Kingdom of Cambodia
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National Strategic Plan for Elimination of Schistosomiasis mekongi in Cambodia 2020-2024

October 2019

FOREWORD

The National Strategic Plan for Elimination of Schistosomiasis, 2020-2024 has been developed by the National Helminth Control Program of National Center for Parasitology, Entomology and Malaria Control enable to accelerate the elimination of Schistosomiasis in Cambodia by 2030.

The development of 5-years National Strategic Plan based on the national consultation workshop, supported by WHO, of all relevant stakeholders at national and provincial levels from Ministry of Health, Ministry of Rural Development, Ministry of Agriculture, Forestry and Fishery, and Ministry of Education, Youth and Sports, and in alignment with the recommendation of the Expert Consultation to Accelerate Elimination of Asian Schistosomiasis, 22-23 May 2017 in Shanghai, China.

I am, finally, grateful to all stakeholders for providing inputs in the finalization of the elimination action plan, and I strongly hope that all involved institutions at all levels and development partners will fully participate implementing the action plan of the National Strategic Plan to eliminate Schistosomiasis from Cambodia.

Phnom Penh, Date. 25 / Sept /2019

Prof. ENG HUOT
SECRETARY OF STATE

PREFACE

Schistosomiasis, caused by the blood fluke *Schistosoma mekongi*, is a public health problem in communities along the Mekong River in Cambodia and Lao People's Democratic Republic. In Cambodia, the distribution of *S. mekongi* is restricted to areas of the Mekong River Basin due to presence of the intermediate host, the snail *Neotricula aperta*, where the transmission occurs mainly around rocky banks of Mekong River. About 80 000 Cambodian people are at risk of infection, and the worst endemic area is found in the villages along the Mekong river in Kratie (56 villages) and Stung Treng (58 villages) provinces where the prevalence among school-age children was up to 70% in 1995.

Since 1996, Cambodia has been implementing a control strategy such as preventive chemotherapy of a single dose of Praziquantel of 40 mg/kg to the at-risk population in endemic areas and health education. After 20 years of control activity, the Schistosomiasis prevalence have been substantially decreased from 70% in 1995 to less than 1% in 2018. This success encouraged the Ministry of Health in Cambodia to shift its target from the control of the disease to elimination of Schistosomiasis.

The National Strategic Plan for Elimination of Schistosomiasis, 2020-2024 has been developed after the national consultation workshop with all relevant stakeholders at national and provincial (Kratie and Stung Treng) levels from Ministry of Health, Ministry of Rural Development, Ministry of Agriculture, Forestry and Fishery, and Ministry of Education, Youth and Sports. This action plan describes goal, strategy, detailed activities and budget of multi-sectoral collaboration in the area of human and veterinary health, water, sanitation and hygiene, health education and nutrition.

Director
of National Center for Parasitology, Entomology
and Malaria Control

Dr. HUY REKOL

Table of Contents

Acronyms

CAA	Circulating Anodic Antigen
CCA	Circulating Cathodic Antigen
CL-SWASH	Community-Led initiatives to eliminate Schistosomiasis by combining deworming with Water, Sanitation and Hygiene intervention
CNM	National Center for Parasitology, Entomology and Malaria Control
DOT	Directly Observed Treatment
ELISA	Enzyme-Linked Immunosorbent Assay
GPS	Global Positioning System
KK	Kato-Katz Method
MDA	Mass Drug Administration
NTDs	Neglected Tropical Diseases
PC	Preventive Chemotherapy
LAMP-PCR	Loop-mediated isothermal amplification - Polymerase Chain Reaction
PZQ	Praziquantel
RWSSH	Rural Water Supply, Sanitation and Hygiene
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization
WinS	Water, Sanitation and Hygiene in School
WSPs	Water Safety Plans

1. Introduction

1.1. Epidemiology of *Schistosoma mekongi*

Schistosomiasis, caused by the blood fluke *Schistosoma mekongi*, is a public health problem in communities along the Mekong River in Cambodia and Lao People's Democratic Republic.

The transmission cycle of *S. mekongi* principally involves humans, but some mammals (such as dogs and pigs) have also been implicated as definitive hosts. The freshwater snail *Neotricula aperta* is the intermediate host. Transmission to a human host occurs when cercariae that are released from the intermediate snail hosts penetrate skin of humans in contact with infested water while bathing, washing clothes or fishing.

Cercariae lose their tails during penetration becoming schistosomulae, which migrate to portal blood vessels in the liver and mature into adults. Paired adults migrate to mesenteric veins and released eggs, which enter the gastro-intestinal tract and are shed in stools into the Mekong River or its influents. The eggs hatch and release free-swimming larva (known as miracidia), which actively seek and penetrate intermediate host snails. Miracidia develop into free swimming cercariae and are released by snail to seek a new human host.

Infection in children can cause anaemia, stunting, growth retardation, delay of puberty, and impaired cognitive development. Chronic schistosomiasis may lead to intestinal and liver complications such as hepatomegaly and ascites, and even death. Infection is usually acquired in childhood as they have regular contact with water.

The schistosomiasis control programme in Cambodia was started in 1995, with the National Malaria Center, Ministry of health. The control strategy is to cover with preventive chemotherapy the entire population at risk of schistosiamisis by applying mass drug administration (MDA) of praziquantel (40 mg/kg) and mebendazole 500mg including implement health education. However in endemic areas, availability of adequate water supply and sanitation facilities are typically poor and open defecation is a common practice, thus contributing to sustainment of the transmission cycle.

1.2. Rationale for targeting elimination of schistosomiasis in Cambodia

The first reported case of schistosomiasis was from Kratie diagnosed in 1968. Two years later, an endemic area in Kratie was identified. In 1978, *S. mekongi* was discovered to be the etiologic agent of schistosomiasis in Kratie. The civil war that occurred in the country in the 1970s and the 1980s diverted attention from this problem. In 1993, the enormity of the schistosomiasis problem in the country was eventually recognized. In 1994, monitoring activities resulted in the diagnosis of severe cases in 20 villages in Kratie Province.

A pilot schistosomiasis control project was started in 1995 in Kratie. In the next two years, the program was scaled up to include all endemic districts in Kratie and Stung Treng bringing the total number of villages to 114.

Currently there are 56 villages in 2 districts of Kratie province and 58 villages in 5 districts in Stung Treng province with an estimate of 80,000 people at risk (50,000 of whom are in 56 villages in two districts of Kratie and 30,000 in 58 villages in five districts of Stung Treng province). Peak Transmission period (February-April) overlaps with fishing season.

Figure 1: Schistosomiasis mekongi endemic areas

Annual Praziquantel (PZQ) started in 1995 with high coverage of those at risk has been maintained during the last two decades, evidenced by the marked decrease in severe cases and SCH egg burdens in the population at risk. During May each year, 80,000 people are targeted, usually with over 90% of reported treatment coverage. There has led to a marked reduction in prevalence since preventive chemotherapy in the recent years (Figure 2).

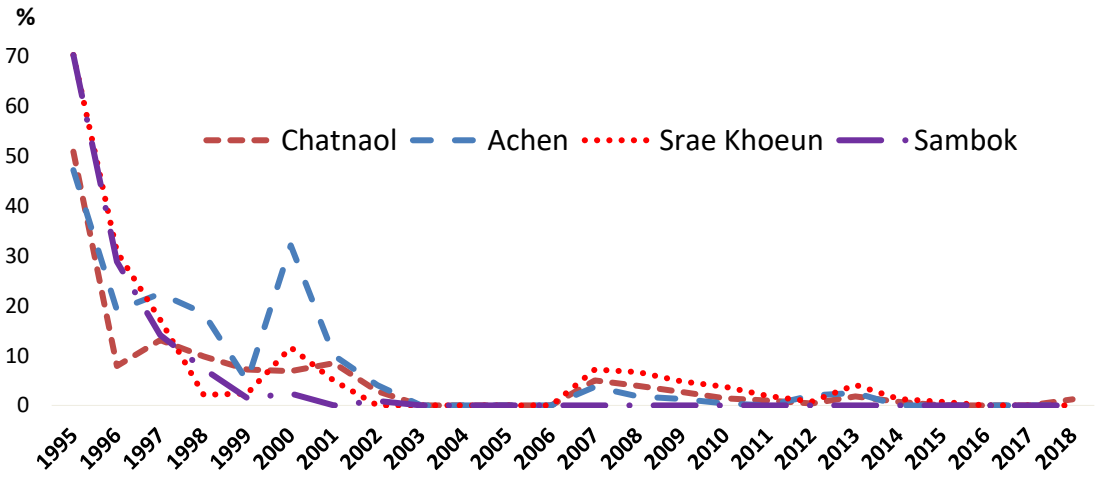

Figure 2: Prevalence of Schistosomiasis at sentinel sites in Kratie Province using Kato-Katz method

In 2016, the World Health Organization (WHO) supported external evaluation of the current status of control of schistosomiasis in Cambodia. The evaluation demonstrated that no heavy-intensity infection has been found in any of sentinel sites and two additional spot-check sites even based on the formalin-detergent method which was proved to have higher sensitivity than Kato-Katz method. It concluded that annual rounds of MDA targeting the entire at risk population above 5 years of age since 1996 successfully reduced transmission of *S. mekongi* in Cambodia and elimination of schistosomiasis as a public health problem defined as the prevalence of heavy-intensity infection (more than 400 eggs per gram) below 1% in all sentinel sites have been achieved.

This success encouraged the Ministry of Health in Cambodia to shift its target from the control of the disease to elimination of schistosomiasis in alignment with the goals and targets set in the WHO Regional Action Plan for Neglected Tropical Diseases in the Western Pacific Region (2012-2016) and the WHO Roadmap for Implementation – Accelerating Work to Overcome the Global Impact of Neglected Tropical Diseases.

2. National strategic plan for elimination of schistosomiasis in Cambodia

2.1. Vision, goal and indicators

2.1.1. Vision

Vision: Overall health improved and sustained in schistosomiasis-endemic communities along the Mekong River through strengthened community health resilience.

2.1.2. Goals:

(i) To interrupt transmission of schistosomiasis in Cambodia by 2025
(ii) To validate elimination of schistosomiasis in Cambodia by 2030

2.1.3. Target and indicators:

(i) To interrupt transmission of schistosomiasis in Cambodia by 2025
- Number of incidence of new indigenous infection in humans;
- Number of incidence of new indigenous infection in animals; and
- Number of infected snails

(ii) To validate elimination of schistosomiasis in Cambodia by 2030
- the same as the indicators for (i)

2.2. Elimination strategy

2.2.1. Universal access to one health intervention package

a. Preventive Chemotherapy (PC)

As per the recommendation in the Expert Consultation to Accelerate Elimination of Asian Schistosomiasis in Shanghai, China, held in 22-23 May 2017, MDA for targeted population (School Age Children from 6-14 years old and adult, age from 15-45 years old) in all endemic villages using praziquantel (a single dose of 40mg/kg body weight) will be

continued, considering the low sensitivity of Kato-Katz technique and cure rate of praziquantel and also low sanitation coverage in the endemic villages.

To ensure achievement of high treatment coverage, implementation of directly observed treatment (DOT) and coverage evaluation will be reinforced.

MDA campaign will be coupled with the health promotion activities delivered by provincial and district health staffs to ensure community members are aware of the purpose of MDA and the needed change in their behaviours to accelerate elimination of schistosomiasis in their communities.

While this plan focuses on schistosomiasis, it should be noted that PC with PZQ has also direct benefits for *Opisthorchis viverrini* control, as there are areas of co-infection with both parasites. It is anticipated that withdrawal of PC could thus lead to increased cases of *O. viverrini*.

b. Water, Sanitation and Hygiene (WASH)

To sustain the reduced prevalence of schistosomiasis through annual rounds of MDA targeting at human population and interrupt the transmission of schistosomes, ensuring adequate sanitation and better hygiene and nutrition practices at each endemic community is essential.

Improvement of WASH has been a consideration previously – with involvement of the Ministry of Education and the Ministry of Rural Development in the national task force and collaboration particularly with the 'WASH in Schools' (WinS) for latrine installation at schools. One of the targets of WinS is latrines in 100% of schools by 2025.

Adding to this is the novel *Community-Led initiatives to eliminate Schistosomiasis by combining deworming with WASH interventions* (CL-SWASH) developed in conjunction with WHO. Conventional donor-driven introduction of sanitation facilities is often said to be unsustainable. To overcome this challenge, it was realized that facilitating community members' discovery and understanding on linkage between inadequate sanitation, water supply and nutrition practices and infection with schistosomiasis is needed to promote their voluntary improvement of their practices.

The Ministry of Rural Development has been leading nationwide scale-up of Water Safety Plans (WSPs) at community level with support of WHO. WSP is a risk management approach to ensure safety of a water supply system, from catchment to consumer, through community participation. It involves setting up an elected community WSP team from community members, who plays a leading role in community dialogue and tour around the village to conduct risk assessment related to water supply and sanitation. The original six steps recommended by WHO to set up a WSP has been adapted and expanded to seven steps in order to serve the needs of the CL-SWASH initiative by integrating components of control of parasitic infection and nutritional impacts.

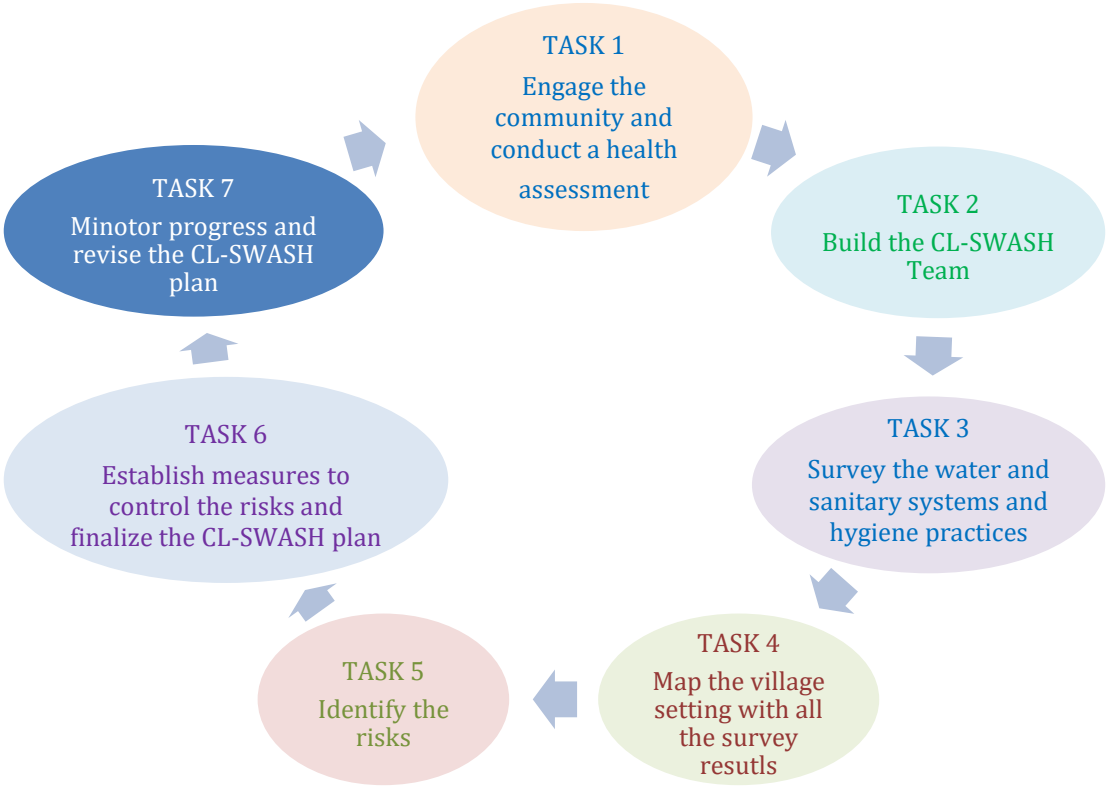

Figure3: Steps to set up a CL-SWASH plan at community level

Using this approach, the CL-SWASH builds on community ownership. It considers that the best outlook to effectively sustain local initiatives is obtained when the stakeholders themselves are the ones who based on informed decisions; trigger the initiative from start by demanding improvement.

The CL-SWASH initiative differs radically from top down and supply driven processes, and aim to build on community ownership and leadership.

Implementation of the CL-SWASH plan at each endemic community will be jointly led by the Ministry of Rural Development and CNM under the Ministry of Health. Funds have been mobilised to support activities in twelve villages in Kratie province and four in Stung Treng province already and this will be further expanded to in both Stung Treng and Kratie provinces.

It is imperative that WinS and CL-SWASH collaborate and complement activities to ensure WASH coverage reaches all 114 villages by providing water supply and sanitation services to communities, rural-area schools, health facilities and public-service institutions.

c. Treatment and management of animal reservoirs

S. mekongi infection has been confirmed in a number of domesticated mammalian hosts. Dogs were first confirmed to be a definitive host of *S. mekongi* in 1971 (Iijima et al, 1971).

Further studies have confirmed this in both Lao PDR and Cambodia (Matsumoto et al, 2000). Infection of pigs with *S. mekongi* was confirmed in one study in Hatxaykhoune village, but this was unusual since pigs do not enter the Mekong River. Infection has not yet been confirmed in bovine species (cattle & buffalo).

It is not known whether any of these species (particularly dogs) are accidental hosts or potential reservoir hosts, the latter is when transmission would be sustained despite interruption of transmission in humans. Confirmatory surveys in all three species (dogs, pigs, and buffalos) are implementing in the pilot villages in Lao PDR using PCR-LAMP and formalin concentration technique as well as Kato-Katz method.

In the event of confirmation of high prevalence of *S. mekongi* in any of these targeted animal species, a decision will be made on whether to use PC or other interventions. Timing is also important, potentially awaiting cessation of MDA in people before use in animals. PZQ is licenced for dogs and thus only requires an efficacy study to confirm it is active against *S. mekongi*. It would be more challenging to provide PC for pigs and buffalo. In China a key intervention is removal of bovine species from snail-infected areas, though PZQ is used in some bovines though with side-effects common.

2.2.2. Community empowerment through effective risk communications

The Expert Consultation to Accelerate Elimination of Asian Schistosomiasis in Shanghai, China, held on 22-23 May 2017 highlighted the importance of empowering communities and strengthening community members' health literacy so that they act as drivers of schistosomiasis elimination efforts and change their sanitation and hygiene behaviours to prevent reinfection and interrupt transmission.

This will be achieved through:

(i) the CL-SWASH, which is jointly led by the CNM at the Ministry of Health and the WASH team at the Ministry of Rural Development to improve the same purpose using participatory risk communication and management approach as described in Section 2.2.1; and

(ii) School health education by integrating teaching curriculum on control and prevention of schistosomiasis and other neglected tropical diseases (NTDs); and

(iii) Improvement of Rural Water Supply, Sanitation and Hygiene (RWSSH) in Kratie and Stung Treng provinces led by Provincial Working Groups in order to review provincial working groups for RWSSH; and organize provincial Partners/NGOs consultation meeting to develop joint program and resource mobilization

The leadership of district and provincial governors will be a key factor to facilitate and mobilise resources from people in the community during MDA campaign and CL-SWASH implementation.

2.2.3. Effective and sustained surveillance of schistosomiasis

a. Active surveillance

Sentinel sites

There are four villages designated as sentinel sites, namely Chatnaol, Achen, Srae Khoeun and Sambok, all of which are in Kratie province and were recruited more than 20 years ago. This gives a time series shown in Figure 2. Prevalence in recent years is significantly low based on Kato-Katz method. From 2020, additional 11 (6 in Kratie, namely Kbal Chour, Koh Pdao, Yeav, Phum Thom, Kampong Krabei and Kampi; and 5 in Stung Treng namely Sdau Mouy, Sdau Pri, Nhang Sum, Koh Sneng, Kralapeas) sentinel sites will be added, making the total to 15 sentinel sites.

Spot-check sites

Up to 2019, five villages are selected each year, not entirely random but those more easily accessible being much more likely to be selected. From 2020, additional 10 (5 in Kratie and 5 in Stung Treng) spot-check sites will be added, making the total to 15 spot-check sites.

With surveillance undertaken in all sentinel and spot-check sites, risk mapping should be conducted in parallel building a complete picture by end 2022. All villages would have GPS location and key data such as prevalence, latrine use, MDA coverage recorded which could be displayed on maps allowing targeted interventions (such as WASH). It should already be possible in the 10-year period to identify villages (or better clusters of villages) that could already be assigned as elimination sites, with potential cessation of PC and monitoring alone.

Diagnostic Tests

Kato-Katz (KK) technique has been the mainstay of *S. mekongi* surveillance to date. KK technique will continue to be applied. One stool sample will be collected from one person for 2 KK slides examination. This method will be applied both for sentinel and spot-check site as well.

Advance diagnostic test can be applied for sentinel and spot check sites if resources permit but data will be considered as additional data.

ELISA can be used to detect *S. mekongi* IgG antibodies. Positive results indicate exposure to the parasites sometimes during the life of the person tested and therefore a decline of the positive rates in young age-groups could confirm effective control. ELISA can be therefore used for longitudinal monitoring of the receipt epidemiological situation of schistosomiasis in selected survey sites.

Circulating Cathodic Antigen (CCA) and Circulating Anodic Antigen (CAA) are being validated for Asian Schistosomiasis. Depending on the outcomes of the validation, CCA/CAA might become the primary test and would be carried out in Cambodia. Not only should it better detect at lower prevalence it could be used more widely as samples may

be pooled (up to seven). Thus increasing numbers of sentinel villages and spot-checks should be considered. The possibility of use in animals is described below.

PCR technology (particularly LAMP-PCR) is also promising in terms of improved detection; it detects sequences of schistosoma eggs in faeces. Further operational research is warranted but the establishment of PCR lab facilities at CNM may take much longer and greater investment before this could be used widely.

Sample size

Currently sample size is limited - the 100-150 samples fixed for each village and thus in some larger villages may not be representative in terms of sample size, also compounded by the limited sensitivity of KK testing in low prevalence. Statistically valid sample size will be calculated for each surveillance site based on the known prevalence of infection.

Snail monitoring

Monitoring of the prevalence of schistosomiasis in snail is important as snail infection is one indicator to validate elimination of schistosomiasis. Snail monitoring has been previously conducted under auspices of operational research, particularly in collaboration with external research partners. Detection of infected snails is challenging as they are difficult to find, can only be 'accessed' in dry season and the population is unknown so prevalence estimate is impossible. Nonetheless, snail infection surveillance will be conducted in the context of operational research.

b. Passive surveillance

Passive case detection formerly yielded a significant number of advanced cases, the majority of who were amenable to treatment, including the surgical procedure of porto-systemic shunt carried out in Phnom Penh; many patients went on to lead normal lives. However with success of control programme no new 'advanced' case has been detected since 2005. However, it remains vital to detect such severe case.

Early case detection and treatment are also important to integrate into health service system. Clinical features include abdominal pain (common), with others such chronic diarrhoea, blood in stool, hepato-splenomegaly and ascites indicating advanced illness; liver cirrhosis (alcohol or hepatitis induced) is one differential diagnosis. Ultrasound scanning has been used in the past to evaluate extent of pathology in liver and associated blood vessels. This is not applicable as a survey tool but indicated for those with high intensity and clinical features of schistosomiasis to evaluate extent of pathology. Capacity of health staff at health centre, district and provincial hospital need to be strengthened on diagnosis, reporting and management in the further.

In the event of a new clinical case a visit to the village will be undertaken to further assess the situation to determine if this case is isolated, e.g. due to non-compliance of annual praziquantel administration, or if there are others with high intensity infection and at risk of severe illness.

The 2012-15 national plan refers to some clinical cases outside Kratie and Stung Treng provinces – 2 cases in Kampong Cham and 6 cases in Ratanakiri (though as far back as

2008). Health Departments should be and included in passive case detection since no MDA is conducted in these areas.

2.3. Priority operational research

Operational research continues to be the key component of the strategies to generate evidence to guide the programme and revise the strategies as necessary for accelerating elimination of schistosomiasis in Cambodia. The priority research needs are identified as follow:

(i) Validation of new diagnostic tools for *S. mekongi*, such as CCA/CAA and LAMP-PCR, to ensure feasibility and no cross reaction with other fluke species;
(ii) Refinement and standardization of diagnostic techniques for monitoring impacts of interventions both in human and animal hosts.
(iii) Development of surveillance protocols include Snail infection surveillance for verification of interruption of transmission of schistosomiasis
(iv) Re-mapping of SCH infection prevalence in all endemic villages.

3. Detailed Activities and Budgets

Budget for Schistosomiasis Elimination Action Plan 2020-2024

Working area	ID	Activities	M&E indicators	Estimated Budget (USD)					
				2020	2021	2022	2023	2024	Total
Program Coordination and Management	***Program management at Central Level***								
	1.1	Organize annual meeting with partners to evaluate implementation of SCH elimination once per year	Annual meeting to evaluate implementation of SCH control is organized once per year	6,000	6,000	6,000	6,000	6,000	**30,000**
	1.2	Oversee meeting related to SCH elimination	# of oversee meeting	8,000	8,000	8,000	8,000	8,000	**40,000**
	1.3	Organize meeting for schistosomiasis team at central level (2 times/year)	# of meeting at central level is organized	1,000	1,000	1,000	1,000	1,000	**5,000**
	Strengthen capacity on program management for provincial level								
	1.4	Establish technical working group on elimination of SCH at provincial level	Technical working group on elimination of SCH at provincial level is established	Not required					
	1.5	Organize local stakeholder and technical working group meeting to review implementation (2 times/year)	Local stakeholder meeting and SCH technical meeting is organized	3,200	3,200	3,200	3,200	3,200	**16,000**
	1.6	Organize meeting to disseminate 10 years action plan to eliminate SCH to staff at provincial and district levels include technical working group.	Meeting to disseminate 10 years action plan of SCH elimination is organized	4,500		4,500		4,500	**13,500**
	1.7	Organize advocacy meeting to mobilize fund from related sectors within province	Advocacy meeting to mobilize fund from related sectors within province is organized	800	800	800	800	800	**4,000**

	Strengthen capacity on program management for district level								
	1.8	Establish technical working group on elimination of SCH at district level	Technical working group on elimination of SCH at district level is organized	Not required					
	1.9	Organize meeting to share lesson learnt on SCH control at 7 districts (1 time/year)	# of meeting to share lesson learnt on SCH control at 7 districts is organized	6,000	6,000	6,000	6,000	6,000	**30,000**
	1.10	Organize advocacy meeting to mobilize fund from related sectors within district (private sector, companies)	Advocacy meeting to mobilize fund from related sectors within district (private sector, companies) is organized	800	800	800	800	800	**4,000**
	1.11	Organize meeting among SCH technical working group at district level (2 times/year)	# of meeting among SCH technical working group at district level is organized	1,200	1,200	1,200	1,200	1,200	**6,000**
	1.12	Promote awareness activity at village levels e.g. provide key massage through loud speaker, set up banner on SCH disease prevention at village level	Awareness activity at village levels e.g. provide key massage through loud speaker, set up banner on SCH disease prevention at village level is conducted	Integrated with activities 2.2					
Multi-Sectoral Intervention	***Mass Drug Administration (MDA)***								
	2.1	Procure Praziquantel (PZQ)	PZQ is available for MDA	Drug donated	Drug donated	Drug donated	Drug donated	Drug donated	
	2.2	Conduct Advocacy meeting before MDA	Advocacy meeting before MDA is organized	3,000	3,000	3,000	3,000	3,000	**15,000**
		Provide training to outreach team	# of outreach team is received training	6,000		6,000		6,000	**18,000**
		Conduct MDA activity	% treatment coverage each year	8,000	8,000	8,000	8,000	8,000	**40,000**
		Field supervision during MDA	# of villages are monitored	5,000	5,000	5,000	5,000	5,000	**25,000**
	2.3	Develop and printing SCH, IEC material to implement in village level	Implementation guideline for village level is available	30,000		30,000		30,000	**90,000**
	2.4	Print facilitator guideline (200 copies) and guideline to implement in community (500 copies)	# of facilitator guidelines and guideline to implement in community level	4,200		4,200			**8,400**

	Implementation of CL-SWASH (Community Led to eliminate SCH by improving Water Sanitation and Hygiene)								
	2.5	Conduct the training workshop for CL-SWASH facilitators and community teams at in all schistosomiasis endemic villages in Kratie and Stung Treng provinces	# of villages are implemented CL-SWASH	100,000	120,000	120,000	120,000		**460,000**
	Water supply at community								
	2.6	Basin stock for water source	# of villages implemented CL-SWASH	Private budget	Private budget	Private budget	Private budget		
	2.7	Set up public pipe water in 7 districts	# of public pipe water system in 7 districts	22,000	33,000	55,000	55,000	55,000	**220,000**
		Provincial of Rural Development promote community to have a fund for community themselves to build of water distribution system	Community fund is available to establish water distribution system at their home	Depend on community fund in each village	Depend on community fund in each village	Depend on community fund in each village	Depend on community fund in each village	Depend on community fund in each village	
	Sanitation and Hygiene at community								
	2.8	CL-SWASH teams at all levels promote community to build the latrine by themselves	Community fund is available to build the latrine	160,000	200,000	200,000	200,000	160,000	**920,000**
	2.9	Develop village model for "Open Defecation Free Village"	# of "Open Defecation Free" Village	50,000	50,000	100,000	100,000	125,000	**425,000**
	2.10	Monitoring Visit and evaluation of CL-SWASH which are part of training module	# of CL-SWASH villages is implemented	40,000	40,000	50,000	50,000	50,000	**230,000**
	2.11	Develop advocacy video for CL-SWASH activity	CL-SWASH video is produced		10,000				**10,000**
	2.12	Develop and print integrated SCH prevention and control into teaching curriculum of primary and secondary schools at all SCH endemic villages in both Kratie and Stung Treng province.	Integrated SCH prevention and control into teaching curriculum is developed	2,000					**2,000**
	2.13	Conduct training on SCH prevention and control for primary and secondary school principals at all SCH endemic villages in both Kratie and Stung Treng provinces	# of primary and secondary school principals who received training	6,000		6,000		6,000	**18,000**

	2.14	Conduct animals (Pigs, Dogs, Cats, Cow and Buffalos) survey to find SCH infection	Positive of SCH in animal is identified	20,000	20,000	20,000	20,000	20,000	**100,000**
Case management and SCH case reporting system	3.1	Strengthen capacity on diagnosis and treatment of SCH for technical staff at health center, district and provincial levels	# of staff who received training	6,000	6,000	6,000	6,000	6,000	**30,000**
	3.2	Develop DHIS 2 database for record of MDA data, stool examination result at sentinel sites	DHIS 4 database is developed	10,000					**10,000**
Monitoring & Evaluation after implementing SCH control activity	4.1	Conduct regular stool examination at sentinel and spot check sites	% prevalence and intensity of SCH	25,000	25,000	25,000	25,000	25,000	**125,000**
	4.2	Conduct treatment coverage survey on SCH	Treatment coverage survey on SCH is conducted		10,000		10,000		**20,000**
	4.3	Conduct snail monitoring to see the infection rate	Snail checking is monitored	5,000	5,000	5,000	5,000	5,000	**25,000**
	Conduct monitoring and supervision on CL-SWASH activity								
	4.4	Staff from central and provincial teams monitor CL-SWASH activity every 6 months	# of monitoring visit	75,000	90,000	900,000	900,000	165,000	**2,130,000**
		Staff from provincial team monitor CL-SWASH activity every 3 months (Join with central team 2 times)	# of monitoring visit by CL-SWAH provincial team	40,000	48,000	48,000	48,000	88,000	**272,000**
		Staff from community team monitor CL-SWASH activity every month	# of monitoring visit	12,600	15,120	15,120	15,120	27,720	**85,680**
	4.5	Conduct monitoring visit for integrated SCH prevention into teach curriculum activity in primary and secondary schools	# of monitoring visit	4,000	4,000	4,000	4,000	4,000	**20,000**

Research	5.1	Validation of new diagnostic tools for *S. mekongi*, such as CCA/CAA and LAMP-PCR, to ensure feasibility and no cross reaction with other fluke species	Research on "Validation of new sensitive test for SCH" is conducted	25,000	25,000				**50,000**
	5.2	Refinement and standardization of diagnostic techniques for monitoring impacts of interventions both in human and animal hosts.	Research to know the actual diagnosis of SCH in human and animals are conducted	40,000	40,000				**80,000**
	5.3	Re-mapping of SCH infection prevalence in all endemic villages.	Research to know the actual diagnosis of SCH in human and animals are conducted			100,000			**100,000**
Exchange lesson learnt with Lao PDR	6.1	Study visit in Lao PDR on CL-SWASH implementation	# of study visit		16,000		16,000		**32,000**
Sustainable CL-SWASH program to SCH elimination	7.1	Quarterly meeting with community CL-SWASH team to enhance the communication	# of community CL-SWASH team meeting	48,000	72,000	180,000	273,600	273,600	**847,200**
TOTAL				**778,300**	**872,120**	**1,917,320**	**1,890,720**	**1,093,820**	**6,556,780**