

REVIEW

A review of national plans of action for nutrition in Southeast Asian countries

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ABSTRACT

This review describes national plans of action for nutrition (NPANs) in six Southeast Asia countries (Indonesia, Malaysia, Myanmar, Philippines, Thailand and Vietnam) in order to provide an understanding of the approach and framework undertaken by these countries in the formulation and implementation of NPANs, as well as the similarities and differences in various NPAN components. The six countries recognised the persistent undernutrition and escalating rates of obesity and other diet-related chronic diseases as the key drivers for nutrition action plan implementation. The prioritisation of nutrition interventions outlined in these NPANs are based on respective country context and needs. Although differing in strategies and targets set, these countries show similarities in several components including objectives, stakeholder involvement, nutritional issues to be addressed, implementation, monitoring and evaluation mechanism, programme/ activities identified and challenges in implementing NPANs. Countries have recognised that effective implementation, monitoring and evaluation are essential to successfully address both extremes of the challenging nutrition situation. Several important similarities in the NPANs studied suggest that closer collaboration among countries and stakeholders on NPANs would be beneficial. Opportunities should be created for periodic exchanges to enable sharing of experiences in the development and implementation of NPANs among the countries. Recommendations and conclusions drawn from this review could serve as useful reference for nutrition policy and planning in the future.

Keywords: National plan of action for nutrition, Southeast Asia, nutrition intervention programmes, implementation strategies, monitoring and evaluation

INTRODUCTION

Countries in Southeast Asia (SEA) region which had, in the past, carried a high burden of child undernutrition has experienced a shift of nutrition scene in

which most countries in the region are facing a double burden of malnutrition. This is characterised by persistent undernutrition including stunting, wasting, micronutrient deficiencies and

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coexisting overweight and obesity across the life cycle. Concern about diet-related chronic non-communicable diseases (NCDs) has also grown as they have been found to be responsible for major and growing proportion of the health burden (Shrimpton & Rokx, 2012; WHO, 2016).

The health systems of the region that were previously geared towards fighting widespread undernutrition, will now need to curb the rising rates of overweight and obesity in order to reduce NCDs. The focus of countries' food policies and national plan of action for nutrition (NPAN) have shifted to address the changes in nutrition scene. Well-established nutrition policies and plans are important tools in guiding the nations in dealing with nutritional issues as well as providing a framework for coordinated implementation of nutrition intervention activities by the government and cross-sectoral nutrition stakeholders in the country. Moreover, the World Health Organization (WHO) has emphasised that unless food and nutrition plans are implemented, unsafe food and poor nutrition will be responsible for an increased economic burden from food-related morbidity and premature mortality (WHO, 2000).

Many countries, including countries in the SEA region have reviewed their own NPAN following the Rome Declaration on Nutrition and the Framework for Action, arising from The Second International Conference on Nutrition (ICN2) in 2014. The present paper analysed NPANs in six SEA countries (Indonesia, Malaysia, Myanmar, Philippines, Thailand and Vietnam) in order to provide an understanding of the approach and framework undertaken by countries to formulate NPANs; stakeholder involvement, main nutritional problems targeted; strategies and programmes identified; and the implementation and monitoring mechanisms. Through this review, useful information on aspects of

NPAN will become available for sharing with other countries which are developing or reviewing national nutrition action plans. Besides, conclusions drawn from this review could also serve as useful reference for nutrition policy and planning in the future.

METHOD

This review of NPANs in six SEA countries is based on the SEA-PHN Network's monograph on NPANs in SEA countries that was first published in 2018 (Tee *et al*, 2018). The intention of this review article is to provide a concise version of the 88-page monograph in a journal article that can have a wider reach to potential users. More details for the action plans that are beyond this review can be obtained from the monograph. Upon checking with the relevant authorities for any updated versions of these action plans, it was found that except for Myanmar and Thailand, all the documents cited in the monograph are still in use in the countries. The updated NPAN in Myanmar and Thailand are used in this journal review.

The NPANs used for this review are namely: National Food and Nutrition Action Plan (NFNAP) (*Rencana Aksi Nasional Pangan Dan Gizi, RANPG*) 2015-2019 (BAPPENAS Indonesia, 2015) (this plan is phasing out in 2019 and a new one is in preparation); National Plan of Action for Nutrition of Malaysia (NPANM) III 2016-2025 (NCCFN Malaysia, 2016); Myanmar's Multi-sectoral National Plan of Action on Nutrition (MS-NPAN) 2018/19 – 2022/23 (NNC Myanmar, 2018); Philippine Plan of Action for Nutrition (PPAN) 2017-2022 Executive Summary (NNC Philippines, 2017); Vietnam National Plan of Action for Nutrition to 2020 (MOH Vietnam, 2018) and Thailand's 5-Year National Plan of Action for Nutrition 2019-2023 (MOPH Thailand, 2019). The

key components of the NPANs were analysed and discussed. This includes formulation of the NPANs, stakeholder involvement, goal and objectives of different NPANs, nutritional issues addressed by the NPANs, strategies, programmes and activities identified for implementation, institutional framework for implementation, monitoring and evaluation approaches, and budget allocation. The challenges in implementing previous NPANs are also discussed.

RESULTS & DISCUSSION

Background of development of NPANs

Most of the NPANs in the six countries were first published in late 1990s or early 2000s, responding to the call of the first ICN on concerted effort to reduce starvation and all forms of malnutrition. The Philippines and Thailand formulated their first NPAN as early as 1970s. All countries had recognised the persistent undernutrition and parallel rise of the rates of obesity and other diet-related chronic diseases as the key drivers for nutrition action plan implementation. The NPANs in these countries have been developed by nutrition and health authorities of the respective countries, usually with extensive consultations and inputs from food and nutrition experts in the country, technical working groups, relevant stakeholders as well as international organisations such as Food and Agricultural Organization (FAO), WHO and the World Bank. Most of the plans were designed based on scientific evidence reviews, the experiences and lessons learnt from the past implementations, as well as detailed analyses of the nutrition situation in the respective country. These documents serve similar role of acting as framework for action and blueprint/reference documents by different stakeholders to address nutrition challenges in

the country. Table 1 summarises the background of the NPANs in the six SEA countries and the stakeholders involved in the implementation.

Stakeholders involvement in the implementation of the action plans

The importance of multidisciplinary approach has been acknowledged by all the NPANs in which collective responsibility and involvement of all stakeholders in the development and implementation of the action plans are stressed and promoted.

The stakeholders pulled together by most of the countries are primarily the governmental organisations (Table 1). Other typical stakeholders include non-government organisations (NGOs), universities, professional bodies, social-political organisations and associations, and international organisations. All countries in this review, except Malaysia, are Scaling Up Nutrition (SUN) Movement member countries. Myanmar provides elaboration of the specific roles of each stakeholder identified.

Most NPANs also acknowledge the importance of involving media and private sector, particularly food-related industries. Food industries in Malaysia have been encouraged to play a major role in producing healthier food and beverage products at affordable prices through reformulation and innovation. In Vietnam, private sector is encouraged to increase production of specialised nutrition products to be used specifically among poor and disadvantaged groups.

Goal and objectives of different NPANs

The six NPANs reviewed present different goals with majority give emphasis to hunger eradication, prevention/reduction of all forms of malnutrition, promotion of food and nutrition security and achievement of nutritional well-

Table 1. Overview of six NPANs included in the review

Country	First NPAN	Current NPAN	Lead organisation in NPAN formulation	Time frame for review/update	Stakeholders/agencies/ partners involved or identified in the action plans
Indonesia	National Food and Nutrition Action Plan (<i>Rencana Aksi Nasional Pangan dan Gizi, RANPG</i>) 2001-2005	National Food and Nutrition Action Plan (<i>Rencana Aksi Nasional Pangan dan Gizi, RANPG</i>) 2015-2019	Ministry of National Development Planning & National Planning Agency (BAPPENAS)	Every 5 years	Government ministries and agencies, Investment Coordinating Board (BKPM), Bank Indonesia, local government, private sectors, civil society organisations, universities, professional organisations, community organisations, UN organisations, donors and media
Malaysia	National Plan of Action for Nutrition of Malaysia I (NPANM I) 1996-2000	National Plan of Action for Nutrition of Malaysia III (NPANM III) 2016- 2025	Ministry of Health, under the purview of the National Coordinating Committee of Food and Nutrition (NCCFN)	Every 10 years	Government ministries and agencies, professional bodies, academicians (universities), NGOs, private hospitals, mass media (telecommunication company), bank association, Federation of Malaysia Manufacturers, other food companies including small medium enterprises, fast food industries, hypermarket chains and supermarkets, food & beverages industries and international organisations [WHO, United Nations Children's Fund (UNICEF), ASEAN Secretariat]
Myanmar	National Plan of Action for Food and Nutrition (NPAFN) 1994	Multi-sectoral National Plan of Action on Nutrition (MS-NPAN) 2018/19 – 2022/23	National Nutrition Centre, Department of Public Health, Ministry of Health and Sports	Every 5 years	Development Assistance Coordinating Unit, National Nutrition Centre, government ministries, departments and agencies, state/regional government authorities, development partners (such as United Nations, SUN United Nations Network for Nutrition), civil society organisations including NGOs, the private sector and communities

(to be continued)

Table 1. Overview of six NPANs included in the review [Cont'd]

Country	First NPAN	Current NPAN	Lead organisation in NPAN formulation	Time frame for review/update	Stakeholders/agencies/partners involved or identified in the action plans
Philippines	Philippine Nutrition Plan 1974-1977	The Philippine Plan of Action for Nutrition (PPAN) 2017-2022	National Nutrition Council (NNC)	Every 5 years	National government agencies particularly the members of the NNC, the NNC Secretariat, local government units, NGOs, academic institutions, and development partners such as UNICEF, WHO, United Nations World Food Program Philippines. Others include Nutrition International (formerly Micronutrient Initiative), the Philippine Coalition of Advocates for Nutrition Security (PhilCAN), Civil Service Commission, media organisations, Employees' Unions, and the food industry
Thailand	National Plan of Action for Food and Nutrition (1977-1981)	The 5-year National Plan of Action for Nutrition 2019-2023	Ministry of Public Health (MOPH)	Every 5 years	Government ministries, related national organisations, Food and Drug Administration, journalist club, food industry group, educational institutions
Vietnam	National Plan of Action for Nutrition for 1995 – 2000	National Plan of Action for Nutrition to 2020	Ministry of Health	Every 5 years	Government ministries and agencies, the National Institute of Nutrition, the Maternal Child Health department and Preventive Medicine Department of MOH, the Hospital of Endocrinology, Central Specialized Hospitals, Institutes of Hygiene and Epidemiology/Pasteur Institutes, Ho Chi Minh Institute of Public Health, training facilities, social-political organisations and associations, People's Committees of provinces and centrally-run cities, Provincial Health Departments, District Health Centers, Commune Health Centers, international organisations (such as UNICEF, WHO, FAO), media

being. Slightly different from other NPANs, Thailand's action plan is developed in line with the food education strategy in the country's 2nd Strategic Framework for Food Management in Thailand 2018-2037, giving emphasis to creating desirable behaviour in healthy food consumption. Most NPANs have similar objectives with emphasis on improving nutritional status of the population, preventing and/or reducing undernutrition and diet-related NCDs, and improving food and/or nutrition security. It is noteworthy that the goal and objectives outlined in these countries' NPAN are consistent with internationally agreed recommendations such as the Rome Declaration and the Framework for Action on Nutrition, and will contribute to the Sustainable Development Goals (SDGs) 2030 of the UN, particularly SDG 2 (end hunger, achieve food security and improved nutrition and promote sustainable agriculture), SDG 3 (good health and well-being), as well as the results of the World Health Assembly for 2025.

Nutrition issues to be addressed in action plans

As most countries in the region face similar situation of double burden of malnutrition, it is not surprising that the different NPANs show similarities in the nutrition situation and issues identified to be addressed (Table 2).

Some of the common priority nutritional issues identified include low exclusive breastfeeding rate; high prevalence of stunting, underweight and wasting amongst children under 5 years of age; increased prevalence of obesity and nutrition-related NCDs; micronutrient deficiencies; low vegetables and fruits intake; and low physical activity levels among the population.

Specific nutritional issues that are considered important to be addressed by respective countries are also identified,

for example the problem of high salt, high fat foods consumptions, and protein consumption that are not meeting requirement in Indonesia; prevalence of low birth weight and teenage pregnancy in Myanmar; hunger in Philippines; and lower physical status and stature of the population in Vietnam.

Framework for NPANs

All NPANs in this study, except Vietnam, had developed a framework for the respective nutrition action plan. All of these frameworks developed are presented in pictorial format (Figures 1-5). These frameworks show one commonality wherein all of them summarise the goal, priorities and strategies identified for the action plan.

Strategies, food and nutrition programmes and activities

In alleviating the nutrition issues of the country, the NPANs in this review has prioritised the nutritionally vulnerable groups i.e. infants and young children, pregnant and lactating women.

Key strategies in NPANs

The overarching strategy of Malaysia is their foundation strategy which emphasises the responsibilities of all relevant agencies. Nutrition objectives, considerations and components are to be incorporated into national development policies and action plans in other relevant ministries and agencies, with the support of a wide range of enabling and facilitating strategies. In Myanmar, the action plan's key strategy is to strengthen multi-sectoral coordination in nutrition and deliver a package of essential nutrition-specific and nutrition-sensitive services/interventions with the overall goal to reduce all forms of malnutrition among mothers, children and adolescent girls. The interventions in each state/region prioritise the most important factors

Table 2. Key nutrition situation/issues to be addressed by different NPANs

<i>Nutrition situation/issues to be addressed</i>	<i>Indonesia</i>	<i>Malaysia</i>	<i>Myanmar</i>	<i>Philippines</i>	<i>Thailand</i>	<i>Vietnam</i>
High prevalence of stunting among children <5 years old	+	+	+	+	+	+
High prevalence of wasting among children <5 years old	+	+	+	+		+
High prevalence of underweight among children <5 years old	+	+	+			+
Increased prevalence of childhood overweight/obesity		+			+	+
Poor nutritional status of pregnant and lactating women			+			+
Low rate of exclusive breastfeeding in the first 6 months of life	+	+	+	+	+	+
Low birth weight	+	+	+	+	+	+
Anaemia	+	+	+	+	+	+
	(in women of childbearing age & pregnant mother)		(in child bearing age women & children <5 years old)	(among infants 6-11 months)	(in pregnant women, children aged 6 months to 3 years old & women of reproductive age)	(in pregnant women & children <5 years old)
Vitamin A deficiency			+	+		+
				(among infants 6-11 months)		
Iodine deficiency disorder (IDD)			+	+	+	+
				(among pregnant & lactating women)	(in pregnant women, children)	
Hunger			+	+		
Poor infant and young child feeding			+			
Low consumption of fruits and vegetables			+		+	+
Energy consumption not meeting requirement	+	+				+
Protein consumption not meeting requirement	+					+
High consumption of salt and high fat foods	+					+
					+	(high salt intake)
Increased prevalence of overweight/obesity among adults	+	+	+	+	+	+
High/Increased prevalence of non-communicable diseases		+	+		+	+
Improper nutrition knowledge and practices among mother and family members						+
Physical inactivity	+	+			+	+
	(especially in urban area)	(among adolescents and adults)				
Physical status & stature (height)					+	+

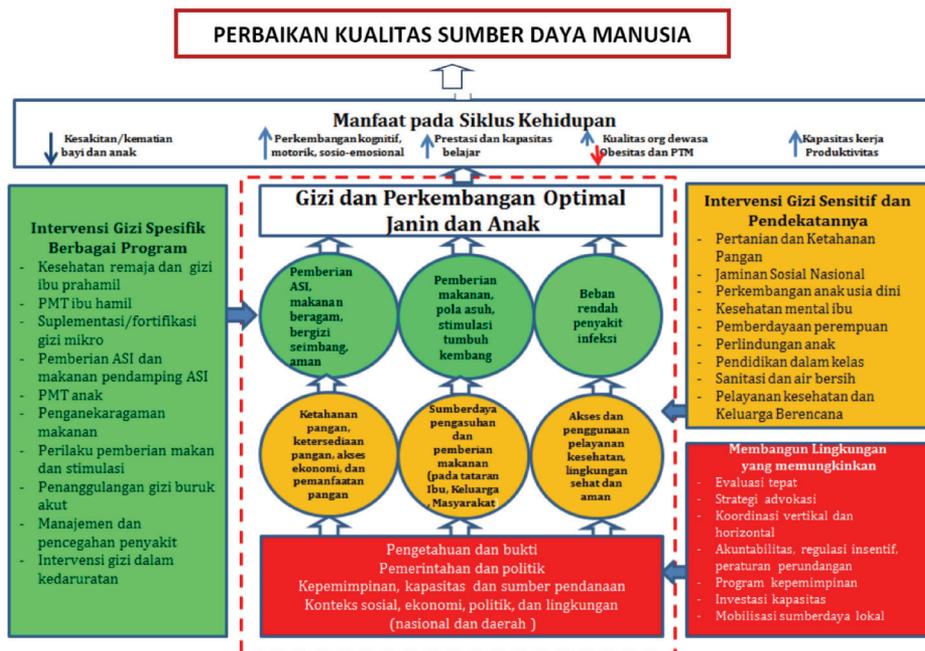


Figure 1. Framework of Indonesia National Food and Nutrition Action Plan (2015-2019)

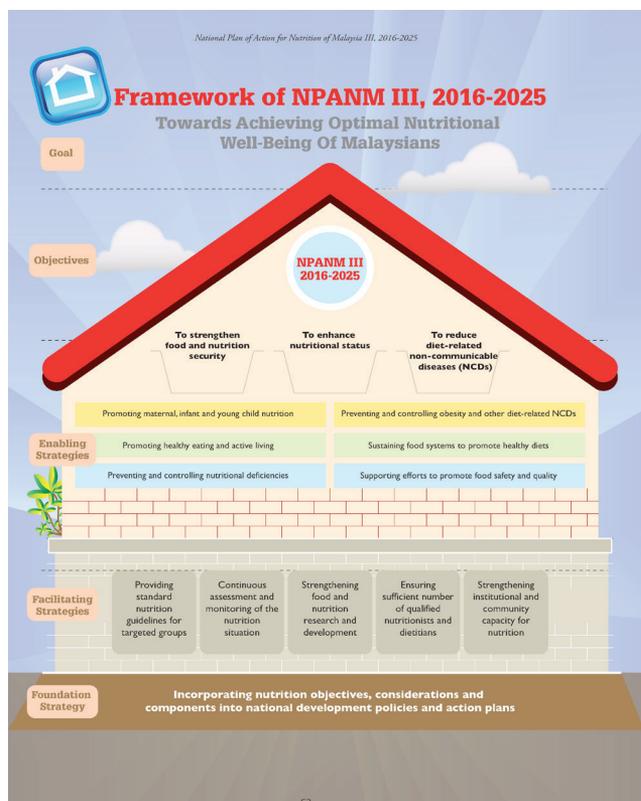


Figure 2. Framework of National Plan of Action for Nutrition III, Malaysia (2016-2025)

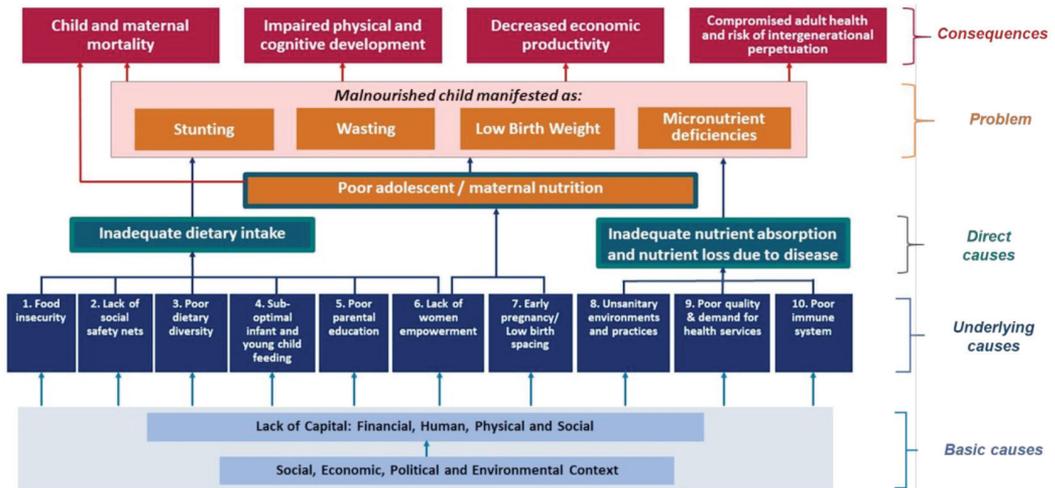


Figure 3. Conceptual Framework of the Multi-sectoral National Plan of Action on Nutrition, Myanmar

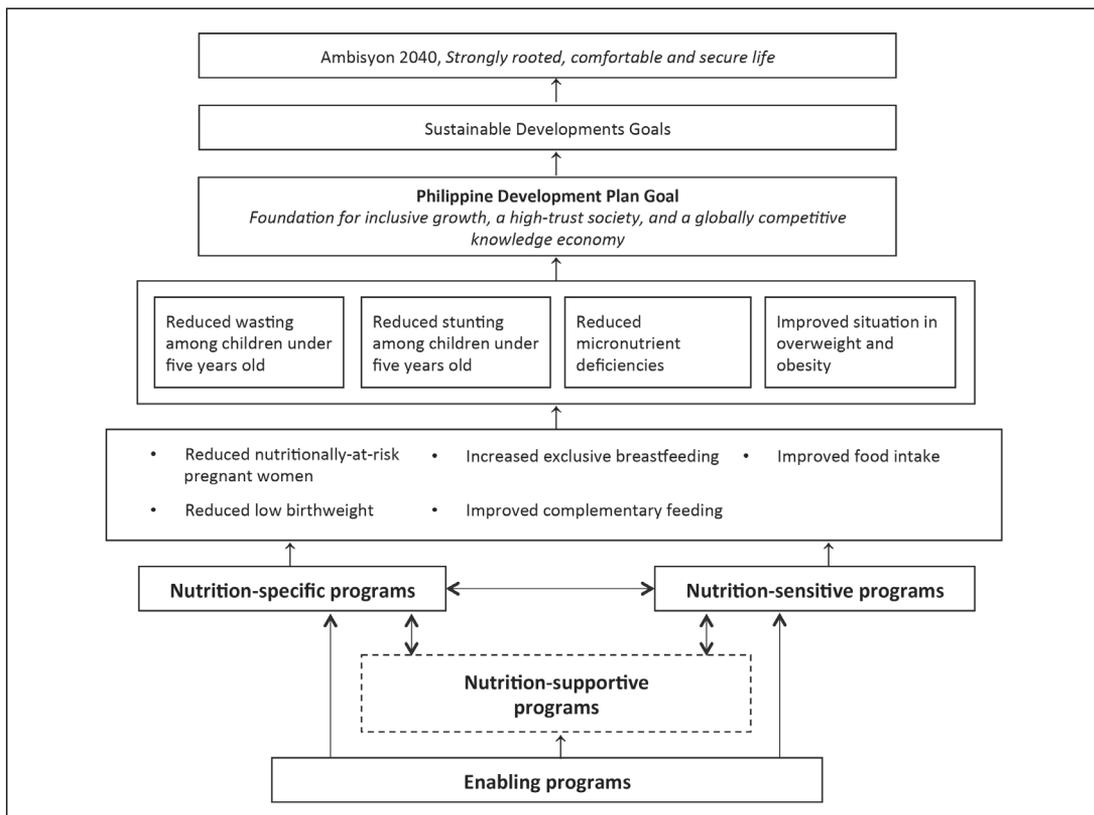


Figure 4. Framework of Philippines Plan of Action for Nutrition (2017-2022)

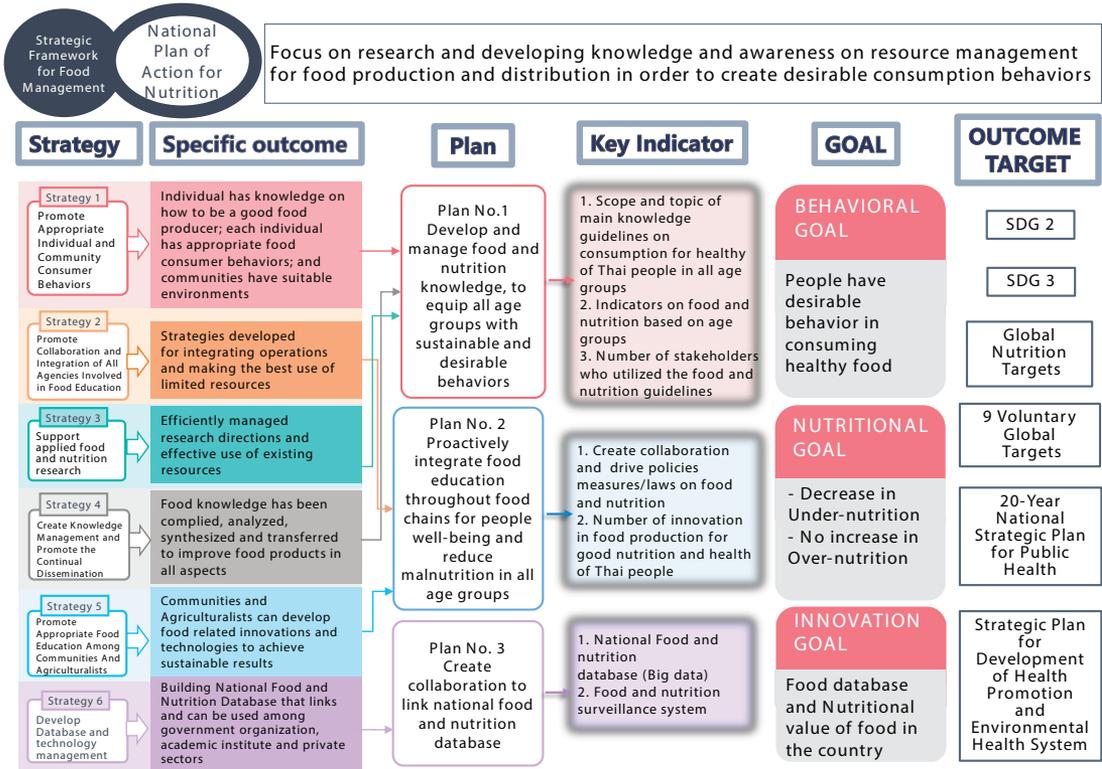


Figure 5. Framework of National Plan of Action for Nutrition, Thailand (2019-2023)

causing poor nutrition as well as interventions that are most responsive to effective operationalisation and scale-up to achieve high coverage and impact. Philippines’ strategies focus on the First 1000 Days of Life, complementation of nutrition-specific and nutrition-sensitive programmes, intensified mobilisation of local government units, reaching geographically isolated and disadvantage areas, and complementation of actions of national and local government units.

Community nutrition improvement, increase in food accessibility, food safety enhancement and food and nutrition institutional strengthening are among the important pillars of strategies undertaken by Indonesia in its action plan. Thailand’s NPAN strategies focus

on the integration of food education throughout the food chains, through the process of promoting, developing and teaching to improve eating behavior thus achieving the goals of improved nutritional status. The three identified focus areas in Thailand’s NPAN include develop and manage knowledge about food and nutrition to equip all groups of people with sustainable and proper behaviours; proactively integrate food education in all food chains; and create collaboration to link national food and nutrition database. Vietnam takes different approaches in its NPAN strategies in which the country focuses on legislative, advocacy and communication, technical, science, and international cooperation approaches.

Food and nutrition programmes & activities identified

Though the strategies proposed are different among countries, the programmes and activities identified by these NPANs are to some extent, similar (especially among the countries participating in SUN Movement). These can be generally divided into nutrition-specific and nutrition sensitive programmes/activities.

Multi-sectoral approach is utilised by most countries in the programme implementation, where several agencies are involved in one programme or activities with a lead agency identified for every activity. Most programmes identified are in response to the nutrition issues identified by respective country, are relevant to the priority gaps identified in the review, locally appropriate, and adopted after considering the past experiences in implementation capacity in order to achieve the intended nutrition impact. Table 3 provides an overview of common nutrition programmes and activities by these action plans.

Different from other countries, majority of the projects identified in Thailand's NPAN focus on development of knowledge, techniques, indicators and tools for behaviour modification and consumption changes; development of food education system (formal and non-formal) and national database on food and nutrition in which the nutrition data system will also be used for food and nutrition surveillance system.

a. Nutrition promotion during the first 1000 days of life

The importance of good nutrition during the first 1000 days of life is recognised by most NPANs in addressing the persistent undernutrition problems. Exclusive breastfeeding is being promoted by all countries and that Vietnam is taking the initiative to develop regulations on the operation of the breast milk bank.

Other common activities undertaken to promote mother and children nutrition include education on complementary feeding; nutrition intervention for teenage girls, pregnant women and mothers; children nutritional status monitoring; supplementary provision of nutritional products for mothers/children at risk for poor nutrition, antenatal and post-natal care, baby friendly hospital initiative and control of the marketing of infant foods.

b. Addressing nutritional needs/nutrients deficiencies

Dietary supplementation, micronutrient supplementation and food fortification are among the common activities outlined by these NPANs to safeguard the health and population's nutritional needs. Most countries implement dietary supplementation programmes for different target groups, particularly the vulnerable groups of infants, children and mothers. School feeding or school milk programme exist in all six countries (Table 3). Iron and folic acid supplementation and iodisation of salt are implemented by all six countries. Multiple micronutrients supplementation for high-risk groups is common in the NPANs of these countries. NPANs of these countries also respectively identified several staple foods such as rice, flour and oil for nutrients fortification (Table 3).

c. Food and nutrition security enhancement

Most NPANs underscore the need to increase/diversify local food production and utilisation. Several countries have price control system in place. Indonesia, Malaysia, Myanmar and Thailand integrate nutrition component/food-based nutrition education into the planning of food supply, agricultural and production. The community healthy food production project in Thailand

Table 3. Overview of some common nutrition programmes and activities identified in the NPANs

	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam
Nutrition promotion for the First 1000 Days of Life	✓	✓	✓	✓	✓	✓
Pre-schoolers/school children/school feeding or school milk programme	✓	✓	✓ (provided in some areas)	✓	✓	✓
Micronutrient supplementation	✓	✓	✓	✓	✓	✓
Iron and folic acid supplementation for women of reproductive age/pregnant women/adolescent girls	✓	✓	✓	✓ (all women age 10-49 years old)	✓ (weekly dose of iron and folic acid supplementation for 20-49 years old women who want to have a child, daily dose for pregnant women)	✓
Multiple micronutrient supplementation	✓ (micronutrient powder supplementation)		✓ (pregnant women)	✓		✓ (children under 2 years old)
Vitamin A supplementation	✓ (lactating women & children aged 6-59 months)		✓ (children 6-59 months, post natal women, community-based distribution for remote area)	✓ (lactating women & children aged 6-59 months)		✓ (children aged 6-36 months, <6 months old not receiving breastfeeding, children <5 years old with risk factors for vitamin A deficiency, women within one month of giving birth)
Zinc supplementation for diarrhoea prevention and control in children	✓		✓	✓		✓

(to be continued)

Table 3. Overview of some common nutrition programmes and activities identified in the NPANs [Cont'd]

	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam
Promote the use of iodised salt	✓	✓	✓	✓ (iodised oil is provided for pregnant and lactating women in endemic areas)	✓ (iodised drinking water is provided for particular remote areas, where the accessibility of iodised salt is limited)	✓ (monitors the production and importation of iodised salt, and provide iodised salt especially for poor and disadvantaged regions, which have no access to iodised salt)
Food fortification programmes	✓ (iodised salt, wheat flour)	✓ (mandatory iron and folic acid fortification of wheat flour has been planned; universal salt iodisation)	✓ (universal salt iodisation, fortified rice, home-fortification with micronutrient powder)	✓ (fortification of flour, oil and sugar with Vitamin A and flour and rice with iron; salt iodisation; fish promotion of voluntary fortification of essential nutrients to manufacturers)	✓ (mandatory fortification of vitamin A in sweetened condensed milk; universal salt iodisation; fish sauce, seasoning products iodisation; triple fortification of instant noodles for iron, iodine and vitamin A)	✓ (vitamin A fortification for edible oil; iron and zinc in wheat flour and iodized salt fortification)
Food and nutrition security enhancement programmes/activities	✓ (superior seed production, food reserves strengthening, price control, integrated farming, food reserve strengthening, local food products market development)	✓ (affordable accessibility of fruits, vegetables and healthier foods, food wastage reduction, underutilised crops promotion)	✓ (women participation in agriculture, livestock and fisheries; quality seeds and fertilizers; agro-forestry, nutrition-sensitive land tenure and agriculture training)	✓ (development of food security plans and guidelines for at risk areas, application of Vegetation-Aquaculture-Cage for Animal husbandry ecosystem for household nutrition security)	✓ (technology and innovation promotion for nutritious and safe foods production)	✓ (development of food security plans and guidelines for at risk areas, application of Vegetation-Aquaculture-Cage for Animal husbandry ecosystem for household nutrition security)

(to be continued)

Table 3. Overview of some common nutrition programmes and activities identified in the NPANs [Cont'd]

	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam
Promotion of diversified local food production & utilisation	✓	✓	✓	✓	✓	✓
Overweight & obesity management and prevention of non-communicable diseases (NCDs)		(Reduction in cooking oil subsidy; taxation on unhealthy foods and beverages; development of Standard guideline on weight management programme for overweight and obese individual at workplace)	✓	(Overweight and Obesity Management and Prevention Programme for overweight and obese individuals across all age groups, policies and guidelines regulating marketing and selling of unhealthy food and beverages catering to all age groups)	(Promote literacy on knowledge of food and nutrition to develop desirable behaviour of people of all age groups)	(annual awareness campaigns, clinical nutrition activities; research and development of nutritional products for different target groups in controlling obesity and nutrition related NCDs)
Nutrition promotion/ education in schools	✓	✓	✓	✓	✓	✓

promote the development of technology and innovation for nutritious foods and encourage entrepreneurs and community chefs who have been trained in food production to produce nutritious and safe food products. Other activities identified are as indicated in Table 3.

d. Prevention of non-communicable diseases (NCDs)

NCDs prevention programmes exist in most countries, mainly focusing on promoting healthy eating and physical activities to prevent overweight and obesity through various approaches and settings (Table 3). Other approaches adopted in Malaysia include taxation of unhealthy foods and beverages.

e. Nutrition promotion & education in schools

The importance of schools in nutrition promotion is acknowledged by all NPANs. Healthy eating component is included in the Malaysia's preschool curriculum whereas in Thailand and Vietnam, nutrition education is provided for children from kindergarten through to university. Alongside nutrition education and school feeding, school is used as a platform for the delivery of nutrition-specific interventions to reach school aged children and adolescents who are difficult to access through the health system in Myanmar. In Philippines, nutrition education is delivered through the School Health and Nutrition Programme, integrating school gardening, supplementary feeding and nutrition education. Parent-teacher/parent teacher associations approach is utilised by most countries (Malaysia, Myanmar and Philippines) to promote nutrition and healthy eating in schools, while some also train the food handlers in schools on healthy meal preparation (Malaysia and Vietnam). Thailand

encourages food and nutrition teaching and develop curriculum for both formal and informal education system.

f. Other activities identified

Other activities identified by the various NPANs include strengthening institutional community capacity for nutrition by improving the number of qualified nutritionists/dietitians in the country; providing training for nutrition, dietetics, and food safety professionals; research and technology development in the areas of nutrition and food.

Performance indicators/outcomes and specific target for indicators

Target and performance indicators are used by all six countries in monitoring of action plans and programmes. Most of them identified similar indicators that can be categorised into three groups, namely indicators related to nutritional status, food security and micronutrient status (Table 4). Malaysia and Philippines have included the indicators that measure all six global nutrition targets.

Most NPANs do not discuss in detail the process of setting targets for the indicators. It is observed that several global targets and available country's baseline data were used and adopted as point of reference in setting the targets for the performance indicators. For several of the indicators, these countries are in agreement and are aiming collectively to reach the Global Nutrition Targets 2025 and SDGs 2030. All countries except Myanmar aim to achieve no increase from baseline for the childhood overweight rate in the country; increase exclusive breastfeeding rate up to least 50% (Indonesia), while Malaysia targets exclusive breastfeeding rate up to least 70%; 11-28% reduction in stunting and reduce childhood wasting to/no more than 5% (Malaysia, Myanmar,

Table 4. Indicators measured in different NPANs

Indicators	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam
Nutritional status						
Prevalence of babies with low birth weight/to reduce the rate of low birth weight	+	+	+	+	+	+
Prevalence of malnutrition (underweight) in toddlers/children <5 years old	+	+	+	+	+	+
Prevalence of wasting in toddlers/children <5 years old	+	+	+	+	+	+
Prevalence of stunting in babies <2 years old/children <5 years old	+	+	+	+	+	+
Prevalence of overweight and obesity among children <5 years old						
To reduce overweight among adolescent						
Prevalence of overweight and obesity among adults	+	+	+	+	+	+
Prevalence of overweight among elderly aged \geq 60 years old	+	+				
Prevalence of obesity among elderly aged \geq 60 years old						
Proportion of nutritionally-at-risk pregnant women				+		
Proportion of chronic energy deficiency among women of childbearing age						
Height of children					+	+
Height of adult by gender increase by 1.0-1.5cm in comparison to the year 2010						+
Teenage pregnancy			+			
Micronutrient status						
Prevalence of anaemia in pregnant mother	+	+	+		+	+
Prevalence of anaemia among children <5 years old			+			
Prevalence of anaemia among women of reproductive age		+	+	+	+	
Prevalence of iodine deficiency among children 6-12 years old						
Median urinary iodine concentration of mothers with children <5 years old						
Median urinary iodine concentration of children 6-12 years old, pregnant & lactating women			+	+	+	+
			(pregnant women)		(pregnant women)	
Percent with urinary iodine concentration <50mcg/L in children 6-12 years old & lactating women						
Prevalence of children under five with vitamin A deficiency/low serum vitamin A				+		+
Iodised salt household coverage salt/Prevalence of households using iodised salt qualified preventive (\geq 20ppm)			+		+	+
					(20-40 ppm)	
Food security						
Improvement of calorie consumption (kcal/capita/day)						
Percentage of household food insecurity/household with food poverty	+	+	+			
Households with acceptable food consumption score			+			
To increase the proportion of household with diets that meet the energy requirements				+		
Reduction of proportion of households with a per capita energy intake below 1800kcal			+			+
Food production (rice, corn, soybean, sugar, beef, fish, salt)	+					

(to be continued)

Table 4. Indicators measured in different NPANs [Cont'd]

<i>Indicators</i>	<i>Indonesia</i>	<i>Malaysia</i>	<i>Myanmar</i>	<i>Philippines</i>	<i>Thailand</i>	<i>Vietnam</i>
Dietary intake		+				
Percentage of infants at 6 months of age who receive solid, semi-solid or soft foods		+				
Percentage of children meeting the minimum acceptable diet		+	+	+		
Desirable dietary pattern score/Percentage of people having appropriate food consumption behaviour	+				+	
Average salt intake					+	+
Fish consumption	+					
Prevalence of adults meeting recommended intake (for cereal and cereal products; fruits; vegetables; meat, poultry and eggs; fish and fish products; legumes and nuts; milk and dairy products; water)		+	+		+	(proper consumption according to age group)
Children consuming iron rich foods			+			
Nutrition practices and others						
Prevalence of exclusive breastfeeding in infants <6 months old	+	+	+	+	+	+
Prevalence of early initiation of breastfeeding (within one hour of birth)		+				
Prevalence of adults reading the Nutrition Information Panel (NIP)		+				
Nutrition officers at the provincial level have specialised training in nutrition						+
Nutrition officers at commune level and nutrition collaborators are trained and updated with nutrition knowledge						+
Have nutritionist/dietitians at the hospital (central, provincial and district level)						+
The proportion of hospitals implementing nutrition counselling and therapeutic treatment for some specific diseases and groups at hospitals of different levels						+
The number of provinces with nutrition surveillance unit capable of collecting adequate and qualified indicators on the implementation of the plan. Supervision of nutrition during emergencies in disaster-prone provinces						+
Non-communicable diseases						
Prevalence of hypercholesterolemia among adults > 18 years old		+				
Prevalence of diabetes among adults > 18 years old		+				
Prevalence of hypertension among adults > 18 years old		+				

Philippines, Thailand, Vietnam); and 10-30% reduction in prevalence of low birth weight.

Implementation, management, monitoring & evaluation

Implementation & management

NPANs of the six countries call for multi-sectoral and multi-stakeholder collaboration to ensure more effective implementation of intervention strategies. Decentralisation and multi-sectoral approach is emphasised by most countries, where the implementation is allocated to a range of different institutions. The implementation is largely led by and coordinated by the Ministry of Health (i.e. Malaysia, Myanmar, Thailand, Vietnam), National Nutrition Council (i.e. Philippines), National Planning Agency or BAPPENAS (Indonesia) or a high level coordinating committee. Some countries such as Indonesia, Myanmar and Philippines develop separate action plans for regional or local level. Specific advisory bodies have been established in most of these countries to provide overall technical assistance and support to all aspects of the action plan. Indonesia, Malaysia and Philippines also established technical working groups to support or facilitate the implementation of the action plan.

Monitoring & evaluation

All NPANs in this review underscore the importance of monitoring and evaluation activities. Most of them (Malaysia, Philippines, Indonesia, Vietnam) involve the generation of annual reports on implementation at all levels and progress report from various stakeholders involved. A system of indicators is used by all six countries in monitoring and evaluating the action plan. National health and nutrition surveys (Malaysia, Myanmar, Vietnam, and Philippines), data collection and indicators recorded

at all levels (Indonesia, Thailand) form the important part of monitoring and evaluation process of these countries. The national nutrition surveys' findings help the respective countries in evaluating the impact of the strategies, reviewing the priorities and activities of the programme implemented, and plan for future action plan. Most countries also have in place mid-term review and long-term review for the NPANs.

Funding and budget for NPANs

The action plans of Indonesia, Myanmar, Philippines and Vietnam provide insights into the funding and budget allocation for NPAN implementation.

The primary funding sources for Indonesia, Philippines, Thailand and Vietnam are from the government budget. Other funding for these countries include special funding schemes allocated for certain regional areas and grant donations from corporate sector (Indonesia); funding and investment from development partners / international organisations (Philippines and Vietnam); contribution and mobilisation from the community and domestic organisations (Vietnam). In Vietnam, the largest proportion of the budget is allocated for improving the quantity and quality of people's meals and nutritional status of mothers and children.

Myanmar, Philippines and Vietnam conducted costing analysis for the action plan and estimated the budget required for the action plan activities. Philippines action plan's budget is an estimate of the costs of 38 projects and their ten programmes for the 6-year period whereas Myanmar's action plan provides details on the indicative total cost and funding required to implement and deliver the 5-year sector-level key results. Malaysia NPAN has not provided details of the funds for the implementation of the identified programmes and activities.

Common challenges in implementing NPANs

All six NPANs have outlined the key factors that influence the extent to which the planned activities can be implemented successfully. It is not surprising that these countries face some common challenges in implementing the plans.

The need for greater coordination among relevant stakeholders and active community participation are the major challenges facing most countries (Myanmar, Vietnam, Malaysia, Thailand, Indonesia). While the shared responsibility for implementation is emphasised, it appears that the Ministry of Health is often perceived as having sole responsibility on the action plan. Malaysia's NPANM III mentions the need to develop a roadmap that allows adequate coordination between national and sub-national levels, with involvement of other related stakeholders and community representatives to ensure commitment and active participation. In Indonesia, the lack of public-private partnership, multi-stakeholders coordination in the national and sub-national level have led to low programme coverage for nutrition specific intervention and fragmented nutrition policies and programmes. Vietnam's NPAN also highlights inadequate policy advocacy, attention from the government has caused inadequateness in cross-collaboration and that activities and resources are not being integrated effectively especially at localities. Thailand highlights that the collaboration among agencies and cooperation with private sector needs to be strengthened.

Financial commitment is also a critical factor in NPAN development and implementation (Philippines, Malaysia, Myanmar, Vietnam). In Vietnam, majority of the budget has been allocated to control malnutrition of children under five, and thus insufficient budget for

other important nutrition issues. In Philippines, the budget formulation for the current plan has been largely concluded prior to the PPAN formulation exercise. In Malaysia, insufficient political commitment to tackling malnutrition has led to a financial shortfall, posed key challenges in implementing previous NPANM II. Proposal to have a "dedicated" budget (separate from Ministry of Health budget) from the Ministry of Finance to support NPANM activities which are largely prevention in nature, did not materialise.

Lack of human resources capacity or development is another common challenge identified. For example in Malaysia and Thailand, there is insufficient number of nutritionists in the health sector and community-based setting. Thailand highlights that the integration of nutrition professions and networking partners to drive work is a challenge. Vietnam recognises that there is a lack of necessary knowledge and means to propagandise and encourage its people to change their nutritional practices due to the limiting capacity of the nutrition network. Indonesia also highlights that commitment and capacity among sub-national level and the provision of technical support and guidance for districts/regional level needs to be improved.

Several of these countries also face difficulties in efficient monitoring and evaluation of the action plan. Philippines highlights inadequate system for managing the previous action plan and that the past PPANs, including the 2011-2016 plan, were not operational plans, not results-based and posed a challenge in evaluability of the plan. In Malaysia, improvement on timely collection of data for monitoring and evaluation purposes is needed as large national surveys are currently carried out only every few years. Thailand highlights the need for improvement

of tracking system and evaluations of the projects carried out, as well as the need of incorporating technology use in information management and effective nutritional surveillance.

Indonesia, Vietnam and Myanmar recognise low level of knowledge and awareness on the importance of nutrition among community and local authorities as one of the challenges in implementing their action plans. Thailand recognises that food and nutrition researches conducted in the country are still not meeting the nutritional gaps and needs of the nation. It has also been acknowledged that clearer policies and strategies on food and nutrition of related organisations are needed for promoting nutrition that covers all age groups.

DISCUSSIONS

Reviewing the NPANs in the six SEA countries, it is recognised that there are more commonalities than differences among these countries. The prioritisations of nutrition interventions outlined are based on respective country context and needs. These country action plans show similarities in several components including objectives, agencies and stakeholders involved, nutritional issues to be addressed, implementation, monitoring and evaluation mechanism as well as challenges in implementing previous NPANs/related documents.

There are, however, differences in a few aspects of the NPANs of these countries, such as the implementation strategies and targets set. Some countries have identified specific nutritional issues and indicators that are considered important to the country context. For example, Indonesia monitors several indicators on food production; Malaysia establishes a few diet-related NCDs indicators; Philippines has specific indicator on the prevalence of nutritionally at-risk pregnant women; Thailand indicators include number

of innovations in food production for good nutrition and those related to national food and nutrition database development, whereas Vietnam includes indicators on improvement of population height. In the effort to achieve Global Nutrition Targets 2025, countries have set specific targets that are comparable to Global Nutrition Target especially for the indicators on prevalence of low birth weight (most countries establish target ranging from 22% to 33% reduction), childhood overweight (most countries aim to achieve no increase from baseline), and childhood wasting (most countries target a prevalence of no more than 5%).

Recommendation/way forward for challenges

The nutrition situation analysis in the NPANs indicates that most countries in this review have not fully achieved the various nutrition targets set. Several common challenges mentioned earlier (the need for greater coordination among stakeholders, capacity for implementation, monitoring and evaluation system improvement, and significant financial commitment to the NPAN by the government) must be tackled in order to effectively implement the NPAN and achieve the targets.

Clear commitment from various stakeholders is important for the multi-sectoral coordination mechanism to function effectively. In order to achieve this, various stakeholders in these countries will have to first recognise that the implementation is not the sole responsibility of the health sector and that the responsibility has to be shared across multisectors. However, the various stakeholders involved may have difficulty in visualising common goals as they may hold contradictory opinions and is competing with others for resource allocations to carry out its own mandate. Thus, harmonising their opinions, identifying their needs in earlier phase

of plan development to ensure that their objectives are not at stake and clearly define the roles and responsibilities for each of the stakeholders are important to ensure good collaboration between them. Activating a nutrition-based mandate across a multiplicity of ministries e.g. using improved nutrition outcomes as one of the performance indicators for relevant stakeholders/ministries could be considered as an approach to improve commitment. For example, Myanmar in its latest MS-NPAN has proposed sector-specific outcomes for different ministries. Besides, population should be actively involved and aware on decision making process, the geographic reach of the programmes should be expanded to reach remote populations, and the community awareness of nutrition problems, programmes and rights should also be improved (Lachat *et al.*, 2005; Gillespie, Bold & the Stories of Change Study Team, 2017; IFPRI, 2016; WHO, 2006).

The roles of different stakeholders have to be backed up by high quality technical expertise and a serious effort to build capacity. The ability to carry out stated objectives is needed at different levels. Thus it is important to ensure that well-trained personnel and decision makers are employed at different levels to coordinate, implement, monitor and evaluate the programmes and activities implemented. In this context, the establishment of a high quality national nutrition research and training institution in the country or region that are capable of providing nutrition and continuous professional development training are crucial. Philippines, Thailand and Vietnam have their respective institute of nutrition for research and training namely Institute of Nutrition, Mahidol University (INMU) in Thailand, Food and Nutrition Research Institute (FNRI) in the Philippines, and National Institute of Nutrition in Vietnam. The establishment

of National Institute of Nutrition (NIN) is on the implementation agenda of Malaysia NPANM III. Nutrition research, science and technology capacities not only contributes to improving food and nutrition security, but also play crucial roles in providing an evidence base for decisions making and supporting policy making by the authorities/stakeholders. Besides, the adequacy of national technical expertise/capacity need to be assessed (Ismail *et al.*, 2005).

Having a common understanding of the form of capacities needed is crucial before trying to strengthen nutrition capacity especially in low-and middle-income countries (Ismail *et al.*, 2005). Shrimpton *et al.*, (2014) proposed a four-level (system, organisational, workforce, community) conceptual framework for capacity development to facilitate a more systematic approach to assessing the need for nutrition capacity development. It is believed that based on such assessment a comprehensive capacity development plan could be established for a country. Myanmar in its latest MS-NPAN adopts the methodology and tools recommended by the SUN UN Network Guidelines and Toolkit and exercised a capacity assessment as part of the action plan planning process to review the country's ability to coordinate, implement, and monitor the action plan at different levels.

The execution/implementation of the NPANs will be very much limited when there is lack of data and evidence that are actionable at national and sub-national levels. Thus, countries must work on establishing better monitoring and evaluation systems to ensure that timely, nationally representative data/information on outcomes of actions and trends of nutritional issues are available and accessible to evaluate and advise plan/programme development. National nutrition surveys or nutrition surveillance should be conducted in a

periodic manner covering all priority nutrition indicators. New surveillance systems in areas still not covered should also be developed. Effective evaluations include not only the assessments of whether a plan works but also the process evaluations that highlight impact pathways in order to better understand why, how, and where programme/plan work, or do not work (Gillespie, Bold & the Stories of Change Study Team, 2017). Besides, monitoring and evaluation should also include the timely management, analysis interpretation, dissemination and communication of accurate nutrition data to and among relevant stakeholders. Countries in the SEA region should take heed of these important aspects and work towards acquiring quality food and nutrition data.

To better support financial commitment, countries may need to consider costing their nutrition plans and exercising budget analyses. Costing help to estimate the funding needed to implement nutrition activities and it serves as a first step in understanding overall resources required to support nutrition actions in a country (SPRING, 2018). With this, it helps policy makers to prioritise among the different implementation strategies in order that the funding can be allocated properly. Besides, it would be helpful to develop appropriate analyses and evidence through budget and expenditure analyses to demonstrate how much money can be lost to poor nutrition of the population if national resources are not invested appropriately in nutrition policy/programmes implementation. This could help to make a powerful case to target decision makers e.g. Ministry of Finance who have the power over budgets and spending for increased funding for nutrition.

CONCLUSION

The development of food and nutrition action plans by governments is vital in providing practical guidance to significantly reduce the burden of preventable diet-related NCDs and all other forms of malnutrition prevalent in the country. All six SEA countries in this review have recognised this importance and have respectively formulated their NPANs to provide a framework for coordinated implementation of nutrition intervention activities by the government and food and nutrition related stakeholders. It is imperative that there must be effective implementation, monitoring and evaluation of the plans so as to successfully address both extremes of the challenging nutrition situation in SEA countries. However, based on the various challenges highlighted by the countries in the implementation of these action plans, it is clear that a great deal remains to be done to be able to achieve the planned targets. The similarities in the nutritional issues, challenges for implementation, multi-sectoral implementation mechanism as well as the programmes/activities identified suggest that closer collaboration among countries on NPANs, periodic exchange of experiences among countries in the development and implementation of NPANs, and discussion on specific topics in NPAN will benefits the countries in the region.

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Authors' contribution

All authors contributed to the preparation of the paper and approved the final draft of the manuscript.

Conflict of interest

The authors declare that they have no conflicts of interest.

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