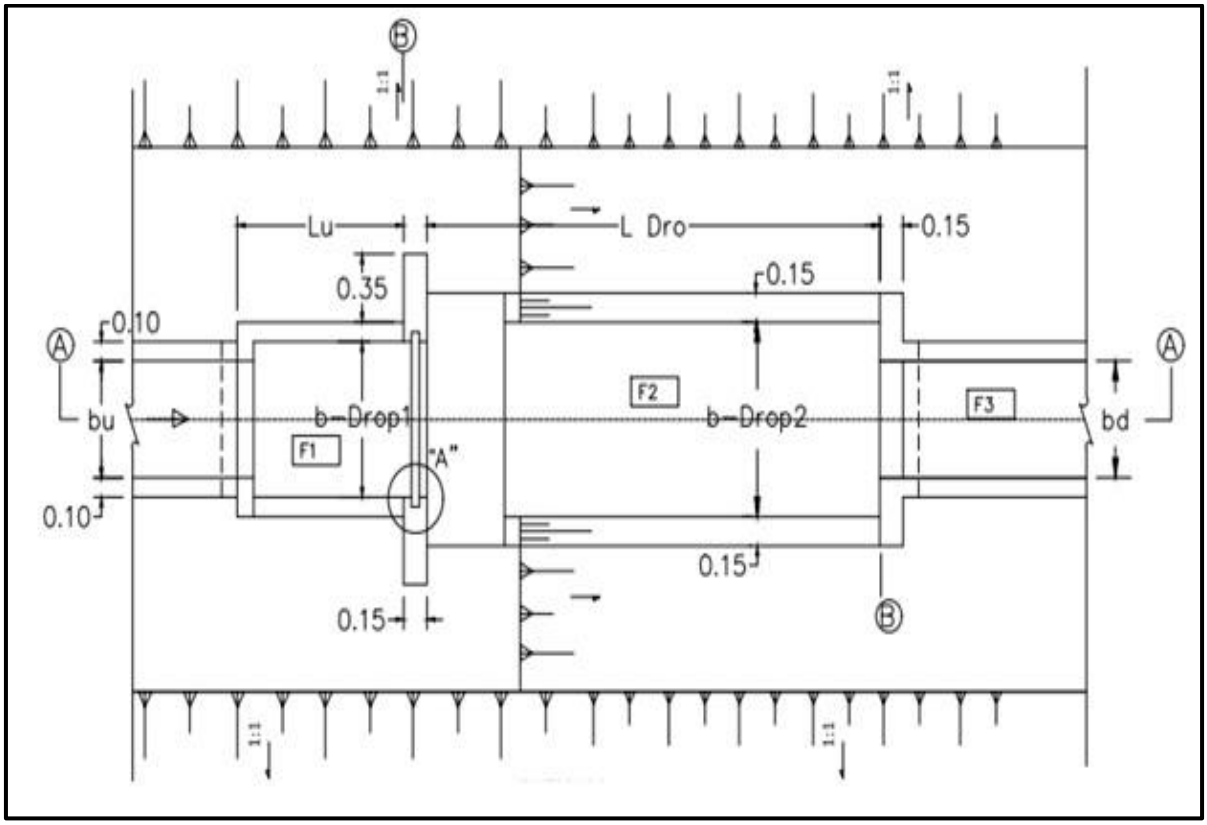
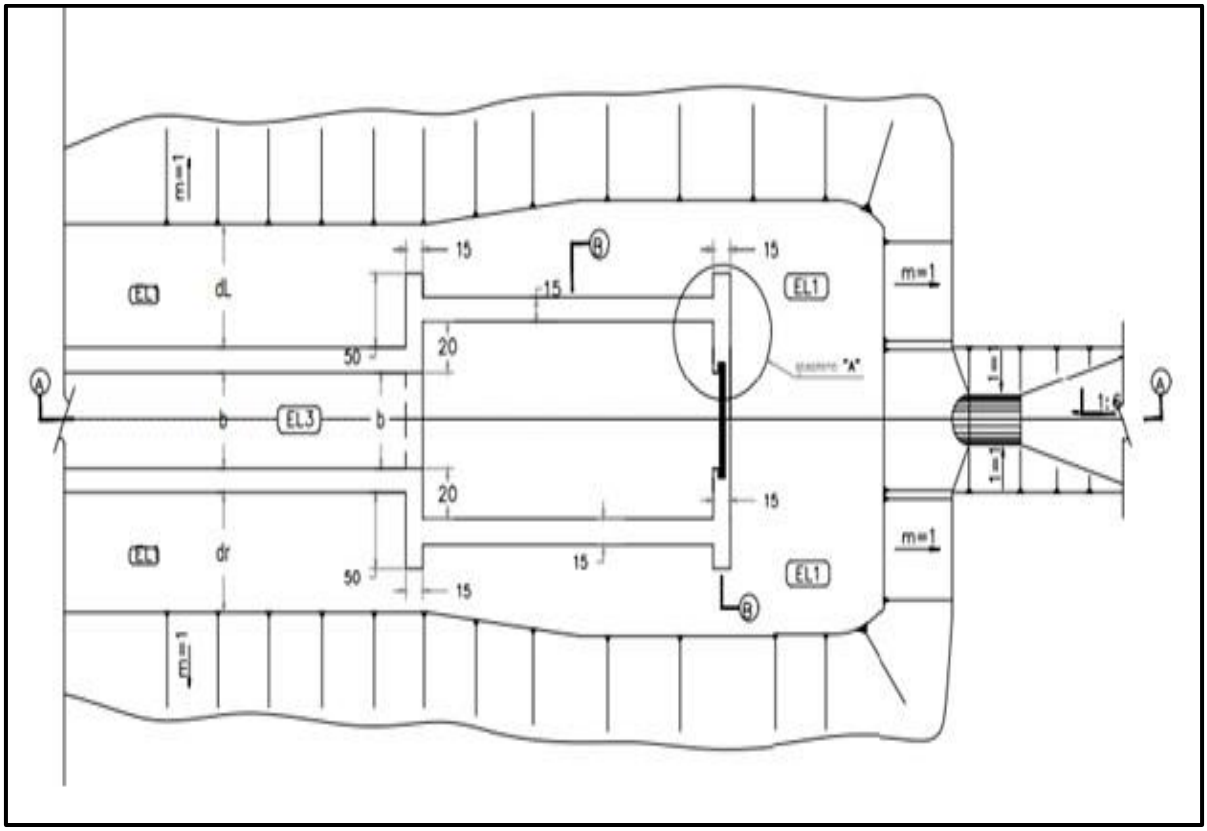


FIGURE 8. TYPICAL CROSS SECTION OF CANALS AND CANAL ELEMENTS



4.1.3 Hydrological Study

60. The requisite hydrologic study was undertaken during the design stage of the su-project. The details of this study are provided in the Feasibility Study for the proposed sub-project. It can be provided upon request. The Nam Nan River Irrigation project consists of two sub-projects, the Nam Nan River 1 associated with the Pang Weir and Nam Nan River 2 associated with the Va Weir.

61. For the design, 2.50 l/s/ha was used to guarantee a sufficient water supply. The design guarantee of a safe water supply was set as P=85% of the volume. The results are shown in Table 5. The calculation of water requirements is presented in the Feasibility Study for the proposed sub-projects and considers recent precipitation, and evaporation data. According to the parameters used in the design, the annual rainfall was set as 600 mm. The 100-year maximum flood discharge was estimated using two standard Lao methods. The results are shown in the Tables 6 to 10.

TABLE 5. WATER AVAILABILITY BY SUB-PROJECT

WATERSHEDS	WATERSHED AREA (KM^2)	ANNUAL VOLUME OF WATER (M^3/S)	DESIGN VOLUME P=85% (M^3)* 106	METHOD
Nam Nan 1 (Pang Weir)	94.9	3.01	62.1	Average monthly rainfall
Nam Nan 3 (Wah Weir)	155.6	4.93	101.8	Average monthly rainfall

TABLE 6. MAXIMUM 100-YEAR FLOOD

IRRIGATION SCHEME	METHOD (100-YEAR) (M^3/S)	
	SOKOLOV	PA MONG
Nam Nan 1 (Pang Weir)	139	200
Nam Nan 3 (Wah Weir)	183	270

TABLE 7. DETERMINATION OF YEAR-ROUND SAFE WATER SUPPLY VOLUME, NAM NAN RVER 1 – PANG WEIR

ATTRIBUTE	AVE	50%	75%	80%	85%	90%	95%
KP MEAN	1.00	0.96	0.75	0.70	0.65	0.61	0.56
VOLUME (10^6M^3)	94.95	91.05	70.83	66.46	62.10	57.73	53.36
WATER QUANTITY (M^3/S)	3.01	2.89	2.25	2.11	1.97	1.83	1.69

TABLE 8. DISTRIBUTION OF MONTHLY WATER FLOW IN THE YEAR (85%), NAM NAN RVER 1 – PANG WEIR

ATTRIBUTE	DAYS	31	28	31	30	31	30	31	31	30	31	30	31
	MONTH	1	2	3	4	5	6	7	8	9	10	11	12
	%	1.00	1.33	2.80	7.48	11.93	13.85	18.05	20.80	12.92	6.63	2.14	1.08
WATER QUANTITY Q: (M^3/S)		0.353	0.520	0.993	2.738	4.230	5.073	6.398	7.374	4.732	2.350	0.785	0.382
WATER VOLUME W: 106(M^3)		0.947	1.259	2.659	7.098	11.330	13.150	17.137	19.751	12.266	6.294	2.034	1.023

TABLE 9. DETERMINATION OF YEAR-ROUND SAFE WATER SUPPLY VOLUME, NAM NAN RVER 1 – VA WEIR

ATTRIBUTE	AVE	50%	75%	80%	85%	90%	95%
KP MEAN	1.00	0.96	0.75	0.70	0.65	0.61	0.56
VOLUME (10^6M^3)	155.60	149.22	116.08	108.92	101.76	94.61	87.45
WATER QUANTITY (M^3/S)	4.93	4.73	3.68	3.45	3.23	3.00	2.77

TABLE 10. DISTRIBUTION OF MONTHLY WATER FLOW IN THE YEAR (85%), NAM NAN RVER 1 – VA WEIR

ATTRIBUTE	DAYS	31	28	31	30	31	30	31	31	30	31	30	31
	MONTH	1	2	3	4	5	6	7	8	9	10	11	12
	%	1.00	1.33	2.80	7.48	11.93	13.85	18.05	20.80	12.92	6.63	2.14	1.08
WATER QUANTITY Q: (M^3/S)		0.579	0.853	1.627	4.488	6.932	8.314	10.486	12.085	7.756	3.851	1.286	0.626
WATER VOLUME W: 106(M^3)		1.551	2.063	4.358	11.632	18.567	21.550	28.084	32.368	20.103	10.315	3.334	1.677

62. Plant water needs were recalculated considering present climate information. The plant water requirements are as follows:

- 2.5 l/s/ha for dry season rice
- 2.0 l/s/ha for rainy season rice
- 0.44 l/s/ha for dry season bean

63. The water requirements for rice fields and dry season crops use a design requirement of q=2.50 l/s/ha. The Feasibility Study provides the detailed calculations for rice fields and dry season crops. Tables 11 and 12 presents the water requirements of rice and sweet corn respectively.

TABLE 11. RICE WATER REQUIREMENT (RIWR)

DAY	30	30	30	28	30	30	30	30	30	30	30	30
MONTH	11	12	1	2	3	4	5	6	7	8	9	10
PRODUCTION SEASON	DRY SEASON						RAINY SEASON					
GROWTH PERIOD		SOIL PREPARATION / SEEDING	GROWTH PERIOD	MID TERM	FINAL TERM		SOIL PREPARATION / SEEDING	GROWTH PERIOD			MID TERM	FINAL TERM
SEASONAL KC COEFFICIENT/MONTH		1.10	1.23	1.18	1.00			1.10	1.10	1.20	1.15	1.00
EVAPORATION ETO CROP (MM/M)	-	40.62	55.01	70.71	37.32			50.57	41.52	41.88	41.22	20.16
SEEDING (MM)	40.00						40.00					
SOIL SATURATED WITH WATER (MM)	200.00						200.00					
WATER INFILTRATION RATE		134.85	269.70	269.70	269.70		134.85	269.70	269.70	269.70	269.70	269.70
WATER LEVEL (MM)		100.00						50.00				
USEFUL RAIN, PE (MM/M)					12.67		103.77	124.46	169.78	199.49	114.42	46.54
RIWR (MM/M)	240.00	275.47	324.71	340.41	294.35		271.08	245.80				
RIWR (MM/D)	8.00	9.18	10.82	11.35	9.81		9.04	8.19				
EFFICIENCY OF RECEIVING WATER	0.60	0.60	0.60	0.60	0.60		0.60	0.60	0.60	0.60	0.60	0.60
AWR (L/S/HA)	1.54	1.77	2.09	2.19	1.89		1.74	1.58	-			
EFFICIENCY OF SUPPLYING WATER IN THE SUB-CANAL	0.90	0.90	0.90	0.90	0.90		0.90	0.90	0.90	0.90	0.90	0.90
SUB-CANAL WATER REQUIREMENT (L/S/HA)	1.71	1.97	2.32	2.43	2.10		1.94	1.76				
EFFICIENCY OF SUPPLYING WATER IN THE MC	0.95	0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95
MC WATER REQUIREMENT (L/S/HA)	1.80	2.07	2.44	2.56	2.21		2.04	1.85				

TABLE 12. SWEET CORN WATER REQUIREMENT

DAY	30	30	30	28	30	30	30	30	30	30	30	30
MONTH	11	12	1	2	3	4	5	6	7	8	9	10
PRODUCTION SEASON		DRY SEASON					RAINY SEASON					
GROWTH PERIOD			IS	CDS	MSS	LSS						
SEASONAL KC COEFFICIENT/MONTH			0.53	0.98	1.05							
EVAPORATION ETO CROP (MM/M)	-	-	23.80	58.73	52.25	-	-	-	-	-	-	-
USEFUL RAIN, PE (MM/M)					12.67	55.67	103.77	124.46	169.78	199.49	114.42	46.54
CIWR (MM)	-	-	23.80	58.73	39.58		-	-				
CIWR (MM/D)	-	-	0.79	1.96	1.32		-	-				
EFFICIENCY OF RECEIVING WATER	0.60	0.60	0.60	0.60	0.60		0.60	0.60	0.60	0.60	0.60	0.60
AWR (L/S/HA)	-	-	0.15	0.38	0.25							
EFFICIENCY OF SUPPLYING WATER IN THE SUB-CANAL	0.90	0.90	0.90	0.90	0.90		0.90	0.90	0.90	0.90	0.90	0.90
SUB-CANAL WATER REQUIREMENT (L/S/HA)	-	-	0.17	0.42	0.28		-	-				
EFFICIENCY OF SUPPLYING WATER IN THE MC	0.95	0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95
WATER REQUIREMENT THROUGH THE MC (L/S/HA)	-	-	0.18	0.44	0.30		-	-				

64. Considering the water available, rice and other crop requirements in the dry and the rainy season, the details of the water balance are shown in Tables 13 and 14.

TABLE 13. SUMMARY RESULT OF WATER BALANCE

IRRIGATION SCHEME	AREA (HA)	WATER DEMAND PER SEASON (M^3/HA)	VOLUME OF WATER	
			RAINY SEASON	DRY SEASON
NAM NAN (PANG WEIR)				
Volume of water available			43,039,765	15,020,251
Dry season	116.9	5,176	605,140	
Wet season	100.0	14,366		1,436,672
Dry Season Crops	16.9	986		16,675
Water balance	233.8		42,434,625	13,566,903
NAM NAN (VA WEIR)				
Volume of water available			70,535,034	24,615,699
Dry season	110.2	5,176	570,253	
Wet season	100.0	14,366		1,436,672
Dry season Crops	10.2	986		10,028
Water balance	220.3		69,964,780	23,168,997

TABLE 14. SUMMARY RESULT OF WATER DEMAND

DRY SEASON RICE							
MONTHS	**11**	**12**	**1**	**2**	**3**	**4**	**TOTAL**
Water demand RIWR (mm)	240.00	275.47	324.71	340.41	294.35		1474.944
Volume of P (mm/m)	28.90	14.53	13.44	17.88	37.78		112.561
Water coefficient	0.34	0.34	0.34	0.34			
Water P available (mm)	9.83	4.94	4.57	6.08	12.85		38.271
Net Water demand (mm)	230.17	270.52	320.14	334.33	281.51		1,436.67
Net Water demand (m^3/ha)	2,301.73	2,705.25	3,201.36	3,343.32	2,815.07		14,366.73
WET SEASON RICE							
MONTHS	**5**	**6**	**7**	**8**	**9**	**10**	**TOTAL**
Water demand RIWR (mm)	271.07	245.80			67.67	137.04	721.60
Volume of P (mm/m)	160.96	186.828			172.12	80.06	599.97
Water coefficient	0.34	0.34			0.34	0.34	
Water P avaibale (mm)	54.7				58.52	27.22	203.99
Net Water demand (mm)	216.35	182.28			9.15	109.83	517316
Net Water demand (m^3/ha)	2163.49	1822.82			91.54	1098.27	5,176.12
OTHER CROPS - DRY SEASON							
MONTHS	**1**	**2**	**3**	**4**	**5**	**6**	**TOTAL**
Water demand for RIWR (mm)	23.80	58.73	39.58				122.11
Volume of P (mm/m)	13.45	17.89	37.78				69.12
Water coefficient	0.34	0.34	0.34				
Water P available (mm)	4.57	6.08	12.85				23.50
Net Water demand (mm)	19.23	52.65	26.74				98.61
Net Water demand (m^3/ha)	192.27	526.47	267.37				986.11

65. Figures 9 and 10 shows the command area of the Nam Nan River 1 and Nam Nan River 3 Irrigation Systems respectively. Plates 2 and 3 presents the imageries of the location of the Proposed Nam Nan River 1 and 3 Irrigation System while Plates 4 and 5 shows the photos of the proposed Nam Nan River 1 and Nam Nan River 3 Irrigation System.

FIGURE 9. COMMAND AREA, NAM NAN 1 IRRIGATION SYSTEMS SUB-PROJECT - PANG WEIR

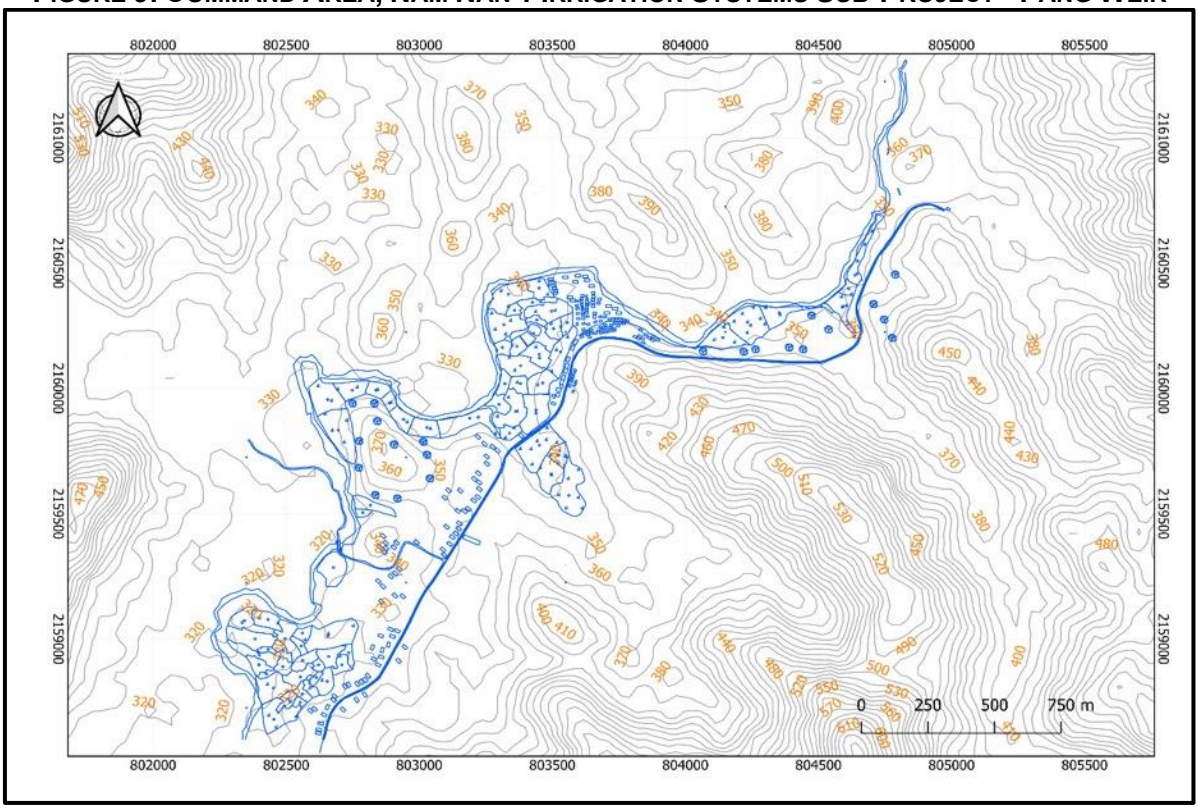


FIGURE 10. COMMAND AREA, NAM NAN 3 IRRIGATION SYSTEMS SUB-PROJECT - VA WEIR

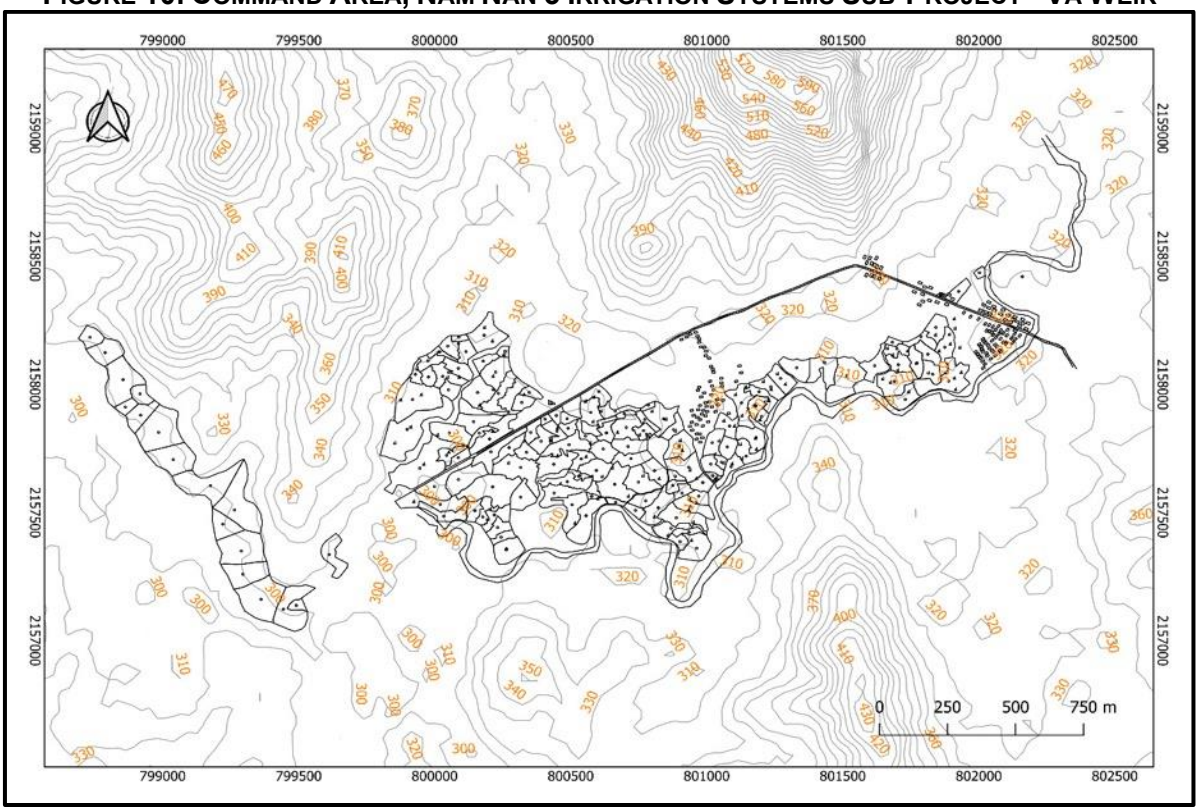


PLATE 2. IMAGERY OF THE LOCATION OF THE PROPOSED NAM NAN RIVER 1 – PANG WEIR IRRIGATION SYSTEM SUB-PROJECT

PLATE 3. IMAGERY OF THE LOCATION OF THE PROPOSED NAM NAN 3 – VA WEIR IRRIGATION SYSTEM SUB-PROJECT

PLATE 4. PHOTOS OF PROPOSED NAM NAN RIVER 1 - PANG WEIR SUB-PROJECT

PLATE 5. PHOTOS OF PROPOSED NAM NAN RIVER 3 - VA WEIR SUB-PROJECT

4.2 NAM NAN 2, 4 AND 5 IRRIGATION SYSTEM SUB-PROJECT

4.2.1 Existing Conditions

67. The Nam Nan River 2, 4 and 5 Irrigation Schemes are existing irrigation schemes in Nan district with suitable area for crop and animal husbandry production bordering the riverbank. The Nam Nan River 2, 4 and 5 Irrigation Scheme has an area of more than 210 hectares, which supports rice production. The command area is associated with seven villages: Na Lao, Pah Phai, Phon Heen, Si Boun Heuang, Thath, Phon, and Si Moung Khoun.

68. The Nam Nan Irrigation Schemes are near the Na Lao village, Na Kheun village, and Phon village of the Nan District, Luang Prabang Province. The project is in the northern part of Laos, some 400 km north of Vientiane and some 65 km southwest of Luang Prabang Municipality along the Pra Bang to Nan District Road. The project is 1.5 km from the Nan District Municipality centre. The project supports the villages of Na Fai and Naphai of the Nan District 1.

69. There are three headwork under the Nam Nan River 2, 4 and 5 Irrigation Scheme and all are in working condition. The Nam Nan District irrigation system was been designed as a gravity fed system consisting of three overflow headworks and a canal distribution system to service 210 hectares.

70. The specific location of each headwork is indicated as follows: Nam Nan 2 - Xieng Weir is about 2 km to the north from Nan district centre; Nam Nan 4 - Khern Weir is located in the southwest of Nan district about 1 km; Nam Nan 5 - Khae Weir is also located in the same direction with Nam Nan 4 and about 3 km from the Nan district centre.

71. The project area is a level area along the creek and suitable for rice cultivation and horticulture crops. The irrigation scheme has open fields, gardens, and farmlands of which 30% of the area is affected by the lack of a reliable on-scheme water supply. Heavy rains and flooding during the monsoon season have caused severe damage to the irrigation infrastructure.

72. The population growth rate in the project area is high, while the food production area is limited. Years with limited rainfall and resulting low yields of paddy rice production creates food security challenges for the local population. In these years there is increased pressure on the upland forests and natural streams to supplied food.

4.2.2 Proposed Development

73. The proposed Nam Nan River 2, 4 and 5 Irrigation System Sub-Projects has been designed as a gravity fed system consisting of two overflow headworks and a canal distribution system to service 210 hectares.

74. The development of agriculture production infrastructure has focused on the restoration and repair of irrigation systems to ensure water supply to the Kheun, Khae, and Xieng irrigation schemes, with a total value of 9,542,570,000 kip. These schemes supply water to service 1.781 hectares and involve some 137 irrigation facilities, 22 permanent irrigation facilities and 115 primary irrigation facilities. The schemes support 40 villages, representing 81% of the total number of villages.

75. The proposed Nam Nan River 2, 4 and 5 Irrigation System Sub-Projects would involve the rehabilitation and upgrading of three existing weirs/headworks and the ancillary canals and structures and the provision of fish passages in the headworks/weirs. Improvements to the irrigation schemes will ensure a reliable supply of water to all parts of the irrigation scheme.

76. The improvements will expand the production area by many hectares and increase the production area in the dry season. Improvements to the irrigation scheme will provide favorable conditions for economic and social development, improved food security, and assist in mitigating poverty through increased and diverse agricultural production.

77. The canal layout of the proposed Nam Nan River 2, 4 and 5 Irrigation System Sub-Projects is based on the original schemes and considers the irrigated area and construction cost. The hydraulic calculations for the structures along the canal were undertaken to ensure that the supply of water through the structures will meet the irrigation water needs and also considers ease of management.

78. The main and secondary canals will be constructed of concrete for ease of maintenance. The canal design is based on the experience of the previous irrigation projects to ensure the efficiency of water use, and to minimize the loss of production area. The summary results for Nam Nan 2 – Xieng Weir, Nam Nan 4 - Kheun Weir and Nam Nan 5 – Khaeh Weir are presented in Tables 15 to 17.

TABLE 15. SUMMARY OF DETAILS, PROPOSED NAM NAN RIVER 2 – XIENG WEIR IRRIGATION

ITEMS	UNITS	AMOUNT
WATER SUPPLY		
Watershed area	km^2	136
Volume of rainfall	mm/year	1,349
Water Yield	m^3/s	4.32
Water Yield	$106.m^3$/year	136.14
IRRIGATION HEADWORKS		
Overflow headwork is in good working condition		1
Canal System		
Total length of main canal (MC)	m	2,890
Total length of secondary canal (RSC)	m	
CANAL SYSTEM		
Total length of main canal (MC)	m	2,890
CANAL CONFIGURATION		
Main Canal (MC)		1
Forest drain		2
Gutter		3
Bridge to cross canal		3
Pipeline		4
Tart Ton Building		4
Forest water receiving		2
Water pipe on the left side		32
End of canal		1

TABLE 16. SUMMARY OF DETAILS, PROPOSED NAM NAN RIVER 4 – KHEUN WEIR IRRIGATION

ITEMS	UNITS	AMOUNT
WATER SUPPLY		
Watershed area	km^2	178
Volume of rainfall	mm/year	1,349
Water Yield	m^3/s	5.67
Water Yield	$106.m^3$/year	178.70
IRRIGATION HEADWORKS		
Overflow headwork is in good working condition		1
CANAL SYSTEM		
Total length of main canal (MC)	m	2,420
CANAL CONFIGURATION		
Culverts		3
Tart Ton		1
Bridge to cross canal		1
Water division		1
Water pipe on the left side		5
End of canal		1

TABLE 17. SUMMARY OF DETAILS, PROPOSED NAM NAN RIVER 5 – KHAEH WEIR IRRIGATION

ITEMS	UNITS	AMOUNT
WATER SUPPLY		
Watershed area	km^2	180
Volume of rainfall	mm/year	1,349
Water Yield	m^3/s	5.71
Water Yield	$106.m^3$/year	180.09
IRRIGATION HEADWORKS		
Overflow headwork is in good working condition		1
CANAL SYSTEM		
Total length of main canal (MC)	m	2,835
Total length of secondary canal (RSC)	m	1,675
BUILDING SYSTEM		
Forest drains		3
Gutter		1
Bridge to cross canal		6
Culverts		1
Drains		2
Water pipe on the left side		16
End of canal		1
MAIN CANAL (LMC)		
Bridge to cross canal		1
Water pipe on the right side		3
End of canal		1

79. The main canal and sub canals are Betong Stone canals to reduce water loss and maintenance. The design is based on the experience of previous irrigation projects to ensure the quality of the structure and the efficiency of water use as well as to reduce the loss of agricultural production area.

80. The main canal and sub-canals at the second level are designed to have a rectangular cross-section as a Betong Stone canal. Figures 11 to 16 presents the typical cross sections of the canals and canal elements.

FIGURE 11. TYPICAL CROSS SECTION OF CANALS AND CANAL ELEMENTS

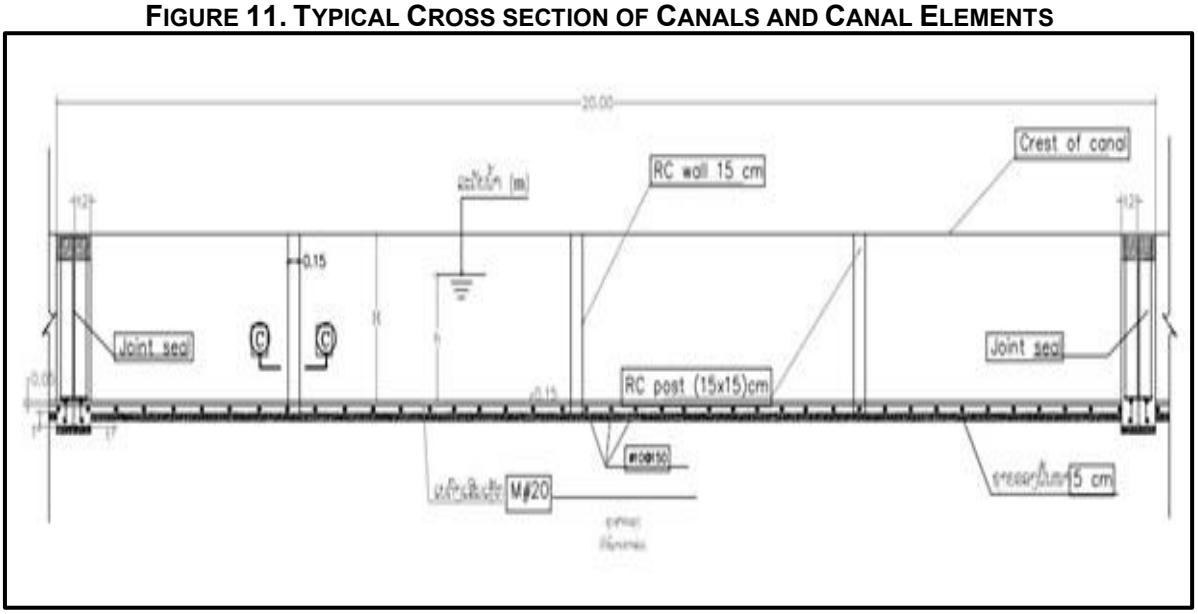


FIGURE 12. TYPICAL CROSS SECTION OF CANALS AND CANAL ELEMENTS

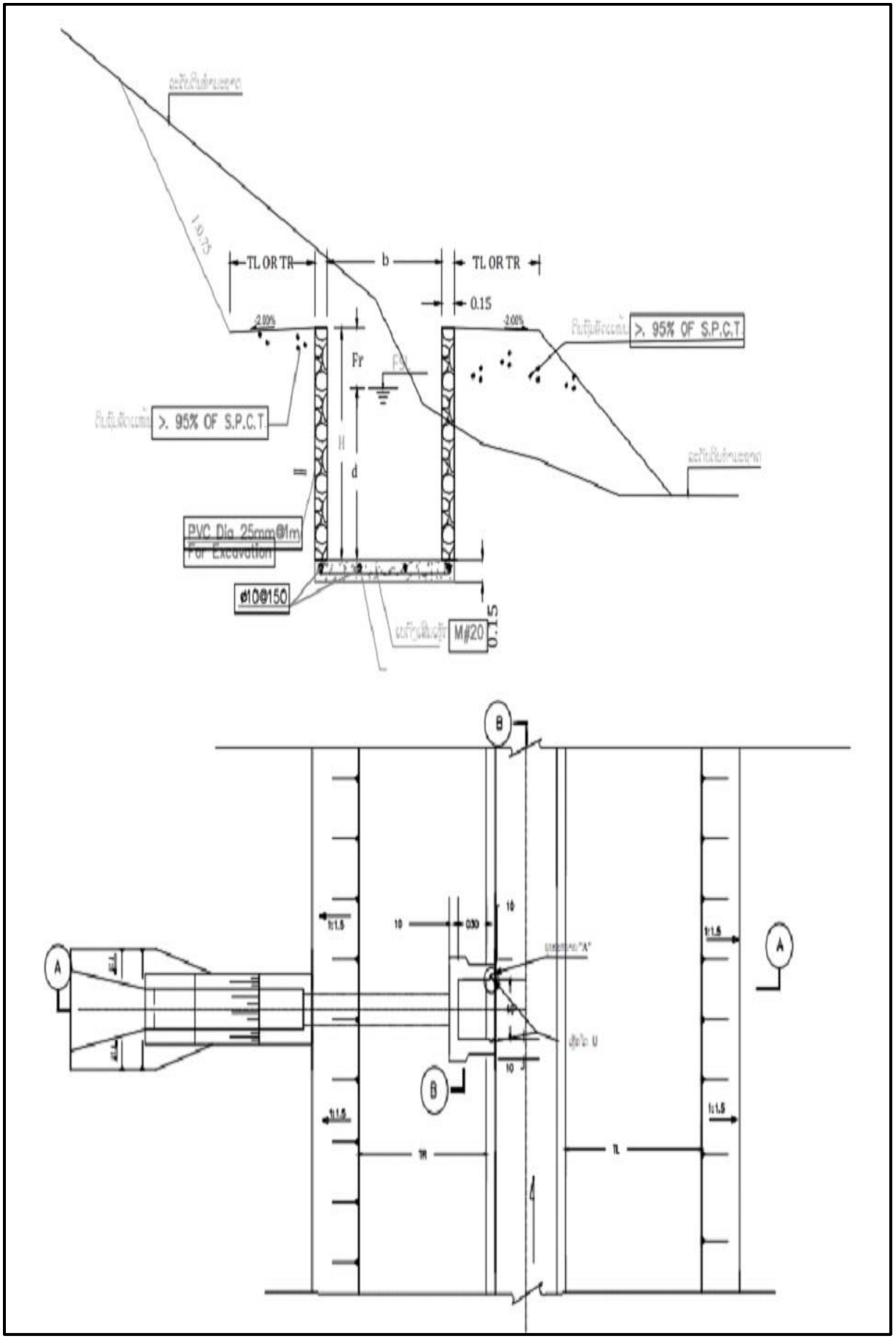


FIGURE 13. TYPICAL CROSS SECTION OF CANALS AND CANAL ELEMENTS

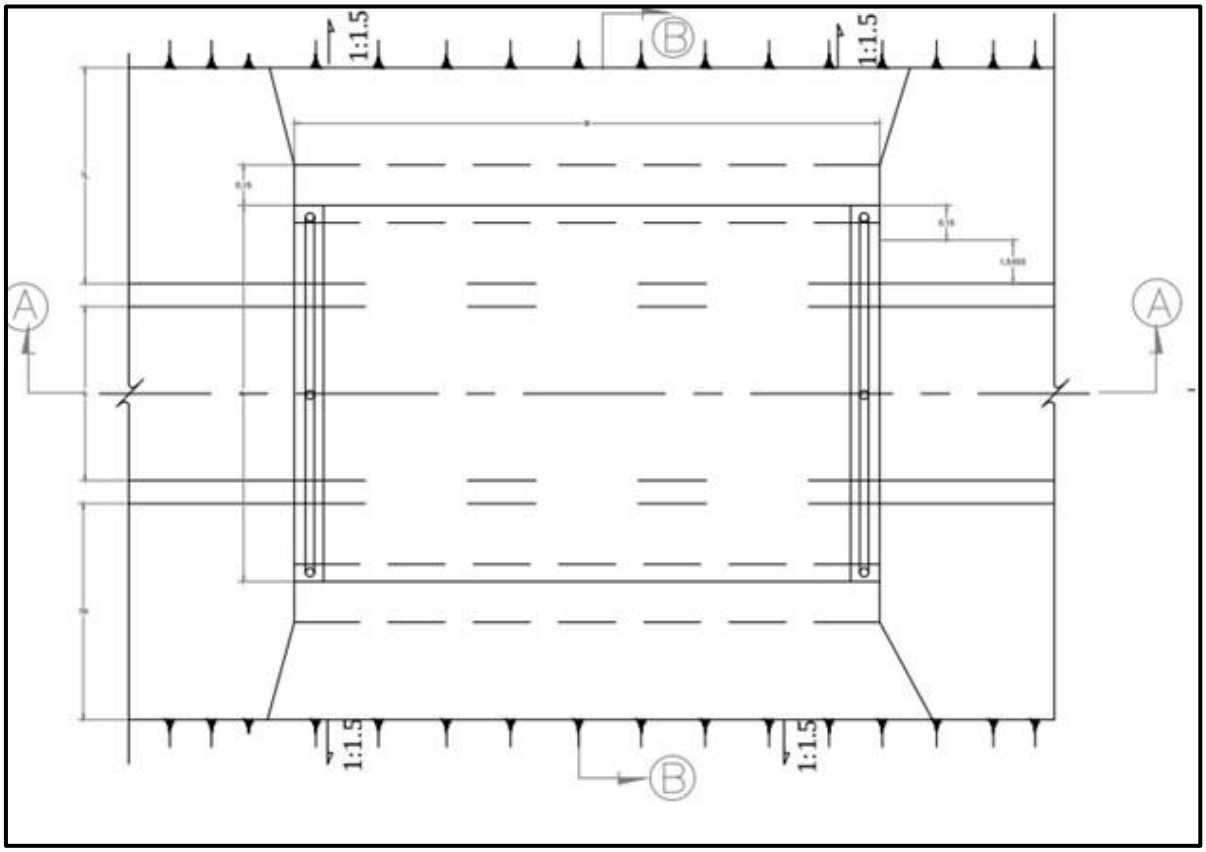


FIGURE 14. TYPICAL CROSS SECTION OF CANALS AND CANAL ELEMENTS

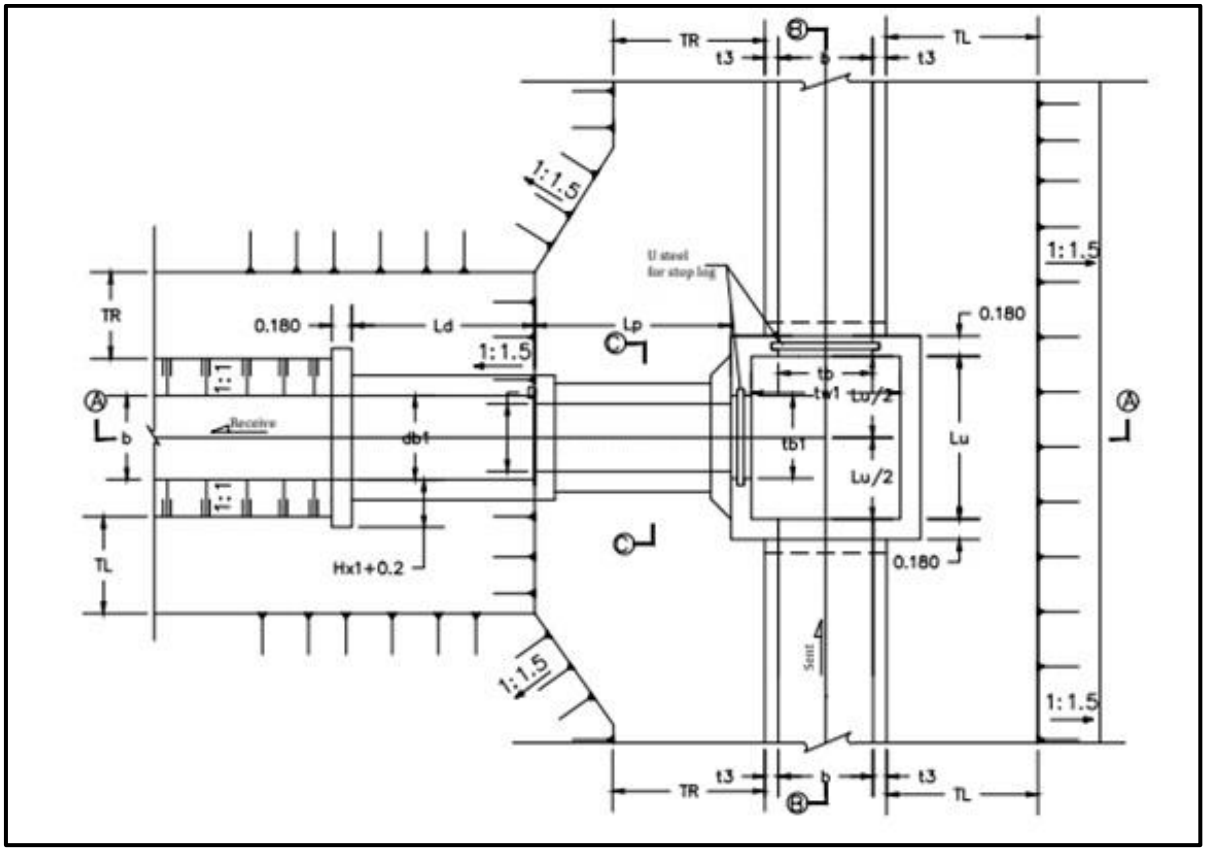


FIGURE 15. TYPICAL CROSS SECTION OF CANALS AND CANAL ELEMENTS

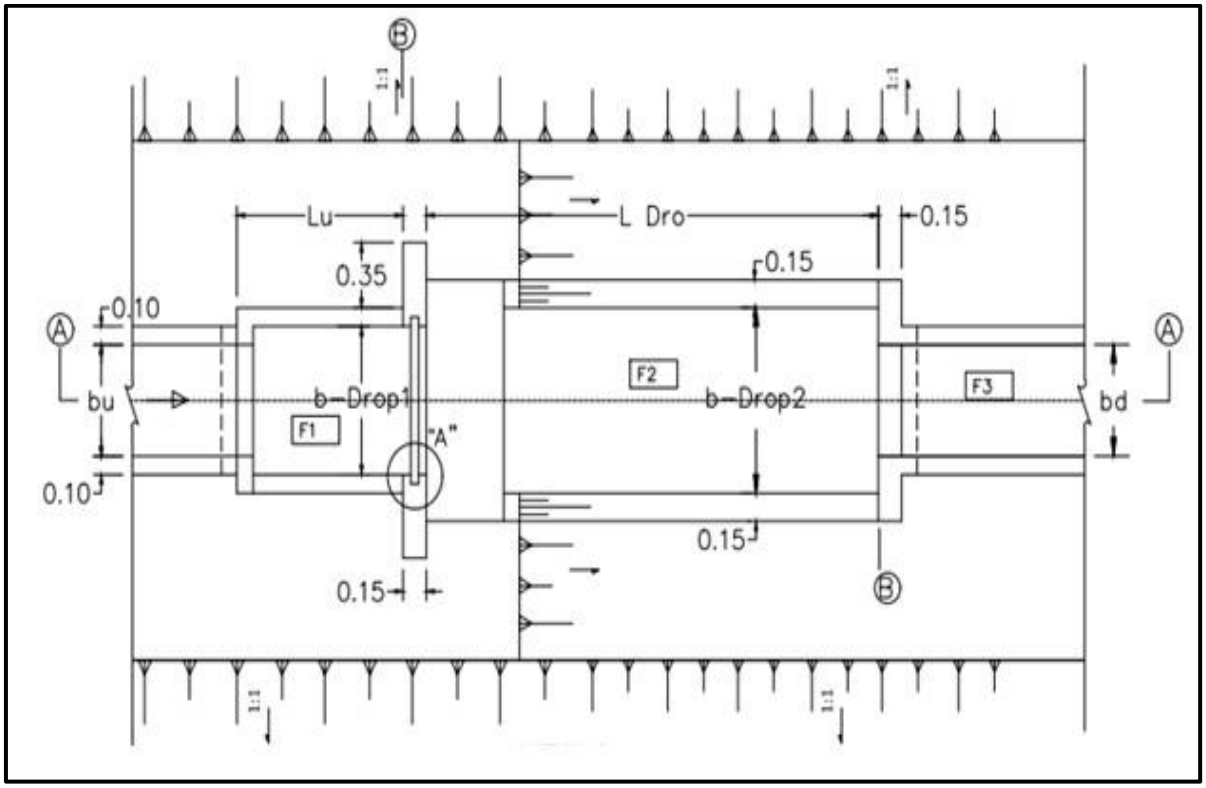
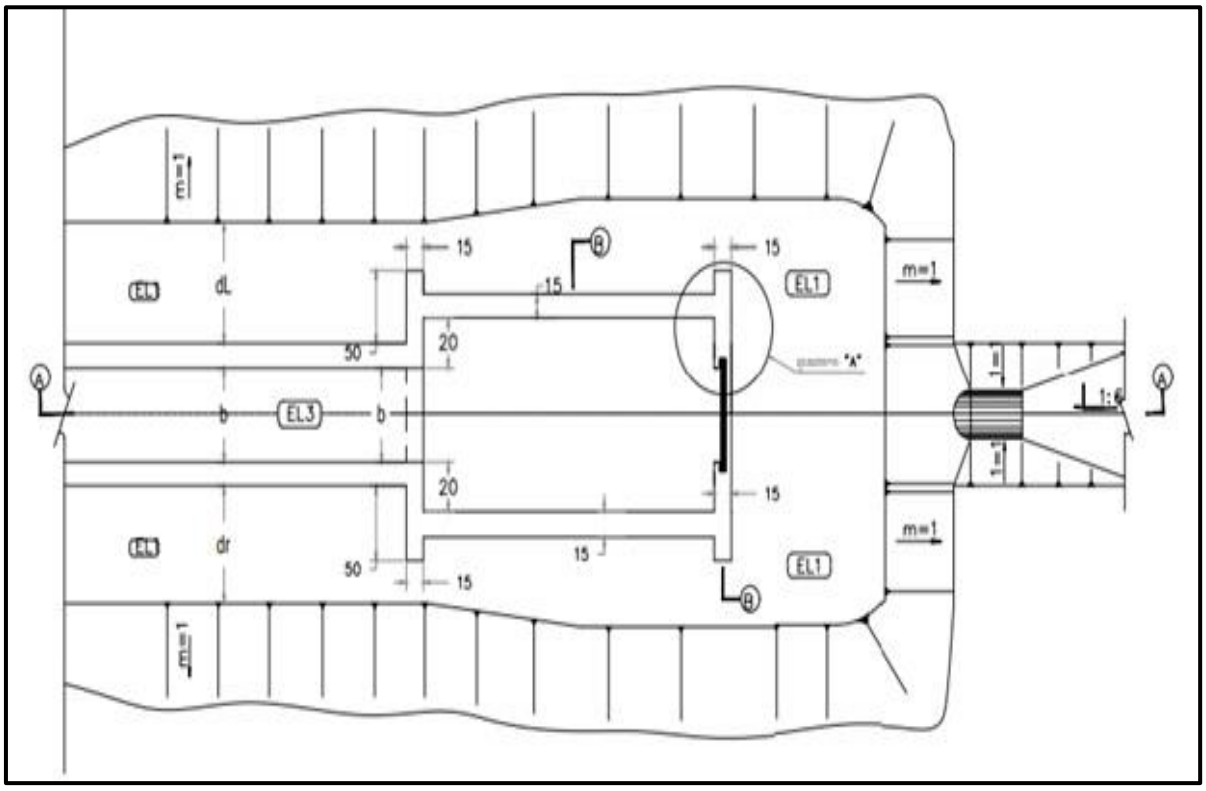


FIGURE 16. TYPICAL CROSS SECTION OF CANALS AND CANAL ELEMENTS



4.2.3 Hydrological Study

81. The requisite hydrologic study was undertaken during the design stage of the su-project. The details of this study are provided in the Feasibility Study for the proposed sub-project. It can be provided upon request. The Nam Nan River Irrigation project consists of three sub-projects, the Nam Nan 2 – Xieng Weir, Nam Nan 4 - Kheun Weir and Nam Nan 5 – Khaeh Weir.

82. The watershed and catchment area of Nam Nan 2, 4 and 5 Irrigation Sub-Project are similar with the Nam Nan 1 and 3 Irrigation Sub-Project. The Nam Nan 2, 4 and 5 Irrigation Sub-Project will benefit the villages of Nafaiy, Sibounheang, Paphai, Nalao, Simoungkhoun, Thad, Phon, Khern and Phonhin.

83. For the design, 2.50 l/s/ha was used to guarantee a sufficient water supply. The design guarantee of a safe water supply was set as P=85% of the volume. The results are shown in Table 18.

TABLE 18. WATER AVAILABILITY BY SUB-PROJECT

WATERSHED	WATERSHED AREA (KM^2)	ANNUAL VOLUME OF WATER (M^3/S)	VOLUME P=85% (M^3) *106	METHOD
Nam Nan (Xieng Weir)	136	4.32	89	Average monthly rainfall
Nam Nan (Kheun Weir)	179	5.56	117	Average monthly rainfall
Nam Nan (Khaeh Weir)	180	5.71	118	Average monthly rainfall

84. The calculation of water requirements is presented in the Feasibility Study for the proposed sub-projects and considers recent precipitation, and evaporation data. According to the parameters used in the design, the annual rainfall was set as 600 mm. The 100-year maximum flood discharge was estimated using two standard Lao methods. The results are shown in the Tables 19 to 25.

TABLE 19. MAXIMUM 100-YEAR FLOOD

NAME OF BASIN	METHOD (100-YEAR) (M^3/S)	
	SOKOLOV	PA MONG
Nam Nan - Xieng Weir	157	230
Nam Nan - Kheun Weir	187	300
Nam Nan - Khaeh Weir	208	310

TABLE 20. DETERMINATION OF YEAR-ROUND SAFE WATER SUPPLY VOLUME, NAM NAN RIVER 2 – XIENG WEIR

ATTRIBUTE	AVE	50%	75%	80%	85%	90%	95%
KP MEAN	1.00	0.96	0.75	0.70	0.65	0.61	0.56
VOLUME (10^6M^3)	136.1	130.5	101.5	95.30	89.04	82.76	76.51
WATER QUANTITY (M^3/S)	4.32	4.14	3.22	3.02	2.82	2.52	2.43

TABLE 21. DISTRIBUTION OF MONTHLY WATER FLOW IN THE YEAR (85%), NAM NAN RIVER 2 – XIENG WEIR

ATTRIBUTE	DAYS	31	28	31	30	31	30	31	31	30	31	30	31
	MONTH	1	2	3	4	5	6	7	8	9	10	11	12
	%	1.00	1.33	2.80	7.48	11.93	13.85	18.05	20.80	12.92	6.63	2.14	1.08
WATER QUANTITY Q: (M^3/S)		0.353	0.520	0.993	2.738	4.230	5.073	6.398	7.374	4.732	2.350	0.785	0.382
WATER VOLUME W: 106(M^3)		0.947	1.259	2.659	7.098	11.33	13.150	17.13	19.75	12.26	6.294	2.034	1.023

TABLE 22. DETERMINATION OF YEAR-ROUND SAFE WATER SUPPLY VOLUME, NAM NAN RIVER 4 – KHEUN WEIR

ATTRIBUTE	AVE	50%	75%	80%	85%	90%	95%
KP MEAN	1.00	0.96	0.75	0.70	0.65	0.61	0.56
VOLUME (10^6M^3)	178.7	171.3	133.3	125.0	116.8	108.65	100.4
WATER QUANTITY (M^3/S)	5.67	5.43	4.23	3.97	3.71	3.44	3.18

TABLE 23. DISTRIBUTION OF MONTHLY WATER FLOW IN THE YEAR (85%), NAM NAN RIVER 4 – KHEUN WEIR

ATTRIBUTE													
	DAYS	31	28	31	30	31	30	31	31	30	31	30	31
	MONTH	1	2	3	4	5	6	7	8	9	10	11	12
	%	1.00	1.33	2.80	7.48	11.93	13.85	18.05	20.80	12.92	6.63	2.14	1.08
WATER QUANTITY Q: (M^3/S)		0.665	0.980	1.869	5.154	7.961	9.548	12.04	13.87	8.907	4.423	1.477	0.719
WATER VOLUME W: 106(M^3)		1.781	2.370	5.005	13.35	21.32	24.749	32.25	37.17	23.08	11.84	3.829	1.926

TABLE 24. DETERMINATION OF YEAR-ROUND SAFE WATER SUPPLY VOLUME, NAM NAN RIVER 5 – KHAEH WEIR

ATTRIBUTE	AVE	50%	75%	80%	85%	90%	95%
KP MEAN	1.00	0.96	0.75	0.70	0.65	0.61	0.56
VOLUME (10^6M^3)	180.0	172.7	134.3	126.0	117.7	109.49	101.21
WATER QUANTITY (M^3/S)	5.71	5.48	4.26	4.00	3.73	3.47	3.21

TABLE 25. DISTRIBUTION OF MONTHLY WATER FLOW IN THE YEAR (85%), NAM NAN RIVER 5 – KHAEH WEIR

ATTRIBUTE													
	DAYS	31	28	31	30	31	30	31	31	30	31	30	31
	MONTH	1	2	3	4	5	6	7	8	9	10	11	12
	%	1.00	1.33	2.80	7.48	11.93	13.85	18.05	20.80	12.92	6.63	2.14	1.08
WATER QUANTITY Q: (M^3/S)		0.670	0.987	1.883	5.194	8.023	9.622	12.13	13.98	8.976	4.457	1.489	0.725
WATER VOLUME W: 106(M^3)		1.795	2.388	5.044	13.46	21.48	24.941	32.50	37.46	23.26	11.93	3.859	1.941

85. Plant water needs were recalculated considering present climate information. The plant water requirements are as follows:

- 2.50 l/s/ha for dry season rice
- 2.04 l/s/ha for rainy season rice
- 0.44 l/s/ha for dry season bean

86. The water requirements for rice fields and dry season crops use a design requirement of q=2.50 l/s/ha. The Feasibility Study provides the detailed calculations for rice fields and dry season crops. Table 26 and 27 presents the water requirements of rice and sweet corn respectively. Considering the water available, rice and other crop requirements in the dry and the rainy season, the details of the water balance are shown in Tables 28 and 29.

TABLE 26. RICE WATER REQUIREMENT (RIWR)

DAY	30	30	30	28	30	30	30	30	30	30	30	30
MONTH	11	12	1	2	3	4	5	6	7	8	9	10
PRODUCTION SEASON	DRY SEASON						RAINY SEASON					
GROWTH PERIOD		SOIL PREPARATION / SEEDING	GROWTH PERIOD	MID TERM	FINAL TERM		SOIL PREPARATION / SEEDING	GROWTH PERIOD			MID TERM	FINAL TERM
SEASONAL KC COEFFICIENT/MONTH		1.10	1.23	1.18	1.00			1.10	1.10	1.20	1.15	1.00
EVAPORATION ETO CROP (MM/M)	-	40.62	55.01	70.71	37.32			50.57	41.52	41.88	41.22	20.16
SEEDING (MM)	40.00						40.00					
SOIL SATURATED WITH WATER (MM)	200.00						200.00					
WATER INFILTRATION RATE		134.85	269.70	269.70	269.70		134.85	269.70	269.70	269.70	269.70	269.70
WATER LEVEL (MM)		100.00						50.00				
USEFUL RAIN, PE (MM/M)					12.67		103.77	124.46	169.78	199.49	114.42	46.54
RIWR (MM/M)	240.00	275.47	324.71	340.41	294.35		271.08	245.80				
RIWR (MM/D)	8.00	9.18	10.82	11.35	9.81		9.04	8.19				
EFFICIENCY OF RECEIVING WATER	0.60	0.60	0.60	0.60	0.60		0.60	0.60	0.60	0.60	0.60	0.60
AWR (L/S/HA)	1.54	1.77	2.09	2.19	1.89		1.74	1.58	-			
EFFICIENCY OF SUPPLYING WATER IN THE SUB-CANAL	0.90	0.90	0.90	0.90	0.90		0.90	0.90	0.90	0.90	0.90	0.90
SUB-CANAL WATER REQUIREMENT (L/S/HA)	1.71	1.97	2.32	2.43	2.10		1.94	1.76				
EFFICIENCY OF SUPPLYING WATER IN THE MC	0.95	0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95
MC WATER REQUIREMENT (L/S/HA)	1.80	2.07	2.44	2.56	2.21		2.04	1.85				

TABLE 27. SWEET CORN WATER REQUIREMENT

DAY	30	30	30	28	30	30	30	30	30	30	30	30
MONTH	11	12	1	2	3	4	5	6	7	8	9	10
PRODUCTION SEASON		DRY SEASON					RAINY SEASON					
GROWTH PERIOD			IS	CDS	MSS	LSS						
SEASONAL KC COEFFICIENT/MONTH	-	-	0.53	0.98	1.05		-	-	-	-	-	-
EVAPORATION ETO CROP (MM/M)	-	-	23.80	58.73	52.25		-	-	-	-	-	-
USEFUL RAIN, PE (MM/M)	-	-	-	-	12.67	55.67	103.77	124.46	169.78	199.49	114.42	46.54
CIWR (MM)	-	-	23.80	58.73	39.58		-	-	-	-	-	-
CIWR (MM/D)												
EFFICIENCY OF RECEIVING WATER	0.60	0.60	0.60	0.60	0.60		0.60	0.60	0.60	0.60	0.60	0.60
AWR (L/S/HA)	-	-	0.15	0.38	0.25		-	-	-	-	-	-
EFFICIENCY OF SUPPLYING WATER IN THE SUB-CANAL	0.90	0.90	0.90	0.90	0.90		0.90	0.90	0.90	0.90	0.90	0.90
SUB-CANAL WATER REQUIREMENT (L/S/HA)	-	-	0.17	0.42	0.28		-	-	-	-	-	-
EFFICIENCY OF SUPPLYING WATER IN THE MC	0.95	0.95	0.95	0.95	0.95		0.95	0.95	0.95	0.95	0.95	0.95
WATER REQUIREMENT THROUGH THE MC (L/S/HA)	-	-	0.18	0.44	0.30		-	-	-	-	-	-

TABLE 28. SUMMARY RESULT OF WATER BALANCE

IRRIGATION SCHEME	AREA (HA)	WATER DEMAND PER SEASON (M^3/HA)	VOLUME OF WATER	
			RAINY SEASON	DRY SEASON
NAM NAN 2 (XIENG WEIR)				
Volume of water available			61,715,500	21,537,810
Dry season	100.0	5,176	517,767	
Wet season	95.0	14.366		1,364,839
Dry Season Crops	5.0	986		4,960
Water balance	200.0		61,197,733	20,168,011
NAM NAN 4 (KHERN WEIR)				
Volume of water available			81,004,912	28,269.534
Dry season	42.0	5,176	215,171	
Wet season	35.0	14.366		502,835
Dry season Crops	6.7	986		6,479
Water balance	83.0		80,789,741	27,760,220
NAM NAN 5 (KHAEH WEIR)				
Volume of water available			81,633.174	28,488,788
Dry season	58.0	5,176	298,921	
Wet season	50.0	14.366		718,336
Dry season Crops	7.8	986		7,642
Water balance	116.0		81,334,253	27,762,809

TABLE 29. SUMMARY RESULT OF WATER DEMAND

DRY SEASON RICE							
MONTHS	**11**	**12**	**1**	**2**	**3**	**4**	**TOTAL**
Water demand RIWR (mm)	240.00	275.47	324.71	340.41	294.35		1474.944
Volume of P (mm/m)	28.90	14.53	13.44	17.88	37.78		112.561
Water coefficient	0.34	0.34	0.34	0.34			
Water P available (mm)	9.83	4.94	4.57	6.08	12.85		38.271
Net Water demand (mm)	230.17	270.52	320.14	334.33	281.51		1,436.67
Net Water demand (m^3/ha)	2,301.73	2,705.25	3,201.36	3,343.32	2,815.07		14,366.73
WET SEASON RICE							
MONTHS	**5**	**6**	**7**	**8**	**9**	**10**	**TOTAL**
Water demand RIWR (mm)	271.07	245.80			67.67	137.04	721.60
Volume of P (mm/m)	160.96	186.828			172.12	80.06	599.97
Water coefficient	0.34	0.34			0.34	0.34	
Water P avaibale (mm)	54.7				58.52	27.22	203.99
Net Water demand (mm)	216.35	182.28			9.15	109.83	517316
Net Water demand (m^3/ha)	2163.49	1822.82			91.54	1098.27	5,176.12
OTHER CROPS - DRY SEASON							
MONTHS	**1**	**2**	**3**	**4**	**5**	**6**	**TOTAL**
Water demand for RIWR (mm)	23.80	58.73	39.58				122.11
Volume of P (mm/m)	13.45	17.89	37.78				69.12
Water coefficient	0.34	0.34	0.34				
Water P available (mm)	4.57	6.08	12.85				23.50
Net Water demand (mm)	19.23	52.65	26.74				98.61
Net Water demand (m^3/ha)	192.27	526.47	267.37				986.11

87. Figures 17 to 19 shows the command area of the Nam Nan River 2, Nam Nan 4 and Nam Nan River 5 Irrigation Systems respectively. Plates 6 to 8 presents the imageries of the location of the Nam Nan River 2, Nam Nan 4 and Nam Nan River 5 Irrigation Systems respectively while Plates 9 and 11 shows the photos of the proposed Nam Nan River 2, Nam Nan 4 and Nam Nan River 5 Irrigation Systems respectively.

FIGURE 17. COMMAND AREA, NAM NAN 2 IRRIGATION SYSTEMS SUB-PROJECT - XIENG WEIR

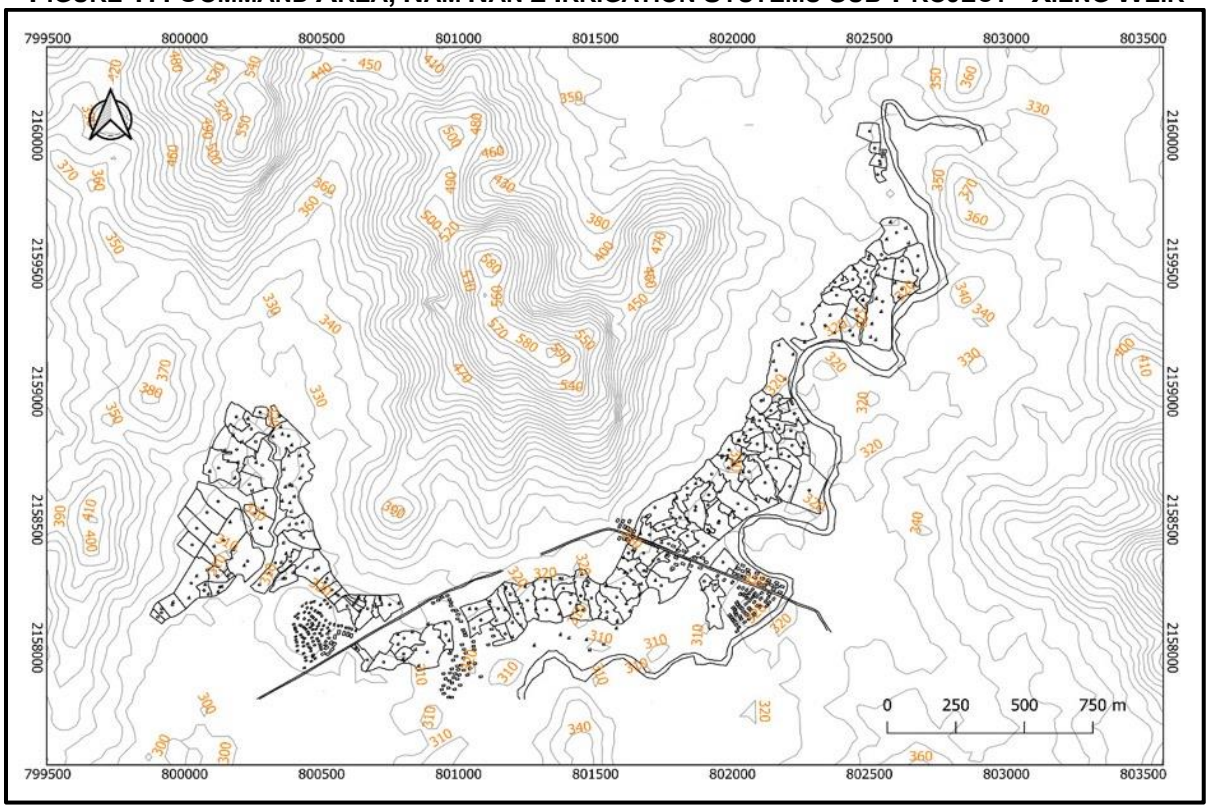


FIGURE 18. COMMAND AREA, NAM NAN 4 IRRIGATION SYSTEMS SUB-PROJECT - KHERN WEIR

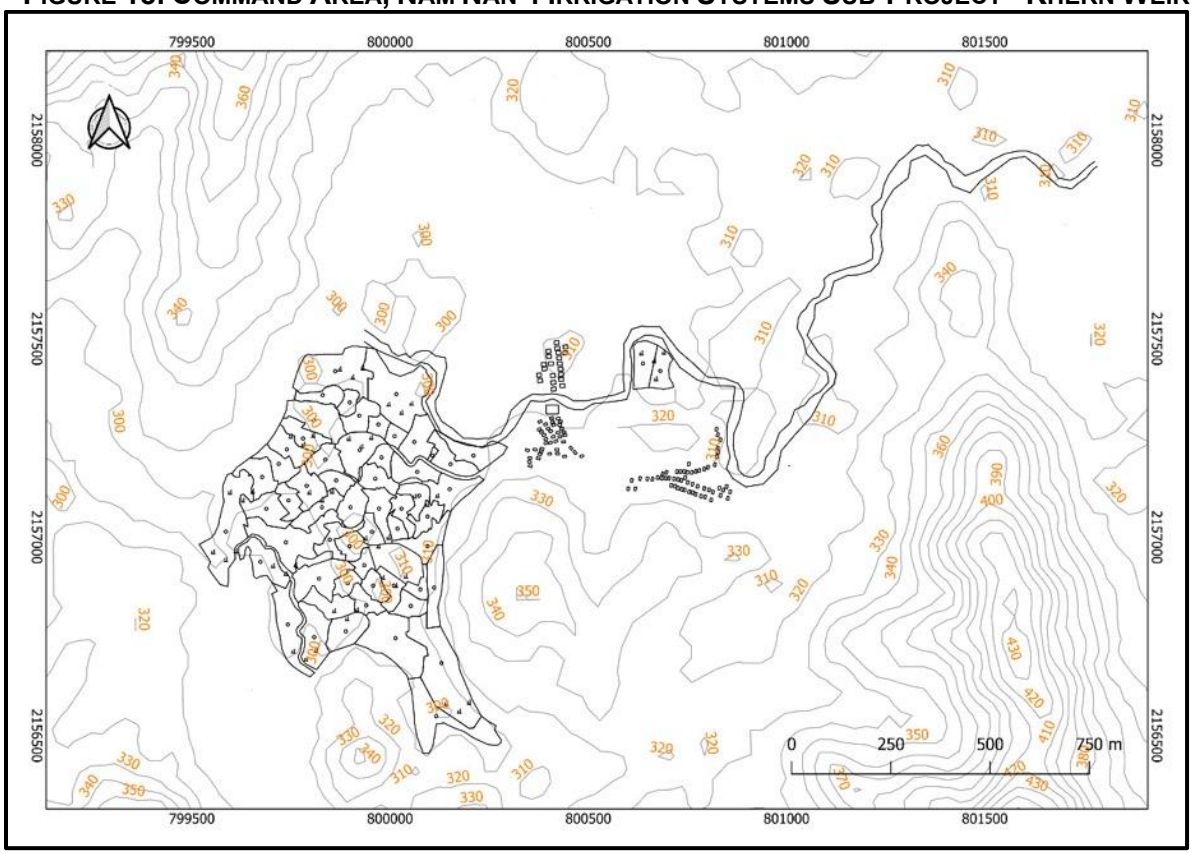


FIGURE 19. COMMAND AREA, NAM NAN 5 IRRIGATION SYSTEMS SUB-PROJECT - KHAE WEIR

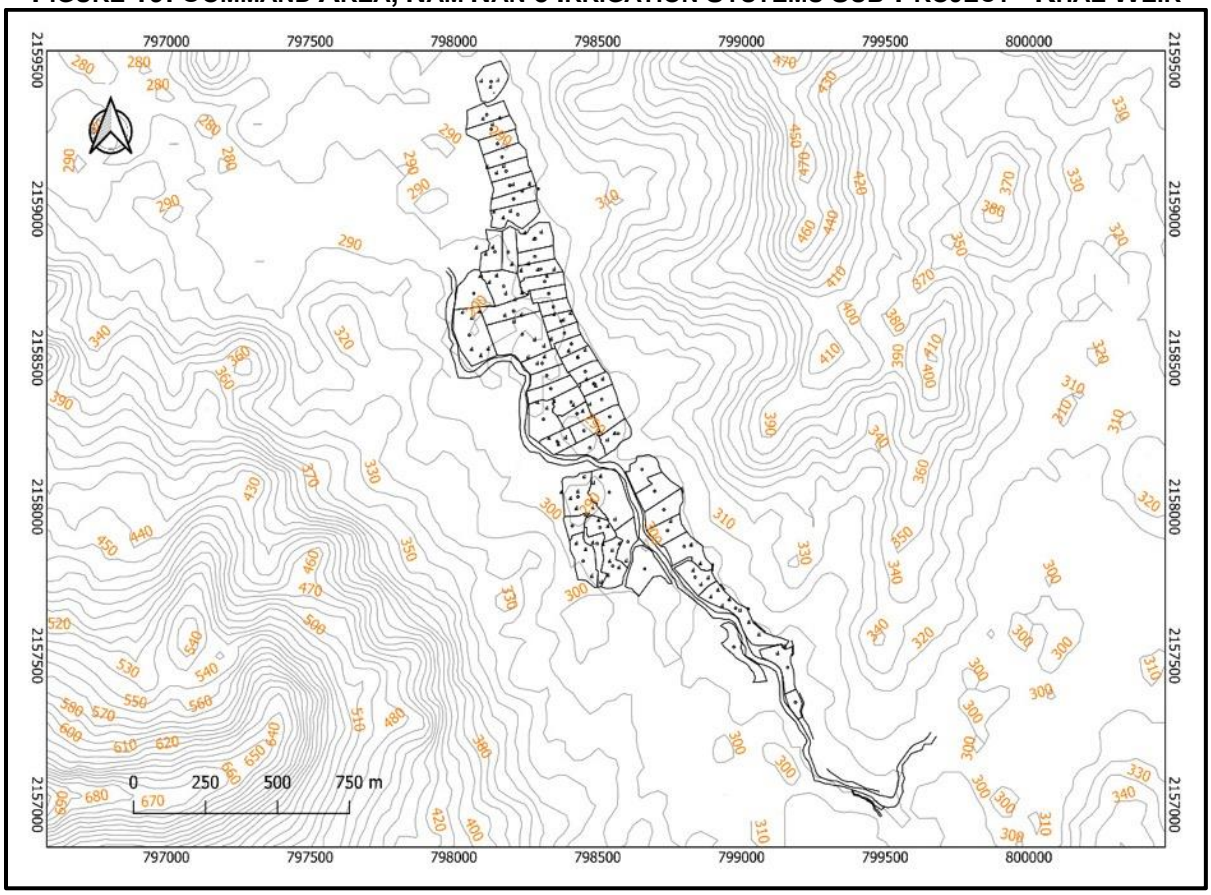


PLATE 6. IMAGERY OF THE LOCATION OF THE PROPOSED NAM NAN 2 IRRIGATION SYSTEM SUB-PROJECT

PLATE 7. IMAGERY OF THE LOCATION OF THE PROPOSED NAM NAN 4 IRRIGATION SYSTEM SUB-PROJECT

PLATE 8. IMAGERY OF THE LOCATION OF THE PROPOSED NAM NAN 5 IRRIGATION SYSTEM SUB-PROJECT

PLATE 9. PHOTOS OF PROPOSED NAM NAN 2 - XIENG WEIR SUB-PROJECT

PLATE 10. PHOTOS OF PROPOSED NAM NAN 4 - KHERN WEIR SUB-PROJECT

PLATE 11. PHOTOS OF PROPOSED NAM NAN 5 - KHAE WEIR SUB-PROJECT

5 DESCRIPTION OF THE ENVIRONMENT

5.1 PHYSICAL RESOURCES

88. The sub-project area is located in Nan District about 75 km from the Luang Prabang city center by the road number 4. Nan District is bounded on the North by Xieng Ngern District and Luang Prabang City, Maed District- and Vientiane Province to the South, Phoukhounm District to the East and Xayabouly Province to the West.

89. Nan District has a mountainous topography with elevations of 273 AMSL to 1,800 AMSL. Nam Nan River has a year-round water flow as the district receives an annual average rainfall of 1000-2000mm.

90. Luang Prabang Province is the central province of northern part of Laos. Nan district is located in the South of Luang Prabang city center about 75 Km. The landscape contains a gradient influenced by shifting cultivation for upland rice. It comprises a few plantations such as agarwood, teak and rubber, as well as livestock and more intensive farming.

5.2 GEOLOGY AND NATURAL HAZARDS

91. Luang Prabang Province is not among the areas vulnerable to earthquake hazards. Eight rivers have been identified as being at particular risk of causing flooding throughout the country but the Nam Nan River is not included in the identified rivers that cause extreme flooding. The topography within the province is characterized by mountainous terrain and narrow river valleys and is typical of the northern uplands of Laos, however it is not prone to landslides.

5.3 AIR QUALITY AND NOISE

92. Air quality in Luang Prabang Province is generally good. There are no industries producing discharges/emissions which result in atmospheric pollution and pollution from vehicular exhaust emissions are not significant given the low levels of traffic and absence of any traffic congestion. The only detrimental effect on air quality is the dust arising from the passage of vehicles over unsealed roads during the dry season. This is an intermittent problem with a minor effect over a limited area of 5 to 10 meters either side of the road. The locations of the project components are relatively far from noise generating activities. There are no industries within the proposed sites so ambient noise levels can be considered very well.

5.4 CLIMATE

93. The meteorological condition in Nan District is typical of the other districts in the northern part of Laos with the average temperature of 26^{0}C with 5.0^{0}C and 40.0^{0}C degrees for the lowest and highest temperature. The climate in Luang Prabang Province is characterized by two seasons, the dry and wet seasons. The dry season occurs between October and March while the wet season occurs between April and September. Table 30 below provides the Monthly Rainfall in Luang Prabang for the period 1971 to 2016.

TABLE 30. MONTHLY RAINFALL (MM), LUANG PRABANG 1971-2016

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1971	4.1	9.3	5.2	-	149.0	212.1	482.7	312.6	47.3	12.9	-	5.9	1,241.1
1972	13.0	52.1	27.0	149.9	65.7	33.7	141.8	210.4	144.6	138.7	63.5	1.8	1,042.2
1973	-	1.9	61.9	69.0	106.0	51.6	324.2	407.7	346.3	66.2	2.8	-	1,437.6
1974	8.7	-	44.9	164.9	102.0	90.6	184.2	304.6	144.3	86.1	4.7	4.0	1,139.0
1975	54.9	17.0	37.6	19.4	190.8	52.9	302.7	273.2	196.7	93.1	14.9	9.1	1,262.3
1976	2.3	69.2	4.7	112.4	170.4	191.9	200.7	267.4	269.0	120.4	55.5	-	1,463.9
1977	26.0	-	17.6	99.1	140.6	57.0	359.7	219.1	158.1	235.5	94.0	57.2	1,463.9
1978	20.2	37.4	11.4	121.9	174.2	246.0	294.9	293.4	191.7	245.5	-	-	1,636.6
1979	43.8	50.2	-	109.3	271.5	237.4	183.5	319.0	49.5	97.4	-	-	1,361.6
1980	0.2	37.2	-	63.8	130.5	330.9	255.2	254.1	258.8	115.9	22.0	16.6	1,485.2
1981	-	-	11.8	208.4	277.5	210.9	282.6	279.2	174.8	355.1	31.3	-	1,831.6
1982	12.2	1.0	23.5	127.4	225.4	193.4	156.4	232.5	174.6	28.9	35.8	-	1,211.1
1983	50.2	34.4	44.5	28.2	169.0	199.1	223.8	359.2	56.9	95.7	44.3	24.5	1,329.8
1984	-	4.9	34.8	43.9	124.9	171.8	137.4	290.7	103.2	169.6	1.1	-	1,082.3
1985	4.9	31.7	17.7	132.3	128.8	116.1	141.8	292.6	103.7	22.4	101.5	-	1,093.5
1986	-	-	10.4	267.3	214.9	373.4	352.0	210.4	62.0	267.2	-	27.5	1,785.1
1987	2.2	29.0	-	145.5	57.4	122.5	180.2	193.5	130.9	28.1	98.9	-	988.2
1988	0.8	31.7	1.5	155.8	173.8	141.1	240.4	181.4	39.2	174.7	15.3	-	1,155.7
1989	13.7	-	69.1	-	156.3	154.2	287.4	288.9	160.8	130.5	-	-	1,260.9
1990	9.7	50.6	77.8	127.9	114.0	193.2	329.3	208.3	262.4	61.1	199.4	-	1,633.7
1991	9.9	-	47.5	32.6	169.8	103.0	179.7	267.2	206.4	21.8	19.4	6.3	1,063.6
1992	19.3	91.1	-	49.7	65.7	124.6	297.1	283.7	92.9	58.4	9.5	137.2	1,229.2
1993	-	-	76.8	80.7	146.1	212.5	263.5	189.5	100.6	118.6	-	1.0	1,189.3
1994	-	5.4	110.7	19.2	170.2	243.6	202.5	366.1	151.6	31.6	18.5	81.6	1,401.0
1995	7.5	4.8	8.7	49.0	201.5	239.4	331.4	541.5	118.8	167.0	71.3	7.0	1,747.9
1996	-	22.0	38.9	147.2	151.6	219.9	291.8	302.4	176.6	185.0	61.2	-	1,596.6
1997	1.5	0.4	56.9	105.7	144.3	147.7	311.6	258.5	128.4	40.1	2.4	-	1,197.5
1998	27.0	2.2	33.0	178.1	160.9	138.2	179.4	265.4	99.4	47.1	25.5	7.5	1,163.7
1999	9.0	-	44.1	60.3	203.5	281.1	73.9	285.0	197.5	97.9	54.9	24.5	1,331.7
2000	-	35.3	11.5	68.0	243.5	269.1	274.4	233.9	228.4	115.6	-	7.0	1,486.7
2001	8.1	-	155.9	53.0	191.9	156.8	393.1	395.7	246.2	192.3	2.0	-	1,795.0
2002	48.5	1.1	24.0	55.5	268.8	155.6	384.4	258.9	161.4	71.0	75.7	96.9	1,601.8
2003	14.6	19.5	76.6	140.0	68.2	315.4	195.5	313.6	222.6	35.0	-	-	1,401.0
2004	15.3	-	-	143.1	240.5	208.4	286.9	233.0	152.2	165.5	27.8	-	1,472.7
2005	-	10.0	82.2	55.8	134.9	307.0	296.8	269.6	200.9	23.1	31.3	23.4	1,435.0
2006	-	17.5	73.9	82.9	93.7	78.1	306.9	266.3	164.1	122.5	-	-	1,205.9
2007	1.0	12.2	30.4	118.7	125.0	138.2	146.9	242.7	256.0	117.2	37.0	-	1,225.3
2008	50.4	60.6	136.6	166.5	154.7	230.6	357.9	272.9	171.3	73.8	13.4	20.0	1,708.7
2009	0.0	0.7	23.6	112.1	127.0	218.2	373.2	169.8	147.2	78.6	9.0	-	1,259.4
2010	23.4	-	24.6	198.4	115.5	146.4	321.1	372.4	90.4	19.2	-	57.2	1,368.6
2011	6.7	-	121.6	127.0	272.3	520.2	291.1	532.5	269.1	83.8	9.2	-	2,233.5
2012	10.8	-	27.7	174.7	226.3	321.5	306.0	337.0	106.8	102.5	118.3	1.4	1,733.0
2013	28.0	1.5	67.5	93.8	141.1	244.6	288.9	394.1	332.9	124.4	28.0	56.9	1,801.7
2014	-	-	15.6	54.7	119.0	205.4	198.3	273.1	470.4	79.7	52.3	-	1,468.5
2015	60.7	72.4	27.4	136.6	87.4	129.1	238.6	428.1	158.2	90.1	28.4	110.1	1,567.1
2016	82.6	2.5	-	123.7	220.9	225.1	232.8	410.6	332.8	8.2	70.9	-	1,710.1
Average	15.0	17.8	39.5	103.8	160.6	194.8	262.7	294.8	175.2	104.7	33.7	17.1	1,419.6
Minimum	0.0	0.0	0.0	0.0	57.4	33.7	73.9	169.8	39.2	8.2	0.0	0.0	988.2
Maximum	82.6	91.1	155.9	267.3	277.5	520.2	482.7	541.5	470.4	355.1	199.4	137.2	2,233.5

5.5 WATER RESOURCES

94. The main water resource supplying the sub-project is the Nam Nan River. It is the longest waterway and covers the majority of the area of the Nan District. During the feasibility study, the requisite water assessment was undertaken on the Nam Nan River. The results of the assessment showed that the water discharge during the dry season (February to May) of Nam Nan River is estimated at 0.8m^3/s. This volume is sufficient to supply the identified command area during the dry season. Table 31 below present the results of the monitoring undertaken for water level and discharge on the Nam Nan River for the period February to May 2019.

TABLE 31. WATER LEVEL AND DISCHARGE OF NAM NAN RIVER, FEBRUARY TO MAY 2019

DATE	QM³/S	DATE	QM³/S	DATE	QM³/S	DATE	QM³/S
14/02/2019	1.25	14/02/2020	1.22	14/02/2021	1.2	14/02/2022	1.2
17/02/2019	1.11	17/02/2020	1.09	17/02/2021	1.07	17/02/2022	1.07
13/03/2019	0.89	13/03/2020	0.87	13/03/2021	0.85	13/03/2022	0.85
16/03/2019	0.86	16/03/2020	0.84	16/03/2021	0.82	16/03/2022	0.82
14/04/2019	0.77	14/04/2020	0.75	14/04/2021	0.73	14/04/2022	0.73
18/04/2019	0.77	18/04/2020	0.75	18/04/2021	0.73	18/04/2022	0.73
14/05/2019	0.75	18/05/2020	0.73	14/05/2021	0.71	14/05/2022	0.71
23/05/2019	0.7	23/05/2020	0.68	23/05/2021	0.6	23/05/2022	0.66
Qav	0.88		0.86		0.84		0.85

5.6 ECOLOGICAL RESOURCES

95. There are no components of the proposed development that will be located within a protected, conservation or biodiversity area. The nearest bio-diversity/protected areas in the proposed sub-project area is the Nam Phouy National Biodiversity Conservation Area which is approximately 67.92 kilometres at the nearest point from the proposed sub-project areas. See Plate 12.

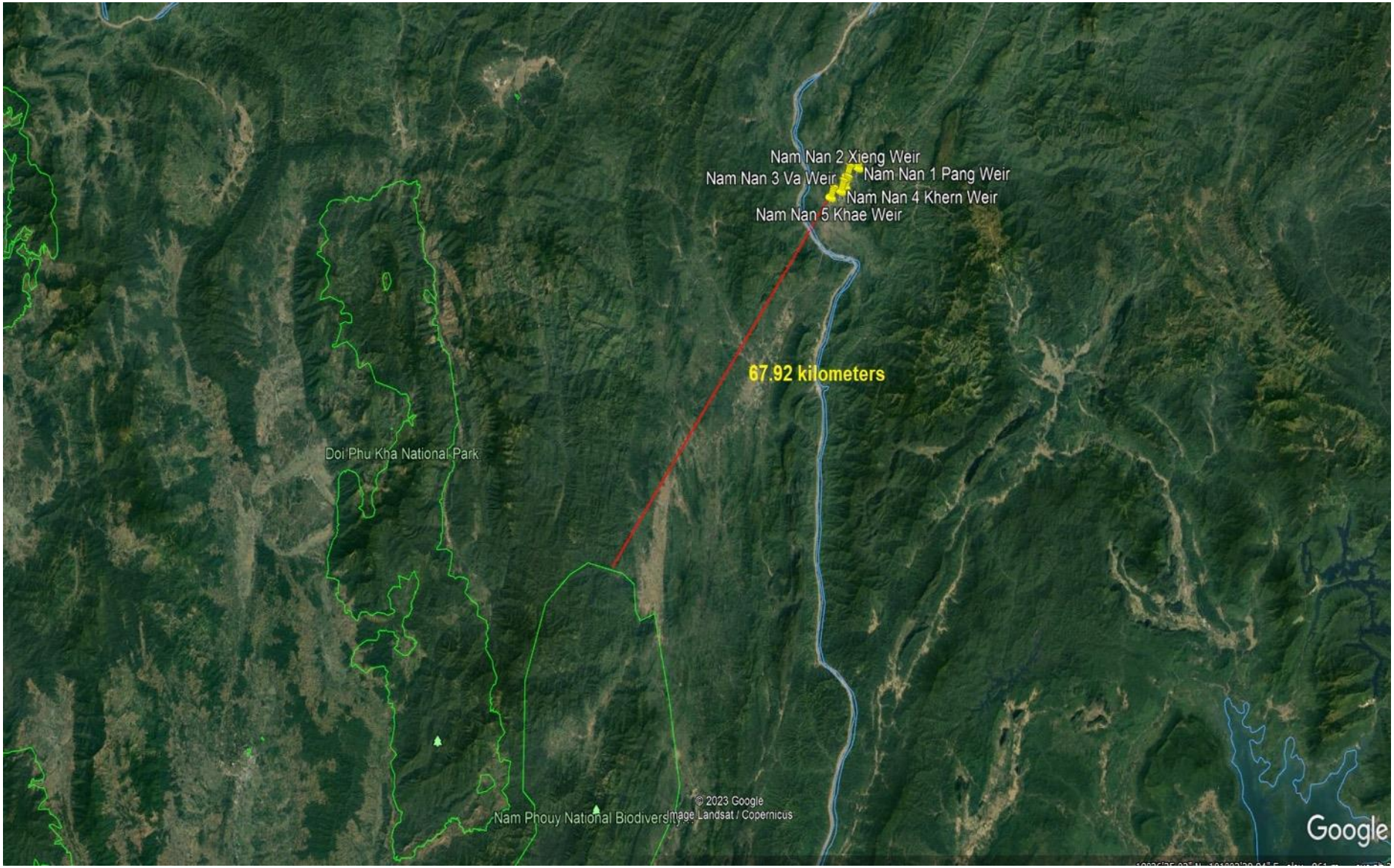
5.7 HISTORICAL AND ARCHAEOLOGICAL SITES

96. There are no sites of archaeological or cultural significance within and around the areas of the proposed development. The project components will not affect any historical and archaeological sites such as temples and burial sites.

5.8 UNEXPLODED ORDNANCE

97. The PAFO Luang Prabang has commissioned a survey to be conducted on the presence of unexploded ordnance (UXO) in the proposed sub-project areas. The survey revealed that there are no UXO remaining in the area. Local residents also reported no known occurrence of UXO in the vicinity of the proposed developments. The certification is attached here as Appendix C.

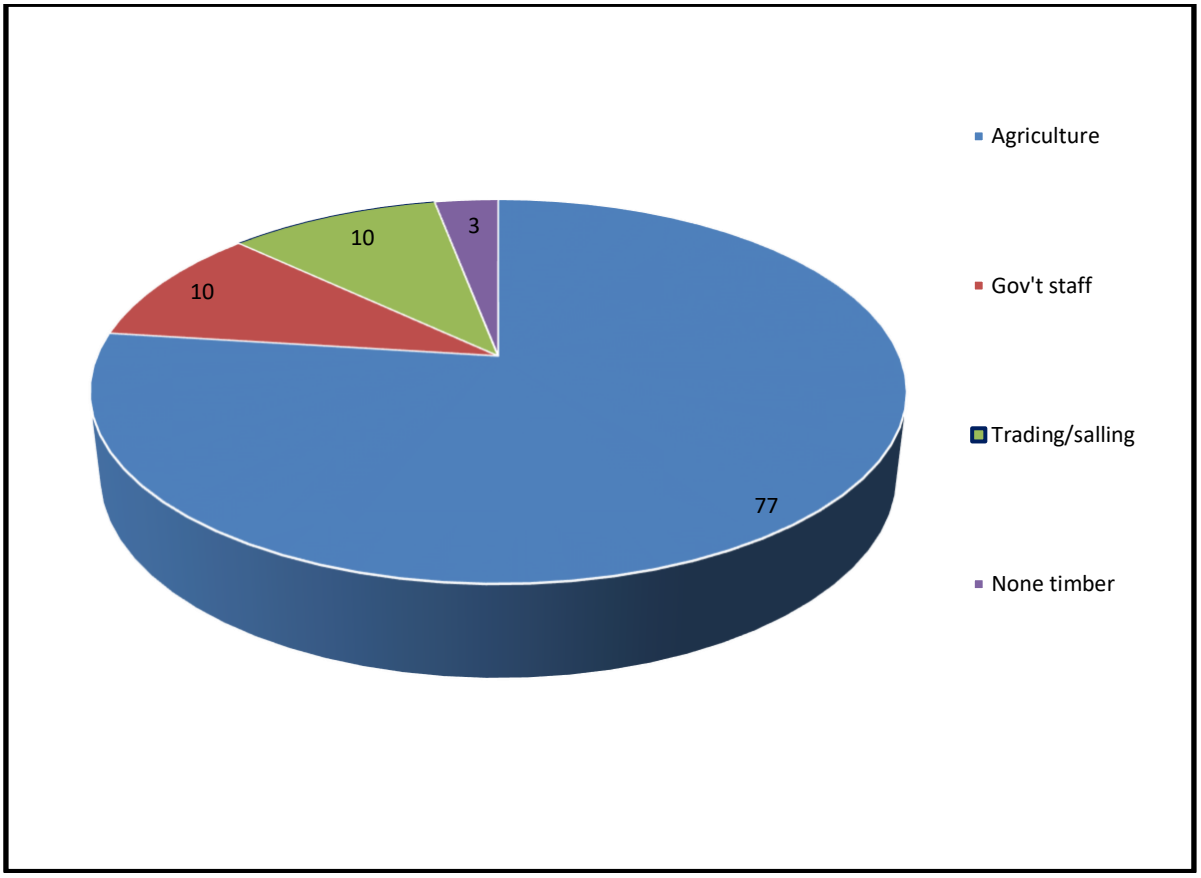
PLATE 12. LOCATION MAP OF NAM PHOUY NATIONAL BIODIVERSITY CONSERVATION AREA FROM PROPOSED SUB-PROJECTS



5.9 SOCIO-ECONOMIC CONDITIONS

98. The main income of the people in the project areas is from agriculture accounting for 77% of the total population while 9.88% of the population work in the government and 9.55% of the population are into trading. See Plate 13. The average income of the family is about 3,500 USD per year. There are 6 primary and 1 secondary schools, 1 hospital, 2 markets and 6 guesthouses in the project areas.

PLATE 13. OCCUPATION OF HEADS OF HOUSEHOLDS AND SPOUSES IN THE SUB-PROJECT



5.9.1 Population

99. From the social and economic survey conducted by the project in 2021, there are 6,632 people in the proposed sub-project areas of which 3,652 are females. Table 32 below presents the population in the proposed sub-project areas.

TABLE 32. POPULATION OF THE PROPOSED SUB-PROJECT AREAS

NO	VILLAGE	NO. OF FAMILY	FEMALE	TOTAL
1	Sibounheuang	207	558	1124
2	Paphai	190	499	358
3	Nakhern	261	721	1421
4	Thad	143	410	799
5	Phon	156	352	753
6	Nalao	159	418	846
7	Naphay	281	694	1331
TOTAL		**1397**	**3652**	**6632**

Source: Socio Economic Survey, SRIWMSP 2021

5.9.2 Ethnicity

100. The main ethnic group in the sub-project areas is Lao-Tai. Other ethnic groups such as Tai-Deng, Yao, Hmong and Khmu are also present in the proposed sub-projects areas. Table 33 below shows the population of the ethnic groups in the proposed sub-project areas.

TABLE 33. POPULATION AND ETHNICITY (BY MAIN ETHNO-LINGUISTIC GROUP)[2],

NO	VILLAGE	LAO-TAI	TAI-DENG	HMONG	YAO	KHMU
1	Sibounheuang	207	0	0	0	0
2	Paphai	165	1	2	22	0
3	Nakhern	255	0	0	5	1
4	Thad	136	0	0	6	1
5	Phon	156	0	0	0	0
6	Nalao	159	0	0	0	0
7	Naphay	274	0	0	3	4
TOTAL (FAMILY)		1352	1	2	36	6

5.9.3 Income and Poverty Levels

101. The income of the communities in the sub-project areas are mainly sourced from the agricultural sector. The poverty level in the sub-project areas is moderate with about 60% of the total population of the sub-project areas above the poverty line as per UNDP standard. Table 34 shows the household income in the Sub-Project Villages.

TABLE 34. HOUSEHOLD INCOME IN SUB-PROJECT VILLAGES

VILLAGE	INCOME (LAK)			
	TOTAL INCOME/YR	FAMILY INCOME/YR	CAPITA/YR	PERSON/M
Nalao	13,000,000,000	81,761,006	2,700,000	391,000
Thad	11,704,200,000	71,465,806	14,400,000	1,200,000
Nakhern	14,315,885,000	10,117,223	10,829,000	902,416
Sibounheuang	16,979,802,867	82,028,033	15,707,600	1,308,000
Paphai	8,387,260,000	45,336,540	8,620,000	718,333
Phon	9,390,000,000	62,500,000	12,120,000	1,010,000
Naphay	4,760,000,000	20,000,000	3,471,918	289,326

6 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

102. The environmental impacts were evaluated in the areas of influence at the subproject component sites. At the headworks, the area of influence includes the upstream and downstream sections from the headworks considering the potential effects to water quality, sustainability of the water supply source, and potential conflict on river water use. At the locations of the main and secondary canals, the affected area may extend to an average of 1-50 meters along the excavated area of the canals.

103. At the proposed sites, temporary disruption and nuisance impacts may be experienced, mainly during the construction and rehabilitation/upgrading period. These affected areas may experience direct impacts associated with temporary disturbance from construction activities. The potential environmental impacts were identified based on the project activities that may occur in each component and evaluation of the environmental and social baseline situation at the subproject area. The identification of environmental impacts was mainly based on the technical information related to project component design and operation, field visits, information from stakeholders, and feasibility study.

[2] *Data from District Government*

6.1 ENVIRONMENTAL IMPACTS RELATED TO LOCATION (PRE-CONSTRUCTION PHASE)

6.1.1 Impact on Community Assets

104. There will be no land acquisition required for the development of the requisite project component facilities. Likewise, it is anticipated that there will be minimal acquisition required for temporary use of land or loss or damage to assets. The Compensation Plan for the subproject has been prepared separately to ensure that any loss of land, trees or damage to property will be subject to compensation in accordance with the existing regulations of the National Government and the safeguards requirements of the Bank.

6.1.2 Impact on Natural Resources and Protected Areas

105. The location of the proposed sub-projects and its components will have no impact on any Biodiversity, Conservation or Protected Areas. The nearest bio-diversity/protected area is the Doi Phu Kha National Park which is an estimated 60 kilometres from the nearest proposed sub-project.

6.1.3 Impact on Historical and Archaeological Sites

106. The proposed subprojects will not affect nor impact any historical, archaeological or culturally important sites as there are no historically/culturally/archeologically important areas within or around the proposed sub-project areas. Should there be accidental finds during the implementation of the works, all activities will be halted and the concerned Lao Government Agencies notified for proper disposition and handling of the artefacts and relics.

6.2 ENVIRONMENTAL IMPACTS DURING CONSTRUCTION, REHABILITATION/UPGRADING

107. Construction and rehabilitation/upgrading activities that may be undertaken for the proposed subprojects would include land clearing, excavation, filling, disposal of excavated soil and movement of construction vehicles, operation of heavy equipment, and operation of worker camps. The works for the proposed sub-projects are expected to generate the following adverse impacts:

- Loss of vegetation as a result of clearing and grubbing
- Contamination of raw water source
- Generation of excavated material
- Runoff of silt
- Temporary loss of access to houses and establishments
- Occurrence of acute increase in ambient Noise
- Acute increase in generation of dust
- Generation of wastes, i.e. domestic wastewater, solid and hazardous wastes
- Community hazards as a result of open excavations
- Hazards to occupational health and safety.

108. It should be noted that during the conduct of the works, there will be no diversion or cutting of the water flow as this is not necessary. The mitigation measures to address the adverse environmental impacts during the construction phase of the subproject implementation are discussed in the succeeding sections. The Subprojects will conform to the Environmental, Health, and Safety General Guidelines of 30 April 2007 (IFC-WB).

6.2.1 Air Pollution

109. The potential sources of air pollution during the construction and rehabilitation/upgrading activities stage include dust from earth works concentrated within a 50-meter radius of the work site; emissions from the operation of construction equipment and machineries; fugitive emissions from vehicles plying the area; fugitive emissions during the transport of construction materials; and localised increased traffic congestion in work areas. Most of the emissions will be in the form of coarse particulate matter and will settle down in close vicinity of the work sites.

110. The impacts will be minor, local, short-term, direct and reversible. The best management practices will be adopted during conduct of the works to minimize dust and release of combustion emissions from operation of the requisite heavy equipment and machineries. Excavated material and stockpiles will be kept moist while transport vehicles will be required to install tarpaulin covers or other suitable material to prevent spillage of the hauled materials.

111. Furthermore, construction equipment and vehicles will, at all times, be well maintained and in good working condition to reduce fugitive emissions. Speed limits on areas will be imposed to minimize dust emission and to reduce the risk of traffic accidents in the work sites. Information about planned construction activities will be provided to residents in the area and will be planned to minimize public disturbance and nuisance.

112. Moreover, spraying of unpaved areas shall be undertaken at least twice a day or as required especially in areas where haul vehicles and heavy equipment operate and areas in close proximity to settlement areas. This is undertaken to minimize, or if at all possible, eliminate the generate of dust/suspended particulates.

6.2.2 Noise

113. Construction and rehabilitation/upgrading activities may cause noise and vibration impacts for a short duration. The operation of equipment may cause nuisance to adjacent residential houses. Diesel generators will also be required during the works. Ambient Noise levels in these areas may reach 88dBA at a distance of about 15m away from the source or operation of equipment. Along the haul roads, the average ambient noise level will also experience an acute increase because of increased vehicular traffic.

114. As mitigation for the adverse impacts identified, work at the sites will be limited only during the daytime from 0700H to 1800H. There will no works that will be permitted beyond this period. Furthermore, the community will be provided with updated information about the schedule of the construction activities through billboards/sign. Stationary equipment like the diesel generators will be installed as far as practical from sensitive receptors. Buffers will also be established, especially in sensitive areas, as further mitigation.

6.2.3 Impact on Ecological Resources

115. During the implementation of the construction activities, workers and labourers of the contractors may undertake hunting of wildlife and cutting of wood. The contractors will be instructed to orient their workers and staff that such activities are strictly prohibited. The contractors is responsible for the provision of the requisite kitchen facilities, food and cooking fuel for their workers and staff.

6.2.4 Clearing of Vegetation

116. The construction and rehabilitation/upgrading works will require the clearing and grubbing of the sites. The impact of the clearing and grubbing works will be minimal because there will be minimal area that will be cleared as the works will mainly be in the existing headworks in the Nam Nan River. The requisite roads and paths will be established with limited width enough only to accommodate vehicles and equipment for construction and operation. This is to minimize the impact on the receiving environment. The vegetative cover that will be cleared will be disposed in the existing disposal facility of the district. The volume of the cleared material is not expected to be substantial as the works will mainly be in the existing headworks in the Nam Nan River. Upon completion of works, the exposed surfaces will be planted with the appropriate vegetation to prevent soil erosion.

6.2.5 Water Pollution

6.2.5.1 Impacts of Sediment Runoff

117. The construction and rehabilitation/upgrading of the facilities may result in erosion of unstable areas during earthworks, especially during heavy rainfall events. Sedimentation of nearby watercourses and channels from runoff heavily laden with material from the work sites may occur as a result of the works. These impacts are transient and short-term. As mitigation, the contractors will be required to implement proper measures which would include the provision of silt traps, ditches, and sump pits to intercept the flow silt laden runoff from the worksites into the nearby channels and watercourses. Moreover, activities, especially earthworks, will be scheduled during the dry season or be stopped during heavy rainfall.

6.2.5.2 Domestic Wastewater from Contractors Facilities and Worker's Camps

118. The contractor and workers camps will generate domestic wastewater. Contamination of surface and groundwater sources and surrounding land is a potential risk that should be addressed accordingly by the contractor. Potential adverse impacts are minimal and temporal in duration and can be readily mitigated through measures established in the EMP. Proper management of the domestic wastewater from the contractor's facilities and workers camps should be undertaken at all times. Appropriate latrines shall be installed in the camps and facilities of the Contractors.

6.2.6 Generation of Construction Wastes

6.2.6.1 Excavated Soil

119. The construction and rehabilitation/upgrading works will require excavation and levelling works. Excavated materials will also be generated. The excavated materials will be utilized as backfill in the other work sites where required. Any surplus material will be disposed properly and given for free to interested villagers as backfill materials in coordination with the village authority. There is no anticipated need for spoil disposal sites.

6.2.6.2 Domestic Waste

120. Solid waste will be generated at the work sites and the worker's camp. Wastes may include domestic solid waste, inert construction waste, and hazardous waste. Domestic waste is not anticipated to be a significant volume as only small temporary camps will be established at the sites. It is projected that the temporary camps will generate an estimated 0.4 to 0.5 kg/person/day and would consist mainly of plastic and glass bottles, paper, cardboard, food wastes, and packaging wastes. This will be collected and properly disposed in the approved disposal facility of the Townships.

6.2.6.3 Inert Construction Waste

121. The inert waste that will be generated during the works will consist mainly of scrap wood and metal, cement bags, aggregates and concrete debris. These wastes are generally disposed of and/or land filled in appropriate sites and represents no direct danger to health. The scrap metal and wood can be collected for recycling.

6.2.7 Impact on Community Health and Safety

122. During the works, the community may be exposed to the health and safety risks from increased vehicular movements in the area, open excavation and operation of heavy equipment. As mitigation and to prevent accidents and hazards to motorists, pedestrians and residents in the area of the worksites, barricades and wood/steel plate covers will be provided in open excavations during non-working time. The worksites will be properly secured with fences and access to the area restricted. The contractor is to ensure that all vehicles and transport equipment and materials that may be required to pass through villages are operated safely without endangering these communities. All loads are to be secured and all loads with fugitive materials (e.g. excavated soil and sand) are to be covered with tarpaulins. The contractor is to immediately remove any drivers that ignore any of the community safety requirements. The required warning signage will be installed in all the worksites.

6.2.8 Occupational Health and Safety

123. During the construction and rehabilitation/upgrading phase, the implementation of the works may result in hazards to the safety of workers such as tripping, slippery surfaces, carrying heavy loads, and during operation of machines and equipment. The contractor will be required to prepare a site safety plan and designate a safety supervisor who will ensure that safety measures during construction are implemented. These safety measures include the use of personnel protective clothing and equipment, placing of hazard warning signs, and excavation covers and barriers. Arrangements for prompt medical attention in the event of accidents will also be made.

124. The contractor will be required to: (i) provide environmental health and safety training to all workers (ii) provide priority hiring of qualified skilled and 100% unskilled workers from the villages, (iii) consult with local people to avoid conflict if migrant workers will be brought to the site, (iv) installation of suitable toilets such as pit latrines and grey water drainage facilities such as soakage pits, (v) arrangement for the proper disposal of solid wastes, (vi) briefing of workers and the villagers on the dangers of communicable diseases, and (vii) assignment of responsibility to workers and local peoples' welfare to a senior member of the contractor's staff.

6.2.9 COVID 19 Risk Management

125. Given the current situation with the COVID 19 Pandemic, a risk management plan for COVID 19 should be prepared and implemented by the Contractor during the construction period. The Contractor shall develop and implement a COVID-19 risk management plan in compliance with most relevant GOL regulations and policies, or in the absence thereof, in accordance with international good practice as issued by the World Health Organization. The Contractor shall implement an awareness and information dissemination campaign on COVID-19 risk management and provide training to workers on necessary risk mitigation and management measures/procedures.

6.3 ENVIRONMENTAL IMPACTS DURING OPERATION

126. Impacts during the operation phase are characteristically spread over a longer period of time and means that environmental impacts can become progressively more significant if they are not adequately mitigated. Environmental mitigation in the operation period is principally the responsibility of the DAFO and the subproject beneficiaries represented by the WUG

6.3.1 Impacts of Water Offtake

127. During operation of the facilities, an impact that may accrue relate to the volumes of water taken off the rivers, and the effects of downstream users and ecology. Disruption of downstream hydrological flows due to offtake from river may occur during the operation of the facilities. This impact is however low as water offtake will be fine-tuned and managed on the basis of environmentally allowable volumes. Once scheme operation commences, the gauged river flows and water offtake volumes must be reassessed. These, plus any complaints from downstream users, must be used to recalculate the allowable offtake. The scheme must then be revised accordingly.

6.3.2 Water Pollution

128. Upstream land uses may cause a decline in the quality of water available for the irrigation scheme. Pro-soil conservation watershed management schemes will be implemented as part of the subproject implementation. This will mitigate deterioration of water quality of the waterway. Water quality will be improved through upper watershed management and within the command area the ability to control water movement will limit contamination risk and the proposed cropping agrichemical use is low. A catchment land use plan must be prepared and implemented to ensure that the scheme is safeguarded throughout its operational life. The primary objective of the plan is the upstream catchment protection to ensure that the subproject irrigation scheme is safeguarded in terms of water supply and limited sediment supply. Arrangements for implementation of the plan must be maintained.

6.3.3 Loss of Aquatic Biodiversity

129. The aquatic resources may decline as a result of the operation of the facilities; however, the river is already a highly altered environment, the changes to the flow regime are expected to be modest and have been the subject of detailed assessment. In addition, long term monitoring and refinement is a required mitigation measure. Headworks weirs will be improved from the environmental perspective by the construction of fish passes.

6.3.4 Increased Utilization of Fertilizers and Pesticides

130. The risk from increased fertilizer and pesticide use is considered to be very low in the short to medium term, however with increased areas and extent of vegetable crops pest populations may build up and require more direct intervention. This period of possible build up needs to be used to introduce the understanding of pests and pest population management through the LAO GAP certification best practice systems. Only agrichemicals approved by the Government of Lao PDR may be used. Strong extension support must be provided to encourage the responsible use of fertilizers and pesticides. The uses of agrichemicals by farmers must be monitored and action taken against anyone using banned substances.

7 ANALYSIS OF ALTERNATIVES

7.1 ALTERNATIVES TO THE SUBPROJECT

131. The beneficiary villages in and around Nan District have been selected as the site of the subproject. The selection process adopted for SRIWMSP involves screening and prioritizations, following which candidate projects were selected for the feasibility study. The feasibility study then confirms subproject eligibility. Prioritization, which was conducted during the Project Preparation phase, was based on a set of criteria as prescribed in the Project Administration Manual (PAM) aimed primarily at ensuring alignment with Government priority, maximizing impact in terms of number of populations to be served, maximizing the contribution to economic development and poverty alleviation and also. Relative to safeguards requirements, identified sub-projects should comply with Government and ADB safeguard guidelines and involve minimal adverse environmental and resettlement impacts, i.e., only MONRE category 1 and ADB safeguard categories B or C will be considered. Preference where works are maintained within existing footprint or right of way to minimize land acquisition costs to Government.

7.2 ALTERNATIVES WITHIN THE SUBPROJECT

132. In the context of the selection and prioritization conducted during the project preparation phase, the Nam Nan 1, and 3 Irrigation System Sub-Project and Nam Nan 2, 4 and 5 Irrigation System Sub Project were identified for Implementation. There were no other alternatives presented as these were the only proposed sub-projects that were deemed eligible.

7.3 "NO PROJECT" ALTERNATIVE

133. The "No Project" alternative would mean, inter alia, (i) that the opportunity to provide irrigation water to a significant rural population toward meeting GoL goals and priorities would not be realized, (ii) that an increase in market-oriented agricultural production would not take place; (iii) that watershed ecological services protected would not be realized.

8 INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

8.1 CONSULTATIONS AND INFORMATION DISCLOSURE DURING SUBPROJECT DESIGN

134. During the preparation of the IEE, Public/Stakeholder consultations were held in the the seven villages with the Provincial Agriculture and Forestry Office (PAFO) and Loan Implementation Consultants (LIC) from July 15 to July 21 and July 29, 2022. Stakeholders who participated during the public consultation process included villagers, local government officers and staff. The consultations were conducted to discuss with the stakeholders the proposed sub-projects to elicit the environmental concerns/issues of the community. In general, consultees were of the view that the proposed sub-projects would result in more benefits than negative impacts. During project implementation, communities within the sub-project impact areas should be appropriately and in a timely manner, informed of the construction activities particularly those which are likely to cause noise and dust nuisance, disruption to roads and pathways.

135. Prior to project implementation, the IEEs for the proposed sub-projects were prepared and the requisite Environmental Compliance Certificate (ECC) secured from PoNRE. The approved IEE shall be posted on the ADB and DOI website. Table 35 presents the summary of the public consultations conducted for the propose sub-projects.

TABLE 35. SUMMARY OF PUBLIC/STAKEHOLDERS CONSULTATIONS

	VILLAGE	DATE OF CONSULTATION
1	Naphay	15/07/2022
2	Nalao	16/07/2022
3	Sibounheuang	17/07/2022
4	Thard	18/07/2022
5	Nakhern	19/07/2022
6	Paphai	20/07/2022
7	Phon	21/07/2022

136. During the consultations with the provincial and district authorities and stakeholders, suggestions, opinions and responses from the community on the proposed sub-project have recorded and noted and feedback from the LIC and DOI provided on how concerns and recommendations will be addressed. The consultees were all in agreement that the proposed sub-projects would be beneficial to the community and interposed no objections. Table 36 summarizes the main comments that were raised during the village consultation meetings. Appendix D presents the proceedings of the Public Consultations.

TABLE 36. SUMMARY OF MAIN CONCERNS RAISED DURING PUBLIC CONSULTATIONS

COMMENTS	RESPONSES OF PAFO/LIC-DOI
Agreed and happy to have the project but worry about quality control	PAFO, LIC-DOI
Dust control properly	PAFO, LIC-DOI, Contractor
Learn from the past failure	PAFO, LIC-DOI, Contractor, O&M team

8.2 INFORMATION DISCLOSURE

137. Prior to project implementation, a copy of the approved IEE and EMP will be submitted to the DoNRE. The IEE will also be posted on the ADB and DOI website. During construction and operation, communities within the impact area of the subproject area will be kept informed of construction activities through billboards or information boards about the construction activities and schedules.

9 GRIEVANCE REDRESS MECHANISM

138. Article 13 of Decree 192/PM requires the subproject to establish an effective mechanism for grievance resolution. GoL legal requirements for this mechanism are further described in Part VI of the Decree's implementing regulations, and in detail in the Technical Guidelines. The loan covenants stipulate the GRM requirements of the ADB for the project. The mechanism to address any grievances on environmental safeguards issues is the same as that designed to address grievances related to compensation.

139. The objective of the grievance redress mechanism (GRM) is to resolve complaints as quickly as possible at the local level through a process of conciliation, and if that is not possible, to provide clear and transparent procedures for appeal. All affected persons will be made fully aware of their rights, and the detailed grievance redress procedures will be publicized through an effective public information campaign.

140. An aggrieved affected person (AP) or affected household (AH) will be free from any fees in connection with the lodging and resolution of complaints, as the costs will be borne by the Executing Agency and the appointed contractors. The GRM committee will be established for the district with assignment of the GRM focal person.

141. During construction and operation, communities within the impact area of the subproject area will be kept informed of construction activities through billboards or information boards about the construction activities and schedules. The details of the PAFO, PGT, GRM Focal Contact Persons and Construction Managers will be prominently displayed in the respective construction areas for the reference of the affected communities/persons. Consultations will be undertaken on a need basis with the date, time and venue to be agreed with the Village Heads and concerned government officials. Complaints and grievances can be directly filed, both written and verbal, to the concerned entities. This will be an alternative to the village complaint system. All suggestions, opinions and responses from the community on the sub-project should be taken into account and feedback provided on how concerns and recommendations have been addressed.

9.1 TYPE OF GRIEVANCES

142. Complainants are entitled to lodge complaints regarding any aspect of the project. Any affected person will be able to submit a grievance if they believe a practice is having a detrimental impact on the community, the environment, or on their quality of life. Eligible grievances or complaints include:

- Negative impacts on a person or a community (e.g. financial loss such as from loss of water, loss of roadside trees, health and safety issues, nuisances, etc.).
- Dangers to health and safety or pollution of the environment.
- Hazards due to construction activities (e.g. noise, dust, disruption of access, etc.)
- Impacts on social infrastructure.
- Failure to comply with standards or legal obligations.
- Improper conduct or unethical behaviour of contractor leading to nuisance of affected person(s).
- Misuse of funds and other irregularities.
- Grievances due to compensation and unaddressed losses.
- Complaints related to gender issues.

9.2 GRIEVANCE RESOLUTION PROCESS

143. Complaints can be made verbally or in written form. It is recognized that in many cases, complainants do not have the writing skills or ability to express their grievances verbally, however, complainants are encouraged to seek assistance from family members or village heads, to have their grievances recorded in writing and to ensure that where disputes do occur and all the details have been recorded accurately enabling all parties to be treated fairly.

144. In the case of verbal complaints, a written record of the complaint will be made during the first meeting with the complainant. Complainants who present their complaints within the prescribed procedures will be exempt from all administrative fees incurred. In addition, complainants who lodge complaints and appeals to district courts will be provided with free legal representation.

145. Grievances are issues, concerns, or complaints that may be raised by stakeholders about the implementation of the project. The GRM provides a systematic process for receiving, validating, and resolving complaints from AP and is designed to achieve the following:

- Serving as an open channel for effective communication of environmental and social issues arising from the project;

- Allowing prompt action or resolution of any complaint or adverse impacts that may occur during project construction and operation;
- Serving as a means to hear community suggestions on the project; and
- Promoting transparency in project implementation.

146. Any PAP may raise and submit a grievance if the activity has a detrimental impact on the environment, the community, or the quality of life of people. Examples of grievances are hazards to community health and safety; construction-related nuisances, such as noise and dust and improper disposal of wastes; adverse changes on way of life and livelihood; peace and order problems due to presence of migrant workers; and failure of the project to comply with environmental policies, safety clearance requirements, and other legal obligations.

9.2.1 Arbitration Committees

147. The sub-project's GRM will rely on the existing village arbitration units that have already been established in the villages. The Village Development Committee (VDC) generally consists of the village chief, deputy chief, village secretary, and village representative of the Lao Women's Union, Lao Front for National Construction, village elders, youth, and village land taxation unit. The VDC is responsible for settling disputes between villagers through conciliation and negotiation. In the absence of these units, the members of the village committee (if formed) or the village leaders will act as grievance officers.

148. The affected households (AHs) may present their complaints to the concerned local administrative officials and resettlement committees. The complaint can be filed first at the village level and can be elevated to the highest or provincial level if the affected persons (APs) are not satisfied with the decisions made by the VDC at village level. At the district and provincial levels, the district and provincial steering committees of the project will act on grievances or complaints that have not been resolved at the VDC.

9.2.2 Grievance Redress Procedures

149. All complaints and resolutions will be properly documented by the Village Development Committee (VDC) and be available for public review and for monitoring purposes. As a general policy, the PAFO and PGT will work proactively toward preventing grievances through the implementation of impact mitigation measures and community liaison activities that anticipate and address potential issues before they become grievances. Nonetheless, during construction and operation it is possible that unanticipated impacts may occur if the mitigation measures are not properly implemented, or unforeseen issues occur. The procedures for the grievance resolution process for the subproject are detailed in Table 37.

TABLE 37. GRIEVANCE REDRESS PROCEDURES

NO.	STAGES
1	**Stage 1 (Village – Subproject Area).** In the first instance, complainants will raise complaints or grievances to the Village Development Committee or other designated village grievance officers. The committee will organize a meeting with the complainants to resolve the issue using its traditional methods of conciliation and negotiation. The meeting will be held in a public place and will be open to other members of the community to ensure transparency. The VDC aims at clarifications and amicable solution with the complainant. This mediation aims at a village internal immediate solution agreed with the subproject. If the complaint cannot be solved at this stage, the next step will apply.
2	**Stage 2 (District Implementing Level)**. If within 5 days of lodging the complaint and no understanding or amicable solution can be reached or no response is received from the Village Development Committee, the complainant can bring the complaint to the Provincial Agriculture and Forestry Office (PAFO). The PAFO will meet with the complainant to discuss the complaint and provide a decision within 10 days of receiving the appeal.
3	**Stage 3 (Provincial Implementing Level)**. If the complainant is not satisfied with the decision of the PAFO or in the absence of any response, the complainant can appeal to the Project Governance Team (PGT) with contribution of authorities and village representative/s. The PGT will meet the complainant to clarify the complaint and will inform the complainant about its decision aiming to solve the complaint. The PGT will provide a decision on the complaint within 10 days.
4	**Stage 4 (Ministerial Project Executive Level).** If the AP is still not satisfied with the decision of the PGT, or in the absence of any response within the stipulated time, the complainant can submit his/her grievance to Department of Irrigation (DOI). The DOI might consider an independent external opinion in this matter. The DOI will render a decision within 10 days of receiving the complaint. Before the next stage is applied additional efforts should be made to find an agreement with the AP.
5	**Stage 5 (Country Level)**. As a last resort, the complainant may submit his/her case to the Court of Law. The complaint will be lodged with the Court of Law. The Court will take note and register the case and will provide the final juristic decision. The DOI will be responsible for forwarding the complaint and ensuring its process in the courts.

150. Normally complaints related to construction and environmental issues are resolved at the VDC level wherein the conciliation and negotiation are promptly attended to by the PAFO and contractors. Complaints related to resettlement and land disputes are normally elevated to the district and provincial levels, and at times to the Court. At each stage of the grievance redress process, written records will be maintained.

151. The VDC will submit reports to the PAFO documenting: (i) complaints received; (ii) names and other pertinent information about complainants; (iii) dates of the original complaint, meetings and any other actions; and (iv) outcomes and/or resolution. The records of grievances with a full inventory of the complaints received will be incorporated in regular progress reporting, including the SAEMR, on the subproject.

152. If efforts to resolve complaints or disputes remain unresolved and unsatisfactory following the GoL GRM, the affected persons/households have the right to send their concerns or problems directly to ADB's Operations Department, i.e., Urban and Water Division, Southeast Asia Department (SERD) or through ADB Lao PDR Resident Mission. If the AP is still not satisfied with the responses of SERD, he/she can directly contact the ADB's Office of the Special Project Facilitator (OSPF) as outlined in the "Information Guide to the Consultation Phase of the ADB Accountability Mechanism". The Information Guide can be downloaded through this link: https://www.adb.org/documents/information-guide-consultation-phase-adb-accountability-mechanism. Those who want to make a complaint with the ADB can refer to the sample letter of complaint adapted from the Information Guide as shown in Figure 20.

FIGURE 20. SAMPLE COMPLAINT LETTER

Date:

Office of the Special Project Facilitator
Asian Development Bank
6 ADB Avenue, 1550 Mandaluyong City
Metro Manila, Philippines

Tel: (+632) 632-4825
Fax: (+632) 636-2490
Email: spf@adb.org

Dear Special Project Facilitator,

We, _____ *[(name of your group) or name of representative authorized by your group]*, whose names and addresses are attached, live in _____ *[location and country]*.

We hereby present this complaint to the Special Project Facilitator. *[If the complaint is filed through a representative, please provide the names of the project-affected people with their addresses and evidence of authority to represent them.]*

1. We are currently experiencing problems due to an ADB-assisted project *[specify name and description of project, and specify the site and country where it is located].*
2. The direct harm we experience is/are the following: *[describe the problem].*
3. We seek the following outcomes and remedies through the help of the Special Project Facilitator: *[describe what you would like to happen, how the harm or problem can be resolved].*
4. We have previously made efforts to address our problem with the EA/IA and ADB Operations Department concerned in the following manner: *[list and attach correspondence, details of meetings, emails, and other communications].*
5. We do not request that our identities be kept confidential
   [or]
   We request that our identities be kept confidential for the following reason: *[state reason].*
6. You can contact us at: *[specify directions how to set a meeting with you and/or your authorized representative].*

_____

Signatures:
Names:
Addresses:
Other contact information:
Tel:
Fax:
Email:
Attachments: *[complete list of complainants and addresses; representative's letter of authorization, if any]*

Some matters not eligible for complaints/requests

- Allegations of fraud and corruption
- Procurement of goods, services, and consulting services
- Projects with a project completion report
- ADB personnel matters

10 ENVIRONMENTAL MANAGEMENT AND MONITORING

153. The matrix of mitigation measures in Table 38 presents all the required measures and monitoring responsibilities corresponding to the impacts as assessed that are considered necessary through the environmental assessment process. The mitigation measures required cover all stages of the contract and are separated into pre-construction, construction and operation phases. This EMP is based on the type, extent and duration of the environmental impacts identified at the design stage. In the event that unexpected impacts occur during implementation, the EMP will be amended to take into account of unexpected impacts and mitigation measures will be amended as necessary.

154. The EMP will be included in the Bid Documents and Construction Contract as such the appointed construction contractor are contractually obligated to (i) allocate sufficient budget to implement the EMP; (ii) appoint an environmental health and safety (EHS) officer to support in EMP implementation; (iii) provide training to his workers on EHS; and (iv) prepare and submit a monthly report on EMP implementation.

TABLE 38. ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	BUDGET	RESPONSIBLE OFFICE
I. PRE-CONSTRUCTION PHASE				
Impact on community assets Loss of community assets due to damage to properties.	Implement the compensation plan that was approved by the ADB for the subproject. Design headworks, canals and related structures within the Right-of-Way when feasible.	External LACP monitoring report	c/o DOI operations cost	PGT
Impact of location of headworks on other water users Downstream river uses such as irrigation, bathing, washing, and fishing will be affected if excessive water abstraction will occur.	There is minimal conflict with other water users of Nam Nan because there is still enough water in the river that will meet the other river uses at the downstream.	River level assessments at the headworks on a monthly basis	c/o PAFO operations cost	PGT
Impact to Natural resources and protected areas Impact on natural resources and protected areas from cutting/clearing of trees and other vegetation.	Cutting of trees will be undertaken as per approved design and only upon approval. Avoid cutting of trees as much as possible and minimize damage to native vegetation. Trees that need to be cut in private land will be compensated in cash.	N/A	N/A	N/A
Impact on Historical and Archaeological Sites Damage to relics and artifacts during the conduct of the works.	The Contractor will ensure that the workforce are briefed that in the event of accidental finds relics they should immediately cease any works in the area and promptly report the find to their supervisor.	Accidental finds	c/o PAFO operations cost	PGT
II. CONSTRUCTION PHASE				
Temporary disruption of existing community roads,	Walking access will be maintained to affected properties and access routes will be temporarily lined with	Periodic monitoring and reporting by	Included in civil works cost	PAFO, PGT Contractor

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	BUDGET	RESPONSIBLE OFFICE
pathways, and accesses Rehabilitation/ upgrading of headworks, canals and related structures will cause temporary disruption of community services and access to properties. Particularly at road crossings, rehabilitation/ upgrading activities along narrow roads may lead to temporary blockage or closure of roads and hamper movement of vehicles and people in the community. Community access to areas in the vicinity of schools, temples, village offices, market places and meeting halls will be affected during rehabilitation/ upgrading works.	timber or similar material. Particular attention will be given to ensuring safety along roads and paths used by pedestrians. Side street parking of construction vehicles on prolonged basis will not be allowed. Install barriers and safety warning signs on road sections and if necessary, deploy traffic aides/ flag persons at affected locations. Information boards at blocked roads will provide information about the temporary closure of roads, schedule of works and the traffic-rerouting plan. Require the contractor to immediately rehabilitate the excavated areas and any damaged road and path sections. Enclose the facilities perimeters so that pathway use and stream access remains unimpeded.	Supervision Consultant Report any complaint received from the community to PAFO and document in safeguard monitoring reports.		
Air pollution Dust and air emissions from earthworks and movement of vehicles can pose nuisance to nearby communities	Require the contractor to cover materials with tarpaulin or other suitable materials while in transit to avoid spillage of materials. Moisten earthen roads during dry and dusty conditions, particularly roads near residences and through the town core area. Impose speed limits on construction vehicles. Conduct regular maintenance on construction equipment and vehicles to control air emissions during vehicle operation.	Periodic monitoring and reporting by Supervision Consultant Report any complaint received from the community to PAFO and document in safeguard monitoring reports.	Included in civil works cost	PAFO, PGT Contractor
Noise Operation of construction equipment such as jackhammer will cause excessive noise resulting in nuisance to communities.	Limit rehabilitation and upgrading activities, particularly operation of noise generating equipment at night. Position any stationary equipment that produce high noise levels such as diesel generators as far as practical from sensitive receptors.	Periodic monitoring and reporting by Supervision Consultant Report any complaint received from the community to PAFO and	Included in civil works cost	PAFO, PGT Contractor

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	BUDGET	RESPONSIBLE OFFICE
	Erect temporary barriers around construction sites especially near schools, hospitals, and houses. Install noise suppression devices to noise generating equipment. Require drivers to minimize blowing of horn and to comply with speed limits. Provide information to community on schedule of rehabilitation and upgrading activities through billboard/signs.	document in safeguard monitoring reports.		
Impact on ecological resources Construction workers may undertake hunting of wildlife and cutting of wood.	The contractors will prohibit activities such as cutting wood for cooking, hunting, or wildlife trade.	Periodic monitoring and reporting by Supervision Consultant Report any complaint received from the community to PAFO and document in safeguard monitoring reports.	Included in civil works cost	PAFO, PGT Contractor
Clearing of vegetation Poor planning and execution of tree clearing/vegetation removal at project facilities and along headworks, canals and related structures will result in loss of vegetation and general landscape	Cutting of trees will be undertaken as per approved design and only upon approval of relevant authorities. Avoid cutting of trees as much as possible and minimize damage to native vegetation. Trees that need to be cut in private land will be compensated in cash accordance with the approved Compensation Plan. Roads and paths to the facilities will only be sufficiently wide to accommodate construction vehicles/equipment to minimize land take. Manual labor will be utilized in sloping terrain where use of heavy equipment would cause unnecessary damage. Steep exposed slopes will be graded and covered with bush and grass to minimize erosion. Implement landscaping and planting of trees/vegetation at sites of the proposed facilities.	Periodic monitoring and reporting by Supervision Consultant Report any complaint received from the community to PAFO and document in safeguard monitoring reports.	Included in civil works cost	PAFO, PGT Contractor
Water pollution - Sediment runoff	Construct silt traps, deviation channels, mounting barriers or	Periodic monitoring and reporting by	Included in civil	PAFO, PGT Contractor

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	BUDGET	RESPONSIBLE OFFICE
Sediment runoff undertaken during excavation, earthworks and grading in the rainy season will cause siltation of rivers	trenches around the stockpiles of materials.	Supervision Consultant Report any complaint received from the community to PAFO and document in safeguard monitoring reports.	works cost	
<u>Water Pollution - Worker's camp</u> Domestic wastewater from worker's camp would result to the discharge of sewage into drainage canals. Unsanitary conditions at the worker's camp will occur without the provision of necessary sanitation arrangements.	Provide adequate water supply and temporary toilet facilities at the worker's camp.	Periodic monitoring and reporting by Supervision Consultant Report any complaint received from the community to PAFO and document in safeguard monitoring reports.	Included in civil works cost	PAFO, PGT Contractor
<u>Generation of construction waste - Generation of excavated soil</u> Generation of excavated materials during rehabilitation and upgrading of headworks, canals and related structures.	During rehabilitation and upgrading of headworks, canals and related structures excavated material will be utilized to backfill the trench. The contractor will be required to properly reinstate the excavated trench after completion of works. Surplus excavated material/cut soil from rehabilitation and upgrading of headworks, canals and related structures will be used as backfill material for low-lying areas that have been identified by the village authority.	Periodic monitoring and reporting by Supervision Consultant Report any complaint received from the community to PAFO and document in safeguard monitoring reports.	Included in civil works cost	PAFO, PGT Contractor
<u>Generation of construction wastes – Solid, Inert and Hazardous Wastes</u> Solid wastes, inert construction wastes, and hazardous wastes during construction will result to pollution of land and receiving water bodies.	Provide appropriate segregation bins or areas for construction wastes. Secure and control storage of all hazardous materials including fuels. Reuse recyclable construction wastes such as wood, steel, and scaffoldings or sell to junk shops. Solid waste to be collected and disposed in approved disposal site of the Townships.	Periodic monitoring and reporting by Supervision Consultant Report any complaint received from the community to PAFO and document in safeguard monitoring reports.	Included in civil works cost	PAFO, PGT Contractor
<u>Community health and safety</u>	Install barricades/barriers and sturdy plate covers in open	Periodic monitoring and	Included in civil	PAFO, PGT Contractor

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	BUDGET	RESPONSIBLE OFFICE
Community may be exposed to dangers of open excavation	excavations during non-working time. Install warning signs in the area.	reporting by Supervision Consultant Report any complaint received from the community to PAFO and document in safeguard monitoring reports.	works cost	
<u>Occupational health and safety</u> Construction activities may pose hazards to workers because of the use of heavy equipment, lifting of heavy loads, and exposure to open excavations and chemicals. Potential conflict with local people will occur if migrant workers will be brought to the site.	Require the contractor to implement the construction health and safety plan in accordance with the World Bank EHS Guidelines (http://www.ifc.org/ehsguidelines) as a minimum standard. The contractor will appoint an environment, health and safety officer to ensure implementation of the plan. The plan will at minimum include: • Provision of first-aid facilities readily accessible by workers. • Provision of personal protective equipment (PPEs) such as hard hats, gloves, rubber boots, etc., • Wearing of PPEs while working onsite will be a mandatory requirement for workers. • Posting of safety signs/reminders in strategic areas within the construction area. • Installation of sufficient lighting at night. • Ensure that vehicle and equipment operators are properly licensed and trained. • Provide staff with communicable disease and HIV-and COVID 19 related awareness training. The contractor will be required to provide priority hiring of qualified workers from the villages and to consult with the local to avoid conflict if migrant workers will be brought to the site.	Periodic monitoring and reporting by Supervision Consultant Report any complaint received from the community to PAFO and document in safeguard monitoring reports.	Included in civil works cost	PAFO, PGT Contractor
<u>COVID-19 risk management</u> Working Camp Siting and Management	Siting of Camps and Field Offices • Not in area liable to flooding, landslide or other natural disaster	Periodic monitoring and reporting by Supervision Consultant	Included in civil works cost	PAFO, PGT Contractor

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	BUDGET	RESPONSIBLE OFFICE

	• Not in area affected by construction dust, noise, sewage or other pollution
	• Not in a residential area
	
	Minimum housing standards
	• separate bed for each worker
	• beds should not be arranged in tiers of more than two;
	• separate accommodation of the sexes or to accommodate couples
	• adequate natural light during the daytime and adequate artificial light
	• adequate ventilation to ensure sufficient movement of air
	• adequate supply of safe potable water
	• adequate sanitary facilities
	• adequate drainage
	• adequate furniture for each worker to secure his or her belongings, such as a locker.
	• common dining rooms, canteens or mess rooms, located away from the sleeping areas
	• appropriately situated and furnished laundry facilities
	• reasonable access to plug sockets for charging telephones and other devices
	• rest and recreation rooms and health facilities, where not available in the community
	
	Minimum accommodation sizes
	• Sleeping space
	  inside dimensions over 198 centimetres by 80 centimetres;
	• Sleeping room
	  headroom of over 203 centimetres allowing full free movement
	  Beds minimum 2m apart for COVID-19 risk management
	
	Sanitation Facilities
	• One toilet, one tap / basin, one toilet for every 6 people
	• Convenient location to accommodation
	• Provision of soap
	• Separate facilities for men and women
		Report any complaint received from the community to PAFO and document in safeguard monitoring reports.		

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	BUDGET	RESPONSIBLE OFFICE
	• Ventilation to open air • Fresh cold running water • Clean and hygienic • Septic tank/sewage treatment facility, or pit latrines located at least 200m from surface waters, and in areas of suitable soil profiles and above the groundwater levels Health and Safety within worker accommodation • Separate area for sick workers to prevent transmission of disease • Smoke detector in sleeping area • Fire safety throughout accommodation such as fire extinguishers, fire alarms, fire blankets • Worker training in fire prevention and procedures • Fire exit sign, adequate means of escape and clearly maintained exit • Security lighting within camp and for sanitation block and lighting for route from sleeping area to sanitation block • Electrical cables to be in safe condition, elevated and not in areas liable to flood Inspection • 2 weekly inspections to inspect for cleanliness, state of repair of building, accommodation and fire equipment • Record inspection results and retain for review			
<u>COVID-19 risk management</u> <u>Construction site working conditions</u>	Form a joint team to plan and organize commencement and/or return to work • Develop or convene a joint occupational safety and health committee with members representing the employer and workers • Train team members on the basic principles for the formulation and implementation of occupational safety and health preventive and control measures. • Develop and communicate a work plan on safe working for COVID-19 • Such plan should be fully aligned with any	Periodic monitoring and reporting by Supervision Consultant Report any complaint received from the community to PAFO and document in safeguard monitoring reports.	Included in civil works cost	PAFO, PGT Contractor

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	BUDGET	RESPONSIBLE OFFICE
	government regulations and guidelines on COVID-19 prevention and control, or in the absence thereof, with international good practice guidelines as may be updated from time to time Risk assessment to decide when to work, who works and how • Undertake a risk assessment to determine the preventive and control measures • Ensure preventative measures are in place before resuming or beginning construction work Adopt engineering, organizational and administrative measures • Avoid physical interaction and maintain physical distancing requirements as prescribed by national policy, or in the absence thereof, international good practice • Ventilate enclosed workplaces including work camps and communal spaces • Avoid concentration of workers - limit the capacity of common areas such as work camp dining rooms and changing rooms to allow the minimum separation of 2 meters and organize one-way systems. This includes sleeping areas which must be a minimum of 2 meters between • beds • Put in place training and information on COVID-19 and measures required for its management. • The construction site is to be segregated to the extent possible in zones or other methods to keep different crews physically separated at all time • Stagger break and lunch schedules to minimize the number of people in close proximity to one another			

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	BUDGET	RESPONSIBLE OFFICE
	Regularly clean and disinfect • Increase the frequency of cleaning and disinfection, in particular heavily trafficked areas and common areas, including work camps • All door handles, railings, ladders, switches, controls, eating surfaces, shared tools and equipment, taps, toilets, and personal areas are wiped down at least twice a day with a disinfectant • Discourage the sharing of items such as cups, glasses, plates, tools Promote personal hygiene • Provide workers with the conditions and means necessary for frequent hand washing (soap, water or alcohol gel) with a posted hand washing protocol at site entries, exits, bathrooms, communal areas, offices, and any other areas with commonly touched surfaces • Inform workers of the need to avoid physical contact when greeting, and avoid touching eyes, nose and mouth • Inform workers of the need to cover the mouth and nose with a disposable handkerchief when coughing or sneezing or the crook of their arm • Dispose of tissues in a lined and covered waste bin and wash hands afterwards Provide personal protective equipment (PPE) and inform workers of its correct use • Identify appropriate PPE related to the tasks and health and safety risks faced by workers according to the results of risk assessment and the level of risk, and provide it to workers free of charge and in sufficient number, along with instructions, procedures, training and supervision			

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	BUDGET	RESPONSIBLE OFFICE

	• Non-medical face-coverings (such as homemade cloth masks) should be worn as mitigation for catching and transmitting the virus, but are not to be treated as substitutes for proper handwashing
	
	Health surveillance and insurance
	• Before entering the site, staff and visitors must confirm that they are not currently exhibiting flu-like symptoms
	• Monitor the health status of workers, develop protocols for cases of suspected and confirmed COVID-19. The protocol will state that:
	• workers with symptoms or confirmed cases must be isolated within the construction camp or stay at home for 7 days after symptoms started
	  If symptoms persist after 7 days, the person must isolate until the symptoms stop
	  People who have been in close contact with the person with confirmed COVID-19 be quarantined for 14 days
	• All workers in quarantine or isolation must be provided with adequate food, water, medical assistance and sanitation
	• Identify workers who have had close contact with people infected with COVID-19 and follow national medical guidance
	• Communicate confirmed cases of COVID-19 infection to the appropriate authorities
	• All workers should be provided with health insurance that includes COVID-19 treatment
	
	Consider other hazards, including psychosocial
	• Promote a safe and healthy working environment free from violence and harassment.			

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	BUDGET	RESPONSIBLE OFFICE
	• Encourage health promotion and wellbeing in the workplace through enough rest, balance of physical and mental activity and adequate work life balance • Implement prevention and control measures for the use and storage of chemicals, particularly those used for disinfection during COVID-19 Review emergency preparedness plans • Develop an emergency plan adapted to COVID-19 and regularly review it Review and update preventive and control measures as the situation evolves • Periodically monitor prevention and control measures to determine whether they have been adequate to avoid or minimize risk, and identify and implement corrective actions for continuous improvement • Establish and maintain records related to work-related injuries, illnesses and incidents, worker exposures, monitoring of the work environment and workers' health			
III. OPERATION PHASE				
Impacts of Water Offtake Disruption of downstream hydrological flows due to offtake from river may occur.	Water offtake will be fine-tuned and managed on the basis of environmentally allowable volumes.	Weekly monitoring of water quantity and water offtake.	Part of DOI operations cost	PGT
Water Pollution Upstream land uses may cause a decline in the quality of water available for the irrigation scheme.	A catchment land use plan must be prepared and implemented to ensure that the scheme is safeguarded throughout its operational life.	Weekly monitoring of water quality.	Part of DOI operations cost	PGT
Loss of Aquatic Biodiversity Aquatic resources may decline as a result of the operation of the facilities.	Headworks weirs will be improved from the environmental perspective by the construction of fish passes.	Weekly monitoring of aquatic flora and fauna.	Part of DOI operations cost	PGT

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	BUDGET	RESPONSIBLE OFFICE
Increased Utilization of Fertilizers and Pesticides Increased areas and extent of vegetable crops pest populations may build up and require more direct intervention	Only agrichemicals approved by the Government of Lao PDR may be used. Strong extension support must be provided to encourage the responsible use of fertilizers and pesticides.	Weekly monitoring of pesticide and fertilizer use of farmers.	Part of DOI operations cost	PGT
Community health and safety Potential hazards to residents in affected communities.	Facilities properly fenced and secured.	Daily log of security personnel	Part of DOI operations cost	PGT

10.1 INSTITUTIONAL ARRANGEMENTS FOR IMPLEMENTATION OF ENVIRONMENTAL SAFEGUARDS

155. The Program Governance Team (PGT) will appoint a qualified environmental safeguards officer to supervise and co-ordinate implementation of environmental safeguard requirements with support of the LIC International and National Environment Specialists. The PGT Project Director will be responsible for submitting semi-annual environmental safeguard reports to ADB for clearance and disclosure. They will also carry out regular monitoring during implementation and prepare a summary of progress of EMP and GRM implementation for the quarterly project progress reports. They will participate in ADB loan review missions, ensure that semi-annual environmental safeguards monitoring reports are submitted to ADB on time and follow-up on agreed actions.

156. Each Provincial Project Implementation Team (PPIT) will nominate an environmental safeguards focal point to support LIC Environment Specialists and PGT with co-ordination at the province level. The PPIT environmental safeguards focal point will undertake joint site visits with subproject Supervision Staff and Contractors to review implementation of EMP and GRM and report issues to PGT and LIC. PPIT will co-ordinate environmental quality monitoring with PONRE and invite PONRE to join site visits and ADB loan review missions. To ensure compliance and to empower PONRE in oversight of the EMP requirements within the works contracts, the PGT and PAFO construction supervision experts will ensure that all findings are fully recorded and shared in the reports to the Provincial Steering Committee. The LIC environmental specialists will provide capacity building for PONRE on construction site reviews.

157. The project implementation consultant (PIC) will assist the executing agency (i.e. the PGT within DOI), the implementing agency (i.e. PAFO) and the other project stakeholders in the design and construction of the subproject. For this reason, the Program Governance Team will contract a LIC with two environmental specialists (9 months International Environment Specialist and 17 months National Environmental Specialist)- See PAM for detailed ToRs to support subproject designs and the preparation of IEE and for the supporting and monitoring of the EMP during subproject implementation.

158. The LIC environmental specialists work with the WUG, PAFO and DAFO and the contractors for the subproject, to ensure the IEE and EMP are properly implemented, with the required environmental mitigation measures incorporated into the final engineering designs and administrative arrangements. During the construction period, they must work with the

subproject implementation partners to ensure that all of the environmental management and mitigation measures are fully complied with, as agreed in each IEE and as outlined in every EMP. The LIC Environment Specialists will provide safeguards and GRM capacity development training for PGT, PPIT, LIC, Contractors and GRM focal points on EMP mitigation and monitoring measures, Contractor EMP preparation, templates for environmental monitoring and report. All contract documents must include the EMP (category B) or Environmental Code of Conduct (category C) and an environment section in the terms of reference for bidders, and environmental contract clauses for contractors that include special conditions for the protection of the physical, biological and socio-economic environments. These will underpin the obligations towards the environment that must be upheld by all contractors. There is a need to ensure that contractors, as the stakeholders with the shortest-term involvement in the subproject, do not give rise to long term liabilities for the subproject owners and other stakeholders through reckless practices.

159. While the contractors themselves must fulfil their environmental responsibilities, in most cases success in this respect requires strict management and supervision of the contractor during site works: this is the responsibility of PAFO. Because of the competitive bidding process and the emphasis on engineering works, there is often a tendency for environmental safeguards to be delayed by contractors in the hope that costs can be saved and overlooked by management staff as being of lower importance than the primary functional infrastructure. This must not be allowed to happen, or it will mean that the subproject and therefore the overall SRIWSM is non-compliant with respect to both government and ADB safeguards. Additional attention must be paid to subcontractors. It must be made clear to the main contractor at all times that they are fully responsible for the actions of his subcontractors, and that retention money is at risk if there is not full compliance with this plan. The contractor should be encouraged to start this process with an orientation for each subcontractor before they start work, and sub-contractual conditions to ensure that the subcontractor complies. The project implementation consultant should be able to assist the contractor in this process.

160. The Contractor will be required to develop a site-specific Construction Environmental Management Plan (CEMP) in accordance with the IEE/EMP and designate an environmental health and safety (EHS) Officer to supervise and train workers on occupational and community health and safety practices and to monitor and report on implementation of EMP/CEMP and corrective actions. A GRM focal point/community liaison officer should also be designated to ensure public disclosure of planned construction to affected persons and monitoring and reporting on GRM. Each works Contractor EHS Officer will prepare a monthly report on EMP/CEMP and GRM implementation for submission to PPIT, PGT and LIC.

161. The construction supervision consultants (CSC) will ensure a CEMP is prepared for each Category B subproject and an Environmental Code of Conduct for each Category C subproject. The CSC will be responsible for day-to-day monitoring of implementation of health and safety and EMP/Code of Conduct requirements and issuing instructions for corrective actions, as needed. ADB will visit project sites and review project performance against the EMPs and legal agreements and as documented in periodic environment monitoring reports submitted by the PGT.

162. If any of the safeguard requirements that are covenanted in the legal agreements are found not to be satisfactorily met, ADB will require the PGT to develop and implement an appropriate corrective action plan (CAP) agreed upon with ADB. If unanticipated environmental impacts become apparent during project implementation, ADB will require the PGT with support of LIC ES to (i) assess the significance of such unanticipated impacts; (ii) evaluate the options available to address them; and (iii) prepare or update the IEE and EMPs.

10.2 TRAINING AND CAPACITY BUILDING

163. The LIC Environment Specialists will provide training and capacity building on environmental safeguards and GRM as set out in Table 39 below. At provincial, district and subproject levels, it will use formal seminars and training courses focused on the needs of the individuals working with each of the stakeholder organizations, as well as guided on-the-ground action learning-through-doing.

TABLE 39. ENVIRONMENTAL SAFEGUARD CAPACITY STRENGTHENING PLAN

TOPIC	TRAINEE	WHEN	TRAINING RESPONSIBILITY
Project Awareness	WUG Official DONRE PONRE assigned staff and Section Head PAFO Safeguard Focal Point PAFO Construction Supervision	Q1-2 Project year 1	PGT Project Management Advisor
ADB and Govt Environment Safeguard Requirements	DONRE PONRE assigned staff and Section Head	Q2 Py 1	LIC National Environmental Consultant and
	PAFO Safeguard Focal Point PAFO Construction Supervision PPIT DIrector		National Project Management Advisor
Environmental Documentation – Additional Subproject Processing	WUG, Assigned staff PONRE and DONRE PAFO – construction supervision	Q2-3 PY 1	LIC Project Management Advisor –PGT LIC International and National Consultant
Environmental Monitoring – RSP	WUG Assigned staff PONRE and DONRE PAFO – construction supervision	Q3 PY 1	LIC International and National Environmental Consultant LIC National Construction Supervision Consultant
Environmental Reporting	Assigned staff PONRE and DONRE PAFO – construction supervision PPIT Project Management Advisor	Q4 PY1 and Q1 Py2	LIC International and National Consultant
Environmental Sampling and water Flow data analysis	Assigned staff PONRE and DONRE PAFO – construction supervision PPIT Project Management Advisor	Q1 Py 2Q2 PY 2	LIC International and National Consultant

10.3 REPORTING

164. **Pre-construction Phase.** The EMP monitoring during the pre-construction phase of the subproject will be undertaken by the LIC consultant (Appendix E - Template of Project Environmental Safeguards Monitoring Report). Semi-annual Integrated Safeguards Monitoring Reports will be prepared by the PAFO with support of the LIC and submitted to ADB for review and disclosed on the ADB project website. Appendix F shows the Semi-Annual Integrated Safeguards Monitoring Report.

165. **Construction Phase.** Throughout the construction period, the contractors will submit monthly environmental compliance progress reports to the PAFO, copy furnished to the PGT. The contractor should be able to highlight the summary of the progress of construction, activities undertaken within the reporting period to implement the measures outlined in the EMP, record any community complaints received and how the complaint was resolved.

166. The PAFO will consolidate the results of the monthly environmental monitoring through a quarterly progress report that will be submitted to the PGT which is based at the Department of Irrigation of the MAFF. The quarterly report will summarize the significant findings and measures undertaken to address any adverse environmental impacts during construction and also present any unforeseen environmental impacts and suggested remedial actions for the next monitoring period. PGT with support from the LIC will consolidate information from quarterly progress reports, compile and submit integrated safeguards monitoring report semi-annually to ADB.

167. Once the reports are received by the PGT, these will be reviewed relative to subproject compliance with the indicators defined in the EMP. The PGT will submit the quarterly reports to the Department of Irrigation of MAFF and other national agencies (MONRE, MOF, MOPC, etc.), and to ADB. The PGT with support from the LIC will also prepare the quarterly Project Progress Reports including the main points of environmental monitoring and Semi-annual Integrated Safeguards Monitoring Reports in English to be submitted to ADB.

168. **Operational Phase.** The EMP monitoring during the operational phase will be undertaken by the PAFO. Semi-annual reports will be submitted by the PAFO to the PGT. The PGT, with support from the LIC, will review the report and check the project's adherence to the EMP and then submit the Semi-annual Integrated Safeguards Monitoring Reports to ADB until the Project Completion Report (PCR) is prepared. The monitoring parameters during the operational phase is outlined in the EMP. Table 40 presents the EMP Reporting Plan.

TABLE 40. EMP REPORTING PLAN

TYPE OF REPORT	BASIC CONTENT	PREPARED BY	SUBMITTED TO	FREQUENCY
PRE-CONSTRUCTION THROUGH OPERATIONAL PHASE				
Progress Reports	Integrated Safeguards Monitoring Report including EMP implementation and monitoring	PAFO, PGT, Department of Irrigation	MAFF ADB	Semi-annual until project completion report (PCR)
CONSTRUCTION PHASE				
Construction Progress Report	Progress of construction, including EMP monitoring results, complaints received and actions taken	Contractor	PAFO copy furnished to PGT	Monthly
Progress Report	Progress of construction, safeguards (EMP) implementation, complaints received and actions taken	PAFO, PGT, Department of Irrigation	MAFF, MONRE, and other national agencies ADB	Quarterly
OPERATIONAL PHASE				
Progress Report	Subproject progress report including EMP implementation and monitoring	PAFO	PGT	Semi-annual until project completion report (PCR)
Integrated Safeguards Monitoring Report	Subproject progress report including EMP implementation and compliance with ADB's policies and regulations	PAFO, PGT, Department of Irrigation	MAFF ADB	Semi-annual until project completion report (PCR)
Project Completion Report	Project evaluation, lessons learned and recommendations	PGT	MAFF ADB	After physical completion of the sub-project.

10.4 ENVIRONMENTAL MANAGEMENT AND MONITORING COSTS

169. The cost for the environmental safeguard activities during rehabilitation and upgrading works, i.e. environmental management, review, and monitoring, for the subprojects will be primarily included in the civil works cost. The cost of environmental management and monitoring activities during the operational phase will be borne by the PGT, as part of operation and maintenance activities.

11 CONCLUSION AND RECOMMENDATIONS

170. This IEE for the Nam Nan 1 and 3 Irrigation and Nam Nan 2, 4 and 5 Irrigation Systems Sub-Project in Luang Prabang Province was undertaken to determine the environmental issues and concerns associated with the proposed irrigation system subproject. The assessment confirms that the subproject remains classified as Category B for environment based on ADB Safeguards Policy Statement (SPS, 2009). The subprojects will have beneficial impacts on the social and economic well-being of the people because of improved accessibility to irrigation.

171. Most of the environmental impacts are expected to occur during the rehabilitation/upgrading phase. The environmental impacts are not expected to cause irreversible and significant adverse environmental impacts and are easily controllable by appropriate and conventional mitigation measures. Based on the assessment of environmental impacts, the anticipated adverse impacts during project implementation are related to nuisances which may happen during the rehabilitation/upgrading works of the

subproject components such as temporary alienation of access, temporary disruption of community facilities, noise, and sediment runoff, release of dust and engine gas emissions. Recommendations formulated in the EMPs, its inclusion in the contractual framework, and an effective inspection of construction sites will reduce these risks to an acceptable level.

172. Environmental mitigation measures have been designed as outlined in the subproject EMP to address any adverse impacts during the various phases of project implementation. The EMP also presents the institutional responsibilities for implementing the mitigation measures. All Subproject activities prior to construction, during construction and during operation will be managed as provided in the EMP and the Contractor's compliance and implementation of the mitigation measures shall be monitored. An environmental monitoring plan has been provided to ensure water quality is maintained according to the prevailing Lao standards.

173. The IEE concludes that the subproject combined with available information on affected environment is sufficient to identify the scope of environmental impacts of the subproject. No further environmental assessment is therefore required.

APPENDIX

APPENDIX A
RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST

RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST

INSTRUCTIONS:

(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Sustainable Development and Environmental Safeguards (SDES) for endorsement by the Director, SDCC and for approval by the Chief Compliance Officer.

(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.

(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

COUNTRY/PROJECT TITLE: LAO PDR: SUSTAINABLE RURAL INFRASTRUCTURE AND WATERSHED MANAGEMENT SECTOR PROJECT (SRIWMSP)

SECTOR DIVISION:

SCREENING QUESTIONS	YES	NO	REMARKS
PROJECT SITE **IS THE PROJECT AREA ADJACENT TO OR WITHIN ANY OF THE FOLLOWING ENVIRONMENTALLY SENSITIVE AREAS?**			
Cultural heritage site		X	Not applicable
Protected area		X	There is no protected area within the component sites and immediate vicinity.
Wetland		X	Not applicable
Mangrove		X	Not applicable
Estuarine		X	Not applicable
Buffer zone of protected area		X	Not applicable
Special area for protecting biodiversity		X	Not applicable
Underground utilities		X	Not applicable
POTENTIAL ENVIRONMENTAL IMPACTS **WILL THE PROJECT CAUSE …**			
Loss of precious ecological values (e.g. result of encroachment into forests/swamplands or historical/cultural buildings/areas, disruption of hydrology of natural waterways, regional flooding, and drainage hazards)?		X	Not applicable
Conflicts in water supply rights and related social conflicts?		X	Not applicable
Impediments to movements of people and animals?		X	Not applicable
Potential ecological problems due to increased soil erosion and siltation, leading to decreased stream capacity?		X	Not applicable
Insufficient drainage leading to salinity intrusion?		X	Not applicable
Over pumping of groundwater, leading to salinization and ground subsidence?		X	Not applicable. Groundwater abstraction is not included in the scheme.

SCREENING QUESTIONS	YES	NO	REMARKS
Impairment of downstream water quality and therefore, impairment of downstream beneficial uses of water?		X	Not applicable
Dislocation or involuntary resettlement of people?		X	Not applicable
Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		X	Not applicable
Potential social conflicts arising from land tenure and land use issues?		X	Not applicable
Soil erosion before compaction and lining of canals?		X	Not applicable
Noise from construction equipment?	X		Noise may be generated during the rehabilitation/upgrading of the subproject components (headworks, canals and gates). Mitigating measures are incorporated in the EMP.
Dust during construction?	X		Dust may be generated during the rehabilitation/upgrading of the subproject components (headworks, canals and gates). Mitigating measures are incorporated in the EMP.
Waterlogging and soil salinization due to inadequate drainage and farm management?		X	Not applicable
Leaching of soil nutrients and changes in soil characteristics due to excessive application of irrigation water?		X	Not applicable
Reduction of downstream water supply during peak seasons?		X	Not applicable
Soil pollution, polluted farm runoff and groundwater, and public health risks due to excessive application of fertilizers and pesticides?		X	Not applicable
Soil erosion (furrow, surface)?		X	Temporary silt runoff from excavation activities may be generated. Silt traps and other measures to control sediment flow into rivers are included in the EMP.
Scouring of canals?		X	Not applicable
Clogging of canals by sediments?		X	Canals will be maintained and cleaned regularly.
Clogging of canals by weeds?		X	Canals will be maintained and cleaned regularly.
Seawater intrusion into downstream freshwater systems?		X	Not applicable
Introduction of increase in incidence of waterborne or water related diseases?		X	Not applicable
Dangers to a safe and healthy working environment due to physical, chemical and biological hazards during project construction and operation?		X	Workers and staff will be properly inducted and oriented on the health and safety protocols in work sites.
Large population influx during project construction and operation that causes increased burden on social		X	Workers will be sourced from the affected communities minimizing/eliminating the need for migrant workers.

SCREENING QUESTIONS	YES	NO	REMARKS
infrastructure and services (such as water supply and sanitation systems)?			
Social conflicts if workers from other regions or countries are hired?		X	Workers will be sourced from the affected communities minimizing/eliminating the need for migrant workers.
Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?		X	Not applicable
Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g., irrigation dams) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?		X	Not applicable

A CHECKLIST FOR PRELIMINARY CLIMATE RISK SCREENING

Country/Project Title: LAO PDR: Sustainable Rural Infrastructure and Watershed Management Sector Project (SRIWMSP)
Sector : Irrigation
Subsector:
Division/Department:

SCREENING QUESTIONS		SCORE	REMARKS
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	0	The river has not dried up even during the dry months. The facilities will not be affected by extreme floods.
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?	1	Design of headworks needs to consider highest and lowest flows of the river and rainfall intensity. River level assessments will be undertaken as part of the monitoring plan.
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	0	
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro- power generation facilities) throughout their design life time?	0	

Options for answers and corresponding score are provided below:

RESPONSE	SCORE
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response will be categorized as high risk project.

Result of Initial Screening (Low, Medium, and High): Total score is 1 thus MEDIUM RISK Other Comments:

_____
_____
_____

Prepared by:

APPENDIX B
ENVIRONMENTAL COMPLIANCE CERTIFICATE (ECC)

ສາທາລະນະລັດ ປະຊາທິປະໄຕ ປະຊາຊົນລາວ
ສັນຕິພາບ ເອກະລາດ ປະຊາທິປະໄຕ ເອກະພາບ ວັດທະນະຖາວອນ
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ພະແນກຊັບພະຍາກອນທຳມະຊາດ
ແລະ ສິ່ງແວດລ້ອມແຂວງ

ເລກທີ 34 /ພຊສ-ໜບ
ຫລວງພະບາງ,ວັນທີ 24 MAY 2022

ໃບຢັ້ງຢືນ

-ອີງຕາມ: ກົດໝາຍ ວ່າດ້ວຍ ການປົກປັກຮັກສາສິ່ງແວດລ້ອມ ສະບັບເລກທີ 29/ສພຊ,ລົງວັນທີ 18/12/2012.
-ອີງຕາມ: ດຳລັດວ່າດ້ວຍ ການປະເມີນຜົນກະທົບຕໍ່ສິ່ງແວດລ້ອມ, ສະບັບເລກທີ 21/ ລບ ລົງວັນທີ 31 ມັງກອນ 2019.
-ອີງຕາມ: ດຳລັດ ວ່າດ້ວຍ ການທົດແທນຄ່າເສຍຫາຍ ແລະ ການຍົກຍ້າຍຈັດສັນປະຊາຊົນ ຈາກໂຄງການພັດທະນາ, ສະບັບເລກທີ 84/ນຍ, ລົງວັນທີ 05 ເມສາ 2016 .
-ອີງຕາມ: ຂໍ້ຕົກລົງ ວ່າດ້ວຍການຈັດຕັ້ງ ແລະ ການເຄື່ອນໄຫວຂອງພະແນກຊັບພະຍາກອນທຳມະຊາດ ແລະ ສິ່ງແວດລ້ອມ ສະບັບ ເລກ ທີ 4983/ກຊສ, ລົງວັນທີ 03 ພະຈິກ 2020.

ພະແນກຊັບພະຍາກອນທຳມະຊາດ ແລະ ສິ່ງແວດລ້ອມ (ພຊສ) ຕົກລົງເຫັນດີຮັບຮອງເອົາບົດລາຍງານແຜນການຄຸ້ມຄອງຕິດຕາມກວດກາສິ່ງແວດລ້ອມລ້ອມທຳມະຊາດ-ສັງຄົມເບື້ອງຕົ້ນຂອງໂຄງການ ກໍ່ສ້າງ ອ່າງໂຕ່ງນ້ຳແສງ ແລະ ນ້ຳນານ , ເມືອງ ນານ , ແຂວງຫຼວງພະບາງ, ສົກປີ 2022-2023, ຂອງ ພະແນກກະສິກຳ ແລະ ປ່າໄມ້ (ໄລຍະ 1 ປີ ນັບແຕ່ ວັນທີ 23 ພຶດສະພາ (05) 2022 ຫາ ວັນທີ 23 ພຶດສະພາ (05) 2023 ໂດຍເຈົ້າຂອງໂຄງການຈະໄດ້ຕ້ອງປະຕິບັດຕາມເງື່ອນໄຂດັ່ງນີ້ :

1. ຮັບຜິດຊອບໂດຍກົງ ຕໍ່ ການສຶກສາ ແລະ ຂໍ້ມູນ ທີ່ໄດ້ລະບຸໄວ້ ໃນບົດລາຍງານການສຶກສາຜົນກະທົບຕໍ່ສິ່ງແວດລ້ອມ ແລະ ສັງຄົມເບື້ອງຕົ້ນ ແລະ ຈັດຕັ້ງປະຕິບັດ ທຸກມາດຕາການແກ້ໄຂຜົນກະທົບ ທີ່ກຳນົດໄວ້ໃນແຜນການຄຸ້ມຄອງສິ່ງແວດ ລ້ອມ ແລະ ສັງຄົມ.
2. ໃນກໍລະນີ ມີບັນຫາທາງດ້ານສິ່ງແວດລ້ອມ ແລະ ສັງຄົມເກີດຂຶ້ນ ທີ່ບໍ່ໄດ້ກຳນົດໄວ້ໃນບົດລາຍງານ ດັ່ງກ່າວ ເຈົ້າຂອງ ໂຄງ ການຈະຕ້ອງໄດ້ຮັບຜິດຊອບເພີ່ມເຕີມ ໃນການສ້າງແຜນການຄຸ້ມຄອງສິ່ງແວດລ້ອມ- ສັງຄົມ ພ້ອມທັງມີມາດຕະການແກ້ ໄຂບັນຫາເຫຼົ່ານັ້ນ ແລະ ຮັບປະກັນ ໃຫ້ງົບປະມານພຽງພໍ ໃນການຈັດຕັ້ງປະຕິບັດແຜນການດັ່ງກ່າວ.
3. ພາຍຫຼັງສຳເລັດ, ເຈົ້າຂອງໂຄງການຕ້ອງໄດ້ປົວແປງ ແລະ ຟື້ນຟູເຂດທີ່ຖືກຜົນກະທົບຈາກການປັບປຸງພື້ນທີ່ ໃຫ້ຄືນສູ່ສະພາບທີ່ ສາມາດນຳໃຊ້ໄດ້ .
4. ເຮັດບົດລາຍງານປະຈຳເດືອນ,ປະຈຳ 3 - 6 ເດືອນ ແລະ ປະຈຳປີກ່ຽວກັບ ການຈັດຕັ້ງປະຕິບັດວຽກງານສິ່ງແວດລ້ອມ ແລະ ສັງຄົມ ຂອງໂຄງການ ສົ່ງໃຫ້ຫ້ອງການ ຊສ ເມືອງ ແລະ ພະແນກຊັບພະຍາກອນທຳມະຊາດ ແລະ ສິ່ງແວດລ້ອມ ແຂວງເພື່ອຕິດຕາມກວດກາ.
ໃຫ້ຂະແໜງສິ່ງແວດລ້ອມ ຂັ້ນແຂວງ ແລະ ຫ້ອງການ ຊສ ເມືອງລົງຕິດຕາມກວດກາການປັບປຸງ ພື້ນທີ່ ເປັນແຕ່ລະໄລຍະຕາມ ເງື່ອນຕົວຈິງ ເພື່ອລາຍງານໃຫ້ທາງຂັ້ນເທິງຊາບ.
5. ໃບຢັ້ງຢືນສະບັບນີ້ ມີຜົນນຳໃຊ້ ນັບແຕ່ມື້ລົງລາຍເຊັນເປັນຕົ້ນໄປ.

ຫົວໜ້າພະແນກ
ຊັບພະຍາກອນທຳມະຊາດ ແລະ ສິ່ງແວດລ້ອມແຂວງ

ຈັນທະລັງ ພົນມະຈິດ

ຫົວໜ້າຂະແໜງ
ສິ່ງແວດລ້ອມ ແລະ ການປ່ຽນແປງດິນຟ້າອາກາດ

ສະພົນ ພິລາພົນ

National Symbol of Laos

Lao People's Democratic Republic
Peace Independence Democracy Unity Prosperity

Natural Resource and Environment Department

No. 34/NR&ES. LPB
Luang Prabang, 24th May 2022

Environmental Certificate

- Pursuant to Law on Environmental Protection, No. 29/NA, dated 18th December 2012;
- Pursuant to Decree on Environmental Impact Assessment, No. 389/GL, dated 20th October 2022;
- Pursuant to Decree on Compensation and Resettlement from Development Project, No. 84/PM, dated 5 May 2016;
- Pursuant to the agreement on the organization and activities of Natural Resource and Environment Section of Province No. 4983/MoNRE, dated 3rd November 2020

The Department of Natural Resources and Environment agreed to adopt the report of the initial social environmental monitoring management plan for the construction project of the Seng and Nam Nan District, Nan District, Luang Prabang Province for the year 2022-2023 of the Department of Agriculture and Forestry (period of 1 year from May 23, 2022 to May 23, 2023). The project owner will have to comply with the following conditions:

1. Be directly responsible for the study and information specified in the preliminary environmental and social impact study report and implement all the measures to correct the effects defined in the environmental and social control plan;
2. In the event that impacts on the social and natural environment occur in the project area that is not specified in the environmental management plan, the project owner must take additional responsibility in defining measures to prevent, reduce and correct the impact as well as ensure that there is sufficient budget for the implementation of such measures;
3. After completion, the owner of the project must repair and rehabilitate the area affected by the improvement of the area to return it to a condition that can be used;
4. Make a monthly, 3-6 month and annual report on the implementation of the environmental and social work of the project and send it to the natural resources and environment office of the district and the natural resources and environment department of the province for monitoring;
   Let the environmental department at the provincial level and the office of natural resources and the environment of the district monitor and update the area periodically according to the actual conditions to report to the upper level.
5. This certificate is effective from the date of signature

Director of Department
Natural Resources and Environment of Province

Signed and sealed by

Chanthavong PHONNACHITH

Director of Section
Environment and Changing Land

Signed and sealed by

Soulaphon PHILAKOUN

APPENDIX C
UXO CERTIFICATION

ສາທາລະນະລັດ ປະຊາທິປະໄຕ ປະຊາຊົນລາວ
ສັນຕິພາບ ເອກະລາດ ປະຊາທິປະໄຕ ເອກະພາບ ວັດທະນະຖາວອນ

ແຂວງ ຫລວງພະບາງ
ຫ້ອງການປະສານງານເກັບກູ້ລະເບີດແຫ່ງຊາດ

ເລກທີ 006 /ຄກລ
ຫລວງພະບາງ ວັນທີ 3/7/2023

ເອກະສານຢັ້ງຢືນ

ເລື່ອງ : ການຢັ້ງຢືນການກວດກາລະເບີດຕາມຈຸດທີ່ຕັ້ງ ແລະ ເນື້ອທີ່ຂອບເຂດຂອງບັນດາໂຄງການຊົນລະປະທານທີ່ຈະຟື້ນຟູສ້ອມແປງທີ່ບອນໃນບັນຊີໂຄງການພັດທະນາພື້ນຖານໂຄງລ່າງຊົນນະບົດ ແລະ ຄຸ້ມຄອງອ່າງໂຕ່ງແບບຍືນຍົງ, (SRIWSM).ເງິນກູ້ຢືມຈາກທະນາຄານພັດທະນາອາຊີ (ADB) ໂຄງການ ຊົນລະປະທານນ້ຳນານ 1-3,ໂຄງການຊົນລະປະທານ ນ້ຳນານ 2-4-5 ເມືອງນານ ແລະ ໂຄງການຊົນລະປະທານ ນ້ຳຊັນ1-2-3-4 ເມືອງຊຽງເງິນ ແຂວງຫລວງພະບາງ.

- ອີງຕາມ ການລົງກວດກາວັດຖຸລະເບີດທີ່ບໍ່ທັນແຕກໃນຂອບເຂດພື້ນທີ່ ຂອງໂຄງການ ຊົນລະປະທານ ນ້ຳນານ 1-3 ແລະ ໂຄງການຊົນລະປະທານ ນ້ຳນານ 2-4-5 ເມືອງນານ ແຂວງຫລວງພະບາງ ໃນຖັງວັນທີ 8-18 ກຸມພາ (02) ປີ 2022.
- ອີງຕາມ ການລົງກວດກາວັດຖຸລະເບີດທີ່ບໍ່ທັນແຕກໃນຂອບເຂດພື້ນທີ່ ຂອງໂຄງການ ຊົນລະປະທານ ນ້ຳຊັນ 1-2-3-4 ເມືອງຊຽງເງິນ ແຂວງຫລວງພະບາງ ໃນຖັງວັນທີ 12-16 ມັງກອນ (1) ປີ 2023.

ໂຄງການເກັບກູ້ລະເບີດແຫ່ງຊາດ ປະຈຳ ແຂວງຫລວງພະບາງໄດ້ລົງກວດກາວັດຖຸລະເບີດທີ່ບໍ່ທັນແຕກ ແລະ ປະເມີນໃນພື້ນທີ່ສ່ຽງ ໃນຂອບເຂດ ໂຄງການ ຊົນລະປະທານ ນ້ຳນານ 1-3,ໂຄງການຊົນລະປະທານ ນ້ຳນານ 2-4-5 ເມືອງນານ ແລະ ໂຄງການ ຊົນລະປະທານ ນ້ຳຊັນ 1-2-3-4 ເມືອງຊຽງເງິນ ແຂວງຫລວງພະບາງ ເຊິ່ງເປັນໂຄງການ ທີ່ຈະມີແຜນກໍ່ສ້າງ ແລະ ສ້ອມແປງ ລະບົບຊົນລະປະທານ ທີ່ບອນໃນບັນຊີໂຄງການພັດທະນາພື້ນຖານໂຄງລ່າງຊົນນະບົດ ແລະ ຄຸ້ມຄອງອ່າງໂຕ່ງແບບຍືນຍົງ, (SRIWSM). ເງິນກູ້ຢືມຈາກທະນາຄານພັດທະນາອາຊີ (ADB) ເຊິ່ງຜົນຂອງການ ການລົງສຳຫຼວດ ແລະ ກວດກາຕົວຈິງອີງຕາມມາດຕະຖານເຕັກນິກວິຊາການຂອງການເກັບກູ້ວັດຖຸລະເບີດແລ້ວສາມາດສະຫລຸບໄດ້ວ່າ :

1. ຕາມຈຸດທີ່ຕັ້ງຫົວງານ,ຄອງເໝືອງ ກິດຈະກຳຂອງໂຄງການທີ່ໄດ້ລະບຸຕາມແຜນໃນການກວດການັ້ນ ແມ່ນບໍ່ປະກົດພົບເຫັນວັດຖຸລະເບີດ ແລະ ສິ່ງທີ່ເປັນອັນຕະລາຍຕໍ່ກິດຈະກຳຕາມແຜນຂອງໂຄງການ
2. ເຫັນໄດ້ວ່າຂອບເຂດພື້ນທີ່ດັ່ງກ່າວນັ້ນແມ່ນບໍ່ເປັນພື້ນທີ່ສ່ຽງ ຕໍ່ວັດຖຸລະເບີດຕົກຄ້າງດັ່ງນັ້ນຈຶ່ງມີຄວາມປອດໄພເປັນຕົ້ນແມ່ນ ການບຸກເບີກພື້ນທີ່ເພື່ອກໍ່ສ້າງ,ການສັນຈອນຂອງເຄື່ອງກົນຈັກ ແລະ ກິດຈະກຳຂອງໂຄງການ.
3. ສຳລັບເອກະສານ ເອກະສານອ້າງອີງການກວດກາທາງທີມງານຈະຄັດຕິດໃບຢັ້ງຢືນສະບັບນີ້.
4. ເອກະສານສະບັບນີ້ແມ່ນມອບໃຫ້ທາງໂຄງການ ພຊຄ ແຂວງຫລວງພະບາງ ເກັບໄວ້ 1 ສະບັບ ແລະ ສຳເນົາ 1 ສະບັບ.

ດັ່ງນັ້ນ,ຈຶ່ງໄດ້ເຮັດເອກະສານຢັ້ງຢືນສະບັບນີ້ເພື່ອນຳໃຊ້ເຂົ້າໃນການຈັດຕັ້ງປະຕິບັດຕໍ່ໄປ

ຜູ້ປະສານງານ
ໂຄງການເກັບກູ້ລະເບີດແຫ່ງຊາດປະຈຳແຂວງຫລວງພະບາງ

ຫຸມເພັດ ຈັນທະວົງ
Houmphanh CHANTHAVONG

Lao People's Democratic Republic
Peace Independence Democracy Unity Prosperity

LuangPrabang Province
UXO Project

No. 006/UXO.LPB
LuangPrabang, Date 03 /07/ 2023

Certified Document

Subject: Certify of UXO Inspection of SRIWSM subproject by ADB Loan in LuangPrabang Province for Nam Nan 1-3 and Nam Nan 2-4-5 in Nan district, and Nam Khan 1-2-3-4 in Xieng-Ngern district, LuangPrabang (LPB) Province

- Pursuant to survey report on UXO site inspection for Nam Nan 1-3 and Nam Nan 2-4-5 irrigation project in Nan district, LuangPrabang Province, between date 8-18/02/2022;
- Pursuant to survey report on UXO site inspection for Nam Khan 1-2-3-4 irrigation project in Xieng-Ngern district, LuangPrabang Province, between date 12-16/01/2023

UXO project of LPB have completed the site inspection in the risk areas of the both project site for Nam Nan 1-3 and Nam Nan 2-4-5 irrigation project in Nan district, LuangPrabang Province and Nam Khan 1-2-3-4 irrigation project in Xieng-Ngern district, LuangPrabang Province. Which are planning to construct as re-habitation project under the loan by ADB. The inspection was followed the national guidance and standard of UXO survey and inspection, and can be summarized as follows:

1. There is no UXO found along the headworks, canals as detailed in the survey report according to project plan.
2. The areas are not the risk areas to UXO and safe for construction activities
3. For the detailed report are attached in this certified letter
4. This document is presented to SRIWSM LPB project coordinator 1 original and 1 copy for keeping in the UXO project office

Therefore, this certified letter is issued for further need of evidence and reference.

UXO Project Coordinator of LPB Province

Houmphan CHANTHAVONG

ບົດລາຍງານຜົນສຳເລັດຂອງການກວດກູ້ Clearance Completion Report

1. ລະຫັດໜ້າວຽກ Task ID: UXO Lao-AC-0603017-002...ລະຫັດ Team ID:AC.01
2. ລະຫັດພື້ນທີ່ຢືນຢັນວ່າອັນຕະລາຍ CHA ID: UXO Lao –CHA-.....
3. ແຂວງ Province: ຫຼວງພະບາງ ເມືອງ District (ເປັນພາສາລາວ): ...ນານ.....
   ບ້ານ Village (ເປັນພາສາລາວ In Lao): ບ້ານນາຝາຍ ແລະ ບ້ານ ປ່າໄຜ່
4. ລາຍລະອຽດຂອງໂຄງການ Project Details:ກໍ່ສ້າງຝາຍປັ້ງແລະ ຝາຍວາ ຜູ້ໃຫ້ທຶນ Donor: ADB
5. ວັນທີເລີ່ມຕົ້ນ Start Date: 7/2/2022..... ວັນທີສຳເລັດ End Date: 11/2/2022.....
   ຈຳນວນມື້ທີ່ເຮັດວຽກ Days Worked: 5 ວັນ.....
6. ລະບົບຈຸດພິກັດ Coordinate System: WGS1984 ຮູບແບບຈຸດພິກັດ Coordinate Format: Latitude/Longitude

6.1. ຈຸດພິກັດຂອງບ້ານ (ຫ້ອງການກະສິກຳເມືອງນານ): ທາງເຂົ້າໂຮງຮຽນ
Village Coordinates (Village Office or Head Person's House):

ເສັ້ນແວງ Longitude/X101.85484	ເສັ້ນຂະໜານ Latitude/Y19.46712

7. ກິດຈະກຳ Activity: ☐ ກວດກູ້ພື້ນທີ່ CHA Clearance ☑ ກວດພື້ນທີ່ໆບໍ່ແມ່ນພື້ນທີ່ CHA Non CHA Clearance
8. ລາຍລະອຽດຂອງການກວດກູ້ Clearance Details:ເນື້ອທີ່ກວດກູ້ແລ້ວ Cleared Area (ຕາແມັດ Square Metres):2.3000m2ຝາຍວາ;20.000m2.ຝາຍປັ້ງ..

ຄວາມເລິກຂອງການກວດກູ້ເປັນແມັດ Clearance Depth(s) in Metres:

ເນື້ອທີ່ທີ1 Area 1: 0.25 ມ²m² ມm	ເນື້ອທີ່ທີ2 Area 2: ມ²m² ມm

9. ເນື້ອທີ່ໆບໍ່ສາມາດກວດກູ້ໄດ້ Area Unable to be Cleared:
   ☐ມີ Yes ☑ບໍ່ມີ No ເນື້ອທີ່ໆບໍ່ສາມາດກວດກູ້ໄດ້ Area Unable to be Cleared: (ຕາແມັດ Square Metres):
   ວິທີການກວດກູ້ Clearance Method: ☑ດ້ວຍມື Manual ☐ກົນຈັກ Mechanical
10. ຍີ່ຫໍ້/ລຸ້ນ ຂອງເຄື່ອງກວດທີ່ນຳໃຊ້ Make/Model of Detection Equipment Used: VALLON
    ຂະໜາດຮູບຮ່າງຂອງເຄື່ອງກວດ Detector Configuration: ຫົວມົນ 30 cm
    ການຕັ້ງຄ່າເຄື່ອງກວດ Detector Setting: 10...
11. ຈຸດພິກັດຂອງຈຸດອ້າງອີງ Reference Point Coordinates:
12.

ເສັ້ນແວງ Longitude/X: 19.87597	ເສັ້ນຂະໜານ Latitude/Y:102.14473

13. ໂພລີກອນຂອງພື້ນທີ່ກວດກູ້ແລ້ວ Cleared Area Polygon:

ຈາກ From	ເຖິງ TO	ໄລຍະຫ່າງ Distance (ແມັດ Metres)	ມຸມ Bearing (ອົງສາ Degrees)	ເສັ້ນແວງLongitude/X:	ເສັ້ນຂະໜານ Latitude/Y:	ຄຳເຫັນ Comments

	TO	s)				
	RP	329	339.2	101.90950	19.51896	GPSຂອ ງຝາຍປ້ ງ
RP	BM1	294	247.2	101.90790	19.52162	
BM1	BM2	327	143.0	101.90577	19.52257	
BM2	SP	215	117.2	101.90504	19.52366	
SP	TP1	175	83.3	101.90439	19.52280	
Tp1	TP2	193	67.2	101.90445	19.52205	
Tp2	TP3	209	50.0	101.90430	19.52146	
TP3	TP4	210	91.8	101.90406	19.52107	
TP4	Tp5	151	37.7	101.90361	19.52036	
TP5	TP6	201	56.1	101.90378	19.52006	
TP6	TP7	167	97.3	101.90358	19.51959	
TP7	TP8	127	55.9	101.90377	19.51873	
TP8	TP9	214	87.0	101.90419	19.51842	
TP9	TP10	220	59.8	101.90371	19.51778	
TP10	TP11	206	78.4	101.90334	19.51737	
TP11	TP12	200	110.5	101.90300	19.51674	
TP12	TP13	165	42.3	101.90262	19.51581	
TP13	TP14	212	33.0	101.90272	19.51544	
TP14	TP15	200	129.3	101.90255	19.51519	
TP15	TP16	148	80.0	101.90211	19.51410	
TP16	TP17	227	31.3	101.90250	19.51348	
TP17	TP18	294	46.5	101.90228	19.51329	
TP18	TP19	331	61.2	101.90188	19.51347	
TP19	TP20	329	51.0	101.90161	19.51396	

TP20	TP21	258	71.6	101.90137	19.51436	
TP21	TP22	263	67.6	101.90070	19.51424	
TP22	TP23	211	57.5	101.90006	19.51418	
TP23	TP24	238	103.9	101.89977	19.51374	
TP24	TP25	223	35.1	101.89892	19.51326	
TP25	TP26	264	113.9	101.89869	19.51303	
TP26	TP27	278	147.9	101.89761	19.51294	
TP27	TP28	293	157.2	101.89622	19.51315	
TP28	TP29	289	95.3	101.89485	19.51372	
TP29	TP30	265	47.4	101.89400	19.51402	
TP30	TP31	249	34.8	101.89355	19.51399	
TP31	TP32	246	66.0	101.89324	19.51388	
TP32	TP33	214	40.5	101.89266	19.51365	
TP34	TP35	205	92.2	101.89244	19.51335	
TP35	TP36	177	34.4	101.89206	19.51260	
TP36	TP37	227	74.0	101.89207	19.51229	
TP37	TP38	185	144.9	101.89155	19.51184	
TP38	TP39	146	109.2	101.89140	19.51054	
TP39	TP40	156	169.2	101.89196	19.50971	
TP40	TP41	195	57.6	101.89258	19.50830	
TP41	TP42	144	52.9	101.89243	19.50780	
TP42	TP43	213	63	101.89272	19.50741	
TP43	TP44	329	339	101.89247	19.50709	

13. ຜູ້ໄດ້ຮັບຜົນປະໂຫຍດ (ຜູ້ທີ່ຈະນຳໃຊ້ດິນຫວດກູ້ແລ້ວ):

Beneficiaries (People that will use the cleared land):

ໃຫ້ຄຳອະທິບາຍສຳລັບພື້ນທີ່ບໍ່ທັນກວດກູ້ເຊິ່ງຢູ່ພາຍໃນພື້ນທີ່ກວດກູ້
ແລ້ວ,ພື້ນທີ່ເຊິ່ງມີຄວາມເລິກຂອງການກວດກູ້ຕ່າງກັນ,
ແລະສຳລັບພື້ນທີ່ຍັ້ງຢືນວ່າອັນຕະລາຍແຕ່ຖືກຍົກເລີກ.

Provide explanations for uncleared areas within the cleared area, areas with different clearance depths and for areas within the CHA being cancelled.

....

22. ການຢືນຢັນ ໂດຍຫົວໜ້າທີມກວດກູ້. Declaration by the Clearance Team Leader:

ພວກຂ້າພະເຈົ້າ ຢືນຢັນວ່າ ພື້ນທີ່ດິນທີ່ອະທິບາຍໂດຍເລກລະຫັດນີ້ ແມ່ນໄດ້ຜ່ານການກວດກູ້ ຕາມມາດຕະຖານແຫ່ງຊາດ ຂອງ ສປປ ລາວ ກ່ຽວກັບການປະຕິບັດງານເພື່ອແກ້ໄຂບັນຫາ ລບຕ ແລະ ບໍ່ມີ ລບຕ ຢູ່ໃນຄວາມເລິກຂອງການກວດກູ້ທີ່ກຳນົດໄວ້.

I declare that the area described by this Task ID has been cleared in accordance with Lao PDR National UXO/Mine Action Standards and is free from UXO to the specified depth(s) of clearance.

ຫົວໜ້າທີມ Team Leader: ບຸນຫຼາຍ ບຸນມະນີວົງ	
ວັນທີ Date:7/2/2022	ລາຍເຊັນ Signature:

23. ລາຍເຊັນ ແລະ ກາປະທັບ ຂອງ ຜູ້ປະສານງານແຂວງ/ຮອງຜູ້ປະສານງານແຂວງ:

Provincial Coordinator's/Deputy Provincial Coordinator's Signature and Stamp:

ຜູ້ປະສານງານ/ຮອງຜູ້ປະສານງານ PC/DPC:	
ວັນທີ Date:7/2/2022	ລາຍເຊັນ ແລະ ກາປະທັບ Signature & Stamp:

[illegible]oumchanh CHANTHAVONG

ບົດລາຍງານຜົນສຳເລັດຂອງການກວດກູ້ Clearance Completion Report

1. ລະຫັດໜ້າວຽກ Task ID: UXO Lao-AC-603016-003...ລະຫັດ Team ID:AC.01
2. ລະຫັດພື້ນທີ່ຢືນຢັນວ່າອັນຕະລາຍ CHA ID: UXO Lao –CHA-.....
3. ແຂວງ Province: ຫຼວງພະບາງ ເມືອງ District (ເປັນພາສາລາວ): ...ນານ.....
   ບ້ານ Village (ເປັນພາສາລາວ In Lao):ນາເລົ່າ ບ້ານນາເຄັນແລະບ້ານໂພນ.....
4. ລາຍລະອຽດຂອງໂຄງການ Project Details:ກໍ່ສ້າງຝາຍຊຽງ ຝາຍແຂ້ແລະຝາຍເຄັນ ຜູ້ໃຫ້ທຶນ Donor:ADB
5. ວັນທີເລີ່ມຕົ້ນ Start Date: 14/02/2022..... ວັນທີສຳເລັດ End Date: 18/02/2022.....
   ຈຳນວນມື້ທີ່ເຮັດວຽກ Days Worked: 5 ວັນ.....
6. ລະບົບຈຸດພິກັດ Coordinate System: WGS1984 ຮູບແບບຈຸດພິກັດ Coordinate Format: Latitude/Longitude

6.1. ຈຸດພິກັດຂອງບ້ານ (ຫ້ອງການກະສິກຳເມືອງນານ): ທາງເຂົ້າໂຮງຮຽນ
Village Coordinates (Village Office or Head Person's House):

ເສັ້ນແວງ Longitude/X: 19.46712	ເສັ້ນຂະໜານ Latitude/Y:101.85484

7. ກິດຈະກຳ Activity: ☐ ກວດກູ້ພື້ນທີ່ CHA Clearance ☑ ກວດພື້ນທີ່ໆບໍ່ແມ່ນພື້ນທີ່ CHA Non CHA Clearance
8. ລາຍລະອຽດຂອງການກວດກູ້ Clearance Details:ເນື້ອທີ່ກວດກູ້ແລ້ວ Cleared Area (ຕາແມັດ Square Metres):.43.000..m2

ຄວາມເລິກຂອງການກວດກູ້ເປັນແມັດ Clearance Depth(s) in Metres:

ເນື້ອທີ່ທີ1 Area 1: 0.25 ມ²m² ມm	ເນື້ອທີ່ທີ2 Area 2: ມ²m² ມm

9. ເນື້ອທີ່ໆບໍ່ສາມາດກວດກູ້ໄດ້ Area Unable to be Cleared:
   ☐ມີ Yes ☑ບໍ່ມີ No ເນື້ອທີ່ໆບໍ່ສາມາດກວດກູ້ໄດ້ Area Unable to be Cleared: (ຕາແມັດ Square Metres):
   ວິທີການກວດກູ້ Clearance Method: ☑ດ້ວຍມື Manual ☐ກົນຈັກ Mechanical
10. ຍີ່ຫໍ້/ລຸ້ນ ຂອງເຄື່ອງກວດທີ່ນຳໃຊ້ Make/Model of Detection Equipment Used: VALLON
    ຂະໜາດຮູບຮ່າງຂອງເຄື່ອງກວດ Detector Configuration: ຫົວມົນ 30 cm
    ການຕັ້ງຄ່າເຄື່ອງກວດ Detector Setting: 10...
11. ຈຸດພິກັດຂອງຈຸດອ້າງອີງ Reference Point Coordinates:

ເສັ້ນແວງ Longitude/X:	ເສັ້ນຂະໜານ Latitude/Y:

12. ໂພລີກອນຂອງພື້ນທີ່ກວດກູ້ແລ້ວ Cleared Area Polygon:

ຈາກ From	ເຖິງ To	ໄລຍະຫ່າງ Distance (ແມັດMetres)	ມຸມBearing (ອົງສາDegrees)	ເສັ້ນແວງLongitude/X:	ເສັ້ນຂະໜານ Latitude/Y:	ຄຳເຫັນ Comments

Provide a sketch map of the cleared land in relation to the CHA boundaries. Show models and locations of UXOs found within the cleared area, any areas that were unable to be or not cleared, areas that have different clearance depths and any cancelled areas within the CHA.

21. ຄຳທິບາຍ Explanations:

ໃຫ້ຄຳອະທິບາຍສຳລັບພື້ນທີ່ບໍ່ທັນກວດກູ້ເຊິ່ງຢູ່ພາຍໃນພື້ນທີ່ກວດກູ້
ແລ້ວ,ພື້ນທີ່ເຊິ່ງມີຄວາມເລິກຂອງການກວດກູ້ຕ່າງກັນ,
ແລະສຳລັບພື້ນທີ່ຍັ້ງຢືນວ່າອັນຕະລາຍແຕ່ຖືກຍົກເລີກ.

Provide explanations for uncleared areas within the cleared area, areas with different clearance depths and for areas within the CHA being cancelled.

.....

22. ການຢືນຢັນ ໂດຍຫົວໜ້າທີມກວດກູ້. Declaration by the Clearance Team Leader:

ພວກຂ້າພະເຈົ້າ ຢືນຢັນວ່າ ພື້ນທີ່ດິນທີ່ອະທິບາຍໂດຍເລກລະຫັດນີ້ ແມ່ນໄດ້ຜ່ານການກວດກູ້ ຕາມມາດຕະຖານແຫ່ງຊາດ ຂອງ ສປປ ລາວ ກ່ຽວກັບການປະຕິບັດງານເພື່ອແກ້ໄຂບັນຫາ ລບຕ ແລະ ບໍ່ມີ ລບຕ ຢູ່ໃນຄວາມເລິກຂອງການກວດກູ້ທີ່ກຳນົດໄວ້.

I declare that the area described by this Task ID has been cleared in accordance with Lao PDR National UXO/Mine Action Standards and is free from UXO to the specified depth(s) of clearance.

ຫົວໜ້າທີມ Team Leader: ບຸນຫຼາຍ ບຸນມະນີວົງ	
ວັນທີ Date:18/02/2022	ລາຍເຊັນ Signature:

23. ລາຍເຊັນ ແລະ ການປະທັບ ຂອງ ຜູ້ປະສານງານແຂວງ/ຮອງຜູ້ປະສານງານແຂວງ:

Provincial Coordinator's/Deputy Provincial Coordinator's Signature and Stamp:

ຜູ້ປະສານງານ/ຮອງຜູ້ປະສານງານ PC/DPC:	
ວັນທີ Date18/02/2022	ລາຍເຊັນ ແລະ ການປະທັບ Signature & Stamp:

ບຸນທັນ ຈັນທະວົງ
Bounthanh CHANTHAVONG

APPENDIX D
PROCEEDINGS OF PUBLIC CONSULTATIONS

ສາທາລະນະລັດ ປະຊາທິປະໄຕ ປະຊາຊົນລາວ
ສັນຕິພາບ ເອກະລາດ ປະຊາທິປະໄຕ ເອກະພາບ ວັດທະນະຖາວອນ

ແຂວງຫລວງພະບາງ
ພະແນກກະສິກຳ ແລະ ປ່າໄມ້
ໂຄງການ ພຄຊ-ຊກຂ

ວັນທີ 29 ກໍລະກົດ 2022

ບົດບັນທຶກ

ກອງປະຊຸມເຜີຍແຜ່ ຜົນສຳເລັດວຽກງານ ການປະເມີນຜົນກະທົບທາງດ້ານສິ່ງແວດລ້ອມ ໂຄງການພັດທະນາ ລະບົບຊົນລະປະທານ ນ້ຳນານ 1-3 ,ນ້ຳນານ 2-4-5 ເມືອງນານ ແຂວງຫລວງພະບາງ.

ໃນວັນທີ **29 ກໍລະກົດ ປີ 2022** ນີ້, ກອງປະຊຸມ ການຄົ້ນຄ້ວາປຶກສາຫາລືລະຫວ່າງ ທີມງານ ຫ້ອງການ ປະສານງານຂອງໂຄງການຂັ້ນແຂວງ ຫລວງພະບາງ, ກອງປະຊຸມໄດ້ຈັດຂຶ້ນ ທີ່ຫ້ອງ ປະຊຸມ ສະໂມສອນເມືອງ ນານ ແຂວງຫລວງພະບາງ ໃນເວລາ **8:30 ນາທີ**. ພາຍໃຕ້ການເປັນປະທານຂອງ **ທ່ານ ສີວອນ ວົງຄຳຈັນ ຫົວໜ້າພະແນກກະສິກຳ ແລະ ປ່າໄມ້ ພ້ອມທັງເປັນຮອງປະທານຄະນະຊີ້ນຳໂຄງການຂັ້ນແຂວງ**. ໂດຍມີແຂກທີ່ຖືກເຊີນ ຂອງບັນດາຫນ່ວຍງານທີ່ກ່ຽວຂ້ອງເຂົ້າຮ່ວມ ທັງໝົດ ມີຈຳນວນ 37 ທ່ານ ຍິງ 5 ທ່ານ.ທີມງານທີ່ມາຈາກສູນກາງ ຈຳນວນ 1 ທ່ານ ຍິງ 0 ທ່ານ,ໃນນັ້ນມາຈາກຫ້ອງການກະສິກາ ແລະ ປ່າໄມ້ເມືອງຈຳນວນ 4 ທ່ານ ຍິງ 0 ທ່ານ ,ມາຈາກຫ້ອງການຊັບພະຍາກອນ ແລະ ສິ່ງແວດລ້ອມເມືອງ 1 ທ່ານຍິງ 0 ທ່ານ .ມາຈາກຫ້ອງການປະສານງານ ໂຄງການຂັ້ນແຂວງ 3 ທ່ານຍິງ 0ທ່ານ ,ມາຈາກພະແນກຊັບພະຍາກອນທຳມະຊາດ 1 ທ່ານຍິງ 0 ທ່ານ ,ຕົວແທນ ຈາກບ້ານເປົ້າໝາຍ ຈຳນວນ 7 ບ້ານ ຈຳນວນ 28 ທ່ານໃນນັ້ນມີຍິງຈຳນວນ 5 ທ່ານ.(ມີໃບທະບຽນຄັດຕິດ)

ຈຸດປະສົງ ຂອງກອງປະຊຸມໃນຄັ້ງນີ້ແມ່ນເພື່ອ ເຜີຍແຜ່ ຜົນສຳເລັດວຽກງານ ການປະເມີນຜົນກະທົບທາງດ້ານ ສິ່ງແວດລ້ອມ ໂຄງການພັດທະນາລະບົບຊົນລະປະທານ ນ້ຳນານ 1-3 ,ນ້ຳນານ 2-4-5 ມີລາຍລະອຽດດັ່ງນີ້:

ທ່ານ ປະທານ ກອງປະຊຸມ (ທ່ານ ສີວອນ ວົງຄຳຈັນ ຫົວໜ້າພະແນກກະສິກຳ ແລະ ປ່າໄມ້ ພ້ອມທັງຮອງ ປະທານ ເປັນຄະນະຊີ້ນຳໂຄງການ ຂັ້ນແຂວງ ໄດ້ມີຄຳເຫັນໂອ້ລົມຕໍ່ທີ່ ປະຊຸມ ໂດຍທ່ານ ເນັ້ນໜັກເຖິງ ສະພາບລວມ ແລະ ປະຫວັດຄວາມເປັນມາໂດຍຫຍໍ້ ຂອງການຈັດຕັ້ງປະຕິບັດໂຄງການ ພ້ອມ ກັບຈຸດປະສົງຫລັກ ຂອງການເຕົ້າລ່ວມບັ້ນເປີດກອງປະຊຸມໃນຄັ້ງນີ້ ພ້ອມກັບສະເໜີ ເຫດຜົນ ອັນຈຳເປັນ ກ່ຽວກັບຄວາມໝາຍ ແລະ ຄວາມສຳຄັນ ຂອງວຽກງານ ປົກປ້ອງສັງຄົມ ແລະ ສິ່ງແວດລ້ອມ ແລະ ທ່ານ ກໍ່ໄດ້ກ່າວເປີດ ກອງປະຊຸມ ໃນ ເວລາ 8:30 ຢ່າງເປັນທາງການ.ພາຍຫລັງການກ່າວເປີດພິທີ ຂອງປະທານກອງປະຊຸມແລ້ວ ຄະນະທີມທີ່ມາແຂວງ ພ້ອມ ຊ່ຽວຊານໄດ້ດຳເນີນການຈັດຕັ້ງປະຕິບັດ ໂດຍອີງໃສ່ວາລະຂອງກອງປະຊຸມ ໂດຍໃຊ້ໄລຍະເວລາເປັນຈຳນວນ ເຄິ່ງ ວັນ ເຊິ່ງດ້ດຳເນີນຕາມຮູບແບບດັ່ງນີ້:

ພາຍຫັລງ ປະທານໄດ້ກ່າວ ເປີດກອງປະຊຸມແລ້ວ ທ່ານ ສັນຍາ ຊຸມພົນພັກດີ ຜູ້ປະສານງານ ໂຄງການ ພຊຄ-ຊກຂ ຂັ້ນແຂວງໄດ້ມີຄຳຄິດຄຳເຫັນ ຕໍ່ກອງປະຊຸມໂດຍທ່ານໄດ້ຍົກບາງບັນຫາທີ່ສຳຄັນແລະພື້ນເດັ່ນເປັນຕົ້ນແມ່ນ ປະຫວັດຄວາມເປັນມາ ແລະ ວຽກງານການລົງທຶນເຂົ້າໃນກິດຈະກຳຕ່າງໆຂອງໂຄງການ ພ້ອມນັ້ນທ່ານຍັງໄດ້ຍົກ

ບັນຫາທີ່ສຳຄັນແລະພື້ນເດັ່ນເປັນຕົ້ນແມ່ນ: ສະພາບລວມຂອງການກະກຽມການປັບປຸງລະບົບຊົນລະປະທານນ້ຳ ນານ 1-3 ແລະ ນ້ານານ 2-4-5 ມາເຖິງປະຈຸບັນ.

ຫັລງຈາກນັ້ນ ຜູ້ຊ່ວຍວຽກງານດ້ານສິ່ງແວດລ້ອມຂອງໂຄງການ ໄດ້ຜ່ານຜົນສຳເລັດຂອງການສຶກສາຂໍ້ມູນທາງ ດ້ານ ສິ່ງແວດລ້ອມຂອງໂຄງການຊົນລະປະທານນ້ຳນານ 1-3 ແລະ ນ້ານານ 2-4-5 ,ໂດຍຜ່ານແຕ່ລະຫົວຂໍ້ຂອງ ການສຶກສາດັ່ງນີ:1)ສະພາບທີ່ຕັ້ງຂອງໂຄງການ,ຜົນສຳເລັດຂອງການເກັບກຳຂໍ້ມູນ ທາງດ້ານຊີວະພາບຂອງພື້ນທີ່, ຜົນສະເລັດຂອງການເກັບກຳຂໍ້ມູນທາງດ້ານກາຍຍະພາບ,ສະພາບພຸມສາດ ແລະ ເນື້ອທີ່ການຜະລິດ

ພາຍຫັລງສຳເລັດ ຕົວແທນຈາກພະແນກຊັບພະຍາກອນທຳມະຊາດ ແລະ ສິ່ງແວດລ້ອມຂອງແຂວງ ໄດ້ຂຶ້ນ ຜ່ານມາດຕະການການຄວາມສິ່ງແວດລ້ອມໂດຍແບ່ງອອກເປັນ 2 ໄລຍະຄື:ໄລຍະດຳເນີນໂຄງການ,ໄລຍະພາຍຫັລງ ສິ້ນສຸດໂຄງການ ໂດຍເນື້ອໃນຈະປະກອບດ້ວຍ ດັ່ງນີ້:1.)ການຈັດການນ້ຳ,2.)ການຈັດການທີ່ດິນ3.)ການຈັດການ ທາງສຽງ,4.)ການຈັດການຝຸ່ນລະອອງ ແລະ ເສດເຫລືອຈາກການກໍ່ສ້າງ,5.)ແຄ້ມທີ່ພັກຂອງບໍລິສັດ ແລະ ອື່ນໆ

ພາຍຫັລງສຳເລັດແລ້ວປະທານກອງປະຊຸມໄດ້ເປີດໂອກາດໃຫ້ມີການແລກປ່ຽນ ປະກອບຄຳຄິດຄຳເຫັນຂອງ ການຈັດຕັ້ງປ້ານເປົ້າໝາຍຂອງໂຄງການ ໂດຍສາມາດສະຫລຸບເນື້ອໃນທີ່ສຳຄັນໄດ້ດັ່ງນີ້:

1. ສະເໜີໃຫ້ທາງໂຄງການ ຊ່ວຍເລັ່ງລີງມືກໍ່ສ້າງ ເພາະປະຊາຊົນມີຄວາມຄອງຄອຍໂຄງການດັ່ງກ່າວ;
2. ສະເໜີໃຫ້ທາງໂຄງການ ຊ່ວຍສ້າງຝາຍຖາວອນ ທີ່ສາມາດປ້ກໄດ້ທັງລະດູຝົນ ແລະ ລະດູແລ້ງ;
3. ທາງອຳນາດປົກຄອງບ້ານ ແລະ ປະຊາຊົນ ເຫັນດີສະໜັບສະໜຸນ ຢາກໃຫ້ມີການກໍ່ສ້າງໂຄງການດັ່ງກ່າວ ເກີດຂຶ້ນໂດຍໄວ;

ປະທານກອງປະຊຸມໄດ້ມີຄຳຄິດຄຳເຫັນ ແລະ ໄດ້ກ່າວປິດກອງປະຊຸມລົງ ເວລາ 11:30 ຂອງວັນດຽວກັນ.

ຜູ້ປະສານງານໂຄງການ ພຊຄ ຂັ້ນແຂວງ

ສັນຍາ ຊຸມພົນພັກດີ
Sanya SOUMPHONPHAKDY

ຜູ້ທຶກກອງປະຊຸມ

ຮູບພາບ ກອງປະຊຸມຜ່ານຜົນສຳເລັດຂອງວຽກງານການປົກປ້ອງສິ່ງແວດລ້ອມ

ຮູບພາບທີ 1 : ຮູບພາບລົງທະບຽນ

ຮູບພາບທີ 2 : ປະທານເປີດກອງປະຊຸມ

ຮູບພາບທີ 3:ດຳເນີນກອງປະຊຸມເຜີຍແຜ່ວຽກງານດ້ານສິ່ງແວດລ້ອມ

ຮູບພາບທີ 4: ຜູ້ແທນກອງປະຊຸມແລກປ່ຽນຄາຄິດຄາເຫັນ

ຮູບພາບທີ 5: ຖ່າຍພາບລວມກັບປະທານກອງປະຊຸມ

ຮູບພາບທີ 6: ປະຊຸມປະຕິຮັບຮອງເອົາຜົນສຳເລັດຂອງບົດສິ່ງແວດລ້ອມ

ແຂວງຫຼວງພະບາງ
ພະແນກກະສິກຳ ແລະ ປ່າໄມ້
ໂຄງການ ພຊຄ (SRIWSM-ADB)

ADB
ASIAN DEVELOPMENT BANK

ລາຍຊື່ຜູ້ເຂົ້າຮ່ວມ

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ໂຄງການພັດທະນາພື້ນຖານໂຄງລ່າງຊົນນະບົດ ແລະ ຄຸ້ມຄອງອ່າງໂຕ່ງແບບຍືນຍົງ (ພຊຄ)
Sustainable Rural Infrastructure and Watershed Management Sector Project (SRIWSM)

ລ/ດ No	ຊື່ ແລະ ນາມສະກຸນ Name & Surname	ໜ້າທີ່ຮັບຜິດຊອບ Position	ບ່ອນປະຈຳການ Address	ເພດ Sex ຍ F	ຊ M	ຊົນເຜົ່າ Ethnic	ໂທລະສັບ Telephone	ລາຍເຊັນ Signature
1	[illegible]	[illegible]	[illegible]		✓	ລາວ	55547719	[signature]
2	[illegible]	[illegible]	[illegible]		–	ລາວ	58124732	[signature]
3	[illegible]	[illegible]	[illegible]		✓	ລາວ	99301527	[signature]
4	[illegible]	[illegible]	[illegible]		✓	ລາວ	55377142	[signature]
5	[illegible]	ປະສານງານ	[illegible]		✓	ລາວ	55700714	[signature]
6	[illegible]	ປະທານ ແນວລາວ	[illegible]		✓	ລາວ	55331128	[signature]
7	[illegible]	[illegible]	[illegible]		✓	ລາວ	55796904	[signature]
8	[illegible]	ນາຍບ້ານ	[illegible]		✓	ລາວ	99997177	[signature]

ຜູ້ສັງລວມ

ແຂວງຫຼວງພະບາງ
ພະແນກກະສິກຳ ແລະ ປ່າໄມ້
ໂຄງການ ພຊຄ (SRIWSM-ADB)

ADB
ASIAN DEVELOPMENT BANK

ລາຍຊື່ຜູ້ເຂົ້າຮ່ວມ

[illegible]
[illegible] 1-3, 2-4-5, [illegible] 29/[illegible]/2022

ໂຄງການພັດທະນາພື້ນຖານໂຄງລ່າງຊົນນະບົດ ແລະ ຄຸ້ມຄອງອ່າງໂຕ່ງແບບຍືນຍົງ (ພຊຄ)

Sustainable Rural Infrastructure and Watershed Management Sector Project (SRIWSM)

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1	[illegible]	[illegible]	PPTT-LPB		✓		55406243	[illegible]
2	[illegible]	[illegible]	[illegible]		✓		[illegible]	[illegible]
3.	[illegible]	[illegible]	ບ. [illegible]		✓		55817589	[illegible]
4	[illegible]	[illegible]	[illegible]		✓		55357446	Phone.
5	ນ. [illegible]	[illegible]	[illegible]	✓	✓		94252742	[illegible]
6	ນ. [illegible]	[illegible]	[illegible]	✓	✓		98570812	[illegible]
7	[illegible]	[illegible]	[illegible]		✓			[illegible]
8	[illegible]	[illegible]	[illegible]		✓		0306033166	[illegible]
9	[illegible]				✓		9964325	[illegible]
10	[illegible] -//-	[illegible]	ບ. [illegible]		—		-//-	[illegible]
11	[illegible]	[illegible]	-//-		—		58599803	[illegible]
12	[illegible]	[illegible]	[illegible]		✓		98701116	[illegible]
13	ທ. [illegible]	[illegible]	[illegible]		✓		57452714	[illegible]

ແຂວງຫຼວງພະບາງ
ພະແນກກະສິກຳ ແລະ ປ່າໄມ້
ໂຄງການ ພຊຄ (SRIWSM-ADB)

ADB
ASIAN DEVELOPMENT BANK

ລາຍຊື່ຜູ້ເຂົ້າຮ່ວມ

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ໂຄງການພັດທະນາພື້ນຖານໂຄງລ່າງຊົນນະບົດ ແລະ ຄຸ້ມຄອງອ່າງໂຕ່ງແບບຍືນຍົງ (ພຊຄ)

Sustainable Rural Infrastructure and Watershed Management Sector Project (SRIWSM)

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				ຍ F	ຊ M			
14	[illegible]				✓	ລາວ	55170844	[signature]
15	[illegible]	[illegible]	[illegible]		✓	ລາວ	55700714	[signature]
16	[illegible]	[illegible]	[illegible]		✓	ລາວ	030 4614253	[signature]
17	[illegible]	[illegible]	[illegible]		✓	ລາວ	02055108429	[signature]
18	[illegible]	[illegible]	[illegible]		✓	ລາວ	02095280211	[signature]
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20	[illegible]	[illegible]	[illegible]		✓	ລາວ	56838370	[signature]
21	[illegible]	ESE	LIC - D02		✓	ລາວ	56428951	[signature]
22	[illegible]	[illegible]	ພຊຄ		✓	ລາວ	23246519	[signature]
23	[illegible]	[illegible]	[illegible]		✓	ໄປຣ.	97565799	[signature]
24	[illegible]	[illegible]	[illegible]		✓	ລາວ	0305694100	[signature]
25	[illegible]	[illegible]	[illegible]		✓	ລາວ	020.22350513	[signature]
26	[illegible]	[illegible]	PPIT		✓	ລາວ	58977969	[signature]

ລ/ດ No	ຊື່ ແລະ ນາມສະກຸນ Name & Surname	ໜ້າທີ່ຮັບຜິດຊອບ Position	ບ່ອນປະຈຳການ Address	ເພດ Sex ຍ F	ຊ M	ຊົນເຜົ່າ Ethnic	ໂທລະສັບ Telephone	ລາຍເຊັນ Signature
27	ທ. ສົມພິດ	ຮອງນາຍບ້ານ	ບ້ານສົບປູນ (ເມືອງ)		✓		98418942	[signature]
28	ນ. ຄຳພອນ ມາລາວົງ	ວິຊາການ	ຈກ2 ເມືອງ[illegible]	✓			59667277	[signature]
29	ທ. ຄຳສຸວັດ ອິນສີຊຽງໃໝ່	Driver	DOI		✓		54999488	[signature]
30	ທ. ວິລະເດດ ພົມທູລ	ວິຊາການ	PPIT-LPB		✓		55175115	Vixomdom
31	ທ. [illegible]	—	—		✓		02054495656	[signature]
32	ນ. ຈັນທະພອນ [illegible]	[illegible]	—	✓			55618363	[signature]
33	ນ. [illegible]	ການເງິນ	—	✓			52220656	[signature]
34	ທ. [illegible]	[illegible]	—		✓		59790999	[signature]
35	ທ. [illegible]	ວິຊາການ	—		✓		52573982	[signature]
36	ທ. ທະນີ [illegible]	-	-				55428824	[signature]
37	ທ. [illegible]	—	PPIT		✓		56868887	[signature]

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[signature]

APPENDIX E
TEMPLATE OF PROJECT ENVIRONMENTAL SAFEGUARDS MONITORING REPORT

1. INTRODUCTION AND PROJECT OVERVIEW

PROJECT NUMBER AND TITLE:	
REPORTING PERIOD:	This section can include, among others, the following: • Activities of Proponent • Progress of Work (% physical completion) • Changes of Surrounding Environment • Status of Permits
MONITORING PERIOD COVERED	
KEY SUB-PROJECT ACTIVITIES IMPLEMENTED SINCE LAST REPORT:	
REPORT PREPARED BY:	

2. ENVIRONMENTAL PERFORMANCE MONITORING

A. STATUS OF COMPLIANCE WITH EMP REQUIREMENTS (ENVIRONMENTAL PERFORMANCE)

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	COMPLIANCE
I. PRE-CONSTRUCTION PHASE			
Impact on community assets Loss of community assets due to damage to properties.	Implement the compensation plan that was approved by the ADB for the subproject. Design headworks, canals and related structures within the Right-of-Way when feasible.	External LACP monitoring report	
Impact of location of headworks on other water users Downstream river uses such as irrigation, bathing, washing, and fishing will be affected if excessive water abstraction will occur.	There is minimal conflict with other water users of Nam Nan because there is still enough water in the river that will meet the other river uses at the downstream.	River level assessments at the headworks on a monthly basis	
Impact to Natural resources and protected areas Impact on natural resources and protected areas from cutting/clearing of trees and other vegetation.	Cutting of trees will be undertaken as per approved design and only upon approval. Avoid cutting of trees as much as possible and minimize damage to native vegetation. Trees that need to be cut in private land will be compensated in cash in accordance with the approved Compensation Plan	N/A	
Impact on Historical and Archaeological Sites Damage to relics and artifacts during the conduct of the works.	The Contractor will ensure that the workforce are briefed that in the event of accidental finds relics they should immediately cease any works in the area and promptly report the find to their supervisor.	Accidental finds	
II. CONSTRUCTION PHASE			
Temporary disruption of existing community roads, pathways, and accesses Rehabilitation/ upgrading of headworks, canals and related structures will cause temporary disruption of community services and access to properties. Particularly at road crossings, rehabilitation/ upgrading activities	Walking access will be maintained to affected properties and access routes will be temporarily lined with timber or similar material. Particular attention will be given to ensuring safety along roads and paths used by pedestrians. Side street parking of construction vehicles on prolonged basis will not be allowed.	Periodic monitoring and reporting by Supervision Consultant.. Report any complaint received from the community to PAFO and document in	

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	COMPLIANCE
along narrow roads may lead to temporary blockage or closure of roads and hamper movement of vehicles and people in the community. Community access to areas in the vicinity of schools, temples, village offices, market places and meeting halls will be affected during rehabilitation/ upgrading works.	Install barriers and safety warning signs on road sections and if necessary deploy traffic aides/ flag persons at affected locations. Information boards at blocked roads will provide information about the temporary closure of roads, schedule of works and the traffic-rerouting plan. Require the contractor to immediately rehabilitate the excavated areas and any damaged road and path sections. Enclose the facilities perimeters so that pathway use and stream access remains unimpeded.	safeguard monitoring reports.	
<u>Air pollution</u> Dust and air emissions from earthworks and movement of vehicles can pose nuisance to nearby communities	Require the contractor to cover materials with tarpaulin or other suitable materials while in transit to avoid spillage of materials. Moisten earthen roads during dry and dusty conditions, particularly roads near residences and through the town core area. Impose speed limits on construction vehicles. Conduct regular maintenance on construction equipment and vehicles to control air emissions during vehicle operation.	Periodic monitoring and reporting by Supervision Consultant.. Report any complaint received from the community to PAFO and document in safeguard monitoring reports.	
<u>Noise</u> Operation of construction equipment such as jackhammer will cause excessive noise resulting in nuisance to communities.	Limit rehabilitation and upgrading activities, particularly operation of noise generating equipment at night. Position any stationary equipment that produce high noise levels such as diesel generators as far as practical from sensitive receptors. Erect temporary barriers around construction sites especially near schools, hospitals, and houses. Install noise suppression devices to noise generating equipment. Require drivers to minimize blowing of horn and to comply with speed limits. Provide information to community on schedule of rehabilitation and upgrading activities through billboard/signs.	Periodic monitoring and reporting by Supervision Consultant.. Report any complaint received from the community to PAFO and document in safeguard monitoring reports.	
<u>Impact on ecological resources</u>	The contractors will prohibit activities such as cutting wood for cooking, hunting, or wildlife trade.	Periodic monitoring and reporting by	

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	COMPLIANCE
Construction workers may undertake hunting of wildlife and cutting of wood.		Supervision Consultant.. Report any complaint received from the community to PAFO and document in safeguard monitoring reports.	
<u>Clearing of vegetation</u> Poor planning and execution of tree clearing/vegetation removal at project facilities and along headworks, canals and related structures can result in loss of vegetation and general landscape	Cutting of trees will be undertaken as per approved design and only upon approval of relevant authorities. Avoid cutting of trees as much as possible and minimize damage to native vegetation. Trees that need to be cut in private land will be compensated in cash accordance with the approved Compensation Plan. Roads and paths to the facilities will only be sufficiently wide to accommodate construction vehicles/equipment to minimize land take. Manual labor will be utilized in sloping terrain where use of heavy equipment would cause unnecessary damage. Steep exposed slopes will be graded and covered with bush and grass to minimize erosion. Implement landscaping and planting of trees/vegetation at sites of the proposed facilities.	Periodic monitoring and reporting by Supervision Consultant.. Report any complaint received from the community to PAFO and document in safeguard monitoring reports.	
<u>Water pollution - Sediment runoff</u> Sediment runoff undertaken during excavation, earthworks and grading in the rainy season will cause siltation of rivers	Construct silt traps, deviation channels, mounting barriers or trenches around the stockpiles of materials.	Periodic monitoring and reporting by Supervision Consultant.. Report any complaint received from the community to PAFO and document in safeguard monitoring reports.	
<u>Water Pollution - Worker's camp</u> Domestic wastewater from worker's camp would result to the discharge of sewage into drainage canals. Unsanitary conditions at the worker's camp will occur without the provision of necessary sanitation arrangements.	Provide adequate water supply and temporary toilet facilities at the worker's camp.	Periodic monitoring and reporting by Supervision Consultant.. Report any complaint received from the community to PAFO and document in	

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	COMPLIANCE
		safeguard monitoring reports.	
Generation of construction waste - Generation of excavated soil Generation of excavated materials during rehabilitation and upgrading of headworks, canals and related structures.	During rehabilitation and upgrading of headworks, canals and related structures excavated material will be utilized to backfill the trench. The contractor will be required to properly reinstate the excavated trench after completion of works. Surplus excavated material/cut soil from rehabilitation and upgrading of headworks, canals and related structures will be used as backfill material for low-lying areas that have been identified by the village authority.	Periodic monitoring and reporting by Supervision Consultant.. Report any complaint received from the community to PAFO and document in safeguard monitoring reports.	
Generation of construction wastes – Solid, Inert and Hazardous Wastes Solid wastes, inert construction wastes, and hazardous wastes during construction will result to pollution of land and receiving water bodies.	Provide appropriate segregation bins or areas for construction wastes. Secure and control storage of all hazardous materials including fuels. Reuse recyclable construction wastes such as wood, steel, and scaffoldings or sell to junk shops. Solid waste to be collected and disposed in approved disposal site of the Townships.	Periodic monitoring and reporting by Supervision Consultant.. Report any complaint received from the community to PAFO and document in safeguard monitoring reports.	
Community health and safety Community may be exposed to dangers of open excavation	Install barricades/barriers and sturdy plate covers in open excavations during non-working time. Install warning signs in the area.	Periodic monitoring and reporting by Supervision Consultant.. Report any complaint received from the community to PAFO and document in safeguard monitoring reports.	
Occupational health and safety Construction activities may pose hazards to workers because of the use of heavy equipment, lifting of heavy loads, and exposure to open excavations and chemicals. Potential conflict with local people will occur if migrant workers will be brought to the site.	Require the contractor to implement the construction health and safety plan in accordance with the World Bank EHS Guidelines (http://www.ifc.org/ehsguidelines) as a minimum standard. The contractor will appoint an environment, health and safety officer to ensure implementation of the plan. The plan will at minimum include: • Provision of first-aid facilities readily accessible by workers. • Provision of personal protective equipment (PPEs) such as hard hats, gloves, rubber boots, etc.,	Periodic monitoring and reporting by Supervision Consultant.. Report any complaint received from the community to PAFO and document in safeguard monitoring reports.	

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	COMPLIANCE
	• Wearing of PPEs while working onsite will be a mandatory requirement for workers. • Posting of safety signs/reminders in strategic areas within the construction area. • Installation of sufficient lighting at night. • Ensure that vehicle and equipment operators are properly licensed and trained. • Provide staff with communicable disease and HIV-and COVID 19 related awareness training. The contractor will be required to provide priority hiring of qualified workers from the villages and to consult with the local to avoid conflict if migrant workers will be brought to the site.		
<u>COVID-19 risk management</u> Working Camp Siting and Management	Siting of Camps and Field Offices • Not in area liable to flooding, landslide or other natural disaster • Not in area affected by construction dust, noise, sewage or other pollution • Not in a residential area Minimum housing standards • separate bed for each worker • beds should not be arranged in tiers of more than two; • separate accommodation of the sexes or to accommodate couples • adequate natural light during the daytime and adequate artificial light • adequate ventilation to ensure sufficient movement of air • adequate supply of safe potable water • adequate sanitary facilities • adequate drainage • adequate furniture for each worker to secure his or her belongings, such as a locker. • common dining rooms, canteens or mess rooms, located away from the sleeping areas • appropriately situated and furnished laundry facilities • reasonable access to plug sockets for charging telephones and other devices • rest and recreation rooms and health facilities, where not available in the community Minimum accommodation sizes • Sleeping space	Periodic monitoring and reporting by Supervision Consultant.. Report any complaint received from the community to PAFO and document in safeguard monitoring reports.	

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	COMPLIANCE
	□ inside dimensions over 198 centimetres by 80 centimetres; • Sleeping room □ headroom of over 203 centimetres allowing full free movement □ Beds minimum 2m apart for COVID-19 risk management Sanitation Facilities • One toilet, one tap / basin, one toilet for every 6 people • Convenient location to accommodation • Provision of soap • Separate facilities for men and women • Ventilation to open air • Fresh cold running water • Clean and hygienic • Septic tank/sewage treatment facility, or pit latrines located at least 200m from surface waters, and in areas of suitable soil profiles and above the groundwater levels Health and Safety within worker accommodation • Separate area for sick workers to prevent transmission of disease • Smoke detector in sleeping area • Fire safety throughout accommodation such as fire extinguishers, fire alarms, fire blankets • Worker training in fire prevention and procedures • Fire exit sign, adequate means of escape and clearly maintained exit • Security lighting within camp and for sanitation block and lighting for route from sleeping area to sanitation block • Electrical cables to be in safe condition, elevated and not in areas liable to flood Inspection • 2 weekly inspections to inspect for cleanliness, state of repair of building, accommodation and fire equipment • Record inspection results and retain for review		
<u>COVID-19 risk management</u> <u>Construction site working conditions</u>	Form a joint team to plan and organize commencement and/or return to work • Develop or convene a joint occupational safety and health committee with members	Periodic monitoring and reporting by Supervision Consultant..	

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	COMPLIANCE
	representing the employer and workers • Train team members on the basic principles for the formulation and implementation of occupational safety and health preventive and control measures. • Develop and communicate a work plan on safe working for COVID-19 • Such plan should be fully aligned with any government regulations and guidelines on COVID-19 prevention and control, or in the absence thereof, with international good practice guidelines as may be updated from time to time Risk assessment to decide when to work, who works and how • Undertake a risk assessment to determine the preventive and control measures • Ensure preventative measures are in place before resuming or beginning construction work Adopt engineering, organizational and administrative measures • Avoid physical interaction and maintain physical distancing requirements as prescribed by national policy, or in the absence thereof, international good practice • Ventilate enclosed workplaces including work camps and communal spaces • Avoid concentration of workers - limit the capacity of common areas such as work camp dining rooms and changing rooms to allow the minimum separation of 2 meters and organize one-way systems. This includes sleeping areas which must be a minimum of 2 meters between • beds • Put in place training and information on COVID-19 and measures required for its management. • The construction site is to be segregated to the extent possible in zones or other methods to keep different crews physically separated at all time • Stagger break and lunch schedules to minimize the number of people in close proximity to one another Regularly clean and disinfect	Report any complaint received from the community to PAFO and document in safeguard monitoring reports.	

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	COMPLIANCE
	• Increase the frequency of cleaning and disinfection, in particular heavily trafficked areas and common areas, including work camps • All door handles, railings, ladders, switches, controls, eating surfaces, shared tools and equipment, taps, toilets, and personal areas are wiped down at least twice a day with a disinfectant • Discourage the sharing of items such as cups, glasses, plates, tools Promote personal hygiene • Provide workers with the conditions and means necessary for frequent hand washing (soap, water or alcohol gel) with a posted hand washing protocol at site entries, exits, bathrooms, communal areas, offices, and any other areas with commonly touched surfaces • Inform workers of the need to avoid physical contact when greeting, and avoid touching eyes, nose and mouth • Inform workers of the need to cover the mouth and nose with a disposable handkerchief when coughing or sneezing or the crook of their arm • Dispose of tissues in a lined and covered waste bin and wash hands afterwards Provide personal protective equipment (PPE) and inform workers of its correct use • Identify appropriate PPE related to the tasks and health and safety risks faced by workers according to the results of risk assessment and the level of risk, and provide it to workers free of charge and in sufficient number, along with instructions, procedures, training and supervision • Non-medical face-coverings (such as homemade cloth masks) should be worn as mitigation for catching and transmitting the virus, but are not to be treated as substitutes for proper handwashing Health surveillance and insurance • Before entering the site, staff and visitors must confirm that they are not currently exhibiting flu-like symptoms		

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	COMPLIANCE

	• Monitor the health status of workers, develop protocols for cases of suspected and confirmed COVID-19. The protocol will state that:
	• workers with symptoms or confirmed cases must be isolated within the construction camp or stay at home for 7 days after symptoms started
	  If symptoms persist after 7 days, the person must isolate until the symptoms stop
	  People who have been in close contact with the person with confirmed COVID-19 be quarantined for 14 days
	• All workers in quarantine or isolation must be provided with adequate food, water, medical assistance and sanitation
	• Identify workers who have had close contact with people infected with COVID-19 and follow national medical guidance
	• Communicate confirmed cases of COVID-19 infection to the appropriate authorities
	• All workers should be provided with health insurance that includes COVID-19 treatment
	
	Consider other hazards, including psychosocial
	• Promote a safe and healthy working environment free from violence and harassment.
	• Encourage health promotion and wellbeing in the workplace through enough rest, balance of physical and mental activity and adequate work life balance
	• Implement prevention and control measures for the use and storage of chemicals, particularly those used for disinfection during COVID-19
	
	Review emergency preparedness plans
	• Develop an emergency plan adapted to COVID-19 and regularly review it
	
	Review and update preventive and control measures as the situation evolves
	
	• Periodically monitor prevention and control measures to determine whether they have been adequate to avoid or minimize risk, and identify and		

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	MONITORING	COMPLIANCE
	implement corrective actions for continuous improvement • Establish and maintain records related to work-related injuries, illnesses and incidents, worker exposures, monitoring of the work environment and workers' health		
III. OPERATION PHASE			
Impacts of Water Offtake Disruption of downstream hydrological flows due to offtake from river may occur.	Water offtake will be fine-tuned and managed on the basis of environmentally allowable volumes.	Weekly monitoring of water quantity and water offtake.	
Water Pollution Upstream land uses may cause a decline in the quality of water available for the irrigation scheme.	A catchment land use plan must be prepared and implemented to ensure that the scheme is safeguarded throughout its operational life.	Weekly monitoring of water quality.	
Loss of Aquatic Biodiversity Aquatic resources may decline as a result of the operation of the facilities.	Headworks weirs will be improved from the environmental perspective by the construction of fish passes.	Weekly monitoring of aquatic flora and fauna.	
Increased Utilization of Fertilizers and Pesticides Increased areas and extent of vegetable crops pest populations may build up and require more direct intervention	Only agrichemicals approved by the Government of Lao PDR may be used. Strong extension support must be provided to encourage the responsible use of fertilizers and pesticides.	Weekly monitoring of pesticide and fertilizer use of farmers.	
Community health and safety Potential hazards to residents in affected communities.	Facilities properly fenced and secured.	Daily log of security personnel	

Summary of EMP Compliance Status: _____

_____

B. RESULTS OF ENVIRONMENTAL MONITORING

- PAFO operational report
- Complaints resolution
- EMP implementation

C. ISSUES FOR FURTHER ACTION

ISSUE	REQUIRED ACTION	RESPONSIBILITY AND TIMING	RESOLUTION
OLD ISSUES FROM PREVIOUS REPORTS			
List of EMP measures or activities not completed (last column of previous table)			
NEW ISSUES FROM THIS REPORT			

3. CONCLUSION

- Important results from the implementation of EMP monitoring
- Recommendations to improve EMP management, implementation, and monitoring

4. ATTACHMENTS

- Permits
- Monitoring data (water quality, etc.)
- Photographs
- Maps

APPENDIX F
SEMI-ANNUAL INTEGRATED SAFEGUARDS MONITORING REPORT TEMPLATE

Safeguards Monitoring Report

Semiannual Report
xxx {month} 20xx

Lao PDR: xxx {Project name}, xxx {sub-project name, if report covers only one sub-project}

Prepared by the Project Management Unit of {complete name of Implementing Agency} for the {complete name of the borrower} and the Asian Development Bank.

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

This safeguards monitoring report is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

1. Executive Summary

{Read and delete: Provide short summary of the following items:

Summary of EMP/RP Implementation
Description of monitoring activities carried out (e.g. field visits, environment effect monitoring, survey questionnaire, public consultation meetings, focus group discussions, etc)
Key issues, any corrective actions already taken, and any grievances
Key activities planned in the next reporting period
Recommendations

Use the paragraph numbering format provided below throughout the report}

1. xxx

2. xxx

2. Project Overview, General safeguard matters

2.1 Project Overview

{Read and delete: Briefly describe project objectives, scope and components – can be taken from PAM or other relevant document}

3. xxx

4. xxx

2.2 Project Progress

{Read and delete: Using most recent project progress report, describe status of project implementation, including full list of contracts, status of contract awarding and implementation, name of contractor, Engineer, Project Supervision Consultant.}

5. xxx

6. xxx

Table 1: Project Overview, Snapshot of Project Progress

Project Number and Title:		
Safeguards Category	Environment	
	Indigenous Peoples	
	Involuntary Resettlement	
Reporting period:		
Last report date:		
Key sub-project activities since last report:	{Read and delete: This section should include, among others, the following:} Contract awarding Progress of Work (% physical completion) Status of Safeguard Approvals / Permits / Consents	
Report prepared by:		

2.3 Safeguard Plans Implementation Arrangements

{Read and delete: Describe institutional arrangements and responsibilities for EMP and RP implementation, internal and external monitoring, and reporting, defining roles of PMU, Engineer, Implementation Consultant, Contractors. (Table format as needed)}

7. xxx

8. xxx

2.4 Updated EMPs and RPs, Incorporation of Safeguards Requirements into Project Contractual Arrangements

{Read and delete: Define manner by which EMP and RP requirements are incorporated into bidding documents, contracts.
Indicate when updated EMPs and RPs were submitted for approval to ADB (Table format appropriate).}

9. xxx

10. xxx

3. Environmental Performance Monitoring

3.1 Status of EMP Implementation (Mitigation Measures)

{Read and delete: Summarize main mitigation/protection measures implemented in the reporting period (narrative section). Structure in accordance to phases (detailed design, construction preparation, construction, and operation).}

11. xxx

12. xxx

{Read and delete: Include EMP table or updated EMP table if applicable. Assess compliance of environmental management activities with the original or updated EMP. For that purpose, include additional columns entitled “Compliance Status”, "Comment or Reasons for Non-Compliance", and "Issues for Further Action". Example is provided below.}

Table 2: Compliance with EMP Requirements (Environmental Performance)

EMP Requirements	Compliance Status (Yes, No, Partial)	Comment or Reasons for Non-Compliance	Issues for Further Action
Use environmental impact as main heading and EMP as listing (see example below)	Use EMP list as basis for rating/evaluating compliance (see example below)		
Rise of employment opportunities: Job openings of the project should give priority to local communities. Recruitment of local laborers should be stipulated in the contract for construction	Field inspections and interviews with communities - DONE Note each complaint case in the field – 3 COMPLAINTS RECEIVED Set up grievance centre and report as part of monitoring action plan – NOT DONE		

Table 3: Issues for Further Action

Issue	Required Action	Responsibility and Timing	Resolution
Old Issues from Previous Reports			
List of EMP measures or activities not completed (last column of previous table)			
New Issues from This Report			

3.2 Health and Safety

{Read and delete: Provide narrative of occupational and community health and safety issues that occurred during the reporting period. Any accident involving injury or death of workers or community members must be reported. Include investigation report of DOLISA as attachment to the report. Provide details in the Table below}.

13. xxx

14. xxx

Table 4: Health and Safety Issues

Issue	Required Action	Responsibility and Timing	Resolution
Old Issues from Previous Reports			
New Issues from This Report			

3.3 Environment Effect Monitoring

15. Monitoring plan. xxx {Read and delete: Present the environment effect monitoring plan as defined in the EMP or the updated monitoring plan. Refer to Table 4. Describe monitoring responsibilities}

16. Monitoring activities in the reporting period. Xxx {Read and delete: Describe the environment effect monitoring activities in the reporting period, including number of monitoring campaigns, number of samples, etc. Confirm compliance with the monitoring plan, or justify any deviation from the plan}

Table 4: Environment Effect Monitoring Results in the Reporting Period
{Read and delete: Present monitoring result in a Table (see example below, adjust as needed). Any non-compliance should be highlighted for attention and follow-up.}

Location	Parameter	Date	Monitoring value	Relevant government standard, standard value

17. Assessment. Xxx {Read and delete: Compare monitoring results with baseline conditions (if baseline data is available) and relevant government standards in qualitative terms. Additional explanatory comments should be provided as necessary. Possible reasons for non-compliance should be identified.}

4. Involuntary Resettlement Performance Monitoring

{Read and delete: Provide narrative of status of implementation of the RP(s), including but not limited to: status of RP or Resettlement Framework updating; number of households relocated during the reporting period; outstanding resettlement activities; etc}.

18. xxx

19. xxx

Table 6: Summary of Compliance with RP Requirements

RP Requirements	Compliance status Yes/No/Partial	Comment or Reasons for Compliance, Partial Compliance/Non-Compliance	Issues for Further Action3
Establishment of personnel in PMU/PIU			
Public consultation and socialization process		Provide information on: Public consultation, participation activities carried out Inclusive dates of these activities To be elaborated on in Item 5	
Land area to be acquired is identified and finalized			
Resettlement plan(s) updated after detailed design			
Land acquisition completed			
Establishment of Resettlement Site(s)		Please state: Number of AHs to be relocated as per agreed RP Number of AHs already relocated Number of houses built Status of installation of community facilities to be provided as per agreed RP	
Compensation payments for affected assets is completed		Please state: Total Number of Eligible AHs and APs (as per agreed RP) Number of AHs and APs compensated as of this monitoring period Total Budget allocation as per agreed RP Total budget disbursed to AHs as of this monitoring period	

3 To be elaborated further in table 3.b (Issues for Further Action)

Transport assistance for relocating affected households		As above	
Additional assistance to vulnerable affected household		Please state: Total Number of vulnerable AHs and APs (as per agreed RP) Agreed forms of assistance as per RP Number of AHs and APs assisted as of this monitoring period	
Income Restoration Program		Please state progress per income restoration feature/activity and actual period of implementation	
Temporary impacts have been addressed (affected properties restored to at least pre-project conditions)		Please state: Total Number of AHs affected by temporary impacts as per agreed RP Actual Number of AHs and total area affected by temporary impacts (if this differs from the projected number, such as in cases of unforeseen project impacts) Status of restoring affected property	
Capacity building activities			

Table 7: Issues for Further Action

Issue	Required Action	Responsibility and Timing	Resolution
Old Issues from Previous Reports			
List of RP activities not completed (last column of previous table)			
New Issues from This Report			

5. Compliance with safeguards related project covenants

{Read and delete: List all environment and resettlement related loan covenants, and assess project's compliance with the covenants (Table format is appropriate, with concluding statement on compliance, partial compliance or non-compliance, and corrective actions as needed)

Schedule	Para No.	Covenant	Remarks/Issues (Status of Compliance)
Schedule 5	xxx		Complied with / Partially complied with / Not complied with. {Identify reason for partial or non-compliance}

6. Public consultation, Information Disclosure, Capability Building

{Read and delete: Describe public consultation activities during the reporting period. Confirm compliance with consultation plan defined in the IEE/EMP and the RP(s), or justify deviation from these plans. Present planned consultation activities in next reporting period. Use Tables as appropriate.}

Field Visits (sites visited, dates, persons met)
Public Consultations and meetings (Date; time; location; agenda; number of participants disaggregated by sex and ethnic group, not including project staff; Issues raised by participants and how these were addressed by the project team)
Training (Nature of training, number of participants disaggregated by gender and ethnicity, date, location, etc.)
Press/Media Releases
Material development/production (e.g., brochure, leaflet, posters)
Information disclosure

7. Grievance Redress Mechanism

{Read and delete: Describe mechanisms established to address and redress public complaints and grievances related to social and environment safeguards. Summarize grievances received, if any, and measures implemented to redress them.}

Number of new grievances, if any, since last monitoring period: ____
Number of grievances resolved: _____
Number of outstanding grievances: _____

Type of Grievance	Details (Date, person, address, contact details, etc.)	Required Action, Responsibility and Timing	Resolution
Old Issues from Previous Reports			
New Issues from This Report			

8. Conclusion

{Read and delete: Highlight important results from the implementation of EMP and RP monitoring; recommendations to improve EMP and RP management, implementation, and monitoring; key activities planned in next reporting period}.

20. xxx

21. xxx

9. Attachments

Consents / permits
Monitoring data (water quality, air quality, etc.)
Inspection checklists
Photographs
Others