

Land Use Management Plan

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1. Scope of Land Use Management Plan (LUMP)

The performance indicator related to the LUMP in the Revised Design and Monitoring Framework (DMF) suggests that “35 watershed management plans with associated land rezoning implemented by June 2022”. Since during the previous phase of NRI project, 22 catchment (24 irrigation subprojects, 2 overlapped) management plans have been completed, the required number for the phase of NRI-AF will be 13 catchment management plans.

Refer to the above, the GIC discussed how to effectively work on LUMP with Land-use Planner/GIS Specialists of GIC, and concluded that the GIS specialists should work on both areas of i) catchment area, and ii) irrigation command area, and transfer the GIS technique to the PPOs/DCOs staff.

In addition to the same approach of this initiative at the previous phase of NRI project, the NRI-AF proposed to implement a practical challenge “Participatory Catchment Management Pilot Activities (PCMPA)” in order to promote further involvement of the community in the implementation of catchment management plan.

2. Implementation of LUMP

Work flow of Land Use Management Plan (LUMP) including an additional practical challenge of PCMPA is summarized in the following steps as shown in **Figure App-9-1**.

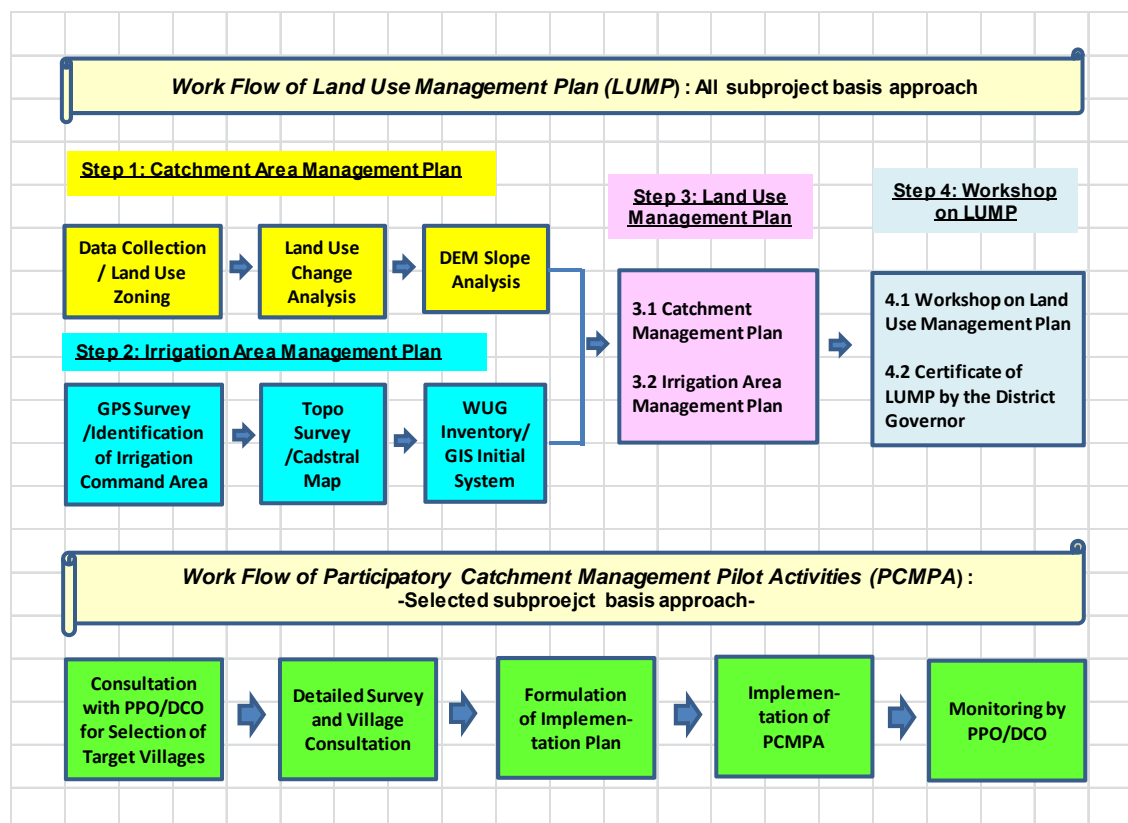


Figure 1: Work Flow of Land Use Management Plan (LUMP)

2.1 Work Flow of LUMP: all subproject basis

(1) Catchment Area Management Plan

The work for Step 1: Catchment Area Management Plan was implemented with the following sub-steps as presented in **Table 1**.

Table 1: Work Flow of Catchment Area Management Plan

Sub-step	Work	Method
1.1	Data collection	Data from NAFRI and MONRE
1.2	Identification of catchment area	Identification of catchment area of each subproject
1.3	Land use zoning	Land use zoning of the catchment area following the land use categories specified by NAFRI

Sub-step	Work	Method
1.4	Land use change analysis	Comparison the land use in 2002, 2010 and 2020
1.5	DEM (Digital Elevation Method) slope analysis	Identify the critical area with steep slope over 35 degrees following the criteria defined as “absolutely prohibited zone” in the Decree on the Protection Forest, No.333/PM, dated 19 July 2010.
1.6	Preparation of Catchment Management Plan	Documents include the results of: i) Land use change analysis; and ii) DEM slope analysis.

(2) Irrigation Area Management Plan

The work for Step 2: Irrigation Area Management Plan was implemented with the following sub-steps as presented in **Table 2**.

Table 2: Work Flow of Irrigation Area Management Plan

Sub-step	Work	Method
2.1	Identification of irrigation command area	Data collection by handy GPS & Google earth for the use of the feasibility study
2.2	Preparation of cadastral map	Topographical survey by a national engineering consulting firm for the use of the detailed design
2.3	Preparation of irrigation block map (GIS Initial System) during O&M stage	i) Review of cadastral map and GIS data ii) Inventory survey by handy GPS together with WUG members iii) Preparation of GIS initial system of irrigation block map iv) Update of irrigation block map according to the changes of land ownership, etc.

Among the sub-steps for Irrigation Area Management Plan, Sub-step 2.2: Preparation of cadastral map is indispensable for obtaining Land Title Certificates for WUG members, which is designated as one of key activities for the additional financing in the revised DMF in the PAM.

(3) Land Use Management Plan

The work for Step 3: Land Use Management Plan was prepared in combination with Step 1 and Step 2.

(4) Workshop/Certificate of LUMP

A public workshop on LUMP was organized at each subproject chaired by district governor participated with i) concerned district government staff, ii) DCO staff, iii) PPO staff, and iv) representative of villages and WUGs.

The purpose of the workshop is to ensure well-understanding of the LUMP among stakeholders, and to adopt the LUMP as a future district land use plan with the following steps as presented in **Table 3**.

Table 3: Workshop/ Certificate of LUMP

Sub-step	Work	Method
4.1	Workshop on Land Use Management Plan	<p><u>Participants (stakeholders):</u></p> <ul style="list-style-type: none"> -DCO/PPO staff of each subproject -District governor and district staff -Representatives of WUG/beneficiaries <p><u>Agenda:</u></p> <ul style="list-style-type: none"> i) Presentation of catchment management plan ii) Presentation of cadastral map/ or irrigation block map iii) Explanation of District Socio-Economic Development Plan iv) Understanding the importance of catchment management by all participants, and for adopting for future district land use plan
4.2	Certificate of LUMP	Certified of LUMP by the district governor

2.2 Work Flow of PCMPA: selected subproject basis

Based on the Catchment Management Plan approved from the District Governor, Participatory Catchment Management Pilot Activities (PCMPA) will be implemented.

At first, the GIC team intended to plant trees in some critical areas within selected catchment areas through community participation. However, in the consultation meetings with the relevant PPOs/DCOs managers and staffs in November 2018, all the provinces claimed that the natural reforestation in wide areas on steep slopes by prohibiting shifting cultivation is more effective than the tree plantations in small areas. Supporting alternative income generating activities are provided to the target shifting cultivators. Some of the relevant provincial/district governments have already been implementing the method for a long period, but always been facing the budget deficit for supporting the target shifting cultivators. The PPOs/DCOs, therefore, requested budget for supporting alternative income generating activities for the affected households. Following the requests by the PPOs/DCOs, the GIC team modified the implementation procedure and schedule for the PCMPA as following.

- (1) Consultation with PPO/DCO for Selection of Villages and Specific Sites PCMPA
 - Consultation with PPO/DCO on selection of appropriate subprojects and potential villages for tree plantation
 - Consultation with the potential village authorities on PCMPA and concept that their requirement and agreeing.
 - Visiting potential sites for tree plantation by NPMO, PPO/DCO, village authority members, and GIC specialists
- (2) Survey and Village Consultation
 - Survey on the actual situation of upland farming in the catchment area
 - Based on the survey, the PPO will formulate an implementation plan of Participatory Catchment Management Pilot Activities
 - A workshop explaining the implementation plan will be held at the village by attendance of the District Governor
 - Establishment of a committee for PCMPA at subproject level
- (3) Formulation of Implementation Plan
 - Based on the result of the survey and village consultation, PPO/DCO to formulate implementation plan including budget and schedule
 - PPO/DCO/ Foresters and other concerned party conduct field survey and data collection for formulation the implementation plan

- Agreement on the implementation plan by the villagers, village authority/ participants/ WUG
- Submission of the implementation plan to DAFO, PAFO, NPMO
- Approval of the implementation plan from the NPMO

(4) Implementation

- Conduct village catchment management committee to manage the activities to be implemented
- Implementation based in activities approved (including (1) bordering posting, (2) mapping, (3) awareness campaign, (4) signs installation and posting for border (5) support activities for the venerable households, (6) planting tree and etc., and (7) monitoring)
- After the delivery of trainings and trees/cardamom saplings to villagers, PPO and DCO (GIS-Land Use Planning Officers with assistant by PAFO and DAFO forestry expert) will undertake monitoring and evaluation closely to villagers, and prepare reports to NPMO/GIC Team at quarterly basis.
- Regular monitoring at least 2 times per month (during the slash and burn seasoning January to May) to ensure that conservation area as agreed no more slashing and burning (continue 2 – 3 years during the project life).
- Regular monitoring support activities that implementing for supporting to farmers

(5) Regular reporting at quarterly basis

3. Implementation Progress to date

Performance indicator of this sub-component is to implement “Number of *the catchment management plan with associated land rezoning by subproject*”. The current project completed the Land Use Management Plan (LUMP) including a catchment management plan, organizing a public workshop chaired by a district governor participated with i) concerned district government staff, ii) DCO staff, PPO staff, and iv) representatives of villages and WUGs in order to ensure well understanding of the LUMP among stakeholders.

In the NRI Additional Financing Phase, the Project plans to try to involve the communities, who live in a part of the catchment area, upstream of the subproject irrigation weirs and will not directly benefit from the project activities. The NRI-AF project are pilot each province one subproject include a certain numbers of i) fruit tree seedlings, and ii) commercial/local tree seedlings, provide animal raising for farmer who cultivated in the upstream for the purpose of limitation slash and burned with the upper stream villagers as one of the activities for Catchment Management.

NRI Project was developed and implementation completed in 20 catchment management plan and still valid. The overall target (based on DMF) is to implemented in total 35 watershed management plans which is NRI-AF to be implemented of 15 watershed management plans.

Current NRI-AF was developed and implementation achieved 16 watershed (Catchment) Management Plan (LUMP) which is covering of 17 subprojects of phase I, II, III, and IV.

3.1 Catchment Area Management Plan

Completed. In order to ensure the capacity, knowledge and sustainability of the project have considered all necessary step (including of Training and on the job training) to support PPOs and DCOs staff for implementation the activity as show in the step below:

Table 4: Work Flow of Catchment Area Management Plan

Sub-step	Work	Method	Progress to date
1.1	Data collection	Data from NAFRI and MONRE	Completed by the GIC Land Use Consultant
1.2	Identification of catchment area	Identification of catchment area of each subproject	Completed 16 subprojects of Phase I, II and III. Ongoing for the 6 subprojects of phase IV
GIS Training Program (I)		Completed: 18-28 Feb.2018 37 participants in total of 4 provinces.	Supporting PPO, DCO staff to implement Land Use Planning and Management. GIS Basic Technology: a) How to use GPS technology and basic of ArcGIS program for mapping work; b) How to transfer survey data to prepare the irrigation inventory map and Water Use Group Map (Irrigation Block Map)
GIS Training Program (II) <u>See Photos-1: (page 8)</u>		Completed: 10-21 June 2019 40 participants from 4 provinces	Supporting PPO, DCO staff in terms of preparation of catchment land use management plan: a) Delineation of catchment area by GIS software; b) Analysis land use change in catchment area
1.3	Land use zoning	Land use zoning of the catchment area following the land use categories specified by NAFRI	<u>Phase I and II subprojects:</u> - Based on the technology obtained by GIS Training Program (II), PPOs/DCOs concerned staff plan to carry out Step 1.3, 1.4 and 1.5 by October 2019. - GIC GIS/Land Use Planning specialist organized Workshops on Land Use Management Plan (LUMP) / Watershed Management Plan for 8 subprojects of Phase I and II in November and December 2019. - <u>By the end of March 2020, LUMP/ Watershed Management Plan for 13 watersheds in 6 subprojects were completed with the relevant district governor's approval as summarized below.</u> (1) Nam Lue – Nam Chang (LNT, LNT, Phase II) – 24 Jan 2020 (2) Houay Xo 2 (BKO, Paktha, Phase II) – 11 Feb 2020 (3) Houay Bong (BKO, Houayxay, Phase II) – 11 Feb 2020 (4) Nam Tong (PSL, Nyot Ou, Phase II) – 17 Feb 2020 (5) Nam Ngene 2 (PSL, Bountai, Phase II) – 17 Feb 2020 (6) Nam Sa (LNT, Long, Phase II) – 3 Mar 2020 <u>Phase III and IV subprojects:</u> - Workshops on LUMP/ Watershed Management Plan for subprojects of Phase III and IV are organized with 1,021 participants including 493 females (48%) at 18 places from 16 to 30 December 2020 as summarized in the table below.
1.4	Land use change analysis	Comparison the land use in 2002, 2010 and 2020	
1.5	DEM (Digital Elevation Method) slope analysis	Identify the critical area with steep slope over 35 degrees following the criteria defined as “absolutely prohibited zone” in the Decree on the Protection Forest, No.333/PM, dated 19 July 2010.	
1.6	Preparation of Catchment Management Plan	Documents include the results of: i) Land use change analysis; and ii) DEM slope analysis.	

Sub-step	Work	Method	Progress to date							
			No	Date	Catchment name	Subproject Name	No. of Workshop	Participants		
							F	M	Total	
			1	16/12/2020	Nam Ngaad	Nam Ngaad	1	49	80	129
			2	17/12/2020	Nam Heng	Nam Hao	1	38	47	85
			3	22-24/12/2020	Nam Theun	Nam Satone	3	68	119	187
			4	25-30/12/2020	Nam Ong	Nam Satone	6	178	55	233
			5	17/12/2020	Nam Gna	Nam Gna 1, 2, 3	1	26	50	76
			6	18/12/2020	Houay Chone	Houay Lap	2	91	58	149
			7	23-25/12/2020	Nam Hoy-Namleu	Nam Hoy-Namleu	3	26	90	116
			8	21/12/2020	Dong Nouark	Dong Nouark	1	17	29	46
			TOTAL				18	493	528	1,021

- LUMP/ Watershed Management Plan for 10 watersheds in 9 subprojects of Phase II, III and VI has been approved by the district governors by the end of February 2021 as summarized below.

(1) Nam Ngaad (ODX, Houn Phase III) – 14 Dec 2020
(2) Nam Hao (ODX, Beng, Phase II) – 18 Feb 2021
(3) Nam Satone (BKO, Houayxay, Phase III) – 26 Jan 2021
 i) Nam Theun
 ii) Nam Ong
(4) Nam Gna 1&3 (LNT, Sing, Phase IV) – 8 Jan 2021
(5) Nam Gna 2 (LNT, Sing, Phase III) – 8 Jan 2021
(6) Houay Lap (PSL, Bountai, Phase IV) – 24 Dec 2020
(7) Nam Hoy-Nam Leu (PSL, Bounneua, Phase III) – 21 Dec 2020
(8) Dong Nouark (PSL, NyotOu, Phase III) – 25 Dec 2020
(9) Nam Ma (LNT, Long, Phase III) – 18 Jan 2021
 i) Nam Arn – Houay Keo
 ii) Nam Tew – Houay Tafark

3.2 Irrigation Area Management Plan

Achieved. The work for Step 2: Irrigation Area Management Plan was implemented with the following sub-steps as presented in **Table 2**.

Table 5: Work Flow of Irrigation Area Management Plan

Sub-step	Work	Progress to date
2.1	Identification of irrigation command area	Data collection by handy GPS & Google earth /ArcGIS for develop of irrigation layout and catchment area map for the use of the feasibility study Completed: 22 subprojects of Phase I, II and III and IV 22 FSs for Phase I, II and III subprojects were submitted to ADB. Concerning 6 Phase IV identification of the command area was completed in June 2019 and the 1 st village consultations were implemented in July – August 2019. Final development of irrigation layout and catchment area map was completed in January 2020
2.2	Preparation of cadastral map	Topographical survey by the national engineering consulting firm for use of detailed design of phase I, II and III have been completed. Cadastral map for Land Title: Regarding 16 subprojects of phase I, II and III, field survey of cadastral map has been completed.

2.3	Preparation of irrigation block map (GIS Initial System) during O&M stage	Phase I (Nam Beng and Nam Oun completed)
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3.3 Completion Develop of Land Use Management Plan (LUMP)

Achieved as indicator in DMF: Total 16 Land Use Management Plan for 17 subprojects (2 LUMP of phase I, 7 LUMP for Phase II, 7 LUMP for phase III & IV) have been developed, conducted workshop for presentation to stakeholders and approved by district governor under NRI-AF project. .

3.4 Workshop/Certificate of Land Use Management Plan (LUMP)

Completed: Total 33 workshops for presentation the LUMP to stakeholders and farmers was conducted during the 2019 to 2021 with total 1,739 persons attended which is 718 (or 41%) of them are female.

Phase 1 subprojects. In December 2019, 2 (two) workshop was held with stakeholders and farmer. There are 185 persons attended the workshop which is 60 (32%) of them are female.

Table 6: Phase 1 LUMP presentation

No.	Subproject Name	No. Workshop	Date of Workshop	Total participant (persons)	Female (persons)	Female (%)	Area of Catchment (Km2)
1	Nam Oun	1	26/12/19	44	15	34	7,620
2	Nam Beng	1	27/12/19	141	45	32	22,570
	Total	2		185	60	32%	30,190

Phase II subprojects. December 2019 to December 2021 12 workshops with stakeholders and farmers for presentation of catchment management plans have been conducted. Total 1,101 persons attended in the workshop which is 294 (27%) of them are female.

Table 7: Phase 2 LUMP presentation

No.	Subproject Name	No. Workshop	Date of Workshop	Total participant (persons)	Female (persons)	Female (%)	Area of Catchment (Km2)
1	Nam Hao	1	17/12/2020	75	38	51	
2	Nam Tong	2	23-24/12/19	59	12	20	171
(i)	<i>Nam Ngong Sub-scheme</i>		23/12/19	43	10	23	144
(ii)	<i>Nam Tong Sub-scheme</i>		24/12/19	16	2	13	27
3	Nam Ngene 2	1	26-27/12/19	134	42	31	130
4	Houay Xo 2	2	24-25/12/19	126	11	9	69
(i)	<i>B. Chiengtong</i>		24/12/19	87	6	7	53
(ii)	<i>B. Houaykhot</i>		25/12/19	39	5	13	16
5	Houay Bong	4	26-29/12/19	204	68	33	118
(i)	<i>Haad Mouark</i>		26/12/19	53	11	21	20
(ii)	<i>Houay Kin</i>		27/12/19	30	10	33	13
(iii)	<i>Houay Neuam</i>		28/12/19	54	20	37	49
(iv)	<i>Houay Khong</i>		29/12/19	67	27	40	36
6	Nam Sa	1	14/02/20	83	28	34	149

No.	Subproject Name	No. Workshop	Date of Workshop	Total participant (persons)	Female (persons)	Female (%)	Area of Catchment (Km2)
7	Nam Lue-Nam Chang	1	09/01/20	31	4	13	81
		12		1,101	294	27%	1,076

Phase III & IV subprojects. 19 workshops with stakeholders and farmers for presentation of 7 catchment management plans (for 6 subproject of phase III and 2 subproject of phase IV) have been conducted. Total 907 persons attended in the workshop which is 74 (52%) of them are female.

Table 8: Phase III&IV LUMP presentation

No.	Subproject Name	No. Workshop	Date of Workshop	Total participant (persons)	Female (persons)	Female (%)	Area of Catchment (Km2)
1	Nam Ngaad	1	16/12/2020	105	49	47	105
2	Dong Nouark	1	21/12/20	37	17	45	133
3	Nam Hoy – Nam Leu	3	23-25/12/20	109	26	24	92
4	Nam Gna 1, 2, 3	1	17/12/20	66	26	39	84
5	Nam Ma						924
(i)	Nam Arn-Houay Keo	1	25/01/2021	37	7	19%	
(ii)	Nam Tew-Houay Tafark	1	25/01/2021	28	12	43%	
6	Nam Satone						177
(i)	<i>Nam Theun Catchment</i>	3	22-24/12/20	170	68	40	
(ii)	<i>Nam Ong Catchment</i>	6	25-30/12/20	213	178	84	
7	Houay Lap	2	18/12/2020	142	91	64	108
		19		907	474	52%	1,623

Note:

- Nam Gna 2 is under phase III and Nam Gna 1,3 under phase IV (with the same river and catchment area).
- Houay Lap is under phase IV.

The remains 5 subprojects under phase III and IV remain only 2 subprojects that project not developed. In Luang Namtha, Namtha 3 was developed, however the catchment of Namtha is part of the Nam Ha National Diversity Conservation Area and implementation of the conservation is responsible by ICBF project. In Phongsaly, Nam Ngay-Nam Boun is not yet developed as the Covid-19 pandemic and restrict of working condition and consultation meeting.

Table 9: Remains subproject that not yet plan/ still valid.

No.	Subproject	Phase	Dist./ Prov.	Status
1	Nam Kha	III	Pha Oudom/ BK	Completed during the implementation of NRI project (Nam Haad, Nam Kha and Houay Lieng) and the LUMP still valid.
2	Nam Ngay-Nam Boun	IV	Bounneua/ PSL	Not yet implemented as the Covid-19 pandemic.
3	Namtha 3	IV	Luangnamtha/ LNT	Not intend to plan as Catchment of the Namtha is part of the Nam Ha National Bio diversity Conservation area and conservation is responsible by ICBF fund.
4	Namtin 2	IV	Houayxai/ BK	Completed during the implementation of NRI project and the LUMP still valid.
5	Houay Sat 2	IV	Paktha/ BK	Completed during the implementation of NRI project and the LUMP still valid.

3.5 Progress of PCMPA to date

Detailed implementation plan of PCMPA for 4 provinces was submitted to ADB on 06 March 2019, and approved by ADB on 14 March 2019.

Implementation of PCMPAs was started in March 2019 in selected pilot areas with relevant main activities and budget as summarized below.

Summary of 4 PCMPAs

Province	Bokeo	Oudomxay	Phongsaly	Luangnamtha
District	Phaoudom	Beng	Bountai	Long
1. Subproject	Houay Bong (Phase II)	Nam Beng (Phase I)	Nam Ngene 2 (Phase II)	Nam Ma (Phase III)
2. Catchment Name	Houay Mouak	Houay Lor	Bor Haad	Houay Keo
3. Total Catchment area (ha)	2,010 ha	3,910 ha	2,645 ha	281 ha
4. Target village	B. Haad Mouak	B. Houaylo	B. Bor Haad	B. Pakha
5. Total households (HH)	197 HHs	204 HHs	125 HHs	70 HHs
6. Main Activities				
1) Assistant Natural Regeneration Forest: Dissemination of PCMPA, setting up PCMPA village committee, organization, rules, responsibilities, installation of signboards, etc.	Target area= 158 ha	Target area= 204 ha	Target area= 80 ha	Target area= 135 ha
2) Tree planting in the village public land (ha)	3 ha (local tree) (197 HHs)	-	-	25 ha (bamboo) (70 HHs)
3) Support shifting cultivation farmers				
3.1: Cardamom planting	4 HHs (4 ha)	21 HHs (12 ha)	34 HHs (2 ha)	-
3.2: Goat raising	6 HHs (30 heads)	-	-	-
3.3: Fruit tree planting	-	-	5 HHs (2 ha)	-
3.4: Grass (pasture) planting for animal fattening	-	2 HHs (3 ha)	-	-
Total budget (Kip)	185,028,000	169,787,000	171,048,000	176,180,000
Grand Total (Kip)	702,043,000 Kip			
Grand Total (US\$)	US\$82,129.- (\$1.0=8,548Kip)			

The 1st field monitoring by GIC specialist was done from 24 April to 12 May 2019 focusing on:

- 1) To monitor PPO, DCO, Village Authority and community on the preparation and arrangement of PCMPA activities, including of visit the preparation of site location for signboards installation, agreement and memo, PCMPA committee and regulation setting up.
- 2) To monitor the PPO, DCO prepare on procurement of equipment, seedling, animal, area to be ready to provide to farmers as scheduled in June 2019.

The 2nd field monitoring by GIC specialist was done from 09 to 23 June 2019 to follow up the activities and to ensure the target achievement during the implementation period.

The 3rd field monitoring by GIC specialist was done from 14 to 29 September 2019 to follow up the activities and to ensure the target achievement during the implementation period.

The 4th field monitoring by GIC specialist was done from 09 December 2019 to 08 January 2020 to follow up and assessment the activities and to ensure the target achievement during the implementation period. The details are presented in the **Appendix 9.2**.

	
<p>LUMP workshop for Namsa PRI Date 14/02/2020</p>	<p>LUMP workshop for Namsa PRI Date 14/02/2020</p>
	
<p>Installation of LUMP sign boat Nam Lue – Nam Chang PRI</p>	<p>LUMP workshop for Nam Lue – Nam Chang PRI Date 09/01/2020</p>

4. Lesson learned during the implementation of LUMP.

During the implementation of NRI and NRI-AF project some lesson learned from the project side is giving as below:

1. **Capacity building of PPOs and DCOs staff:** During the developing of watershed Management plan project found that all local staff (PPOs and DCOs related staff) is still low capacity and knowledge about how to develop of LUMP and new Technology including of hardware and software, as well as data analysis. The project has done a lot of GIS and ArcGIS training for PPO and DCOs related member during the implementation of NRI and NRI-AF Project, however without supporting of Consultant some province still not be able to develop of LUMP by themselves. Related PPOs and DCOs who received training still keep changing, it makes the continue transfer of technology and knowledge from consultant is not continue. In order to ensure future developing more training is needed.
2. **Large scale of catchment area:** The project has found some difficult during the implementation of LUMP as the catchment of some river is too large and border of the watershed is cover to other villages/districts/province which is not benefit by project and project have no fund for support the upstream villages that related to the environment protection.
3. **Conservation related Issues:** Local people and farmers still low responsibility of environment keeping (including of forest conservation) in the upstream river. Some subproject slash and burn for cultivation is continue; this impact risk for lack of water supply for irrigation system in the future, and as well as flash flooding control. Catchment management plan and implementation for related upstream villages is need in the future. Such issue need future project to consider include in the project design.