



សហព័ន្ធសមាគមកសិករកម្ពុជា
 Cambodian Farmers Association Federation of Agricultural Producers
 CFAP Cambodia



FINAL REPORT

CLIMATE ADAPTIVE APPROACH FOR FOOD SECURITY (CAAFS)

PROJECT NO.13CAM-6019-13AT-4294



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Acronyms

Agriterra	The Combination of Dutch Rural People’s Organizations
AAO	Agriculture and Advisory Officer
ADB	Asian Development Bank
ASEAN	The Association of South–East Asian Nations
BoD	Board of Director
CAAFS	Climate Adaptive Approach to Food Security
CARD	Council for Agricultural and Rural Development
CARDI	Cambodian Agricultural Research and Development Insitute
CFA	Commune Farmers Association
CFAP	Cambodian Farmers Association Federation of Agricultural Producers
COOPs	The Cooperatives
Demo	Demonstration Farm
EU	European Union
Ex.Com	Executive Committee
FAO	Food and Agriculture Organisation of the United Nations
FFS	Farmers’ Field School
FG	Focused Group
FOs	Farmers’ organizations
GA	General Assembly
Govt’	Government
HH	Household
IYFF	International Year of Family Farming
LCB	Local Capacity Builder
LTO Noord	Dutch Farmer Organisation in the North of the Netherlands
NSALA	Non-State Actor and Local Authorities in Development
MoE	Ministry of Environment
PDWRAM	Provincial Department of Water Resource and Meteorology
MoWRAM	Ministry of Water Resource and Meteorology
MWH	MWH Global
PG	Producer Group
RF	Rabobank Foundation
SNV	Dutch Development Organisation
VGs	Vegetable Groups
WB	World Bank
WUR	Wageningen University

I. INTRODUCTION

1.1 Background

The Cambodian Farmers Association Federation of Agricultural Producers (CFAP) developed from an NGO in 2002 and reformulated its working policy in a membership base style till 2006 (organizational reformulation), the organisation registered officially with the Ministry of Interior (MOI), Ref no. 583 last May 25th, 2007 and Ref. no 216, dated 4th February 2010. There are 19 FOs/Coops registered as member of CFAP in 5 provinces (SvayRieng, PreyVeng, KampongSpeu, Kandal and KampongThom). CFAP has a total of 8,579 household members from 117 villages and 939 producing groups. Through these households members CFAP currently targets 34,640 individuals, out of which 18,012 female (52%). The organisation focuses mainly on small scale and rural farmers who are active in farming and earn a living in both agriculture and non-agriculture. Females participated actively in CFAP's activities where they take over important roles such as group leaders, committee members and oversight of group activities. CFAP is currently supported in this effort by Agriterra while Rabobank Foundation support CFAP in both small loan/grant to complement some related activities, especially in agricultural development CFAP extended loan service to only member organisations. Majority sector is agriculture which represent of about 80% of the total population.

CFAP also networks with 5 other farmers' organisation/cooperatives in Takeo, Kampot, Kampong Cham, Siem Reap and Phnom Penh, so there are 10 provinces/municipalities at the countrywide in collaboration. CFAP held its first General Assembly (GA) in December 2009, second General Assembly (GA) in March 2012 and the 3rd General Assembly (GA) held on 29th September 2014 which participated by relevant Stakeholders, Government, Farmer leaders and Farmer members.

It aims to build the capacity of FOs/Coops as members to become a professional entity, that's why various activities for instance strengthening the capacity and services of FOs to farmer members, improvement of agricultural production, rural economic initiatives, getting access of FOs and small scale farmers on proper agricultural technologies, getting access of FOs members to markets, facilitate FOs to get access to inputs and produces sale at FOs level, networking of FOs with buyers/traders and inputs suppliers and vice versa, facilitate members access to trading, AGRI-Credit/Saving (use of a revolving fund) and advocacy that could serve direct services to farmer members. Many rural and small scale households have low incomes because their livelihood depends almost exclusively on low-yielding rice, vegetable and animals production. Fluctuating rice and vegetable prices and disparities in incomes mean that rural poor families are trapped in constant debt, no strong economic initiatives for sustainable agriculture that could stand with climate changes created so far (lack of clear strategic action plan) which is feasible for long run at all FOs level. Moreover, agricultural production depends exclusively on rain water, sometimes there is flood in rainy season (May-Oct) while in dry season (Nov-Apr) is too dry, there is no or very limited irrigation system in most rural areas, farmers could not get access to water for agriculture. Shallow of cannels, open-wells (almost disappear now) and natural lakes or rivers are other challenges for small rural farmers in Cambodia.

CFAP entered into cooperation with the LTO Noord since 2011. As CFAP won the Global contest of climate change in 2010 organised by the LTO Noord, Wageningen University and the MWH-Global, funding by Agriterra. Therefore, farmer members themselves get direct support through this programme. There were several missions made prior and during the project implementation period 2012-September 2014 by the Dutch Farmers Organisation LTO Noord, supported by Agriterra.

Goal of this action plan is to empower Farmers Organisations and include farmers in the discussion on climate change and agriculture and take a leading role in the translation of adaptation strategies into viable farm level activities. 35 multipurpose ponds expected to be intervened in this project and about 350 household members got direct benefits from the project while the rest of other 801, 441 female got indirect benefits from the project intervention.

2. Achieved results

2.1. Meetings/Workshops

The workshops/meetings organised in different levels i.e. from groups level to FOs level, regional level and high level which participated by different stakeholders like farmers, local authorities, sub-national specialized government officials and national government since the start of this project “Climate Adaptive Approach for Food Security”. The participants were farmer members (villagers), local authorities (village chief, commune/Sangkat councils, district governors), sub-national governments (provincial department of agriculture, provincial department of environment and provincial governors), national governments (Ministry of Agriculture and Forestry and Fisheries, Ministry of Environment, Ministry of Water Resources and Meteorology and Council for Agricultural and Rural Development), research institute (Cambodian Agricultural Research and Development Institute), farmers’ organisations (all FOs in network), University of Svay Rieng and International Development Agencies.

CFAP in collaboration with LTO Noord represented by a project manager Mr. Peter Prins also met with ADB, WB, EU, FAO, SNV and IFAD at their representative offices in Cambodia. The purposes of meetings are to share/talk respectively about the project “Climate Adaptive Approach for Food Security” and also seeking for information, network strengthening, impact on climate change and adaptation, research activities in relation to the impact of climate change, especially drought, ground water is sour, iron and salty which farmers could not use for drinking as majority of rural farmers in Cambodia still use ground water for drinking and cooking food because they are poor, they could not get access to pure drinking water, ground water now is almost empty in dry season (November to April). Flood also affected seriously on rice and vegetable production, especially in rainy season. The weather forecasts and agriculture (early warming), water resources, geohydrological data, use of ground water in Cambodia etc. It aims also to minimize gap between stakeholders and farmers’ organisations and opportunity of FOs to collaborate with those national and international development agencies in the future. We also visited seeds companies, Svay Rieng organic fertilizer company, farmers’ field school to see the changes and risk management linked up to the courses, demonstration farms to get a picture about drought tolerant varieties and crops and to involve the private sector in a follow up (e.g. experiments on demo farms).

Several workshops also organised accordingly from grass-root to provincial and national level. Such workshop focused mainly on climate change and food production in the pilot-regions, soil analysis, and sharing results of soil testing for improvement tested by BLGG AGROXPERTUS of the Netherlands, study/research made by students Van Hall Larenstein, University of Applied Sciences, the Netherlands dept. Land and Water management Ms. Janneke van den Tillaart Ms. Elske Möring to all farmer leaders as members of CFAP and relevant stakeholders include consultant from a University of Svay Rieng. In the workshops we had discussed all kind of adaptation measures on the farm/local level, based on technical inputs we collected.

High level workshop organised at the national level by CFAP in collaboration with LTO Noord to present the draft Action Plan of CFAP to get commitment of national partners,

relevant stakeholders from farmers' organisations, governments, private sector, national and international development agencies included UN (FAO and IFAD), Mekong river committee and Media (TVs).

- 2.1.1. Workshop held on 22-January 2014 at CFA-BS, the workshop focused on climate change and food production in the pilot-regions. In this workshop we discussed all kind of affordable adaptation measures which is applicable, especially small scale farmers. 31 participants participated in the meetings, 7 female.
- 2.1.2. Workshop held on 24-January 2014 at CDA, the workshop focused on climate change and food production in the pilot-regions. In this workshop we discussed all kind of affordable adaptation measures which is applicable, especially small scale farmers. 33 participants participated in the meetings, 7female.
- 2.1.3. Workshop held on 23-January 2014 at meeting hall of the Provincial Department of Agriculture (PDA), the workshop focused on sharing of knowledge and experiences in climate change, updated information regarding climate changes, explanation the results of soil tests, advise the appropriate methodologies in soil improvement, use of water technically for vegetable production, vegetable planting, vegetable management and uses of fertilizer technically. 53 participants participated in the meetings, 9 female (16%).
- 2.1.4. Provincial/Regional workshop on climate adaptive approach and sharing of relevant information and impacts as a result of climate change, quick changes of climate that could threats to farming activities, especially small scale farmers, it is too hot in day time while in night time is too cold, more foggy now, losses of biodiversity, increase of temperature up to 2.68 Degree Celsius by 2060 etc. The workshop held on 25th of January 2014 at Cambodian Red Cross. In this workshop we discussed all kind of affordable adaptation measures. Recommendations made to relevant stakeholders included national and international development agencies for their continuous support to farmers' organisations directly because FOs work directly with farmer members, especially small scale farmers. 45participants participated in the meetings, 10female.
- 2.1.5. The high level workshop on climate adaptive approach for food security held on 28th of January 2014 at Cambodiana Hotel in Phnom Penh. In this workshop we discussed all kind of affordable adaptation measures. Recommendations made to relevant stakeholders included national and international development agencies for their continuous support to farmers' organisations directly because FOs work directly with farmer members, especially small scale farmers. 36participants participated in the meetings, 8female.
- 2.1.6. *(Details of workshops at all level, please see in separate reports, Annexure).*

2.2. Advisory Support

There are two types of advises conducted prior and during the project implementation i.e. advisory support conducted by CFAP's staff/LSBs to producer group members/farmers' organisations and advisory mission conducted by LTO Noord and Agriterra to producer groups, farmers' organisations and CFAP. CFAP provided technical advisory support on

technical vegetable growing, water management, use of fertilizer, soil quality improvement, soil treatment, diseases prevention, crop protection, production planning, use of cropping calendar in a rotation system, marketing and the results of soil analysis to 35 producer group members equal to 1151 farmers, 562 female (49%) in Prey Veng and Svay Rieng provinces intervened by this project, moreover 12 on sites training were also got additional advisory support climate change knowledge as well, so there were 47 groups got regular strengthening under the project on climate changes. Each producer group members got five advisory missions starting from dissemination of the project, identification of farmer members, practical growing techniques, taking care of crops and harvest.

Another type of advisory support conducted by LTO Noord/Agriterra as follow:-

There are five distinguished phases:

1. Fact finding mission. The first mission (March 2012) has focused on the current knowledge about climate change at CFAP and how the organisation is linked to existing networks of farmers, science and policies. The findings of this step have provided the base of the programme in phase 2.
2. Mission to link up to research and education on agriculture and climate change. This, additional mission to the first mission, has gathered more input from science for the Workshops Climate Change and Agriculture (phase 3) and a pilot project. Empowering CFAP to understand environmental change, identifying climate change and adaptation measures. Building commitment private seed companies, input companies and agencies. Get focus in the project (prioritizing adaptation strategies).
3. Workshops Climate Change and Agriculture which took place in January 2013.
4. Harvesting the project. Which measures can be taken to structural improvement, to climate smart food production. Several measures will be part of an Action Plan of CFAP, to be executed end 2013-2014.
5. Meeting with CFAP staff, board members and local consultant to discuss follow up of the project, up scaling it to region, with focus on integrated soil- water and crop management.

2.3. On site trainings

Onsite training is one of the most practical training method/model of CFAP to build the capacity of producer group leaders, farmer leaders and staff members to become specialized in services providing to farmer members in the future. To achieve this plan goal, the organisation requires building the capacity of staff members at CFAP, they use received knowledge/skills to extend to FOs staff members. Next FOs staff will deliver training services directly to farmer members by coaching from CFAP staff. This training model got interested very much from farmer members and FOs as members as they got real knowledge through practical method which they themselves got opportunity to conduct trainings to farmer members after that they would become local expertise after those practical trainings. Farmer members satisfied very much to this training model and it is clear that, this will enable them to continue growing successfully; therefore they can extend land size for agricultural production, not only for household consumption, but also for regular sale on market and supply for traders and super market as well. To make sure that producer group members are able to influence on market, especially the prices of their produces which is beneficial to their cost production properly, CFAP has facilitated them to produce same crops for collective sale in the future. In term of growing techniques and practices now, we could see that farmers, especially farmer members in our operational areas have changed quickly of their behavior in agricultural production i.e. most of them apply new growing technical protocol, and it is the fact that the yield is higher 3-4 times compared to old practice. Bellow is the list of onsite training schedule. *Please see in Annex for the list of onsite training schedule.*

Figure 2: Constructed pond



Figure 3: Constructed pond filled with rain water and vegetable growing



Table 1: List of farmers received ponds

#	Name of FOs	Name of Farmers	Sex	Specialized crops
1	CFA-KTB	Ung Salan	M	Ridge gourd and Cucumber
2	CFA-BS	Khen Kea	M	Leaf onion, Lettuce and cucumber
3	CFA-BS	Hout Dara	M	Ridge gourd and Cucumber
4	CFA-BS	Phrum Saream	M	Ridge gourd and Cucumber
5	CFA-BS	Kong Rany	F	Leaf onion, Lettuce and cucumber
6	FEDA	Koy Vanndeth	F	Ridge gourd and Cucumber
7	FEDA	Chak Borat	M	Ridge gourd and Cucumber
8	FEDA	Khiev Sophal	M	Ridge gourd and Cucumber
9	CFA-KCH	Neang Phan	F	Lettuce and cucumber
10	CFA-KCH	Reach Noeun	F	Ridge gourd and Cucumber
11	CFA-KCH	Phouk Khen	M	Ridge gourd and Cucumber
12	CFA-KCH	So Sreymom	F	Ridge gourd and Cucumber
13	CDA	Norng Boran	M	Pumpkin, winter melon and cucumber
14	CDA	Moun Vanna	M	Kang Kong, ridge gourd and lemon grass
15	CDA	Svay Samnang	M	Ridge gourd and cucumber
16	CFA-CH	Phouk Sokha	F	Ridge gourd and Cucumber
17	CFA-CH	Doung Sokhon	M	Ridge gourd and Cucumber
18	CFA-CH	Doung Saran	F	Leaf onion, papaya and cucumber
19	CFA-PTR	Dom Bunthoeun	M	Leek, Lettuce and cucumber
20	CFA-PTR	Phrom Sara	M	Lettuce, Leek and long been
21	CFA-PTR	Phou Sopha	M	Kang kong and cucumber
22	CFA-THL	Va Vanndoeun	M	Lettuce and Cucumber
23	CFA-THL	Moa Meak	M	Sugar cane , ridge gourd
24	CFA-THL	Hem Sarat	M	Ridge gourd and Cucumber
25	CFA-THL	Meas Yarn	M	Wax gourd ridge gourd and Cucumber
26	SACKS	Soun Sony	M	Ridge gourd and Cucumber
27	SACKS	Moa Saret	F	Ridge gourd and Cucumber

28	SACKS	Has soun	M	Ridge gourd and Cucumber
29	SACKS	Mounh Thean	M	Ridge gourd and Cucumber
30	CFA-SCH	Suon Samart	F	Ridge gourd and Cucumber
31	CFA-SCH	Torn Saly	M	Ridge gourd and Cucumber
32	CFA-SCH	Heam Sakhem	M	Ridge gourd and Cucumber
33	CFA-SCH	Kheam Sok	F	Ridge gourd and Cucumber
34	KADC	Ly savon	F	Better gourd and Cucumber
35	MADC	Chharng Pheap	M	Better gourd and Cucumber

Table 2: List of fishes raising farmers

#	Name of FOs	Name of Farmers	Sex	Starting Date	Type of fish	Fishes amount
1	CFA-KTB	Ung Salan	M	5/8/14	Pangasius	1100
2	CFA-BS	Khen Kea	M	Planning	Pangasius	
3	CFA-BS	Hout Dara	M	10/8/14	Pangasius, Karopy	700
4	CFA-BS	Phrum Saream	M	Planning	Catfish	1000
5	CFA-BS	Kong Rany	F	1/7/14	Pangasius, catfish and Silver carp	1000
6	FEDA	Koy Vanndeth	F	22/6/14	Pangasius	800
7	FEDA	Chak Borat	M	10/5/14	Pangasius, catfish	900
8	FEDA	Khiev Sopal	M	5/4/14	Catfish	500
9	CFA-KCH	Neang Phan	F	26/6/14	Fingerling fish	500
10	CFA-KCH	Reach Noeun	F	15/5/14	Fingerling fish	900
11	CFA-KCH	Phouk Khen	M	27/5/14	Fingerling fish	600
12	CFA-KCH	So Sreymom	F	2/6/14	Fingerling fish	1000
13	CDA	Morng Boran	M	17/7/14	Catfish	730
14	CDA	Moun Vanna	M	18/7/14	Fingerling fish	450
15	CDA	Svay Samnang	M	7/7/14	Pangasius	600
16	CFA-CH	Phouk Sokha	F	1/7/14	Pangasius	500
17	CFA-CH	Doung Sokhon	M	16/6/14	Pangasius, Silver Carp	450
18	CFA-CH	Doung Saran	F	16/6/14	Silver carp, Karopy	1300
19	CFA-PTR	Dom Bunthoeun	M	28/4/14	Pangasius	500

20	CFA-PTR	Phrom Sara	M	7/7/14	Catfish	1000
21	CFA-PTR	Phou Sopha	M	Planning	Catfish	
22	CFA-THL	Va Vanndoeun	M	25/7/14	Catfish	350
23	CFA-THL	Moa Meak	M	5/7/14	Catfish	700
24	CFA-THL	Hem Sarat	M	10/7/14	Pangasius	1000
25	CFA-THL	Meas Yarn	M	15/4/14	Pangasius	200
26	SACKS	Soun Sony	M	25/5/14	Catfish, Pangasius	1400
27	SACKS	Moa Saret	F	5/7/14	Catfish, Pangasius	600
28	SACKS	Has soun	M	1/7/14	Silver carp, Tilapai	600
29	SACKS	Mounh Thean	M	9/8/14	Pangasius	170
30	CFA-SCH	Suon Samart	F	20/7/14	Tilapai, Karopy	450
31	CFA-SCH	Torn Saly	M	21/7/14	Pangasius	1300
32	CFA-SCH	Heam Sakhem	M	13/6/14	Pangasius	300
33	CFA-SCH	Kheev Saoun	F	25/6/14	Pangasius	1000
34	KADC	Ly savon	F	25/6/14	Pangasius	48
35	MADC	Chharnng Pheap	M	20/6/14	Fingerling fish	450

2.5. Crops Production



Knowledge on crop production provided through trainings to producer group members and farmer leaders/staff members at FOs level. The basic requirements/trainings for FOs and PGs at the moment are soil preparation, technical seed germination, planting, pest management, use of water and water management and harvest. Moreover, crop growing plan in a rotation system that could meet beneficial opportunity

seasonally for high market demands also trained/advised to farmer members. Various vegetable/ crops such as cucumber, long bean, taro, radish, ginger, corn and rice were introduced to farmer members; the poultry production was also made. To enable farmers getting access to grow in a year round, specific cropping calendar was given to all farmer group members, however farmers in Cambodia still have limited capacity to run farming activities regularly because they do not have regular market for sale of their produces when produced over a need at local market, therefore both technical advisory support to improve production with quality and market networking are needed.

ការថែទាំ

ការពារការបាក់គ្រោះ:

- ១- ពិនិត្យស្រះទឹកឱ្យបានរៀងទាត់
- ២- ធ្វើអោយមានជម្រាលទោតស្រឹកជាតិចង្វាង ៤-១
- ៣- ដាំស្លឹកក្រៃជុំវិញស្រះទឹក
- ៤- ប្រើដីគង្កើតដើម្បីបំពេញរន្ធជុំវិញទំងន់ដែលបាក់គ្រោះ



ប្រសិនបើមានអាក្រក់ដូចខាងក្រោម:

- ១. គ្របជម្រាលជើងទោងដោយផ្កាស្លឹក
- ២. យកដីដែលបាក់គ្រោះចេញជំនួសវិញដោយដីគង្កើត



ការចិញ្ចឹមត្រី និង ដាំរុក្ខជាតិលើទឹក

កសិករចង់ដាក់ត្រីចិញ្ចឹមក្នុងស្រះទឹកក៏ត្រូវដាំរុក្ខជាតិលើទឹកក្នុងស្រះផងដែរ។ រុក្ខជាតិលើទឹកផ្តល់អុកស៊ីសែនដែលត្រូវត្រូវការ។

ចំនួនត្រីក្នុងស្រះទឹក: ស្រះទឹកអាចដាក់ត្រីចិញ្ចឹមបានពី ២០ទៅ៤០ ក្បាលក្នុងមួយម៉ែត្រ គូប។

ចំនួនរុក្ខជាតិលើទឹកក្នុងស្រះទឹក: ត្រូវរត់មាន ៤០%នៃផ្ទៃទឹករយៈពេល៣ម៉ែត្រក្រោយ។



រក្សាគុណភាពទឹក

ទឹកអាចមានគុណភាពមិនល្អ ប្រសិនបើមានវិញ្ញាតក ឬថ្លីត្រាត មានកំរិតខ្ពស់។

- ហេតុផលអាចបណ្តាលមកពី: (១. រុក្ខជាតិទឹកមិនមានគ្របគ្រាន់)
- ២. ត្រីច្រើនពេក ៣. ភក់ច្រើនពេកនិងការបំបែកសារធាតុសរីរាង្គ)
- ដំណោះស្រាយសាមញ្ញៗ (១. យកសារធាតុសរីរាង្គចេញ)
- ២. យកត្រីចេញខ្លះ ៣. ដាក់រុក្ខជាតិលើទឹកបន្ថែមក្នុងស្រះទឹក)

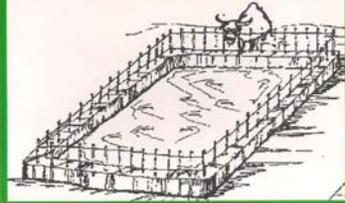
វិធីសាស្ត្ររង្វង់រៀង គឺរៀបចំអោយមានទឹកគ្រប់គ្រាន់ក្នុងស្រះទឹក បន្ទាប់មកធ្វើដូចខាងក្រោម:

- ១. បន្ថែមកំបោកស្លឹកម្លូ ៥ទៅ៧ គ.ក្រក្នុងស្រះទឹក
- ២. បន្ថែមជីលាមកសត្វលាមក ៤០ទៅ ៥០គ.ក្រក្នុងស្រះទឹក
- ៣. បន្ថែមជីលាមកសត្វមាត់ ១០ទៅ ១៥គ.ក្រក្នុងស្រះទឹក
- ៤. បន្ថែមជីលាមកសត្វជ្រូក ១៥ទៅ ២០គ.ក្រក្នុងស្រះទឹក.
- ៥. បន្ថែមជីបេតុង (ស្លឹកឈើ) ១៥ទៅ ២០គ.ក្រក្នុងស្រះទឹក

វិធានការសុវត្ថិភាព!

ដើម្បីស្រះទឹកមានសុវត្ថិភាពត្រូវអនុវត្តដូចខាងក្រោម:

- រៀបចំជាការកណ្តាលស្រះទឹកដើម្បីងាយស្រួលលេង។
- ធ្វើរបងជុំវិញដើម្បីការពារក្មេងៗស្រះទឹក ។
- ធ្វើរបងជុំវិញដើម្បីការពារក្មេងៗស្រះទឹក ។



សហគ័ន្ធស៊ីហ្វាប កម្ពុជា

ផ្លូវលេខ. ២០៤. ផ្ទះលេខ. ២៤១. ភូមិស្រះរាំង. សង្កាត់ស្វាយរៀង, ក្រុងស្វាយរៀង, ខេត្តស្វាយរៀង, កម្ពុជា
 ទូរស័ព្ទ/ទូរសារ: ៩៨៥៥ ៤៤ ៩៤៥៥ ៥៥៣
 E-mail: cfap-cambodia@cfap-cambodia.org
 Website: www.cfap-cambodia.org

ការដាំដំណាំឆ្នាំង

ប្រសិនបើ កសិករដាំដំណាំឆ្នាំងមុនការដាំដំណាំឆ្នាំងស្រូវវាពិតជាមានសារៈសំខាន់ខ្លាំង។ បើមិនធ្វើដូច្នោះទេ ទិន្នផលរបស់វា និងធម្មត្រូវ ហើយគុណភាពដីក៏ថយទៅតាមនោះដែរ។

ដើម្បីធ្វើដូច្នោះបាន ត្រូវបែងចែកផ្ទៃដីទៅតាមវិធីដាំដូចខាងក្រោម ហើយផ្អែកនឹងដីដាំដំណាំឆ្នាំងត្រូវដាំដំណាំឆ្នាំងស្រូវ ធ្វើរងស្រូវឆ្នាំទាំង១ ឬ កំពស់ និងបណ្តោយរង។ ដំណាំត្រូវមានការផ្លាស់ប្តូរជារៀងរាល់ឆ្នាំ រាល់២ឆ្នាំម្តង, ៤ឆ្នាំម្តង ឬ ត្រើនជាង៥ឆ្នាំ។

២ ឆ្នាំ
 ស្ពៃ, ខ្លោង, កាតុត, សណ្តែកបាតាំង, ត្រសក់, ណ្តុំ, សណ្តែក និង ធុំត្រីក ។

៤ ឆ្នាំ
 ដំឡូង, មើងលើ, ម្លូស, ម្លូសរ្លាត, ខាត់ណា, ផ្កា, ស្ពៃ និង គ្រប់



វិធីនៃការ ឆ្នាំង

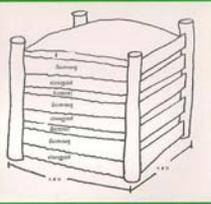
សកម្មភាពខាងក្រោមនេះ មានសារៈសំខាន់ណាស់សំរាប់វិធីនៃការដាំដំណាំឆ្នាំង។

- ផ្លាស់ប្តូរទឹកផ្លែឆ្នាំងដំណាំជារៀងរាល់ឆ្នាំ
- ដំណាំដែលមានស៊ីប្រដូចគ្នាត្រូវតែដាំឆ្នាំង/ដាំបំបែក
- ជាការល្អគួរដាំដំណាំដែលមានស៊ីប្រផ្សេងគ្នា

ផ្លែឆ្នាំង	ផ្លែឆ្នាំង	ផ្លែឆ្នាំង	ផ្លែឆ្នាំង	ផ្លែឆ្នាំង
ស្លឹក	ផ្លែ	មើម	បន្លែឆ្នាំង	
ផ្លែឆ្នាំង	ផ្លែឆ្នាំង	ផ្លែឆ្នាំង	ផ្លែឆ្នាំង	ផ្លែឆ្នាំង
ផ្លែ	មើម	បន្លែឆ្នាំង	ស្លឹក	ផ្លែ
ផ្លែឆ្នាំង	ផ្លែឆ្នាំង	ផ្លែឆ្នាំង	ផ្លែឆ្នាំង	ផ្លែឆ្នាំង
មើម	បន្លែឆ្នាំង	ស្លឹក	ផ្លែ	
ផ្លែឆ្នាំង	ផ្លែឆ្នាំង	ផ្លែឆ្នាំង	ផ្លែឆ្នាំង	ផ្លែឆ្នាំង
បន្លែឆ្នាំង	ស្លឹក	ផ្លែ	មើម	

ការរៀបចំធ្វើដីកំប៉ុស្តិ៍

កំប៉ុស្តិ៍ត្រូវតែប្រើប្រាស់សំរាប់កែលម្អទំរង់ដី



- កំប៉ុស្តិ៍ត្រូវបានរៀបជាស្រទាប់ៗស្រទាប់ដីមួយៗមានកំរាស់៣០ស.ម។
- បន្ទាប់មកដាក់កំបោះកសិកម្មឱ្យឱ្យកាច់។
- បន្ទាប់មកដាក់ដីគង្កើតឱ្យចំនួនតូចៗ ហើយដីលាមកសត្វខ្លះ
- ដីកំប៉ុស្តិ៍ល្អមានស្រទាប់ចាប់ពី ៥ទៅ៦ស្រទាប់ ហើយដើម្បីការពារកំប៉ុស្តិ៍ ពីការបាក់បែកនិងការដុះរុក្ខជាតិ កសិករអាចដាំណ្តើរលើដី បន្ទាប់ដំណាំណ្តើរក៏ត្រូវទៅដាក់កំប៉ុស្តិ៍ដែរ។

ការកែលម្អស្រះទឹកដើម្បីទទួលបានផលប្រយោជន៍ច្រើន



ទឹកប័ណ្ណនេះផ្តល់អោយសហគ័ន្ធស៊ីហ្វាបកម្ពុជា ជួយកែលម្អស្រះទឹកដើម្បីទទួលបានផលប្រយោជន៍ច្រើន។ ព័ត៌មានក្នុងទឹកប័ណ្ណនេះរួមមាន:

- ដំណាំឆ្នាំងនៃវិធីនៃការ ឆ្នាំង
- ការថែទាំស្រះទឹក
- ការចិញ្ចឹមត្រី និងរុក្ខជាតិលើទឹក
- រក្សាគុណភាពទឹក
- ការរៀបចំធ្វើដីកំប៉ុស្តិ៍ និងវិធានការ



2.7. Internship



CFAP has studied and prepared an article on impacts of small producers/farmers in Cambodia to join in the climate change adaptation contest, organized by LTO Noord, Wageningen UR, and MWH Global last 2010. The internship is part of the project between the ‘Climate adaptive approaches to Food Security’ and ‘Empowering of Small Farmers Toward Cooperative Marketing and Enterprising’ executed by

CFAP in Cambodia from January 2013 to December 2014 which focused on harvesting the project which measures can be taken to structural improvement, to climate smart food production. Several measures would be part of the Action Plans of CFAP, to be executed end 2013-2014. Construction of 35 multipurpose ponds at the family level is backbone of the adaptation strategy, aiming resilient agriculture in this part of Cambodia. The multipurpose ponds play a central role in the adaptation strategy. But what are the experiences of the farmers in the first months after construction? This internship will monitor the first results and will give an insight in several aspects which can be related to this solution. Does it work, what were expectations of the farmers, what are points of attention when has to be up scaled?



Problem statement:

What can be learned from the first experiences with multipurpose pond? Evaluate and monitor several aspects of this new designed pond, so this information can be used for implementation and up scaling the construction of more ponds in the near future.

Objectives

1. Evaluating and monitoring the construction/development of the multipurpose ponds by assessing a reference (zero phase)
2. Getting insight in the economic perspective for the farmer and his household
3. Define critical factors for up scaling the construction of ponds

Activities

- Writing an Action Plan in collaboration with CFAP staff
- Field research: interviews, taking and assessing soil- and water samples, qualitative and (if possible) quantitative survey of the ecological state of the art of the ponds

- Attending meetings of Farmers' Groups (study groups formed around the farmers who got a pond)
- Collecting quantitative data (yields of crops, prices, income, costs and benefits)
- Analysis aspects of market/value chain: what is the impact of higher yields in terms of marketing of these products

Results achieved as follow:

- Report describing the zero-phase
- Recommendations for construction and maintenance of the ponds
- Recommendations for soil improvement and fertilization
- Recommendations for up scaling (construction, financing, adoption by other farmers)
- Manual for constructing and maintenance of a multi-purpose pond
- Illustrative posters/leaflets for promotion and knowledge dissemination
- Presentation made by interns to CFAP and farmers

(Details will be available in a separate report)

2.8. Computer Training



To improve the capacity of farmer leaders/staff members of FOs to get access to technology, information on internet, CFAP in collaboration with the computer training centre in Svay Rieng delivered a training course on Ms. Word, Excel, PowerPoint and use of internet and e-mail to 36 FOs leaders/staff members, 10 female. After training, FOs leaders and staff members can use a computer to speed up their work better and on time, due quick changes of climate recently in Cambodia, using a technology is very helpful for farmer producers they can find such information relate to their farming activities, especially through internet to serve the

interests of their farmer members for example the website of the Ministry of Water Resources and Meteorology www.cambodiameteo.com, so that farmers can prepare well for their agricultural production.

2.9. Training workshop on soil and water management to FOs

(Details will be available in a separate report, Annex.5)



2.10. Field visits

There were several field visits organized to all operational working areas to see the status of project execution and the living conditions which intervened by this project. The field visits hosted by the following organisations:-

- 1). KANTREAN AGRICULTURAL DEVELOPMENT COOPERATIVE (**KADC**)
- 2). MONGKULMEANCHEY AGRICULTURAL DEVELOPMENT COOPERATIVE (**MADC**)
- 3). SAMAKUM APIVAT CHAMROS KHUM SVAY ANG (**SACKS**)
- 4). THLORK COMMUNE FARMERS' ASSOCIATION (**CFA-THL**)
- 5). THNOT COMMUNE FARMERS' ASSOCIATION (**CFA-THN**)
- 6). SVAY CHRUM COMMUNE FARMERS' ASSOCIATION (**CFA-SCH**)
- 7). BASAC COMMUNE FARMERS' ASSOCIATION (**CFA-BS**)
- 8). KAMPONG CHAMLANG COMMUNE FARMERS' ASSOCIATION (**CFA-KCH**)
- 9). KOYTRABAEK COMMUNE FARMERS' ASSOCIATION (**CFA-KTB**)
- 10). PORTHIREACH COMMUNE FARMERS' ASSOCIATION (**CFA-PTR**)
- 11). CHEK COMMUNE FARMERS' ASSOCIATION (**CFA-CH**)
- 12). THE FAMILY ECONOMIC DEVELOPMENT ASSOCIATION (**FEDA**)

3. Findings

3.1. Agricultural production

Various trainings and advisory supports provided by CFAP staff members (AAOs and LSBs) to all group members at respective on-site trainings. 49% of women participated in the project activities. The trainings/advisory supports focused mainly on technical vegetable/crops growing, water management, use of water, use of fertilizer, soil quality improvement, soil treatment, diseases prevention, crop protection, production planning, use of cropping calendar in a rotation system and marketing. Base on our analysis of a new growing technique on climate change programme, the production has increased 124% between 2012-Mid 2014, it is the fact that new practice provided higher yield compared to old practice, 60% of farmer group members applies new technical protocols i.e. they follow an on-site training model of CFAP. *(See article 2.2 and 2.3 above for more details)*

3.2. Water harvest

Majority of farmers in rural Cambodia however could not get access to collect rain water properly for longer use, not only for agricultural production, but also for household consumption. There is no broad knowledge base on rain water collection and the investment cost for example water basins (household pond and water storage pool) are too expensive for small rural farmers.

It is true that farmers in the operational provinces of CFAP are small scale farmers, they rely exclusively on rainwater for agricultural production. The lack of irrigation system greatly restricts the quantity and diversity of vegetable/crops, rice and animals that farmers are able to produce. Using rainwater, farmers are limited to 1 crop of rice and vegetable per year. The area is particularly vulnerable to unpredictable weather conditions; extreme drought in the dry season and extreme flood in the wet season are endemic. Small scale farmers have difficulties adapting their farming practices to such environmental conditions and outward agricultural labour migration, particularly of young farmers because there is no or very limited knowledge and capital to invest on their own farm land in the villages, there is no specific horticultural programme at high school level in Cambodia, lack of well preparation of rural infrastructure, sustainable economic initiatives etc. Moreover, non-agricultural jobs

give them high income in a short term period. They normally come back to the village when there is no job in the city or when they are aging. Lack of irrigation in the dry season greatly restricts the quantity and diversity of crops that farmers are able to produce. As a result of this “unproductive” situation, farm incomes are low and farmers have practically no investment capacity. Agriculture is generally not mechanized and most farmers employ traditional cultivation techniques which rely largely on animal power and manual labour.

Those who received a household pond directly granted by the project “Climate Adaptive Approach to Food Security” (CAAFS) in Prey Veng and Svay Rieng also received trainings on water use and water management as well; therefore they have basic knowledge on use of water properly. *(See article 2.4 above for more details)*

3.3. Marketing

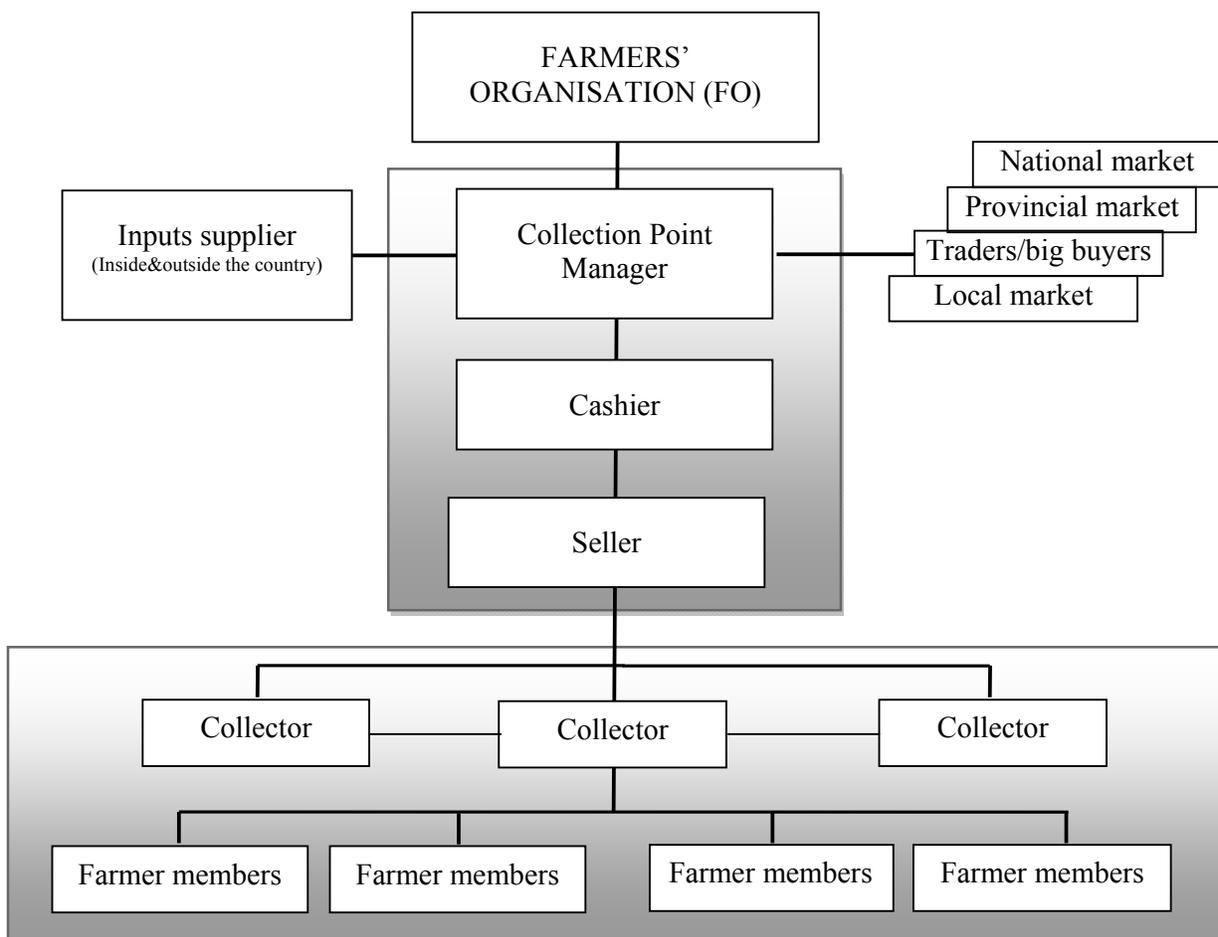
Majority of farmers in rural Cambodia however could not get access to collect rain water properly for longer use, not only for agricultural production, but also for household consumption even though all farmers depend exclusively on rain water for agriculture. There is very limited knowledge to collect water properly, moreover the investment cost for example water basins (household pond and water storage pool etc) are too expensive for small rural farmers and it is not possible for them as well due to low household income of household farmer members and there is no regular market for their products as well. I agree that farmers can use their own money in a large amount when markets for their products would have been organized well. To meet this, it really needs times.

CFAP currently has strengthened five collection points amongst the fifteen collections in operational provinces, the five collection points now are functioning. Most daily required inputs (seeds, fertilizer, pesticide, plastic mulch and agri-lime etc) are sold to farmer members, next will be organised to market farmer members produces with clear marketing planning. These needed to be well prepared in advance. The investment cost had calculated and trained to all 5 collection points. The collection points situate in the following organisations.

1. The Family Economic Development Association (FEDA)
2. Samakum Apivot Chamros Khum Svay Ang (SACKS)
3. SVAY CHRUM Commune Farmers’ Association (CFA-SCH)
4. BASAC Commune Farmers’ Association (CFA-BS)
5. THLORK Commune Farmers’ Association (CFA-THL)

Structure of the collection point

Figure 5:



The collection points contribute directly partly to the rural economic development purposes as farmers do not pay for their travel far away from the villages to market. Moreover, farmer members can buy inputs with high quality from their own organisations. The sellers give advises to the buyers/clients of how it works when farmers come and buy inputs from their collection points. The collection points could also sell in credit for farmer members, so they can pay back at the harvest season or any times during the farming period. In Cambodia, the high season for sale of agricultural inputs is in dry season (November-April) because in dry season there is more land available for farming, especially vegetable production while in rainy season, most of agricultural land is used for rice production. *(This is part of interaction between project "Climate Adaptive Approach to Food Security and Empowering of Small Farmers toward Cooperative Marketing and Enterprising")*.

4. Next activities

4.1. Follow up

Base on the lessons learned as a result of climate change programme which participated actively of rural farmer members and various recommendations and suggestions made by farmers and farmer leaders to CFAP which household ponds needed to scale up in 2015, at the same time exchanges of knowledge and experiences between those who received multiple pond and those who are expected to select in next period would have been

organized through workshops at the local, sub-national and national level to give direct opportunity for farmers and relevant stakeholders such as specialized government entities, research institutes, media, national and international development agencies come together, thus to minimize gap between relevant institutions and information is heard nationally and internationally of the successful model of small scale farmers and family farming for sustainability. Lots of rural farmers got interested in CFAP's multiple ponds which accompanying by on-site trainings and advisory support to ensure that farmers become specialized growers in agricultural production, especially growing vegetable/crops for sale and market supply which will lead to the access of farmers to contract farming as well in the future.

5. Recommendations

The project "Climate Adaptive Approach to Food Security" gave direct benefits to small scale farmers/producers in rural Cambodia where farmers live depend much on agriculture and there is no access to water for agricultural production, working directly with farmers' organisations as membership base, not only help agricultural production improvement and capacity building of farmers and farmer leaders, but also help strengthening network between farmers and farmers, FOs and relevant stakeholders, research institutes, national and international development agencies, media and the government to get closer, thus to minimize gap between farmers and those stakeholders. This will enable farmer members get access to direct opportunity from the project, thus to reduce bureaucracy, thus farmers' organisations get direct cooperation with development agencies/donors. Agriterria should consider highly to the innovation of this multiple pond and training model (on-site training) held at the field which required farmer group members participated actively in a training cycle, this is clear that farmers will become specialized in vegetable/crops and animals farming for sale as their main incomes to support their family members. Linking farmers/producers to market is the most important thing; therefore farmers can continue to produce in a year round. Scaling up of the multiple ponds will also enlarge larger volume of agricultural production for food security and sustainability, thus to minimize hunger gap, malnutrition and innutrition as well.

The continuity of farmers in vegetable/crop growing and animals rearing is something in questions if there is no or limited water to irrigate their crops while specific trainings are also very needed to ensure that farmers are specialized in farming for household incomes.

Gap between FOs and FOs, FOs and Development Agencies, FOs and Government and FOs with stakeholders include private sector and media must be minimized.

6. Conclusions

The desired project outcomes have reflected to the needs of small scale farmers/producers and farmers' organisations because the ideas were raised by farmers themselves prior to the execution of this project on ground. The Climate Adaptive Approach for Food Security plays its important role to minimize gap between stakeholders and farmers, strengthen network between FOs and FOs, farmers and farmers, FOs and stakeholders and FOs and the government effectively in Cambodia. Multiple pond well, but it really needs lessons learned for improvement as well such as volume of water estimated for use of at least 3-4 months in dry season, this need to see actual uses and period for further calculation in the future. Most farmers received pond has ideas of fish raising, they will continue to grow fish as well now and in the future. The on-site training model of CFAP got interested strongly from farmer members as they become specialized vegetable/crops grower and fish raiser and animals' raisers from the start of trainings to end of the trainings because the trainings made specific to ensure that trainees will become local experts in the future.

FOs led-participation is required to enter into network and sharing of this project and achieved results, so farmers have opportunity to exchange knowledge at the national and international level. This project will also enable farmers' organisations to engage with relevant institutions, policy makers and policy dialogues, so that their voice heard directly to the public.

Scaling up of this programme is needed, however the multiple pond cost money of farmers, and it is difficult for them to borrow money from the bank/MFI to pay for the whole cost because there is no regular market yet for them at the moment, however this will take until they have regular market to sell their produces regularly.

In general, the project "Climate Adaptive Approach for Food security" gets active participation and support from small scale farmers/producers, farmers' organizations and relevant stakeholders include the government in Cambodia.