



Project Site	<ul style="list-style-type: none"> <li>● Cambodia</li> <li>● Siem Reap province</li> <li>● 2 districts: Prasat Bakong and Banteay Srey District</li> <li>● 2 commune: Ballangk and Preahdak</li> <li>● 14 Villages: <ul style="list-style-type: none"> <li>○ Ballangk Commune : Kropeu / Sna Sangkream / Prum Kod / Trach / Kok Russey / Popel / Ta Koy/ Thlok Kambot</li> <li>○ Preahdak Commune : Prehdak / Thnol Bondoy / Tatrav / Thnol Toteng / Takos / O'tatung</li> </ul> </li> </ul>
Proponent	Community Translation Organization (CTO)
Authorized Representatives	<ol style="list-style-type: none"> <li>1. Mr. Kat Bun Heng, Director</li> <li>2. Mr. Vinh Ya, Program Coordinator</li> </ol>
Cooperating Organizations	<ol style="list-style-type: none"> <li>1. Provincial Department of Water Resources &amp; Meteorology of Siem Reap (PDOWRAM)</li> <li>2. Provincial Department of Environment of Siem Reap (POE)</li> <li>3. Provincial Department of Women's Affair of Siem Reap (PDOWA)</li> <li>4. Provincial Department of Agriculture, forestry and fishery of Siem Reap (PDAFF)</li> </ol>
Project Dates	01st August 2011 – 30 November 2012 ( 16 months )
Total Project Cost (USD) (local currency)	\$ <b>84,965.42</b>
Amount Requested from CBA (USD) (local currency)	\$ <b>49,835.31</b>

Project  
Objectives

Project Goal: Increased adaptive capacity and reducing vulnerability of 14225 people including 8014 women and 125 disable people in the target communities from climate change impacts by piloting CBA livelihood activities and mainstreaming climate change adaptation priorities into Commune Development Plan

**Objective 1 : Awareness Raising**

At the end of the project by June 2013, about 14225 people including 125 disable people and CC members from 14 villages in 2 communes will be aware of climate change and its impact through education and awareness campaigns about cause and impact of climate change and adaptation.

**Objective 2 : Institutions Development and Capacity Building**

At the end of the project by June 2013, 5 community based committees, Commune committee for disaster management (CCDM), FWUC (FWUC), Community fish hatchery station, community fishery committee and a cow bank committee will be established, reorganized and trained and put into operation

**Objective 3 : Adaptive Agriculture (diversification) and Natural Resources Management**

At the end of the project by June 2013, vulnerability to livelihood and socio-economic caused by climate change will be reduced by increasing farming water access for 225 families (Canal construction), rice yield improvement ( 2 times year for 225 families ) , aquaculture productions (for 50 families ), vegetable gardening (125 families of women headed household and disable people ), Increasing natural fish stock by managing community fishery for 2331 families.

**Objective 4 : Lesson Learnt Documentation and Sharing**

At the end of the project by June 2013, Lesson learnt, cases study will be documented and shared among other NGOs, Communities and government institutions through (1)- three photo stories (2)- One video documentary (3)- 2 Cases studies

**Brief Project Description**

Mainstreaming Climate Change Adaptation's Strategy into Community Livelihood and Development (MCCASIC-LiD) is project participatory developed by community and relevant government agencies as mention above with the purpose of assisting the target communes of CTO to adapt and contribute to reducing their climate change vulnerability. From the VRA exercise, in order to enable community people to adapt to climate change, four pillar factors should be addressed and intervened those are:

- (1)-Awareness Raising on Climate Change and Adaptation
- (2)-Adaptive agriculture practices
- (3)-Management of adapting enabling natural resources
- (4)-Vulnerability reducing and adapting infrastructures

Based on the agreed by finding and analyzing among villagers, CC and government agencies, the project will provide awareness raising on climate change causes, impact and adaptation to villagers including CCs . Understanding that community should have relevant, effective and capable local institutions to coordinate collective actions, provide information on climate change to villagers, the project will reorganize or establish and train commune committee for disaster risk management, FWUC, community fishery committee and community based cow bank committee to deal with a number of issues that are as enabling factors to adapt to climate change.

The project will assist villager financially and technically to be able to practice adaptive agriculture by introducing water effective irrigation system (drip-system) which are ideal for women and disable people for vegetable gardening, building canal (2000m) to increase rice yield by enabling 225 farmer to do two time a year of rice farming and improving rice yield from 1100 kgs to 2500kgs per Ha \*. From the VRA, the project identify that natural resources are second important sources of livelihood for villagers, the project will assist villagers and CC to manage natural resources that enable to adapt to climate change. This project will assist the communities to manage water resource and fishery resources. The project will work cooperatively and actively with key stakeholders such as CC, commune committee for disaster management (CCDM), provincial department of water resources (PDOWRAM), Provincial Department of Environment (DOE), Provincial Department of Women's Affair (PDOWA) and Provincial Department of Agriculture, Forestry and Fishery (PDOAFF), Provincial Committee for Disasters Management (PCDM) and University of Build Bright (BBU). The main goal of the project is to ensure that community has sustainable and effective capacity to adapt to climate change and to reduce vulnerability dramatically caused by climate change.

# 1.0 RATIONALE

## 1.1 Geographical, Socio-economic and ecosystem Context

### A. Geography of the Target Areas & Vulnerability to Climate Change:

Province: Siem Reap, District: Prasat Bakong & Banteay Srey District , Commune: Ballangk Commune , Preah Dak Commune

From the study of national adaptation program to climate change (NAPA) has shown that Siem Reap is in moderate high vulnerability to climate change. The study ranks Siem Reap as third province after Banteay Meanchey and Prey Veng province in high vulnerable to climate change. There are two terminologies defined the vulnerability:

1. Vulnerable
2. Quite vulnerable

The project plans to work in two separate communes in two districts of Siem Reap. Those communes are: (1)-Ballangk commune , Prasat Bakong district (2)-Preah Dak commune, [Banteay Srey district](#).

### Target 1:

Ballangk is one of the communes of Prasat Bakong district situated along the downstream and slight step hill of Koulen Mountain range. The commune is about 35 km of from Siem Reap town. We can access the commune at the juncture of national road No.6 and road 67 at the point of O'chunhchean Bridge. Ballangk commune is bordered with Run Taek commune of Banteay Srey district to the north, Kantrean commune to the south, Bakong commune to the west and with Khnar Por commune of Sotr Nikum district to the east. The commune is administratively subdivided into 8 villages which are:

- 1.Kropeu Village
- 2.SnasangKream village
- 3.Prum Kod village
- 4.Trach Village
- 5.Kok Russey village
- 6.Popel village
- 7.Takoy village
- 8.Thlok Kambot village

The commune has the total land areas of 4309 ha. Land use is categorized into following titles:

No.	Land Use	Size	Note
1	Village Crop garden	122	Only small % is utilized

2	Rain Feed Rice Farm land	2895	Partly possible for dry season rice farming, canal fed water
3	Swidden	357	Only small part is active
4	Abandoned field with grass	179	Possible for dry season farming with water from newly built canal by CTO
5	Abandoned field with shrubs	179	X
6	Mosaic of crop with forest	336	Possible for dry season rice farming and other crops
7	Deciduous Forest	36	Listed and approved as community fishery site
8	Re-growing Forest	80	
9	Wetland	48	Upstream natural water storage site, prevent sudden flooded and provided water during long drought
10	Permanent stream, lake or water body	22	As watershed site but no management in place yet
11	Water Reservoir	88	As community fish refuge site and irrigation water source
			4309 HA

From the study, natural resources have important role in environment and livelihood of the villagers. However, since the commune is located on the slight step site of Koulen Mountain range and on the water way, the commune is very prone to sudden short flooded and drought as most of the water is flowing away down very fast after the rain at upstream.

### Target 2:

Preah Dak is one of the communes of Banteay Srey district, situated along the national road 67 and it is about 40 km from the provincial town. The district is also situated along the down stream and slight step hill of Koulen Mountain range. The commune is bordered with Khnar Sanday to the north, with Lean Dai commune of Angkor Thom district to the west, Ampil commune to the south of Siem Reap district and with Run Taek and Rum Chek commune to the east. The commune is administratively subdivided into six villages namely:

1. Preah Dak village
2. Thnol Bondoy Village
3. Ta Trav village
4. Thnol Totenh Village
5. Ta Kos village
6. O'toteung village

The commune has the total land of 60072 ha. Land use is categorized into following titles:

No.	Land Use	Size	Note
1	Forest Land areas	2000 ha	Under Forest Administration

2	Flooded Forest	0 ha	X
3	Water Reservoir	400 ha	Potential for community fishery site establishment
5	Cultivation Land Areas	6664 ha	Most land remain fallow
6	Archaeological Site (protected)	37503 ha	under Apsara Authority
7	Home garden	269 ha	Estimated, not fully used
8	Homestead and Development areas	13636 ha	X

Natural resources including land use for farming have important role in environment and livelihood of the people in the community. However, since the commune is located on the slight step site of Koulen Mountain range and on the water way, the commune is very prone to sudden short flooded and drought as most of the water is flowing away down very fast after the rain at upstream. In the context of climate change and adaptation, the natural resource protection and conservation is significant to reduce the impact of climate change. For example, if managed well and effectively, the reservoir and wetland areas can significant reduce the sudden flood by absorbing and storing a big portion of run off water from Koulen Mountain. Geographically, the two target commune is prone to flood and drought due to its location is along the slight down hill of Koulen mountain plateau.

## **B. Demography**

### **Target 1:**

Ballangk commune, Prasat Bakong district : Ballangk commune has the total population of 1302 families including 125 disable families who are former soldiers and victims of land mine equally to 6325 people including 3902 women. Most of villagers, about 90% are farmers engaging mostly in rice farming but with low yield range from 900 kgs to 1100 kgs pr ha due to poor soil and natural disaster such as flood and drought causing by climate change. According to World Food Program (WFP/CHAN 2008) shows that commune is one of the food insecurity communes of Siem Reap.

Apart from rice farming, villagers are depending on natural resources to supplement their livelihood and need such as collecting wood for housing and other purpose and collecting wild vegetable from nearby community forests. Since most of the villager are depending strongly on agriculture and natural resources leading to a pressure on local natural resources such as on forest and fishery resources while rice farming yield barely secures food security.

Agriculture and natural resources have played vital role for livelihood, environment and local economy, apart from being as livelihood sources, agriculture and natural resources are also an income generation sources for families.

## Target 2:

Preah Dak commune, Banteay Srei district The commune shares similar demography as Ballangk commune. Preah Dak commune has the population of 2331 families equal to 7900 people including 4112 women. Most people, about 90% (NCDD-2009) are farmers and other 10% involved in tourism sector and government servants.

Farming is dominated by rice farming but with low yield about 1100 kgs to 1250 kgs (WFP/Chan 2008) due to farming knowledge and to poor soil and natural disaster such as flood and drought causing by climate change. According to NCDD -2009,, the commune is vulnerable to flood and drought.

Apart from rice farming, villagers are depending on natural resources to supplement their livelihood and need such as collecting wood for housing and other purpose and collecting wild vegetable from nearby community forests. With larger water areas called Boeung Taneav Lake (about 400ha in size) with potential for fishery, fishery management in the commune is poor leading to sharply decline of fish reproduction in local water areas.

## 1.2 Current (Baseline) Climate and Risks

From the figure 1 & 2 above, Siem Reap is vulnerable to climate change (MOE 2002/NAPA) The frequency and intensity of floods may increase with changing climate conditions, and cause severe damage to rice harvests. Successions and combinations of droughts and floods have resulted in a significant number of fatalities and considerable economic losses.

Losses arising from floods have been further exacerbated by deforestation. Floods have accounted for 70% of rice production losses between 2005 and 2009. While drought accounted for 20% of losses.

### Vulnerability Reduction Assessment (VRA):

Though villagers at community level witness the change in weather pattern and affected by the climate change but villagers unable to clearly specify the trend of climate change, current experiences of climate change, Have no ideas what impact to their livelihood if situation gets worse caused by climate change, all villagers do not have any awareness and adaptation capacity to climate change and very unsure of adaptation's sustainability. CTO was looking for a tool to asses vulnerability and develop an participatory adaptation strategy at community level. We would like to thanks to UNDP GEF SGP who was able to provide training on VRA on time. VRA is tools where villagers can get more reliable knowledge on:

1. Climate Change and its impact and can express their current experiences on climate change (impact),
2. Help villagers to anticipate future situation for their family and community from climate change



3. Help villagers to think what sustainable actions at individual / family level and community level to adapt successfully to climate change

Since it is the first time of VRA exercise, CTO and Villagers find it hard to follow and produce result as expected, but however, after the VRA, CTO and villagers agree that we have identify realistic problem and develop practical solution for villagers and communities to apply.

#### **Awareness and Preparedness on Climate Change Impact:**

Most of the villagers do not have awareness on climate change and its impact. So they are vulnerable to climate change hazard as they do not have any preparedness. As the result, most of the villagers have been victims of climate change hazards and they will continue to be if they still do not have awareness and preparedness on climate change hazard which will increase the rate of poverty in the community since their sources of livelihood and income have been destroyed every year. To prevent more villagers falling into poverty and extreme poverty, there is a need to mainstream awareness and preparedness into daily livelihood activities.

#### **Capacity of Commune committee for disaster management (CCDM)**

Some hazards are beyond individual effort but need a collective responsive mechanism. At commune level, there is a commune committee for disaster management whose capacity so far still far to be able to coordinate collective preparedness. For instance, flooded have cut off many section of community road and this need a collective force to repair and maintenance to avoid further damage which make villagers more vulnerable. For instant, the canal was broken in small size and this need to be repaired immediately so that further damage can be prevented but CCDM very often failed to coordinate due to low capacity.

#### **Water Resources Management and Climate Change Adaptation**

Effective water resource management can contribute in reducing climate change hazard either flood or drought. Each of target communes has public water reservoir and canal but the management is still very weak. In the last two years, community witnessed that too much water flowing out of the reservoir in wet season and not stuffiness water in dry season for farming and consumption. Reservoirs and canal can reduce climate change impact mainly dealing with drought. The communities do overlook the importance of water resource management. Effective water management for farming can help community to cope better to climate change hazard.

#### **Conservation of Wetland Areas**

At the upstream areas of Trav Kod reservoir in Ballangk commune, there is a wetland site, about 40 ha in size, this wet land has played very important role in reducing flood and down stream and need to be protected. However, the wetland is being under threats from land clearing and ownership claiming by local villagers as they do not understand the function of wetland. This wetland can absorb much of run down water during heavy rain thus help to reduce flood vulnerability for down stream villages. The wetland also has important value for bio-diversity and food source for villagers.

### Use of sustainable energy, Biogas Digester

100% of villagers have traditionally used woods collected from local community forest as fuel. It is putting pressure on forest resources that play important role in climate change mitigation. Villagers do not have knowledge, technical and financial capacity to tap alternative renewable energy though the study shows that community has resources for small scale biogas digesters. The survey show that about 25% of villagers have more than four animals (cows , ox and buffalos) which provide manure enough for running small scale biogas digester. CTO has consulted with provincial NBP project and agree to cooperate to help interest villagers to obtain biogas digesters.

### Community Fishery and Water Resources Management

In Preah Dak commune, there is a hug water reservoir called "Ta Neave" which is about 400 ha in size. This reservoir has provided fish for community but start to loss its capacity to supply fishes as fishing has been done in a destructive way with no management by the community. Villagers and CC realize the problem but unable to take action due to no capacity and technical supports. There is a need to help community to manage fishery resources by help the community to establish community based fish refuge site to increase fishery reproduction and sustainable fishery management.

### Infrastructure enabling the capacity of villagers to adapt to climate change:

Since most of the villagers are farmers and they have depended on rain water for farming, depending solely on rain water can make villagers vulnerable to climate change. There is too much water during flood from heavy rain and no water left available after rain as it flows downward out of the villages. There is some existing canal but proves to be small proportion comparing to the need. From field VRA and gender planning exercise, villagers, mainly women strongly express their concern of lacking of water for consumption and especially for farming. If they Can access water for all season for farming, they think that they can reduce impact of climate change. The canal can play a vital role in this sense, as flood prevention and water storage and delivery structure which can reduce the impact of flood and increase the water availability and access for villagers mainly women.

### Promote diversified crops using appropriate technology adapting to climate change among most vulnerable group:

There are about 125 families of disabled people and about 125 women headed households who are, from VRA, the most vulnerable people. All of them make a living from farming and climate change does affect them the most. Some people lost 2 legs and two hand, they are struggling even with farming activity around their houses due to physical unfitnes. During the VRA, they suggest for less consuming water agricultural techniques for vegetable farming around their home. In average, each family of disabled people have about 1.5 ha of farming land.

## 1.3 Future Climate Risks

In the Cambodian CBA Country Programme Strategy one of the most significant phenomena associated with climate change is increased frequency and intensity of extreme climatic events, such as floods and drought. Drought and floods are common occurrences in Cambodia, and are considered as two of the main contributors to poverty\*\*\*\*.

As identified during the VRA discussion on the topic of the future risks from climate change, the villagers have raised that the change in rainfall timing, based on the record, the rain fall in late May in 2010 but start as early as March in 2011 which most of the farmers note and recognize that the change of raining fall timing is real but can not pint point exactly how stable the change. The change in rainfall timing affect positively and negatively to livelihood of the villagers as they are not prepared to adapt to that change by not having preparedness and do not know how to adapt to this change yet. The change in rainfall timing is strongly affecting on agriculture production.

The agricultural survey\* (WFP/Chan 2008) show low yield in regular farming, topping by this change in rainfall timing the community will face increasing risk of food security as this will cause disruption in agricultural yield or from lacking of water during the end of habitual farming. Villagers have identified that they have lost about 30% (National Adaptation Plan of Action 2006 (NAPA)) of the agricultural yield due to this change destroying their crops by lacking of rain water and no substitute water sources such as canal. If villagers do not adapt to this change, they think that they will have greater risk of losing agricultural production and yield.

### Impact on agricultural yield caused by change in rainfall timing

The key adverse impacts of climate change in Cambodia identified in VRA report include increasing swift flood and drought magnitude and frequency, reduction of rain-fed crop yields, long-term decrease of water availability, and an increase in the number of people exposed to vector and waterborne diseases which is in line with NAPA process in Cambodia that recommend a climate change-resilient agricultural water management strategy as top priority (\*\*\*\*\*). This change of rainfall timing will also continue to affect livestock in the community, in 2010, villagers have estimated that they have lost about 30% of their livestock

The community will also face greater risk of livelihood degradation such as fishery resources and forestry resources. The climate change have and will have direct impact on water resources and fishery resources, for example, too much rain or swift flood can wash away their fish pond and flow a way natural fishes from community fishery site. Villagers have noticed the decrease in natural fish stock from community fishery site due to server drought and partly from no management. The impact of climate change also causes disruption of domestic and wild animal food chain.

## 1.4 Impacts Context

From the VRA, villagers have concluded that their families and community will be impacted by climate hazards and most of the impacts are directly linked to their livelihoods. Climate change will have negative impact on:

1. Lower Agricultural Production and Yield including rice, crops and livestock
2. Community Infrastructure damage
3. Decrease productivity of natural resources
4. Negative impact on villager health

The key adverse impacts of climate change in Cambodia identified in the NAPA report include increased flood and drought magnitude and frequency, reduction of rain-fed crop yields, long-term decrease of water availability, and an increase in the number of people exposed to vector and waterborne diseases. The NAPA process in Cambodia has recommended a climate change-resilient agricultural water management strategy as top priority.

In the Vulnerability and Adaptation Assessment to Climate Change in Cambodia Report in 2001 it is highlighted that temperatures in Cambodia could rise by up to 2.0c (under one scenario) or 2.5c (under another scenario). Rainfall is expected to increase from its current levels, and by 2100 they could increase by between 3% and 35%, depending on the location. Low lying areas will be impacted more than areas of higher ground<sup>[1]</sup>. Also according to Cambodia's CBA CPS, "At present, there is emerging evidence that agriculture-based livelihoods and overall food security in Cambodia are affected by increased frequency and severity of floods, dry spells and drought events. Various climate models depict different trends in annual precipitation, with some predicting substantial increases in total precipitation (i.e. more intensive rainfall events following after longer dry spells), and some predicting a rise, followed by a fall."

Also stated in the CBA CPS is "with the increase in heavy precipitation events, adverse effects on quality of surface and groundwater, as well as contamination of water supply, are projected. Economic losses by disease due to poor sanitation and hygiene are estimated at USD 187 million annually, mainly as a result of diarrhoea and malaria."

(\*) WFP / Chan 2008

(\*\*) NAPA 2006

(\*\*\*) VRA report by CTO, May 2011

(\*\*\*\*) CBA Country Programme Strategy January 2010

(\*\*\*\*\*) National Adaptation Plan of Action 2006 (NAPA)

The Cambodian Government has established policy to work on climate change issues. The country ratified the United Nations Framework Convention on Climate Change (UNFCCC) on 18 December 1995 and accepted the Kyoto protocol in 2002. In 2006, Cambodia's National Adaptation Program of Action to climate change (NAPA) set the baseline for the country to take action on climate change and is aligned with Cambodia's development objectives following the Rectangular Strategy for Growth, Employment, Equity and Efficiency (Adopted July 2004).

**According to the NAPA report key findings showed that:**

- 81% of households suffer from water shortages for agricultural uses
- 54% suffer from water shortages for personal uses
- In coping with drought, 24% of villagers organize religious ceremonies in the hope that they will bring rain
- 16% plant crops as usual, hoping that the rain will come in time
- 17% of households reduce water consumption by limiting the amount of water used for personal hygiene

At the same time, apart from NAPA report of the impact, villagers in the community think that the impact is likely to increase

Since they see the trend of climate change is also likely to get worst. They predict following future impact:

Impact Type	Infrastructure / Housing / Wealth	Crops / fruit trees / Vegetable / Rice	Animals (wild and domestic)	People
Change in raining pattern	No	Reduce 30% - 35% of crops	No comment from villagers	No comment by villagers
Flood	Destroy about 30% - 50% of housing or community infrastructure mainly road, canal	Destroyed Crops (40%-60%)	Killed (30%-40%) of the animals	No comment by villagers
Drought	No major risk	Destroyed rice (30%)	En mass kill poultry (30%-60%)	Lack of water for consumption
Wind Storm	Will increased from 2% to 10% of housing in the future	No major issues	No major issues	Injured 5% of total people from house collapse

## 1.5 Project Approach

This concept paper for the proposed project is developed in consultation and participatory assessment (VRA) with villagers, most vulnerable group, CC, fishery authority and department of agriculture. The consultation objectives are to (1)-Identify role of each stakeholder in implementation and cooperation (2)-to identify strategy to sustain the project. From the consultation, all stakeholders have come with agreement that assure cooperative implementation and sustainability of the project:

Stakeholders	Implementing Role	Sustainability Indicator
CTO	Overall manage the project and coordinate with all project's stakeholders	The project outputs will be integrated into annual plan relevant stakeholders
Commune Committee for Disaster Management	After training from CTO, this committee will be coordinating and helping villagers to develop adaptation plan	CCDM has a clear plan of actions extracted from family based adaptation plan and will coordinate to integrate into commune plan
CC	Overseeing and coordinate the project implementation and provide legal support	Community adaptation plan is integrated into commune development plan
Fishery Authority	Provide technical support on fishery and provide legal recognition	Community fishery management and hatchery station support plan is integrated into fishery annual plan
Forestry Authority	Provide technical support on wetland protection and legal recognition	Community based wetland management is approved by forestry authority
Provincial Committee for Disaster Management	Provide technical support and legal approval to CCDM	CCDM is approved and recognized by PCDM
Vulnerable Group (Disable People, Women Headed Households)	As beneficiaries and implementers of adaptation plan. Will advocate with CC to integrate CC adaptation plan into commune plan	They practice climate change adaptive activities at family level and community level
Community fishery Committee	Directly consult and work with villagers on community fishery establishment and management	Community fishery management plan is developed and approved by fishery authority

Provincial Department of agriculture	Provide technical support on adaptive agriculture	Provincial department of agriculture will have support follow up plan to biogas digesters and adaptive agriculture (DRIP system) at the target commune
Provincial Department of Environment	Provide technical support and knowledge about climate change	Provincial department of Environment will recognize and support community base climate change adaptation

## 2.0 COMMUNITY OWNERSHIP

### 2.1 Project Formulation

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### **Gender and Most Vulnerable Group (Disable People):**

VRA exercise has shown that Women and Disable people are the most vulnerable groups to climate change impact. All stakeholders agree that this project should be *gender and disable people focused* since they are the primary target and stakeholders. For instance, women are more vulnerable than men and disable people are more vulnerable than ordinary people when flood or drought occurs. From the experiences and consultation, we have defined following strategy for gender and disabled people:

No.	Project Activity	Gender and disable people participation strategy
1	Awareness Raising on climate change	Women and disable people vulnerability to climate change will be highlighted At least 50% of women and 50% of disabled people participate
2	Trainings , access to knowledge and information	At least 50% of women and disable people attend the trainings and gain access to information on climate change and adaptation strategy



3	Decision making (committee election)	At least 60% of women and disabled people participate in election and At least 50% of women, 50% of disabled people stand for election and at least 30% of women and 20% of disabled people will be elected as local committee members
4	Resources support on biogas digester and agriculture	Poor and women headed household and disable people families will be first priority as they are the most vulnerable to climate change
5	Community Development Activities	Encourage, facilitate and support women and disable people to participate in community development such in Natural Resource Management and conservation activities.

## 2.2 Project Implementation

The project will be implemented in line with CTO management line and policy. CTO will apply result based management (RBM) which UNDP GEF SGP trained to implementing partner including CTO and it proves to be effective. CTO has 9 technical staffs that have knowledge and capacity in fields related to proposed project. CTO has staffs that have knowledge of natural resources management, environment, community development, water management and agriculture. Most of the staffs get training and have already involved in conducting VRA with villagers. One project officer will be solely in charge of this project; however, for maximum impact, this project will be mainstreamed into other CTO existing projects as the project title reflects. Project coordinator will be responsible to make sure that climate change adaptation activities of this project will be effectively mainstreamed into existing project activities.

The project will provide orientation training to CTO relevant component staffs, (1)- Natural resource management component, (2) Agriculture component (3)-Community Development Component as this proposed project are compliment to the three components of CTO existing project. At the same time, CTO will also provide orientation training to relevant government department staff about the project overall objectives and objective that is relevant to their departments. Those department are: (1)-department of water resources (2)-Department of agriculture, forestry and fishery (3)-department of women's affair (4)-department of environment.

Though project is proposed by CTO, but this project will be implemented in a participatory with villagers, local committee, commune councils and provincial departments and authorities as below:

**CTO** will lead in the implementation and coordination of the project with all stakeholders who have participated in VRA exercise and planning of the proposal. CTO will be a principal institution of communication of the project.

### **Villagers or Beneficiaries = Vulnerable Group (Disable People, Women Headed Households):**

Beneficiary villagers have main roles of participating in the decision making of their own community development, through the many meetings prior to the start of the projects and through feedback during implementation. At the same time, the local people contribute their own resources for the development of some of the project outputs such as canal maintenance, building cows housing structure for cow bank and will participate in maintaining and protecting the community property in the future. The project will also provide them capacity building to advocate with commune council to integrate climate change adaptation plan into commune plan. the project will provide them awareness raising on climate change hazard and provide them the capacity building on adaptive agriculture.

### **Commune Committee for Disaster Management:**

After capacity building from CTO, the committee will be coordinate al community level with villagers to adopt adaptation activities and plans to adapt to climate change. The committee will be implementing according to their regulation and by-law.

### **Community fishery Committee:**

One after election and capacity building, the committee have roles to consult, coordinate and support villagers to maker that villagers participate and have voices in decision making related to community fishery management and benefit.

### **Commune Council:**

The commune council will oversee the and coordinate the project implementation and provide legal support to local committee supported by this project. Commune council will play vital role in solving the problem arise during the project implementation.

### **Fishery Authority:**

Two of the outputs of this project are involved with fishery authority of Siem Reap, after orientation training from CTO, fishery authority of Siem Reap have role in providing technical and legal support and recognition to community based fishery and hatchery station. The fishery authority of Siem Reap has already committed to that role.

### **Provincial Committee for Disaster Management:**

CTO and commune council after discussion have come up the plan we should implement the project with existing system of Provincial Committee for Disaster Management who has set up commune based committee for disaster management (CCDM). CTO has consulted with Provincial Committee for Disaster Management and find out that it would best benefit the community with we work cooperatively strengthen the CCDM with support from Provincial Committee for Disaster Management which will provide technical and legal support to CCDM.

### **Provincial Department of Environment:**

During the training on VRA, officer from department of environment expressed strong interest in participating the project implementation as they VRA is the good tools to assess community vulnerability to climate change and climate change is the main subject that the ministry of environment is try to address. They can see their role in educating

villagers about climate change and also they expect to learn from this project implementation.

**Provincial Department of Agriculture:**

It is relevant that most of the villager is farmers and their adaptive way to climate change are agriculture based; the department of agriculture is interested in assisting the project to help farmers to reduce their vulnerability mainly on agriculture. The department will be providing technical support and training to villagers related to adaptive farming.

**Provincial Department of Women's Affair:**

Since women are more vulnerable in term of climate change, the project aim to assist most vulnerable women to be able to adapt to climate change. The department will play coordinating role working with women headed households in planning and practicing climate change adaptive actions. CTO will provide orientation to department of women's affair for the project implementation.

**Department of water resources and meteorology:**

The department will be assisting the project in canal design and in the construction process making sure the canal built by the project is technically complied with standard of the ministry of water resources and meteorology. The department also has role in coordinating legal process to the ministry of water resources and meteorology. The department also will provide technical support to farmer water user group in building their capacity to manage and maintenance of the canal and irrigation system.

*Please refer to project management for further information.*

## 2.3 Volunteering

The project will open to any academic or skill person to do volunteerism on related activities of the project, specifically the project have already discussed with Build Bright University (BBU) in Siem Reap on student volunteerism project for the project. The students will be selected based on their major field that relevant to the project. One selected, they will be oriented on climate change impact and adaptation, project objective & activities, target areas and field ethic of CTO. The project coordinator will coordinate with the students to plan for the field works. The students from both district of Prasat Bakong and Banteay Srey will be given priority so that they have chance to practice their skill or help their community.

The student mostly will do their volunteering work to help on education of climate change and its impact, natural resources management education, water conservation and management awareness raising and livelihood activity. CTO will issue a certificate of community volunteering works to students who complete the volunteering works with the project.

## 2.4 Phase-Out Mechanism, Sustainability

Based on previous project experiences and as strategies given by UNDP GEF SGP during capacity building trainings to implementing partners, this concept paper take serious consideration of sustainability of its objectives by assuring that outcomes and outputs will be further implemented by fishery authority, CC, local established committee and villagers. During the process of VRA and project concept papers development, beneficiary's mainly most vulnerable group express that they will continue the activities as it is their need to adapt to climate change. At the same time, supportive stakeholder such as fishery authority, department of agriculture, CC agrees to integrate this proposed project into their annual plan. In order to sustainability, the project have designed a strategy to hand over the operation and management to local committees which are officially recognized as local legal entity or institutions after the establishment and capacity building , The project will take following phase out strategy to ensure sustainability:

No.	Local entity or institution	Key phase out strategy
1	Commune Committee for Disaster Management	-Provide capacity building on disaster management, climate change adaptation strategy and planning
		-Develop a clear roles and responsibility for the committee
		-Inform villages of roles and responsibility of the committee
		-Develop guideline and regulation for the committee to implement
		-The committee is recognized by the commune and provincial committee for disaster management (PCDM)
2	Community Fisher Committee	-Provide capacity building on fishery management
		-The committee is legally recognized by CC and fishery authority of Siem Reap
		-Develop by-law, regulation and management plan to implement
3	Cow bank committee	-A cow bank committee is established and training on cow bank operation and livestock management
		-Develop a by-law and regulation and action plan to implement

		-The committee is legally recognized by the department of agriculture of Siem Reap
4	FWUC	-It is already officially recognized by provincial department of water resources and meteorology of Siem Reap with by-law and regulation
		-Provide capacity building on irrigation system operation, management, maintenance and financial management

## 2.5 Environment

The construction of irrigation canal (2000m) will bring positive impact to the environment by increasing water access that will be accessible year round allowing villagers to double their farming cycle leading to the increase of agricultural yield. With water presence year round, the canal will become stronger ecosystems that are resilient to climate change. With more water, notably, fishes will be able to breed more and have a more sustainable environment for fish reproduction, which will also support the people in the area with a with a more reliable food source at the same time.

The establishment of community fishery site will also have impact on the environment as when the fishery site effectively managed by the community, apart from increasing in fish stock, water resources is also constantly maintained to the level that fit for fish reproduction. The constant water presence at the fisher site will have a positive impact on biodi