



Food and Agriculture  
Organization of the  
United Nations

# School-based food and nutrition education

A white paper on the current state, principles, challenges and  
recommendations for low-and middle-income countries

Creating healthy and sustainable foodways for the next generation





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# FOREWORD

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Around the globe, school-based food and nutrition education (SFNE) is being increasingly recognized as a key strategy among the package of complementary interventions to improve the diets, nutrition and wellbeing of schoolchildren and adolescents.

As recommended by the Second International Conference on Nutrition (ICN2 2014) and the United Nations Decade of Action on Nutrition (2016-2025) Work Programme and motivated by the lessons learned during more than three decades of work in this area, FAO embarked in a 3-year process to lay the foundation for SFNE to raise its potential and to effectively address current challenges in low- and middle-income countries (LMICs).

This publication makes the case for increasing the profile and investment in SFNE, by presenting the evidence for its effectiveness in improving dietary practices and nutrition outcomes, and by showing the productive interactions it has with interventions to enhance food access and improve food environments within and beyond school grounds. Furthermore, it advocates for expanding the scope of traditional SFNE, transcending a personal diet and an information-based approach, to a more societal and experiential focus using a food systems-lens.

This white paper is built upon a theory of change that frames the SFNE learning model and processes put forward by FAO, in consultation with a range of international experts. It also reflects FAO's renewed vision for SFNE of "contributing to a population with health-promoting and sustainable food practices and outlooks", through fostering food competent, reactive and proactive schoolchildren and families.

The Paper goes in depth into what works and what doesn't in practice and presents detailed recommendations, real-life examples and tools for overcoming common challenges, enhancing the scope and improving the effectiveness of SFNE initiatives and programmes in LMICs.

It also calls for more and higher quality research into the long term impacts of SFNE beyond nutrition outcomes and into the most cost-effective combinations of SFNE with other interventions, as well as for a better understanding of countries' SFNE situation on the ground and formative research to design needs-based and contextualized interventions.

We hope that technical staff in ministries, local governments and school systems make use of this resource to develop their own guidelines and approaches for the optimal integration and scale-up of SFNE as part of their 2030 Agenda strategies and plans, in order to not only support the right to food and improve the nutrition of their schoolchildren and adolescents, but to also empower the school community for driving positive change in their local food systems.

FAO is committed to supporting its Members with the development of practical tools, technical guidance and capacity development initiatives to enable them to put this white paper's principles into action.



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# ABBREVIATIONS & ACRONYMS

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<b>ASF</b>	animal source food
<b>BMI</b>	body mass index
<b>CNE</b>	Community nutrition education
<b>ENAs</b>	essential nutrition actions
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>FBDGs</b>	food-based dietary guidelines
<b>FGD</b>	focus group discussion
<b>FNE</b>	food and nutrition education
<b>FRESH</b>	Schools, agencies, systems For Recovery, Engagement, Social Inclusion and Health
<b>GLOPAN</b>	Global Panel on Agriculture and Food Systems for Nutrition
<b>HGSF</b>	Home-grown school feeding
<b>HICs</b>	high-income countries
<b>HKI</b>	Hellen Keller International
<b>HLPE</b>	High Level Panel of Experts on Food Security and Nutrition
<b>ICN2</b>	Second International Conference on Nutrition
<b>IEC</b>	Information, education and communication
<b>IFAD</b>	International Fund for Agricultural Development
<b>IYCF</b>	infant and young child feeding
<b>KAPP</b>	knowledge, attitudes, practices and perceptions
<b>LMICs</b>	low- and middle-income countries
<b>LSHTM</b>	London School of Hygiene and Tropical Medicine
<b>M&amp;E</b>	monitoring and evaluation
<b>MNCH</b>	Maternal, newborn and child health
<b>MoA</b>	Ministry of Agriculture
<b>MoE</b>	Ministry of Education
<b>MoH</b>	Ministry of Health
<b>NCD</b>	non-communicable disease

<b>NFSI</b>	Nutrition-Friendly Schools Initiative
<b>NGO</b>	non-governmental organization
<b>PCD</b>	Partnership for Child Development
<b>PTA</b>	parent-teacher association
<b>QALY</b>	quality-adjusted life year
<b>RRA</b>	rapid rural appraisal
<b>SBCC</b>	social and behaviour change communication
<b>SDG</b>	Sustainable Development Goal
<b>SFNE</b>	school-based food and nutrition education
<b>SHN</b>	School Health and Nutrition
<b>SM</b>	social marketing
<b>SMS</b>	short message service
<b>SNEB</b>	Society for Nutrition Education and Behavior
<b>SSB</b>	sugar-sweetened beverages
<b>STP</b>	schools of thought and practice
<b>TIPs</b>	trials of improved practices
<b>UN</b>	United Nations
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>UNICEF</b>	United Nations Children's Fund
<b>UNSCN</b>	United Nations System Standing Committee on Nutrition
<b>WASH</b>	water, sanitation and hygiene
<b>WFP</b>	World Food Programme
<b>WHO</b>	World Health Organization
<b>WinS</b>	WASH in Schools

# Introduction



# INTRODUCTION

## Aims and target audience

This *white paper on the current state, principles of effectiveness and challenges of school-based food and nutrition education for low- and middle-income countries, with recommendations for action*, is the first of its kind. Based on evidence, professional expertise and field experience, as well as the lessons learned and the documented challenges of school-based food and nutrition education (SFNE) work in a variety of contexts, the paper presents the case for raising its profile, and for transforming its vision and learning model in low- and middle-income countries (LMICs).

The paper sets out the principles of effective SFNE, identifies the main challenges to its application and effectiveness in LMICs and proposes recommendations for overcoming these challenges.

As a publication, it is directed firstly at a technical audience working in governmental organizations that deal with schoolchildren and adolescents. This includes policy advisors, ministry staff, programme and school-level planners, curriculum developers, teacher educators and school staff. It is also intended to be of interest to researchers and technical advisors to decision makers, donors and investors, as well as to civil society and to staff working in non-governmental organizations (NGOs) and international organizations – including the Food and Agriculture Organization of the United Nations (FAO) and other United Nations agencies.

FAO intends to use the white paper as the foundation for developing comprehensive guidance resources and a capacity development package to support member countries in designing, implementing and evaluating, as well as strengthening their SFNE-related policies and programmes. Planned outputs include guidelines on integrating SFNE into nutrition, health, social protection and food security interventions; SFNE learning modules targeted at various professionals and technical staff; briefs for middle- and high-level decision makers in various sectors and for investors and donors; and much more.

It should therefore be noted that the white paper is *not*:

- a manual;
- a curriculum development guide;
- a policy brief; or
- a donor advocacy document.

While the white paper provides guidance and detailed recommendations, it is meant to be used by countries and institutions as a basis for developing their own guidelines and contextualized approaches for the adequate integration and scale-up of SFNE, as part of the 2030 Agenda for Sustainable Development.



# BACKGROUND

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According to recent estimates, poor diets now represent the leading risk factor for the global burden of disease (GBD 2017 Risk Factor Collaborators, 2018). Worldwide, 149 million children under the age of five are stunted, 49.5 million are wasted, 40 million are overweight and many millions are suffering from micronutrient deficiencies (FAO *et al.*, 2019).

Many of these young children, particularly in LMICs, are carrying over their nutritional problems into school age, entering and continuing school malnourished, thereby affecting their cognitive and physical potential and overall development (Grantham-McGregor *et al.*, 2007; Bundy *et al.*, 2017).

Although efforts have been made to understand the nutrition situation and the global burden of malnutrition in schoolchildren and adolescents, large data gaps remain. The studies available show a complex national malnutrition picture that is context-specific, with high in-country variations. Chronic and acute undernutrition and micronutrient deficiencies (iodine, iron, vitamin A and zinc) continue to be persistent issues, especially in Africa and Asia. While overweight and obesity rates appear to be plateauing in some high-income countries, they represent an increasing epidemic in most LMICs (Best *et al.*, 2010; Muthuri *et al.*, 2014; NCD Risk Factor Collaboration, 2017; Caleyachetty *et al.*, 2018). In 2016, the number of obese 5- to 19-year-olds was estimated at 124 million, rising more than tenfold in the past four decades (NCD Risk Factor Collaboration, 2017).

As the linkages between childhood nutrition and health, and development and productivity in adulthood have become increasingly evident, it is clear that addressing malnutrition is central to improving individual development and well-being, improving the overall economic and social development of families and communities and supporting societal development (GLOPAN, 2015; FAO *et al.*, 2019).

Given the high human and economic returns that investments in child and adolescent nutrition bring (Development Initiatives, 2017) and the growing recognition of the right to adequate food, the global commitment to addressing malnutrition has intensified. It now features prominently on the international agenda, including the Sustainable Development Goals (SDGs), the Rome Declaration and Framework for Action adopted by the Second International Conference on Nutrition (ICN2), and the UN Decade of Action on Nutrition 2016–2025, among others (FAO and WHO, 2014; UN General Assembly, 2015).

International organizations have focused on developing frameworks for action and on promoting a series of policy recommendations to address malnutrition in all its forms, underpinned by the recognition that nutrition is a complex and cross-sectoral issue that affects and is affected by many other development areas including health, education and food systems.

However, this is not enough. Meeting the interrelated challenges at country level requires scaling up effective interventions, investing in innovative solutions that are adaptable to various contexts (while also sustainable, evidence-based and people-centred), and establishing feasible frameworks of collaboration and accountability between sectors and among stakeholders. Particular focus should be placed on mechanisms that support interrelated development objectives by implementing synergistic and multilevel strategies.



## What is the role of school-based food and nutrition education?

Formal education systems – including pre-school centres, schools, universities and technical training centres, among others – provide entry points to simultaneously address issues related to education, food and nutrition, health and the environment. In this sense, they represent a key opportunity for advancing sustainable development.

More and more, schools in particular have become a focus for policies and programmes that aim to address malnutrition and other related challenges, as they reach the majority of school-age children (World Bank, 2018) in non-crisis contexts over a prolonged period of time, and can extend benefits to families and wider communities.

As one of the main roles of a school is to equip children with life skills and capacities that support their well-being, the interest and action for integrating SFNE into national education curricula has been growing. A similar trend is seen in complementing various types of school-based programmes with SFNE – such as school meal programmes; school health; and water, sanitation and hygiene (WASH) programmes – using improved food practices and outlooks for an enhanced impact on diet.

SFNE also plays an important role in complementing global efforts to improve food environments, and in empowering children and adolescents to become active participants and future leaders in shaping food systems that are better able to deliver healthy and sustainable diets.

Box 1 illustrates the global call for integrating SFNE in schools as a key strategy in the fight against all forms of malnutrition and in supporting the transformation of food systems.

### Box 1. International frameworks and global documents recommending school-based food and nutrition education

- **ICN2 Framework for Action:** Recommendations 19 and 20 (FAO and WHO, 2014) <http://www.fao.org/3/a-mm215e.pdf>
- **Global Panel on Agriculture and Food Systems for Nutrition (GLOPAN) Healthy Meals in Schools:** Policy Innovations Linking Agriculture, Food Systems and Nutrition: Recommendations 2 and 7 (GLOPAN, 2015) <http://www.glopan.org/sites/default/files/HealthyMealsBrief.pdf>
- **UN Decade of Action on Nutrition Work Programme:** Action Area 3 (FAO and WHO, n.d.) [https://www.un.org/nutrition/sites/www.un.org.nutrition/files/general/pdf/work\\_programme\\_nutrition\\_decade.pdf](https://www.un.org/nutrition/sites/www.un.org.nutrition/files/general/pdf/work_programme_nutrition_decade.pdf)
- **World Health Organization (WHO) Report of the Commission on Ending Childhood Obesity:** Recommendations 5.4 and 5.5 (WHO, 2017) <https://apps.who.int/iris/bitstream/handle/10665/259349/WHO-NMH-PND-ECHO-17.1-eng.pdf?sequence=1>
- **United Nations System Standing Committee on Nutrition (UNSCN) Schools as a System to Improve Nutrition:** A new statement for school-based food and nutrition interventions: Recommendation 6 (UNSCN, 2017) <https://www.unscn.org/uploads/web/news/document/School-Paper-EN-WEB-8oct.pdf>

## What is the problem?

Despite this increasing interest in SFNE and the evidence that supports it and its potential (see Theme 1), much traditional SFNE work is largely underfunded, does not deliver intended results and remains disconnected from other key interventions that aim to strengthen benefits at the food, nutrition, environment and education nexus.

Recent assessments in LMICs have shown that even though SFNE is reported as widespread, it is not usually prioritized in national policy frameworks, and/or dedicated SFNE policies are not fully implemented. SFNE coverage in the curriculum is narrow, the time allowed is short, and the approach is largely theoretical. Progress in developing and implementing programmes is slow, and there is tough competition with core subjects for a dedicated and constant timeslot, either separately or within those subjects (FAO and CELAC, 2018; FAO, ABC and FNDE, 2018; FAO, forthcoming).

SFNE is under-resourced, with shortages in capacities and capacity development opportunities throughout the system. Learning and training materials are generally lacking, inadequate or in need of updating. Many countries report that SFNE is included in their national school meal programmes, but little is known about whether it is done, how it is done, how well it is done and how effective it is. In general, apart from some research studies, SFNE is not usually monitored or evaluated and if it is, the results are not widely available or well used (FAO and CELAC, 2018; FAO, ABC and FNDE, 2018; FAO, forthcoming).

On the other hand, SFNE is not often subject to rigorous evaluation, as compared with other types of nutrition education interventions (when part of development or research projects or programmes), or as compared with some school subjects (such as maths) that are seen as “core curriculum”.

These issues undermine the effectiveness of SFNE.

**FAO defines SFNE as a series of coherent and progressive sequences of educational activities, with environmental supports, that will help schoolchildren (along with school staff and parents) to achieve lasting improvements in their diets and other food practices as well as their outlooks and knowledge; to build their capacity to change and adapt to external change; and to pass on their learning to others (FAO, 2019a).**

## What is FAO's framework for action?

In an effort to tackle the abovementioned issues and respond to evolving needs from member countries, FAO, along with partners, is at the forefront of improving the methodological quality, scope and impact of SFNE interventions and their fruitful integration within school systems in LMICs. This work is part of the agenda that FAO committed to during ICN2, and supports SDGs 2 (Zero Hunger), 3 (Good Health and Well-being), 4 (Quality Education), 5 (Gender Equality) and 12 (Responsible Consumption and Production).

To ensure success, a transformative vision for SFNE that directly responds to interrelated sustainable development challenges is needed: a vision in which the school community fosters healthier and more sustainable food practices in their different contexts, and work together to promote positive changes in their local food system from their own entry points and areas of influence (not only through the curriculum). This means that a) SFNE is not targeted only to children, adolescents and families, but also to the broader school community; b) children and their communities are not passive subjects, but rather take ownership of their food learning processes and become agents of change in their local food systems; and c) the scope of SFNE goes beyond the transmission of generic and basic nutrition information and plays a key role in real-life action and practice.

## Box 2. FAO's school food and nutrition approach

As a direct response to the international call for improved nutrition and food systems, and in the context of ICN2 and the UN Decade of Action on Nutrition, FAO put together a corporate framework for action in school-based interventions and programmes. The Framework focuses on the most effective options and on the synergies between and within sectors that represent multi-win outcomes across education, nutrition, food security and community development.

It aims to support countries not only to ensure that children in school consume adequate, nutritious, diverse, safe and enjoyable food for improved learning, but also to foster lasting, healthy food-related practices that extend to their families and, when possible, to favourably impact the local food system and economies in the process.

The School Food and Nutrition Framework is focused on four areas: a) promoting a healthy food environment and school food; b) *integrating effective food and nutrition education throughout the whole school system*; c) stimulating inclusive procurement and value chains for school food; and d) creating an enabling political, legal, financial and institutional environment. Each of these has explicit linkages, points of entry and areas of technical support.

Through this framework, FAO can support countries by:

- identifying and disseminating successful, cost-effective experiences, and drawing out best practices and lessons learned;
- identifying entry points and underexploited linkages between different sectors (especially agriculture, education, social protection, nutrition and health);
- providing technical assistance and advice in various areas of expertise;
- supporting the creation of enabling regulatory frameworks;
- building or strengthening institutional capacities; and
- facilitating mechanisms for improved sectoral coordination, evaluation and accountability.

All of this aims at making existing programmes more cost-effective and sustainable within a food systems context, and at supporting new approaches where needed.



Source: FAO, 2019b

## What type of school-based food and nutrition education programme/intervention is the subject of this white paper?

This white paper recognizes the importance of addressing the food and nutrition education needs of all young people – not only those who are in school. These include children in early childhood education contexts, children and adolescents outside school (for example, in youth programmes and clubs) and non-attenders. However, the focus of the Paper centres on schoolchildren, adolescents in school, parents and school staff, while also recognizing the many spin-offs achieved (from school education to other groups) by taking SFNE into the home and community.

Food and nutrition education (FNE) has played a demonstrably essential role in enhancing the nutrition behavioural impact of interventions in various fields, most notably social protection and food security, with a particular focus on infant and young child feeding (Bhutta *et al.*, 2013; Lamstein *et al.*, 2014; Kuchenbecker *et al.*, 2017; Muehlhoff *et al.*, 2017). Evidence on the latter has in fact supported the international recommendation to implement FNE as part of the essential package for reducing stunting in the first five years of life (Bhutta *et al.*, 2013; Lamstein *et al.*, 2014).

Though still critical, this type of non-school education is often part of interventions with limited time frames, which aim to have a “remedial” approach to identified behavioural issues. In contrast, SFNE has a wider reach, is integrated into formal learning structures and presents opportunities for continuous learning. It can therefore reach children, families and the wider school community in a regular and continuous way, and can include not only acute “remedial” learning but also broader preventive strategies, which support children and adolescents in developing good food practices, behaviours and ultimately habits.

Countries frame and contextualize SFNE in different ways. Tables 1 and 2 describe briefly the different types of school-based and school-linked food and nutrition education programmes/ interventions as referenced throughout this white paper. The tables are not meant to provide a comprehensive list but rather to showcase the wide range of differences in scope, time frame, regularity, operationalization/implementation, impact and duration (i.e. the continuity of the intervention). The responsibility for each kind of intervention varies. For instance, the ministry of education is usually responsible for the main curriculum, while other entities like the ministry of health, ministry of agriculture, NGOs, institutions, and voluntary groups and associations, have the responsibility by themselves or shared with the ministry of education, for specific interventions and programmes.

**Table 1.** Various types of SFNE programmes/interventions

Type of SFNE programme/intervention	Description and examples	Potential for impact
Part of the mainstream school curriculum	<p>SFNE can be integrated into the curriculum as a stand-alone subject, across various subjects or within one subject (e.g. health, home economics, biology, etc.).</p> <p>It can also be made available for specific grades or for all age groups.</p> <p>Usually, this type of intervention is most likely to be sustained as it is institutionalized and can involve a wide range of food and nutrition learning targets and activities.</p>	The potential for impact is very high if the SFNE curriculum responds to nutrition needs, aims at practices and outlooks as well as at knowledge, is developed from year to year, is supported by parents, and is reflected in the schools' own practices and staff outlooks.
Through projects within the curriculum, but focused on specific aspects of food and nutrition	Aspects of SFNE are integrated into specific lessons (e.g. cooking or agriculture), or as topics for specific and time-bound school projects (e.g. children creating a school campaign to promote fruit and vegetable consumption, or adolescents presenting a research project on the environmental issues of specific food production or processing).	The potential depends on the linkages with school curriculum objectives, the regularity of exposure, the overall project or programme objectives and the approach.
Through regular extracurricular activities (within the formal school system)	<p>SFNE is integrated into schools' normative extracurricular programmes (e.g. school gardens, sports, dance, cooking and health clubs).</p> <p>This type of intervention also includes schools' explicit food- and nutrition-related activities, such as recommendations on lunchboxes, messages in school assemblies, rules about food waste and handwashing, and children's presentations and posters on open days.</p>	The potential for impact depends on aims, approach and regularity, and linkages with the school curriculum, as well as on other factors. For example, some elements are easy to establish and maintain, but those based on organized groups have to cope with challenges in finding and maintaining time, leadership and funding.
Through the hidden curriculum	Not strictly an intervention, but as influential or more: the hidden curriculum involves everything in the material and social environments that sends implicit messages about food behaviour – from the snacks on teachers' desks and the food sold in the schools, supermarkets and streets, to peer and family food preferences, home meals and home skills in food procurement and preparation.	Powerful forces, which need to be identified, articulated and discussed among school staff, families and in the classroom.
As a component of school-based programmes and services	<p>SFNE is designed and implemented as a component of institutionalized programmes and services, most commonly school meal programmes, school health programmes, regular school nutrition interventions (e.g. malaria control, deworming, and micronutrient supplementation), or WASH programmes.</p> <p>Activities commonly involve lessons and school/parent briefings, and can also target food service and other school staff.</p>	The potential is very high for reinforcing environmental and health actions to enhance value added, as well as perceptions, understanding and use. This potential is generally underexploited: material facilities and actions are not often seen as "object lessons" with educational dimensions.

**Table 2.** Various types of school-linked food and nutrition education programmes/interventions

Type of SFNE programme/intervention	Description and examples	Potential for impact
Through extracurricular activities/projects (outside the formal school system)	FNE is integrated into (parts of) projects or programmes managed by external entities (other ministries, universities, NGOs, etc.), and not usually embedded in the school system or institutionalized. Examples include anaemia prevention projects in school grounds, summer schools sponsored by donors and Junior Farmer Field and Life Schools.	The potential for impact depends on aims, approach and regularity, and linkages with the school curriculum, as well as on other factors.
As a component/element of nutrition, agriculture, food security, social protection, infant and young child feeding (IYCF) or community development programmes and policies	These programmes are not usually school-based, but may include a component relevant to schools. For example, learning materials promoting fish consumption within a large-scale fisheries management project, community food gardens that share space and expertise with school gardens, and school lessons relating to national 5-a-day fruit and vegetable consumption or to national food-based dietary guidelines (FBDGs).	There is potential for valuable triangulation in influencing community outlooks if the same messages and actions are promoted through schools as well as through other channels, and taken home by children. Unfortunately, this type of programme/intervention is rare: projects and campaigns should consult the ministry of education about promoting their work through schools.
Through research projects	These projects may include any of the interventions discussed here, but are accompanied by the necessary research apparatus (e.g. formative research, control groups, impact evaluation, etc.).	There is potential for high value, especially if the research involves schools, school staff, and parents and children directly, and if the findings are discussed, implemented and incorporated into policy and planning. For example, monitoring and evaluation (M&E) can have a strong formative effect.

## Process of development

This white paper is the result of a two-year process that began with an International Expert Consultation entitled “Stepping up School-based Food and Nutrition Education: Exploring Challenges, Finding Solutions and Building Partnerships”. This consultation, organized jointly with the United Arab Emirates University, brought together 63 experts from more than 25 countries, representing various fields in education, communication, food systems and nutrition, to establish the foundation for reshaping and carrying SFNE work forward, and to develop a shared vision for effective SFNE and for its future in LMICs (FAO, 2019a).

In preparation for the consultation, a package of draft outputs and global guidance documents was developed to serve as the basis for discussion. The package consisted of: a) outlines of the themes of this white paper; b) a scoping literature review of design, implementation and evaluation practices in LMICs; c) a survey of how LMICs integrate SFNE into their school systems, including trends, challenges and opportunities; and d) a tool to assess capacities (at national or subnational level) for developing and implementing successful SFNE interventions (FAO, 2019a).



To contribute towards the white paper, other materials and resources were developed, including a literature database and matrix specific to SFNE, country case studies and examples of technical requests to FAO, and summaries of recent global and regional assessments on the state of SFNE in LMICs.

The themes of the white paper were developed with input from 14 experts. Each theme is based on the most relevant evidence and on recent assessments conducted by FAO and partners, as well as on country case studies, country requests to FAO, and the knowledge and field experience of relevant experts in SFNE.

### The iterative process for developing the white paper involved:

1. Definition of scope and thematic focus of the white paper, including overarching structure.
2. Drafting of terms of reference and guidelines for expert writers.
3. Global stakeholder mapping to identify leaders and experts in SFNE and related fields.
4. Initial selection of a group of experts based on technical profile, experience and geographical representation.
5. Negotiation and development of formal agreements with the experts to develop inputs for the themes of the white paper.
6. A series of online meetings to a) present an overview of FAO's work on SFNE, describe the terms of reference, and introduce the white paper process, aims and expectations; b) discuss and review the annotated outlines of each theme as prepared by the writers; and c) provide guidance, feedback and review of three sets of drafts for each theme.
7. An International Expert Consultation (held in 2017), during which the expert writers provided overviews of their assigned themes in order to get feedback and input from 63 consultation participants, including on tone, completeness and accuracy of content, and on the feasibility of the recommendations (FAO, 2019a).
8. A round of revisions by the writers, to integrate feedback received during the International Expert Consultation.
9. Three rounds of rewriting, technical revision and editing by FAO staff to enhance the content, improve coherence between the themes and improve the usability of the white paper.
10. A final validation of the harmonized version through an international working group meeting (held in 2018), including representatives from the International Fund for Agricultural Development (IFAD), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the United Nations Children's Fund (UNICEF), the World Food Programme (WFP) and WHO, and the original writers.
11. An external review procedure in which representatives from five international organizations, along with independent experts, submitted a scoring of the document and provided qualitative input across ten domains (target audience, geographical and contextual balance, purpose and alignment, accuracy, clarity, tone, uniformity, adequacy of visual aids and supplements, references, and impact and originality).
12. A final round of revisions, professional editing and layout.



## Structure and content

Composed of eight themes, the white paper reflects the main processes and phases of SFNE renewal, roughly following a project formulation framework, with a learning model guiding the activities at the centre. (See Table 3 for the aims and guiding questions of each theme.)

Theme	Processes addressed
<b>SFNE for sustainable development:</b> Developing a transformative vision for SFNE in LMICs	Developing a shared vision and goals, situation and needs analysis, as well as advocacy and enabling policy
<b>Education–environment linkages:</b> Strengthening the synergies between food environments and SFNE	Developing purposeful synergies with food environments
<b>Competences in context:</b> A new educational paradigm for effective SFNE in LMICs	Exploring learning needs, influences and contexts, and establishing action aims (formulating competences)
<b>The SFNE curriculum:</b> Developing competence-based integrated curricula	Developing, adapting and updating curricula
<b>Learning pathways and approaches:</b> Filling the methodology gap	Operationalizing SFNE interventions: learning models and learning programmes
<b>Effective SFNE activities:</b> Action, reaction and interaction	Developing learning materials and activities
<b>Systemic capacity:</b> Developing capacities throughout the system for managing sustainable SFNE	Developing capacity at all levels (individual, institutional and enabling environment)
<b>Evaluation for SFNE practice:</b> Capturing effectiveness and implementation, and making refinements	Capturing SFNE effectiveness and fidelity of implementation, and making necessary improvements (monitoring and evaluation)

Although they are meant to be read and taken together, the themes can also be read individually. Each theme follows a common structure:

Background	What s needed	Challenges	Recommendation
Provides an overview of the history, current situation and important concepts for the given theme.	Describes what is required for SFNE to achieve its full potential, and presents the main principles for the theme.	Discusses the main challenges identified in LMICs, as relevant to the needs described in the theme.	Proposes practical and progressive recommendations for addressing what is needed for overcoming the identified challenges.

Recurring elements in most themes highlight key aspects, specifically:

- **Misconceptions:** to flag enduring but mistaken ideas and perceptions that affect the adoption, implementation and impact of SFNE.
- **Focus on adolescents:** to highlight specific issues related to adolescent nutrition (in response to the recent global Call to Action<sup>1</sup>) and to engage adolescents in their own development.
- **Yellow arrows:** to flag specific **innovative practices and insights.**

<sup>1</sup> See <https://www.spring-nutrition.org/about-us/news/adolescent-nutrition-call-action-better-data-now-drive-better-policies-and-programs>.

**Table 3.** Aims and guiding questions for each theme

#	Theme	Aims	Guiding questions
1	<b>SFNE for sustainable development:</b> Developing a transformative vision for SFNE in LMICs	<p>To show that SFNE is important for sustainable development in LMICs, highlighting the evidence available.</p> <p>To define the new vision and goals of SFNE.</p> <p>To showcase the need for a systemic transformation of SFNE.</p> <p>To propose ways to raise SFNE visibility and develop enabling policy frameworks.</p>	<p>Can SFNE make a difference for sustainable development? What can it achieve?</p> <p>Why are a new vision and goals needed to transform SFNE?</p> <p>What are the challenges to systemic transformation for SFNE?</p>
2	<b>Education–environment linkages:</b> Strengthening the synergies between food environments and SFNE	<p>To describe the most influential food environments for schoolchildren and adolescents.</p> <p>To show that explicit and purposeful education–environment linkages are crucial for impact on food practices.</p> <p>To identify ways to strengthen school-relevant education–environment synergies.</p>	<p>What are the strongest immediate influences of the food environment on schoolchildren and adolescents?</p> <p>Why is it important to “educationalize” food environments?</p> <p>What is needed to integrate SFNE with food environmental actions?</p> <p>How can interactions between education and environment be synergized for better food practices?</p>
3	<b>Competences in context:</b> A new educational paradigm for effective SFNE in LMICs	<p>To provide a framework for developing SFNE competences for any school-based SFNE interventions.</p> <p>To identify the challenges to implementing this design process and suggest strategies for tackling them.</p>	<p>What are “competences” and why are they important in SFNE?</p> <p>How can the main SFNE target competences be identified and formulated for a given context?</p> <p>What support competences (e.g. knowledge, skills and perceptions) are needed to achieve the targets?</p> <p>How should SFNE link to the existing school curriculum?</p> <p>What are the challenges to implementing this design process and how can they be tackled?</p>
4	<b>The SFNE curriculum:</b> Developing competence-based integrated curricula	<p>To discuss how school curricula can substantially help to produce population groups capable of taking charge of their diet – both for their own health and for the health of the environment.</p> <p>To show how effective SFNE can be expressed in competence-based curricula.</p> <p>To illustrate the process of developing a competence-based SFNE curriculum.</p>	<p>What is a subject curriculum and what are the parameters involved in revising it?</p> <p>What are the essential elements of a competence-based curriculum?</p> <p>What are its essential (and desirable) products?</p> <p>What is its due process and who should participate?</p> <p>What are the challenges to putting such a curriculum into place and how can curriculum developers accommodate them?</p>

<p><b>5 Learning pathways and approaches:</b> Filling the methodology gap</p>	<p>To present a workable model for developing effective SFNE learning programmes.</p> <p>To illustrate some of the main principles which should govern the process.</p> <p>To illuminate the “methodology gap” in SFNE.</p> <p>To show the roles of food environments, parents, families and communities.</p> <p>To identify activity types for the main phases of the process.</p> <p>To suggest entry points for innovation.</p>	<p>What food learning do children bring to school?</p> <p>What is the learning path to good food practices for schoolchildren and adolescents?</p> <p>What are the essential activities for achieving food competences?</p> <p>Who and what should be involved?</p> <p>What are the main challenges?</p> <p>How can these challenges be tackled?</p>
<p><b>6 Effective SFNE activities:</b> Action, reaction and interaction</p>	<p>To highlight the need for purpose, relevance, variety and ownership in SFNE activities.</p> <p>To suggest frameworks for SFNE delivery.</p> <p>To illustrate suitable (and unsuitable) SFNE activity types.</p> <p>To characterize the needs for SFNE learning materials.</p> <p>To identify challenges and propose solutions.</p>	<p>How can SFNE activities help children achieve specific competences?</p> <p>What working criteria and principles will make SFNE activities effective?</p> <p>What types of activity are “fit for purpose”?</p> <p>What is the value of learning materials and what is needed to develop them?</p> <p>What are the challenges?</p> <p>How can these challenges be tackled?</p>
<p><b>7 Systemic capacity:</b> Developing capacities throughout the system for managing sustainable SFNE</p>	<p>To discuss the need for a capable system for enabling, managing and sustaining SFNE.</p> <p>To suggest ways for progressively addressing the three dimensions of SFNE capacity.</p>	<p>What does capacity development mean for SFNE?</p> <p>Why is SFNE training not enough?</p> <p>What are the needs across the system?</p> <p>What are the main challenges of developing SFNE capacities across the system?</p> <p>What are some ways to overcome these challenges?</p>
<p><b>8 Evaluation for SFNE practice:</b> Capturing effectiveness and implementation, and making refinements</p>	<p>To provide key principles and elements that support planning, designing, implementing and reporting the results of SFNE evaluations.</p>	<p>What can evaluation do for SFNE?</p> <p>Why is practical guidance needed for SFNE evaluation?</p> <p>What are some key principles needed for conducting optimal SFNE evaluations?</p> <p>What are the main challenges of SFNE evaluation?</p> <p>How can these challenges be tackled?</p>

## School-based food and nutrition education transformation: an interconnected process

As shown in the preceding section (see “Structure and content”), the eight themes of this white paper deal with the construct of effective SFNE and with a series of tasks that aim to implement the construct.

### The pathway to change

The white paper puts forward, and is structured around, a simplified theory of change (see Figure 1) that represents the way effective SFNE can contribute to a population with health-promoting and sustainable food practices and outlooks.

*The base circle* denotes the national/subnational processes that are crucial for effective SFNE, and that are thus the main concern of the themes. These are illustrated as cogs, to emphasize their interdependency: they need to work for and with each other and are not necessarily linear or sequential. All such processes are guided by the vision and core principles of SFNE, as proposed in this white paper.

The light blue *cross-cutting bars* present three key elements common and necessary to all SFNE processes, while the *external ring* reflect the enabling policy, programmatic and institutional frameworks needed for such processes to be implemented, accepted and promoted, and sustained and/or brought to scale.

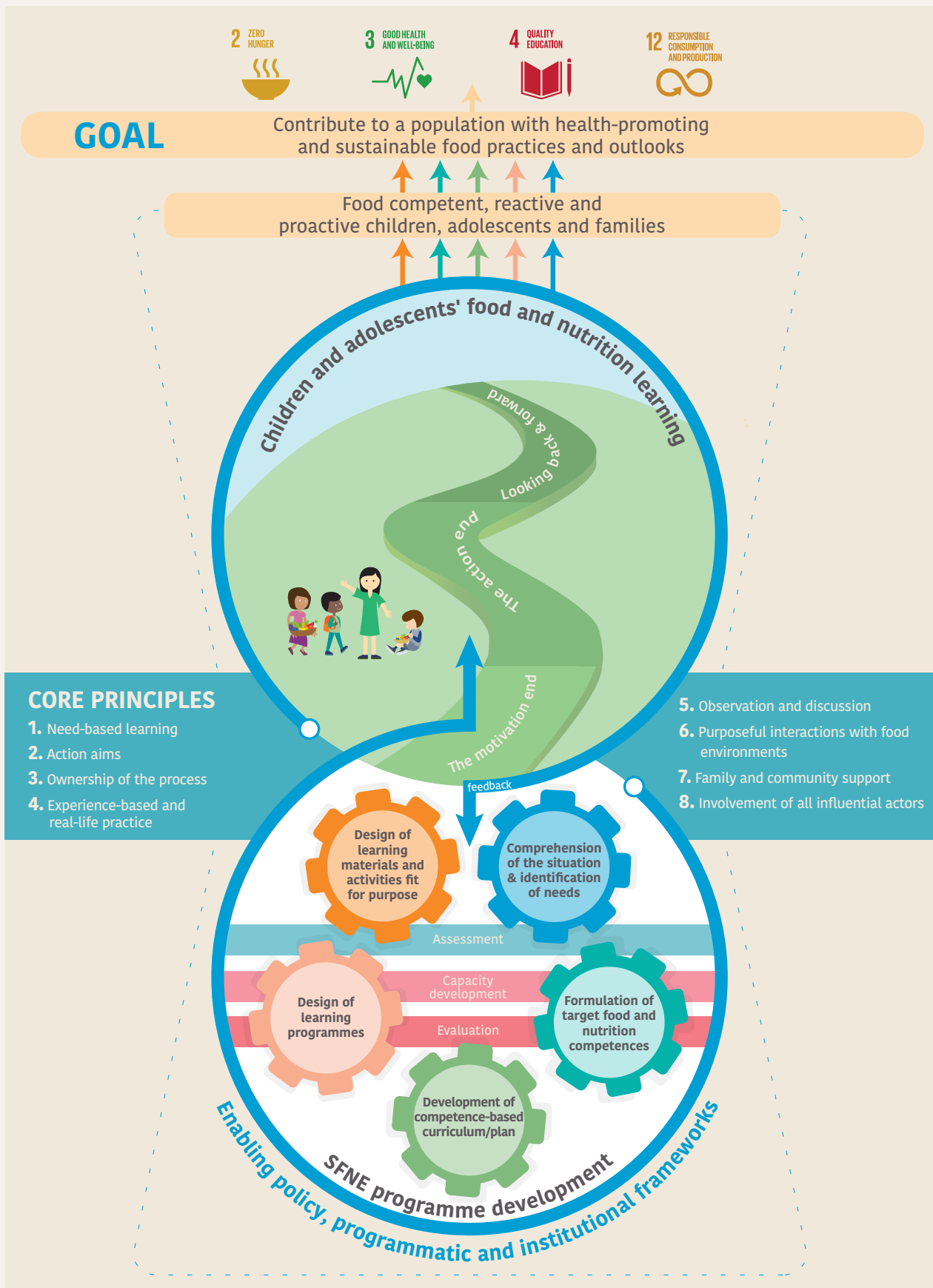
*The top circle* illustrates the implementation of SFNE programmes through the pathway along which children’s food and nutrition learning takes place. This pathway is based on the SFNE model and core principles put forward by this white paper, where continuous food and nutrition learning purposefully linked with food environment improvements, result in the achievement of food competences and reactive and proactive capacities. *The arrow* signifies a feedback loop to inform revision and continuous improvement of SFNE programme design processes reflected in the first circle.

*The top boxes* present the main outcome and goal, respectively, of SFNE processes, as well as their contribution to the SDGs and 2030 Sustainable Development Agenda.

### Underpinning considerations

As in any complex endeavour, several SFNE processes (see Box 3) have their own dedicated staff and departments in ministries or organizations. The white paper sees these processes as interrelated and stresses that when it comes to successful paradigm change they are strongly and necessarily interdependent. Piecemeal innovations (such as new learning materials, teacher education, etc.) are unlikely to be sustained and spread. To make innovation work, practitioners need consensus on what is to be achieved and how, and familiarity with what it looks like in practice. Hence all parts of the system need progressive capacity development – preferably shared and on-the-job. Each part of the process needs to build on several other tasks and outputs and at the same time it is important that the needs and experiences of all its users across the system are reflected. Good programme management encourages ongoing dialogue, negotiation and participation, as well as easy liaison and collaboration.

Figure 1. School-based food and nutrition education (SFNE) Theory of change



### Box 3. School-based food and nutrition education system processes

- Situation analysis
- Capacity assessment
- Advocacy
- Policy formulation/revision
- Formative research/learning needs analysis
- Identification/formulation of target competences Curriculum development
- Learning programme/course design
- Learning materials development
- Capacity development
- Implementation in schools
- Monitoring and evaluation

Beyond these interactions within the education system, the white paper's themes reinforce the importance of promoting partnerships and liaisons of various kinds and at various levels: with other government services, with parents, producers, processors and vendors, and with publishers, academics, professional institutes, donors, NGOs and other organizations. (Table 4 shows potential participants in SFNE and some of their possible roles.)

While they are beyond its scope, the white paper also recognizes the critical significance of maternal and early childhood interventions for nutrition and development, and thus promotes synergies, extension and collaboration whenever possible between SFNE initiatives and other efforts and stakeholders working in this area.

The Paper reflects this network of relationships, dependencies and synergies. There are also many commonalities among the needs, challenges and recommendations that are identified in the themes. Taken together, they suggest that a professional platform is emerging upon which to build a more coherent, collaborative, convinced and coordinated approach to promoting better health and sustainable development in LMICs.

Furthermore, across the themes, a strong message emerges regarding the need for overall programme or project management and coordination that considers systemic needs and addresses the shared areas for change – for example, initiating and maintaining discussions on aims and methodology; formulating policy; establishing feasible time frames; guiding efforts for ongoing advocacy; assembling usable archives; organizing situation and needs analyses and data-gathering; disseminating results; drafting terms of reference and defining outputs; scoping, budgeting, and planning; coordinating capacity analysis and development; establishing communication networks; monitoring and evaluation at all stages and levels; and cultivating and maintaining professional and public interest.

Each theme makes its own specific recommendations in this area (see Supplement 1 for a summary of the challenges and recommendations of the white paper).

**Table 4. Participants in SFNE and examples of their possible roles**

Possible participants	Examples of possible roles in SFNE
<p><b>All relevant parts of the education system:</b> policy and planning, curriculum development, pre-service and in-service teacher development, teachers' organizations, head teachers, materials writers, school administrators and inspectors, school cooks, gardeners, caretakers and schoolchildren.</p> <p>Related groups: educational publishers and parent-teacher associations (PTAs).</p>	<p>Recognize and discuss changing roles and implications for their own work.</p> <p>Help with devising, carrying out, analysing and using surveys of needs, practices, attitudes and resources among their own clients (parents, teachers and students).</p> <p>Contribute descriptions of regional and local food practices.</p> <p>Help to identify prevailing attitudes to diet, food environments and SFNE in their own fields of work.</p> <p>Gather information about schools' actions in the school food environment, and relationships with families.</p> <p>Identify and assess relevant literature, curricula, learning materials and training programmes.</p> <p>Identify barriers to implementation in their own spheres of work.</p> <p>Call on their professional experience to identify needed competences and barriers.</p> <p>Discuss and demonstrate their own skills to students.</p>
<p><b>School-based services and regular projects:</b> for example, school health services, school meal programmes and WASH programmes.</p> <p>Other relevant ministries: for example, the ministry of health, the ministry of agriculture and/or food security, community development, etc.</p>	<p>Discuss how their programmes can interact with and reinforce the education programme, for example, through information, education and communication (IEC), lessons, messages and field trips.</p> <p>Help with data and technical information and IEC materials.</p> <p>Consult/survey their own clientele (e.g. farmers, parents and communities) and help with surveys of food practices/attitudes.</p> <p>Describe previous interventions and advise on how to achieve impact on practices.</p> <p>Advise on improving the school environment and facilities.</p> <p>Suggest ways to link school and community actions.</p>
<p><b>Nutrition institutes, professional associations and universities.</b></p>	<p>Undertake formative research and situation analysis, share existing research findings and conduct literature reviews.</p> <p>Promote and advocate for SFNE and act as pressure groups.</p> <p>Provide data (nutrition issues, history of interventions, etc.).</p> <p>Establish / online platforms for teachers, parents and students.</p> <p>Produce learning resources and information sheets.</p>
<p><b>NGOs working in the community:</b> for example, in agriculture, fisheries, forestry, health, livelihoods and social programmes.</p> <p>Other organizations: donors and aid agencies (including those already active in the field) and civil society organizations.</p>	<p>Discuss how their programmes can interact with and reinforce education programmes (e.g. IEC, lessons, messages and field trips).</p> <p>Contribute their own relevant experience.</p> <p>Test or pilot materials and activities in their own projects.</p> <p>Discuss funding possibilities.</p> <p>Set criteria for effective SFNE to guide funding proposals.</p> <p>Promote and advocate for SFNE.</p>
<p><b>Local food producers, processors, retailers and vendors.</b></p>	<p>Conduct demonstrations for schools.</p> <p>Provide information and data.</p> <p>Contribute to improving school food environments.</p>

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THEME


1

# School-based food and nutrition education for sustainable development

“Food education is absolutely vital in the fight against diet-related disease and integral to young people leading healthy and happy lives.”

-Jamie Oliver

# Developing a transformative vision for school-based food and nutrition education in low- and middle-income countries



**Comprehension  
of the situation  
& identification  
of needs**



### Target audience

This theme is targeted at institutions, organizations and stakeholders that have a mandate to work with SFNE and/or those that aim to advocate for its need at both the national level (mainly ministries of education, health and agriculture, as well as policy advisors, academia and civil society) and at the international level (non-governmental organizations [NGOs], United Nations agencies and other international organizations).

Theme 1 is the first of eight in this white paper. It presents a broad overview of the evidence for school-based food and nutrition education (SFNE), and proposes a transformative vision for its role in the context of the 2030 Agenda for Sustainable Development.

## BACKGROUND

Addressing the challenges of poor diets and malnutrition is central to improving individual development and well-being, enhancing the overall socio-economic growth of families and communities, and achieving the Sustainable Development Goals (SDGs). In this context, increasing investment in nutrition such that children worldwide may reach their full development potential has become an economic, as well as a moral imperative (GLOPAN, 2015; FAO *et al.*, 2019).

In low- and middle-income countries (LMICs) however, health and nutrition investments that target middle childhood<sup>2</sup> and adolescence are still scarce in comparison to those that target the first 1000 days. The same imbalance holds true for globally agreed health and nutrition targets<sup>3</sup>, service coverage, monitoring and research (UN General Assembly, 2015; Bundy *et al.*, 2017).

This disparity represents a missed opportunity to scale up and institutionalize successful interventions to prevent or address malnutrition during the critical stages that follow the first years of life. Moreover, it is counterproductive to sustaining the progress made with early childhood<sup>4</sup> interventions. Most importantly, it hinders the realization of a life cycle approach to good nutrition and well-being. Fortunately, these trends have recently started to change (see Box 1.1).

Because education remains the main priority for public spending on schoolchildren and adolescents, it is imperative to promote cost-effective interventions that optimize the synergies between education, nutrition, health and food systems. In fact, the potential for multilevel outcomes in these areas of development makes a strong case for increasing investment in multicomponent school-based interventions such as those promoted through FAO's School Food and Nutrition Framework (see Box 2 in the Introduction).

<sup>2</sup> The period from 6-12 years of life.

<sup>3</sup> SDG Target 2.2 mentions addressing the nutritional needs of adolescent girls, but there is no indicator to measure any kind of progress in this area. Similarly, the Global Targets of the World Health Organization (WHO) focus mostly on children under five (except with regard to anaemia).

<sup>4</sup> The period from 0-5 years of life.

### Box 1.1. Focus on adolescents!

Adolescents are vulnerable to all forms of malnutrition, and addressing their nutrition needs, particularly those of girls, is key to achieving the SDGs.

Worldwide recognition of the need to advocate for and invest in adolescent nutrition has been increasing. This has sprung partly from global agendas and movements, and from the commitment of several international organizations, not only to dedicate resources and drive research in improving nutrition during adolescence, but also to actively engage adolescents in their own development processes (SPRING, 2018).





But in spite of efforts at the international level and commendable progress in some countries, these synergies are seldom fully exploited in practice. SFNE, which is perhaps one of the most explicit opportunities to meaningfully link food, nutrition and education, has had a low profile in terms of both investment and evidence generation, and has not been adequately integrated into interventions<sup>5</sup> like school feeding and micronutrient supplementation (Bundy *et al.*, 2017; FAO, 2019a).

The section below summarizes the most relevant evidence supporting long-term investments in SFNE. Where possible, the research results are focused on LMICs.

## Improvement in food and nutrition outcomes

Results are presented at two levels of assessment: medium-term impact on food practices<sup>6</sup>/behaviours and diet, and long-term impact on nutrition status. No reviews reported on short-term outcomes. The following points reflect certain caveats to bear in mind when considering the research findings presented below:

- Most of the systematic reviews have largely focused on the impact of SFNE interventions on obesity-related outcomes.
- Measuring changes in nutritional status is not an appropriate method to evaluate short-term educational interventions (Dollahite, Fitch and Carroll, 2016).
- Depending exclusively on randomized control trials to identify appropriate evidence might not be suitable for all SFNE interventions (Dollahite, Fitch and Carroll, 2016).
- Some specific sections feature research from high-income countries (HICs), due to the lack of evidence elsewhere. Although the interventions cannot always be replicated in LMICs, they remain proof that well-designed, well-contextualized SFNE can have impact.
- A key factor of success is the learning model or educational approach, yet most research studies give little information about it. Bearing this in mind, the specific determinants of success are highlighted where possible.

A systematic review of randomized control trials in 12 countries (Silveira *et al.*, 2011) showed that high-quality SFNE interventions increased the consumption of fruits and vegetables among children and adolescents and reduced the prevalence of overweight and obesity. Characteristics of the interventions that demonstrated effectiveness included a duration longer than one year, integration into regular school activities, involvement of parents, introduction of SFNE into the regular curriculum and provision of fruits and vegetables by school food services.

A different review of 11 randomized controlled trials in high-income countries showed that multistrategy food and nutrition education interventions appear to have statistically

<sup>5</sup>This means going beyond the delivery of isolated health, nutrition and food interventions and providing a package of integrated and mutually reinforcing school-based strategies that will lead to sustainable nutrition and health outcomes. The most common examples include healthy school meals (procured in part from local smallholders), nutrition education, healthy food policies at both national and school level, deworming, and water, sanitation and hygiene (WASH) programmes.

<sup>6</sup>In this white paper, food practices refer to all practices involved in the personal and domestic production, selection, acquisition, preparation, conservation, consumption, sharing, storage and disposal of food. Examples include shopping, cooking, gardening, food hygiene and responding to marketing. For a full definition, see the Glossary.

significant impacts on anthropometric measures and dietary intake of adolescents when they are behaviourally focused, inclusive of theory-based learning strategies, delivered by school staff and teachers, and feature parental involvement (Meiklejohn, Ryam and Palermo, 2016).

A meta-analysis of eight randomized controlled trials concluded that SFNE is effective in (modestly) reducing children's and adolescents' body mass index (BMI). This effect becomes even more noteworthy when considering only the high-quality randomized control trials that were carried out for more than one year (Silveira *et al.*, 2013). A review of reviews highlighted intervention duration and intensity as crucial determinants of effectiveness (Amini *et al.*, 2015).

A systematic review of 22 school-based interventions (controlled trials with or without randomization) from LMICs found that those that were effective in enacting changes in food practices and nutritional status were of a multicomponent nature, with a strong education component facilitated by teachers and with additional physical activity sessions or integrated classes about healthy foods, nutrition, or physical activity. Other elements of success included the involvement of parents and a duration of more than one year (Verstraeten *et al.*, 2012). A separate global systematic review of randomized controlled trials and quasi experimental studies, also found that school-based interventions with combined diet (mostly SFNE), physical activity and home outreach components were effective in preventing overweight (Bleich *et al.*, 2017).

In a scoping review of SFNE design, implementation and evaluation practices in LMICs carried out by FAO, 28 interventions reported statistically significant improvements for their intended outcomes (versus 12 that were not able to achieve a significant change on expected outcomes). Such outcomes were mostly related to dietary practices (including: increased consumption of fruits, vegetables and breakfast; reduced consumption of foods high in fat, salt and sugar); and determinants of behaviour. From those that reported no significant changes, authors emphasized on the need to use more reliable instruments, increase intervention length and improve overall design (including parent involvement and complementary food environment components) (FAO, forthcoming, b).

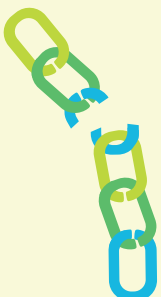
### Box 1.2. Common misconceptions

The media and the public are quick to leap to negative conclusions about the value of SFNE, often on the basis of thin evidence.

For example, the WAVES study in the UK found no impact on BMI in a school-based programme (Adab *et al.*, 2017). A major news outlet reported these results with the headline, "Schools are not the answer to childhood obesity epidemic, study shows" (Boseley, 2018).

However, when looking closely at the approach, various inferences can be done. The food and nutrition education component consisted of three cooking workshops, two half-day sessions (six weeks apart), a song and sporadic family challenges, spread over a year. The authors themselves noted that "the balance of components, intensity, and behaviour change strategies used to deliver the intervention may have contributed to the absence of evidence of effect on the primary outcomes in WAVES and other trials".

When such programmes fail to achieve impact, people may claim that education "doesn't work". Instead they should ask, what doesn't work? What does work? And what do we mean by work?





The quality of the intervention design is key to success (see Theme 5 and Theme 6). In the reviews cited here, intervention time, experiential learning, quality of curriculum integration, and involvement of parents all featured strongly as determinants of effectiveness. Poor outcomes in some studies are often attributed to the quality of the intervention design (see example in Box 1.2) in terms of the overarching model, learning strategies, intensity and duration; fidelity of implementation and the lack of coherent environmental and policy interventions (Ramos, Santos and Reis, 2013; Amini *et al.*, 2015).

## Food environment interventions

SFNE interventions undertaken in isolation are unlikely to achieve sustained change (see Theme 2) and work best when part of multicomponent programmes. The same holds true for isolated food environment interventions. A recent meta-analysis and systematic review highlighted that school food environment policies can be effective in increasing consumption of fruits and reducing total sodium and fat intake, but when evaluating for sustainability, authors concluded that such results are “difficult to sustain if school food environment policies are cancelled” (Micha *et al.*, 2018).

A systematic review of controlled trials and quasi-experimental studies in high-income countries, concluded that there is consistent evidence that combining SFNE with positive changes to the school food environment is more effective for improving dietary intake than making changes to the food environment alone (EAL, 2012). This has been highlighted by other authors when discussing school food environment policies (Hawkes *et al.*, 2015). **Education–environment interactions of this kind are consistently found to produce a great deal more than the sum of their parts** (see Theme 2). In this context, there has been an increase in the design and implementation of SFNE as a complement to supply-side efforts and to food environment policies and programmes (Moore, de Silva-Sanigorski and Moore, 2013). For example, a diet and physical activity promotion strategy implemented in Mexico capitalized on these complementarities, finding a modest but significant effect in maintaining BMI in fifth-graders (Shamah Levy *et al.*, 2012). A more recent study in Burkina Faso evaluated the impact of the Nutrition-Friendly School Initiative, which is based on the accreditation of schools that meet conditions related to an enabling environment, a curriculum that integrates nutrition and health, the provision of nutrition and health services and enhanced awareness among school staff. The study found that the Initiative had a positive effect on the prevalence of anaemia and underweight among schoolchildren over a five-year period (Elkhouri *et al.*, 2019).

## School meal programmes

School meal programmes are one of the few non-education interventions in schools to receive considerable funding and to enjoy widespread adoption at a global level (WFP, 2013; Bundy *et al.*, 2017). However, food supplied without linked food and nutrition education does not automatically generate student or parent demand for healthier meals (either in school or at home) or healthier independent food practices (GLOPAN, 2015). In this sense, linking SFNE with school meal programmes has been recommended by international organizations and researchers, as such integrated approaches can influence both healthy food supply and demand, even if more evidence is still needed on how best to do so. More research is likewise needed in LMICs to understand the connection between school meals and broader food consumption practices at home.

Several possible strategies have been proposed through which SFNE might directly support the nutrition outcomes of school meal programmes, for example:

- enhancing the acceptance and adequate consumption of the meals – mostly by developing expectations and increasing their perceived value (IOM, 2010; Cervato-Mancuso *et al.*, 2013; Torres and Benn, 2017; Tarossi, Silva and Bandoni, 2018);
- enabling and supporting healthy diet objectives – by improving food practices and creating demand for more nutritious, higher-quality meals in school and at home (Sidaner, Balaban and Burlandy, 2013; GLOPAN, 2015; Tarossi, Silva and Bandoni, 2018);
- enabling the use of meals and meal times as (both planned and informal) learning opportunities (Benn and Carlsson, 2014; GLOPAN, 2015; Torres and Benn, 2017);
- promoting coherence between the meals provided and what is taught/learned in the classroom (Pérez-Rodrigo and Aranceta, 2003; Nelson and Breda, 2013);
- supporting the planning of meals according to nutritional needs and socio-cultural context – by developing the capacities of food service staff – (Pérez-Rodrigo and Aranceta, 2003);
- promoting the active involvement of students, families and food service staff (Pérez-Rodrigo and Aranceta, 2003); and
- promoting social justice and emphasizing the (often ignored) socio-cultural role of food (Ramos, Santos and Reis, 2013; Torres, 2017).

There remains however, a lack of evidence on the differential contributions of each of these strategies. Moreover, they depend particularly on contextual factors such as having choice in the foods provided, the perceptions around meals as part of the education paradigm, the degree of awareness and involvement of parents and school meal service providers, and acceptability to children. It is therefore a promising area for research.

## Improvements in academic outcomes

Existing evidence supports the association between improved nutrition, and educational achievement (Burrows *et al.*, 2017; Asigbee, Whitney and Peterson, 2018). Researchers and policy advisors have argued that the profile and value of SFNE within the education sector would benefit from demonstrating improvements in student academic performance<sup>7</sup> or so-called “school-valued” outcomes (Shilts *et al.*, 2009; Chan, Knight and Nicholson, 2017; FAO, 2019a), yet very few studies have explored the direct impact of SFNE interventions on such outcomes.

Two exceptions include a small pilot study and an empirical review, both focused on the United States of America. The pilot study found that a nutrition education intervention built on the Social Cognitive Theory and comprised of three components (classroom curriculum, workbook and web-based diet assessment), improved the academic performance of sixth-grade students, as measured by the achievement of specific mathematics and English education standards (Shilts *et al.*, 2009).

<sup>7</sup> In addition to the primary diet and nutrition-related outcomes.





The empirical review of 48 studies, which looked into the academic outcomes of garden-based learning interventions<sup>8</sup>, showed “a preponderance of positive impacts on direct academic outcomes with the highest positive impact for science followed by maths and language. Indirect academic outcomes were also measured with social development surfacing most frequently and positively” (Dilafroz, Williams and Dixon, 2013). The outcomes were associated in part to “hands-on experiences that made classroom learning relevant”. However, the authors cited the need for more rigour in the research models used.

## Cost-effectiveness

To date, cost-effectiveness studies for SFNE have been limited in comparison to other interventions, due to the difficulties of estimating long-term effects, the complexity of assumptions, the uncertainties in translating short-term outcomes into medium- and long-term nutrition outcomes (Gortmaker *et al.*, 2015), and the challenges of extrapolating small-scale study costs as programmes scale up. Where studies have been done, they usually assess short-term interventions. Costs are often higher in context-specific interventions than in standardized and institutionalized programmes.

In the United States of America, the benefit–cost ratios<sup>9</sup> for a nutrition education intervention in California ranged from 3.67 to 1.00, to 8.34 to 1.00, meaning that for every dollar spent on nutrition education, between 3.67 and 8.34 dollars were saved in health care costs (Joy, Pradhan and Goldman, 2006).

Specifically for obesity prevention, an assessment of a nutrition education curriculum for fifth-grade students in New York (the “Food, Health & Choices” Programme<sup>10</sup>) was predicted to be cost-effective at USD 275/QALY (quality-adjusted life year), with a 95 percent confidence interval. Modelled obesity reductions (at fifth grade) as a result of the intervention were estimated to be able to save 1 599 QALYs and avert USD 8 098 600 in direct medical costs over the lifespan (Graziose *et al.*, 2017).

Another study in China found that a school-based intervention featuring SFNE and physical activity was cost-effective in improving BMI at USD 120.30 (where cost-effective ratio equals cost per capita divided by reduction in BMI) (Meng *et al.*, 2013). And an SFNE intervention in Spain was found to be cost-effective in decreasing BMI by one unit, at EUR 44.68 (Conesa *et al.*, 2018). In the last two studies, the accounting for long-term effects was recommended by the authors.

<sup>8</sup> The studies varied in theme and function, ranging from a focus on nutrition, to agriculture training.

<sup>9</sup> Cost-effectiveness and cost–benefit studies are not always comparable, due to the assumptions made and the lack of enough information to allow for reinterpreting findings. These estimates are presented as examples.

<sup>10</sup> The 24-lesson curriculum delivered over one school year focused on six behaviours: reducing consumption of sugar-sweetened beverages; reducing consumption of fast food; reducing consumption of processed, packaged snacks; reducing screen time; increasing physical activity and increasing consumption of fruits and vegetables.

## Conclusions

There is key evidence to demonstrate that **well-designed and well implemented SFNE can improve food practices and nutrition outcomes, especially when part of multicomponent programmes**. On the other hand, more and better quality research is still needed, particularly on the long-term and broader impacts of SFNE, including academic outcomes, as well as on the most cost-effective models and the most effective synergies with other components/interventions, in particular for LMICs (FAO, forthcoming, b).

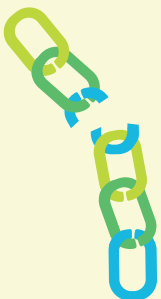
At the same time, it is clear that **not all SFNE is equal, and that further research is necessary on the most effective learning models and intervention approaches**. Efficacy depends on design, programme components, fidelity and flexibility of implementation. Some programme components are known to be essential for success, for example, specific behaviour objectives, intervention intensity and duration, meaningful parental involvement, environmental supports, age appropriateness, experiential learning and integration within the curriculum (Murimi *et al.*, 2018). Unfortunately, as mentioned above, the majority of studies and evaluations are not specific about the methodologies, modalities, learning strategies and combinations used. Conversely, many interventions continue to be based on the knowledge transmission paradigm (see Box 1.3) despite consolidated evidence of its inadequacy.

The lack of programmatic guidance on the design of effective SFNE in LMICs is notable. This white paper aims to start filling this gap.

### Box 1.3. Common misconceptions

Nutrition education has often been misunderstood and practiced as the simple transmission of nutrition information, in the belief that “knowing equals doing” – namely, that knowledge alone is sufficient to change behaviour. However, research contradicts this paradigm (Contento, Dew Manning and Shannon, 1992).

To have a greater chance of changing or improving dietary behaviours, interventions need to combine a mental (knowledge) focus, a behavioural focus and a practical focus for developing skills, good practices and habits (see Box 1.4).



# WHAT IS NEEDED?

The preceding section provided a broad overview of the kind of SFNE that has proven to be effective at improving diet, nutrition and other outcomes. But before exploring the best approaches to achieve such outcomes (in other words, how best to get there?), it is reasonable to first consider and clarify the broader goals to be pursued (in other words, where do we want to go?).

As emphasized in the Introduction, the complexity of the current global nutrition and food systems situation and the mounting and interrelated development challenges, together underscore the need for a more holistic vision and model for SFNE. The focus needs to go beyond improving individual diets, to acknowledging and addressing many other dimensions of food as integral to human well-being and planetary health (Ramos, Santos and Reis, 2013; Torres, 2017; FAO, 2019a).

Attempts to provide a common goal for SFNE have been increasing. Among these, the definition of the term food literacy effectively sums up the everyday practicalities associated with navigating the food system and using it to ensure a regular food intake that is consistent with nutrition recommendations. However, it has been noted that this concept should be expanded to capture enjoyment, environmental sustainability, culture and proactive responses to the food system (FAO, 2019a).

As such, the holistic vision adopted in this white paper entails a world where **SFNE contributes meaningfully not only to individual capacities but also to sustainable development as a whole – supporting educational, environmental and economic goals, as well as those related to food systems, health, gender and social justice<sup>11</sup>**. This is the “north star” for all SFNE and can serve for advocacy at all levels from policy makers to practitioners and parents.

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## Where do we want to go? The need for holistic goals

Translating the vision into long-term educational aims, the goal of SFNE can therefore be seen as:

**Food competent, reactive and proactive children, adolescents and families that contribute to a population with health-promoting and sustainable food practices and outlooks.<sup>12</sup>**

Below are some examples to illustrate broad goals where SFNE can play a key role:

- Nutrition and health: Children and adolescents develop long-lasting food and nutrition practices and habits that support a healthy life, their own overall well-being and that of their future families.

<sup>11</sup> Of course, this vision is aspirational and does not depend solely on SFNE. As with all vision statements, it serves as a picture of what SFNE ultimately strives for.

<sup>12</sup> The term “outlooks” covers the mental, affective and psychosocial aspects of food practices that are explored in formative research and behaviour change theory, and that represent a critical dimension of SFNE. Examples include ideas of good diet, perceptions of food practices and self-efficacy in making and maintaining changes. For a full definition, see the Glossary.

- Food systems: Children and adolescents become responsible actors (consumers, producers, processors, policy makers, etc.) who understand the evolving relationships between food supply and demand, apply critical thinking and are empowered to enact positive changes in their own food system/environment.
- Enjoyment: Children and their families are invested in, curious about and enjoy daily food-related activities.
- Social justice: The future generation challenges social disparities and promotes fair and respectful treatment of all those involved in food production, preparation and consumption processes.

### A stronger focus on human rights

The holistic vision of SFNE implies a human rights lens, focusing particularly on the right to food. Beyond regular and adequate access to healthy food, children and adolescents also require easy access to unbiased information on food and nutrition, and protection from pervasive and harmful commercially driven influences<sup>13</sup> (FAO, 2005).

Schools can play an important role in supporting the right to food, most commonly by guaranteeing access to adequate food for the most vulnerable children (FAO, n.d). But an equally important and seldom implemented dimension involves a child's right to learning opportunities and tools for developing basic food competences (see Theme 3) that can positively impact human and environmental health, regardless of age, grade or situation. This view assigns value not only to the results of education, but by implication to the learning processes that lead to these results.

Every country has a stake in protecting children's rights to nurture healthy, accomplished and productive citizens. Developing basic food competences through the education system is an inherent part of this, and should not be overlooked by advocacy, policy making and fundraising initiatives.

## How best to get there? The need for gradual transformation

Achieving these holistic goals for SFNE will essentially require a gradual transformation of the school system and of current models. Broadly, this means conducting some form of situation and needs assessments, agreeing on needs-based learning targets (food competences) that are wide in scope, establishing enabling policy frameworks, adopting effective learning models implemented through a coherent curriculum and programmes, and developing the capacities of all those involved (see "SFNE transformation: an interconnected process" in the Introduction).

### Identifying, understanding and prioritizing needs

Since SFNE aims to respond to needs, the process of introducing or transforming SFNE must be well-informed and grounded in context. A solid understanding of the food, nutrition, health and education situation and issues that affect schoolchildren and adolescents at national and subnational levels is therefore fundamental.

<sup>13</sup> The right to food includes the right to education and awareness on food and nutrition security, healthy diets and eating habits as noted in Guidelines 10 and 11 of the Voluntary guidelines to support the progressive realization of the right to adequate food in the context of national food security (FAO, 2005). For a full definition, see the Glossary.



These issues may involve specific public health and/or nutrition-related problems in target groups, such as the increase in school-age obesity or the continuing prevalence of anaemia in adolescent girls. More broadly, issues may involve situations and trends, which call for pre-emptive educational and environmental responses. Examples include the excessive consumption of sugar sweetened beverages, the lack of diversity in daily diets, the availability and quality of children's meals (both at school and at home), the lack of safe drinking water, excessive food waste in schools and the special dietary needs of adolescents.

From here, a learning needs analysis can determine which of these issues could be improved if optimal food and nutrition practices were widespread – that is, which problems are most sensitive to educational influence (see Theme 3).

Other key information stems from an analysis of existing policy and programming priorities, and the capacity, outlook and readiness of the school system with regard to the profile and role of SFNE (see Theme 7).

The findings and insights that result from such assessments should be owned and shared by all key players and stakeholders in SFNE, including parents and students, so that the whole school system is both informed by these needs and better unified.

### Agreeing on the learning targets and strategies needed for effective school-based food and nutrition education

The renewed goals will have little chance of being achieved without the development of a wide range of context- and needs-based functional food competences in children and adolescents (for example, from taking a critical attitude to where food comes from, to meal planning that is conscious of both nutrition and food waste).

Furthermore, developing children's capacities to change, adapt to change and promote change is key to resilience in the face of evolving food environments, and hence central to the SFNE renewal process. Together, these competences will then be protective, performative and supportive of the foundation for social change (see Theme 3).

#### Box 1.4. Essential elements in effective school-based food and nutrition education models

These include:

- needs-based learning with practical, real-life aims;
- building on existing experience and expertise;
- plenty of observation and discussion;
- action and practice in real-life settings;
- interactions with physical and social environments in all learning activities (see Theme 2);
- consolidation and maintenance of practices;
- ownership of the process;
- family and community support and involvement; and
- enabling food environments (see Theme 2).

Activities that are particularly effective are those that stimulate observation, discussion, actions and practice in real-life settings where most food learning takes place; interaction with the food environment at school and at home as well as with the family and the community; and consolidation and maintenance of practices and outlooks (Kwasnicka *et al.*, 2016). This relatively new learning model for food and nutrition education has been used with some success, and is now gaining attention and recognition for wider application (SNEB, 2016).

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The feasibility of achieving these competences will certainly differ according to the type of programme or intervention, the learning model, and whether SFNE is implemented on its own or as complementary to other interventions. For instance, one-off, short-term extracurricular interventions will not have the same scope for change as SFNE that is integrated throughout the national curriculum for all age groups (see “Aims and target audience” and the Background in the Introduction). However, an important element of the process of transformation is that all efforts involving SFNE can contribute meaningfully to agreed, endorsed and widely recognized food competences.

Some elements that characterize an effective model for developing and fostering food competences of this kind are listed in Box 1.4. They are more fully explored in Themes 2–6.

Throughout the white paper consistent attention is also focused on how these processes and features can come to be well known and easily handled by all stakeholders, in order to enable and support the SFNE paradigm shift.

### Enabling policy frameworks

The process of transformation needs a policy framework that will enable this kind of SFNE (see Box 1.4) to reach all schoolchildren and adolescents.

Policies demonstrate government commitment and pave the way for programmes and strategies for action. Wherever possible, they should be backed by institutional support and smart<sup>14</sup>, consistent and coherent investments<sup>15</sup>. Education and related policy and programming should also cover the processes of developing a national, competence-based SFNE curriculum, designing the learning programme(s) (courses, activities and materials), developing capacities of the system and conducting both process and outcome evaluation, which are extensively explored in the subsequent themes of this white paper.

## Summary of needs

In summary, there is a need for establishing a vision for SFNE that responds to modern sustainable development challenges, reflects the overall ecology of food and food practices, and guides the setting of shared goals that stakeholders (from various sectors and at all levels) can recognize and endorse.

This requires a gradual but holistic transformation of SFNE and the school system in which it is usually embedded, particularly in terms of identifying learning needs and an effective learning model that can actually work for shared SFNE goals.

Finally, there is also a need for developing or strengthening policy frameworks that permit long-term commitment in terms of resources, and ensuring that SFNE programmes are institutionalized and able to meet minimum standards (in both delivery and processes) for achieving the agreed goals.

<sup>14</sup> Smart investments are those that discriminate between ineffective models (a main concern of this white paper), and ensure that interventions have the potential to be integrated systemically (considering the different sectors involved and regarding policy and accountability). At the same time, interventions should strive for coherence with the education system and with existing food and nutrition policy and environmental initiatives.

<sup>15</sup> In this white paper, “investments” refer to financial, human and time resources.

## CHALLENGES

Significant challenges often hinder the implementation of SFNE in LMICs, and can jeopardize the adoption of the holistic SFNE goals, corresponding strategies and policy frameworks. These need to be identified, understood and addressed. The challenges presented throughout this white paper aim to be specific to the issues and scope of each theme, but also recognize (whether implicitly or explicitly) the general challenges of the education and food systems and the broader socio-economic and political environments.

### Concept, value and scope: lack of awareness and consensus

As already noted (see Background), the low profile of SFNE in LMICs is due in part to the lack of consensus on the concept, goals, value and nature of effective SFNE, and the associated shortage of evidence in LMICs (see Supplement 1. Summary of SFNE challenges and recommendations).

At the same time, professional communities concerned with food and nutrition may not have an agreed model of SFNE: its aims, how to achieve it, how it works and what it looks like in practice. The media and the public may also lack awareness on the value of an action-oriented SFNE model that moves beyond targeted improvements in personal diet.

In particular, SFNE is not always seen as essential to the education sector's priorities nor to the mandates of schools. A strong emphasis on academic learning and the corresponding institutional structure, rather than on citizenship and life skills, limits the integration of SFNE into the school system (through the curriculum, school routines, meal times, etc.), and hence its effectiveness.

### Low policy priority

SFNE tends to have a low profile in both national and local policy contexts (see example in Box 1.5). Several regional and global assessments conducted by FAO have shed light on the current status of SFNE in the national policies of LMICs (see Box 1.6). Findings suggest that even though policies are often reported, they tend to be fragmented or lacking in priority, and implementation is often limited and irregular. Leadership in SFNE is also still incipient.

#### Box 1.5. Lack of policy support for school-based food and nutrition education

In South Africa, a study on teachers' perceptions indicated that school policy support for SFNE was limited, and that this undermined its ability to influence the healthy eating behaviours of learners (Kupolati, Gericke and MacIntyre, 2015).

In terms of challenges related to curricula (see Theme 4), most current school policies in LMICs prioritize examined, core subjects such as maths and science (FAO, 2007; forthcoming, a), as evidenced by time allocation. A common argument that is advanced is that the curriculum is overloaded. And even when it is part of the curriculum, SFNE often risks dilution because it is integrated across all subjects.

### Box 1.6. FAO school-based food and nutrition education assessments

A global survey (of 30 countries from different regions) reports that most countries have awareness-raising initiatives on the need for SFNE, but that they are irregular or only directed to specific sectors. Similarly, SFNE is commonly included in national policies or strategies, but is covered in a very limited way or with obsolete recommendations for its effective design, implementation and evaluation. Regarding reported implementation, SFNE policy recommendations are implemented partially or not at all, and vary considerably from school to school. As for the budget allocated to SFNE, the assigned resources are reported to be insufficient to meet the needs (FAO, forthcoming, a).

A regional assessment in Africa has further shown that even when countries have policies promoting SFNE (29 out of 41 countries surveyed), exposure time is very limited and implementation is irregular. In contrast, a regional study from Latin America (a region at the vanguard of SFNE), found that the implementation of many SFNE actions has not been fully supported by policy and regulatory frameworks (FAO, ABC and FNDE, 2018; FAO and CELAC, 2018).

An older study of East Asia and the Pacific region found that SFNE programmes were small-scale, often implemented as pilot projects, and prioritized the transfer of basic nutrition knowledge over the promotion of active learning and the development of healthy attitudes, life skills and practices. In general, food and nutrition education was not systematically integrated into school curricula (FAO, 2007).

### Collaboration and change management: competing priorities and fragmentation

Several sectors and entities have an interest in working within schools, which can create competition for resources (funds, contact hours, teacher time, use of infrastructure, etc.). These sectors often work in silos or only with the education sector, without considering complementary approaches and sectors/stakeholders.

Even within the field of food and nutrition, different initiatives can suffer from isolation, for instance, when scattered and uncoordinated interventions differ in length, methods, focus and philosophy, or when changes sequestered in one part of the system (such as policy, curriculum or teacher education) are not backed by the system as a whole. Such fragmented interventions do not build on existing efforts, fill gaps, or learn from each other's lessons. Instead they create additional strains on human resources and on the system, and end up diluting resources without significant results.

### Evidence and assessment: lack of a clear picture and contextual evidence

Even with the growing recognition of the need for national nutrition situation analyses, there is little focus on the local needs and behavioural determinants of food and nutrition issues or even on dietary patterns and other food-related behaviours, all of which are crucial for identifying key SFNE learning needs and targets. There is also difficulty in accessing / making use of existing information, as it is often unpublished, unpublicized, difficult to access and/or dispersed.





There is still a large information/data gap in understanding what goes on inside schools with regard to SFNE. Even in high-income countries, there is little regular feedback on how SFNE policies are actually implemented (if at all), for example in terms of hours of contact, integration in the curriculum, learning strategies and activities, teacher training, practical linkages with the food environment and meals, and variation between schools.

Without clear and consistent information (on the priority issues, on what is being done, what works and what hinders success), stakeholders at all levels have difficulty in taking corrective measures, making reforms or introducing new SFNE policy initiatives (Page and Hart, 2017).

Furthermore, formal research studies and contextualized high-quality evidence from LMICs are still limited (see Background), particularly regarding the long-term outcomes of SFNE (including potential academic outcomes<sup>16</sup>), implementation approaches, cost-effectiveness and comparison across different learning models. Another important research gap concerns the relative effect of SFNE when integrated into school meal programmes and other interventions.

Even in terms of existing evidence, there are challenges: much of it is often not known to practitioners, critically interpreted or tapped into. And findings or observations are sometimes used to discredit the effectiveness of SFNE, without recognizing unrealistic impact pathways or obvious flaws in design (see Box 1.2).

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<sup>16</sup> With the new vision and in support of wider integration of SFNE into school systems, a proposed area for exploration involves the potential effects of SFNE on academic performance (one of the key priorities of the education sector).

## RECOMMENDATIONS

The recommendations that follow are meant to address and support “what is needed” for SFNE in LMICs, and to overcome some of the main challenges as previously described. They are targeted at the institutions and stakeholders that have a mandate to work with SFNE and/or those that aim to advocate for SFNE at both the national level (mainly with ministries of education, health and agriculture, as well as policy advisors, academia and civil society) and the international level (e.g. United Nations agencies and other international organizations). Key outputs are underlined.

### Establish the concept of school-based food and nutrition education: develop the vision and reach consensus

- Start with a small team or even a SFNE champion responsible for organizing and drafting the outputs described below (concept note or manifesto).
- Set up a consultative network/group to support an informal analysis of SFNE concepts and learning models used in the professional community.
- Convene a (small-scale) multistakeholder meeting/workshop to discuss, develop and reach consensus regarding the new vision and main goals of SFNE in the country, according to main needs of each sector/entity involved (for example, education, health, agriculture, community development and social protection) and building on existing understanding and awareness. Alternatively, build upon existing multisectoral platforms or national committees by inserting discussions on the vision and goals for SFNE.
- Disseminate a simple concept note and/or manifesto outlining the concept, value and principles of SFNE, in line with the agreed vision, to a broadened stakeholder group.
- Aim to involve the professional network and stakeholders in advocacy activities with their own constituencies (see next section “Raise the profile of SFNE: conduct advocacy at different levels”).

### Gather and use evidence and data: carry out school-based food and nutrition education assessments and promote research

As a general approach, it is recommended to ally with research institutions, academia, the practitioner community and other relevant organizations to identify gaps in the knowledge base and gather data on the situation on the ground.

#### Assessments

Collect information in the areas below from existing sources and relevant assessments and make use of it to set priorities. Identify expert sources and authorial teams who can recommend and present key documents and decide how they will be used, publicized and accessed. Assessments can focus on:

- The food and nutrition situation: This includes food and nutrition issues (focusing on disaggregated data) and trends, potential causes of malnutrition, the food security situation, food environment characteristics, children’s and adolescents’ diets and food practices, and media/public awareness on food and nutrition issues. There are various international entities that develop country nutrition snapshots/profiles which can be useful.

- The education situation and school system characteristics: This includes key education issues, the role of nutrition in the national education system, school environments, infrastructure and resources (including equipment, learning materials and internet access), as well as class sizes, attendance, average years at school, gender balance and gender dynamics.
- The policy and programmatic landscape (focusing on relevance for SFNE and considering the political economy<sup>17</sup>): This includes existing health, nutrition, food security and school policies, institutional structures and arrangements, public resources and funding sources, and food and nutrition programmes and interventions (both ongoing and past).

If some areas are not well covered, consider a local situation analysis that can later be expanded to other regions, or a national rapid assessment.<sup>18</sup> Published evidence from similar contexts can also be used as a basis for discussion. At the minimum, draw up an ongoing need-to-know list which can inspire research (see below).

## Research

As demonstrated throughout the themes of this white paper, the research agenda for SFNE is wide. Key actions with regard to this theme are as follows:

- Identify priority evidence and data gaps in consultation with the professional network.
- Promote research to address priority evidence gaps through strategic collaboration with academia and research institutes (see the research gaps put forward in Themes 2-8).
- (If possible) Establish a functional and simple online database to assemble existing evidence and package its content in various forms to cater to different audiences and to support advocacy actions in diverse contexts.

## Raise the profile: conduct advocacy at different levels

There is usually a need for advocacy on more effective SFNE, in line with the new vision, at various levels. This is particularly important for SFNE to be purposefully integrated into (and not merely mentioned in) relevant policies and legislation and, most importantly, to ensure that adequate resources are allocated to its implementation and long-term institutionalization.

This can be achieved through policy briefings, policy dialogues, lobbying, campaigning, petitions and presentations at professional meetings. The goal is to build the activist base and spread the load among professionals. Key recommendations follow:

- Create advocacy documents and multimedia outputs that use real-life cases and success stories to showcase the meaning of effective SFNE, its widened scope and its impact. Circulate and discuss these with the professional community. Bear in mind the need for advocacy materials that can be adapted for all audiences and levels (for example across professional working groups, within local education offices and schools, and with parents).
- Consider how food and nutrition concerns and objectives relate to overall legal

<sup>17</sup> The political economy refers to the social, economic, cultural and political factors that structure, sustain and transform constellations of public and private actors, along with their interests and power relations, over time.

<sup>18</sup> Ideally, situation assessments should not be limited to one point in time; if possible, they should be carried out periodically.

frameworks, mandates and priorities, as well as core policies and routines, curriculum models and staffing patterns in education systems.

- When drafting advocacy documents, consider:
  - including demystification and myth deconstruction;
  - using both quantitative and qualitative evidence to construct a strong argument that also considers opposing evidence and views on SFNE; and
  - ensuring consistent and clear messages about the role and type of SFNE needed.
- Promote good learning practices that work in low-income contexts and that can be implemented both gradually and systematically.
- Tailor messages to ensure that they are reaching the right decision makers and implementers in the right format, using context-specific understandings of political motivation. Where political engagement already exists, a first step is to explore with policy and legislation makers their own objectives and the evidence that would be of greatest use to them.
- Mobilize influencers and champions with first-hand experience in SFNE (for example food activists, teacher and parent organizations, professional educator associations and civil society/consumer organizations) that share a similar vision.
- Reach mainstream media and potential donors through strategic communication plans including press releases, human-interest stories, plain language statements, blogs and social media campaigns.
- Join or advocate with international organizations for a dedicated global platform for SFNE that can serve as a lobby and reference point, and establish a professional discourse community for discussion and promotion of the new SFNE vision, goals and outcomes.

### Develop or strengthen enabling policy frameworks

- Conduct an assessment of legislation, policies and programmes as relevant to SFNE (see examples in Box 1.7), considering the history and evidence behind the policies; the degree of implementation, the resources and budget allocated; the prevailing SFNE models; the coverage of SFNE in both school and teacher education curricula; and identified attitudes to SFNE in the professional and education communities.

#### **Box 1.7. Examples of school-based food and nutrition education assessments in the United Kingdom of Great Britain and Northern Ireland, and the United States of America**

In 2017, the Jamie Oliver Food Foundation, concerned with the state of food education in England, commissioned a study with stakeholders at all levels to understand how food education policy is implemented across the country through: a) curriculum, b) whole school approach and c) behaviour change.

The study found a troubling variation among schools in the quantity, quality and content of food education; a disconnect between the food environment, culture and food education; and generally unhealthy food environments. The results were used to derive recommendations for government officials and school level officials (Page and Hart, 2017).

In 2018, Teachers College, Columbia University conducted a policy assessment of nutrition education in New York, at city and state levels. It found that state laws and regulations do not provide strong support for nutrition education in schools, and that small-scale interventions are often fragmented and uncoordinated (McCarthy et al., 2018a; McCarthy et al., 2018b).

- Based on the results of the analysis, engage staff experienced in policy formulation to develop a *draft model SFNE policy document* with clearly defined objectives and scope, main sectoral responsibilities, minimum standards of quality, main priorities to address, minimum time requirement in the curriculum and capacity requirements of front-line educators.
- Look for policy entry points in terms of shared or easily aligned objectives and relevant paradigms (including those based on rights, education, health and agriculture), to help ensure the best fit for SFNE (for example, through school feeding laws and school health policies). (See example in Box 1.8.)

### Box 1.8. School-based food and nutrition education in Brazilian law

In 2018, Brazil made a historic move to amend the “Law on the Guidelines and Bases of National Education” to integrate food and nutrition education transversally across the disciplines of science and biology (Government of Brazil, 2018).

- During policy processes, foster early discussions and negotiations on intersectoral collaboration models (in particular education, health, food and agriculture, and social protection; see example in Box 1.9), that are integrated within the school system. These discussions can help to better understand and address each sector’s priorities, constraints, processes, responsibilities and accountability mechanisms. Using the SDGs and an agreed vision can help reconcile potential differences, increase accountability and incorporate holistic development of the child when defining SFNE policies. Food system considerations (i.e. food procurement standards, food safety and meal guidelines) can also support the coherence of these policies.

### Box 1.9. The case of the Plurinational State of Bolivia

One of the strategies the Government used to strengthen sector coherence involved a presidential decree and bi-ministerial resolutions for joint coordination between the Ministries of Health and Education in the area of school feeding and SFNE (Government of the Plurinational State of Bolivia, 2015).

- Initiate dialogue with parent organizations, civil society and communities to anticipate and address challenges at school level. A policy document should clarify how dialogue between all stakeholders is to be facilitated.

### Explore partnerships, cooperation and multisector dialogue

- Bring together several organizations in joint ventures to develop scalable and cost-effective model SFNE interventions, in line with the new vision and goals of SFNE, which can be widely promoted and publicized.
- Based on priority policy actions, link, share experience and coordinate efforts with established initiatives for school health and nutrition; established initiatives for other age groups such as infants and young children, early childhood, adolescents, adults and the general public (to facilitate a continuum of interest and shared

approaches); other school-related sectors including health, agriculture, environment and social protection (for example, for school meal programmes); other schools of thought and practice (for example, social and behaviour change communication, social marketing and counselling); and finally, with other organizations, NGOs or professional associations working in food systems, nutrition, health, sustainable development and human rights.

- Jointly develop/adapt guidelines for nutrition/nutrition-sensitive and other interventions that can contribute to the vision and goals of SFNE (see Supplement 2.2).
- Ensure that student, parent and teacher representatives are actively involved and participate throughout the entire process to enhance SFNE suitability and sustainability.



## Useful tools and links

Design, implementation and evaluation practices for school-based food and nutrition education in 24 low-and middle-income countries: a scoping review of the literature (FAO, forthcoming, b)

Policy Guidance Note: Education (FAO, 2019b)

<http://www.fao.org/3/ca7149en/ca7149en.pdf>

Legal Guide on School Food and Nutrition (FAO, forthcoming, c)

What Does Evidence-Based Mean for Nutrition Educators? (Dollahite, Fitch and Carroll, 2016)

<https://www.ncbi.nlm.nih.gov/pubmed/27449051>

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THEME

2

# Education-environment linkages

“...behavior change as a result of nutrition education may not be sustained without policy, systems, and environmental changes to support it.”

-Jamie Dollahite

# Strengthening the synergies between food environments and school-based food and nutrition education

**Purposeful  
interactions  
with food  
environments**



### Target audience

This theme is targeted at all stakeholders that deal with SFNE and with the school food environment, particularly policy advisors, ministry staff, curriculum developers, learning materials writers, programme planners, school educators, parent-teacher associations and the school services including school meal and health interventions, non-governmental organizations (NGOs) and international organizations.

Theme 1 highlighted a supportive environment as a key element for effective school-based food and nutrition education (SFNE). In following, Theme 2 aims to describe what enabling food environments mean for SFNE and vice versa, and how education-environment interactions should be explicitly identified and purposefully exploited.

## BACKGROUND

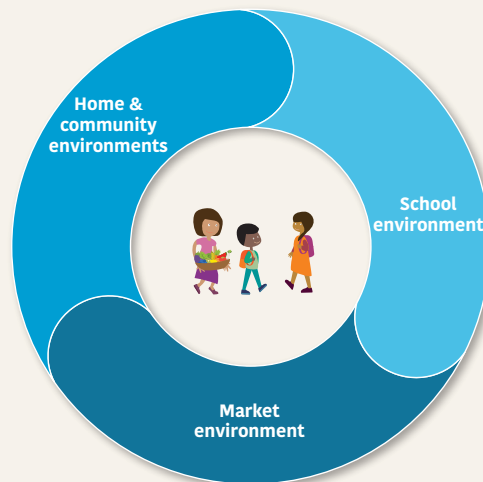
### The influences of the food environment

In food and nutrition, there is a strong reciprocal relationship – both actual and potential – between education and the environment<sup>19</sup>. Of interest is whether SFNE can play an essential role in this relationship.

As part of the larger food system, the food environment is seen as the interface that mediates food acquisition and consumption (HLPE, 2017). It comprises food availability and physical access; economic access; food promotion, advertising and information; and food quality and safety. The food environment shapes how accessible, desirable and convenient specific foods are, and plays a central role in influencing people's food choices and behaviours, whether health-promoting or not (Lobstein *et al.*, 2015).

For schoolchildren and adolescents, the strongest and most immediate food environment influences come from the home and community, the market, and the school, as shown in Figure 2.1.

**Figure 2.1**  
Food environment influences



#### Home and community environments

The home and the community are the environments in which children and adolescents have their primary food experiences, and through which they establish both conscious and unconscious preferences, perceptions and prejudices about food. Through their food choices, parenting styles and views on what constitutes a healthy child, parents and caregivers not only influence children's diets, they shape their eating patterns and their very ideas of good food and socially appropriate food behaviour (FAO, 2005; Birch, Savage and Ventura, 2009).

<sup>19</sup> The recent adoption of the terms "nutrition education" and "policy, systems and environmental change" are in part a reflection of this relationship.

### Box 2.1. Children as consumers

Children and adolescents have varying degrees of control over their food choices. But even young children manifest preferences for certain foods and food products that can influence household food acquisition. And when they have some degree of independence and a little spending power, they can act directly on these preferences (Engler-Stringer *et al.*, 2014).

From a very early age, children also pick up food practices by observing and imitating others – in particular parents, and later peers. If the home diet is lacking in variety or in certain essential foods (such as fruits and vegetables), or laden with empty calories, these may be felt as norms. These views are also reinforced by the community at large, through children's own experiences in markets and food outlets, through advertising, neighbours and peers, and the ways in which food is depicted in familiar settings. Conversely, parents' food-related practices can also be influenced by their children's characteristics, preferences and practices (Lopez *et al.*, 2018). (See example in Box 2.1.)

### Market environment

The market environment refers to the type and quality of foods available in convenience stores, supermarkets, farmers markets, restaurants, snack bars, street food stalls and food vendors in a given locality; as well as the information on and promotion of those foods. This environment influences children's awareness and knowledge of what is commonly available or rare, and what is inexpensive or costly. It also influences their views and perceptions regarding healthy foods and foods deemed desirable and fashionable, and the responses of their family, peers and others at school to these outlooks.

The ways in which consumers access food have been changing rapidly, particularly in urban settings in LMICs (Development Initiatives, 2017). For instance, informal food vendors (e.g. street foods) remain a key source for meals, but the market penetration of conventional supermarkets has also increased. These developments, together with modern lifestyles and the pervasive marketing of convenient, highly processed products rich in sugar, fat and/or salt, have contributed to shape the nutrition transition toward unhealthy dietary preferences (HLPE, 2017; Turner *et al.*, 2017). Evidence suggests that food promotion, marketing and branding<sup>20</sup> have a direct influence on the food choices and consumption patterns of children and adolescents, and consequently on their diets and health (WHO, 2010). (See Box 2.2.)

<sup>20</sup> This includes broadcast, print and digital advertising, as well as packaging, media, social media and sponsorships.

### Box 2.2. Focus on adolescents!

Research on adolescent food behaviours and their food environments is expanding. A recent systematic review focusing on the diet practices of adolescent girls in LMICs found that in general, this population group has poor diets and high risk of malnutrition in all its forms. Key findings included frequent snacking during school hours, a higher likelihood of older adolescents eating outside the home, and the strong influence of obesogenic environments in urban areas (Keats *et al.*, 2018).



In contrast, a range of specific public efforts that attempt to mitigate negative market influences are generating significant global interest. These include government regulation of food advertising aimed at children, taxation of highly processed foods, compulsory labelling, and incentivizing the sale and promotion of nutritious foods and fresh produce (HLPE, 2017).

### School environment

Some of the strongest evidence for education–environment interaction comes from the school environment. In the school context, an enabling food environment is one that consistently promotes healthy behaviours and supports multiple approaches through a variety of programmes and policies. Research suggests that multifaceted or multicomponent approaches that involve different environments and integrate several components coherently (such as curriculum activities, school meals, school gardens and food policies) are preferable to one-off approaches for more sustainable and beneficial effects in improving food practices (Development Initiatives, 2017; Lobstein *et al.*, 2015; HLPE, 2017). (See Theme 1.)

The school food environment is made up of several food and nutrition-related elements, including school grounds and school gardens, school meals and other food available on the premises, water and sanitation facilities, school food and nutrition policies and rules, and the modelling of food behaviour by school staff (see Box 2.3). Their influences may be positive or negative – for example, through the ready availability of a variety of nutritious foods as opposed to meals that are nutritious but unpalatable, or through limited time for eating and sharing (Oostindjer *et al.*, 2017).

#### Box 2.3. School staff have great influence as role models

Due to their authority and the amount of time they spend with students, school staff (including food service staff), and teachers in particular, act as important role models not only through classroom or school food practices but also through their own food behaviours and beliefs (Kubik *et al.*, 2002).

Taken together, these environments are to be recognized not only as key areas for material improvement, but firstly, as part of a hidden curriculum from which children and adolescents learn sub- or semiconsciously what their communities do and think; and secondly, as arenas where children enact their own food behaviours, and where they may develop good habits as well as unhealthy ones. Food environments are therefore the physical, experiential and social starting points for change. The general finding is that the **two types of intervention – educational and environmental – work best in synergy, yet there are few attempts to “educationalize” food environments.**

Innovative  
practice & insight

From an educational point of view, this involves a focus on:

- **Environments as educational tools:** Food environments need to be perceived, understood and “used” by children. In relation to the curriculum (see Theme 4), they offer an array of elements to observe and discuss (such as food storage at home,



snack foods on sale and food ads), as well as opportunities for action, reaction and interaction (e.g. finding out, shopping), and for social support from other actors – especially parents, family members and community role-models. Because environments and food cultures vary (for example, by region, by urban vs rural, and by community and household), their differences need to be acknowledged and addressed in the learning process.

- **Environmental actions:** Creating enabling food environments paves the way for SFNE capacity goals (see Theme 1 and Theme 3). But while deliberate environmental improvements (for example, through food policies and regulations) may be built into interventions at several levels, they do not usually have an education component, and may even undermine educational efforts to improve food behaviours and practices (Micha *et al.*, 2018). The school environment in particular (including school food<sup>21</sup> and meals, school gardens, grounds and infrastructure, facilities and sanitation, health interventions, rules, and staff behaviour) is not often explicit in its messaging. In short, its hidden curriculum needs to be revealed.

SFNE can help to reinforce the synergies and interactions between educational and food environment interventions, through a) observation, experience and discussion (e.g. finding out where the foods sold in school come from); b) action and practice (e.g. showing younger children how to wash hands or planning and packing a healthy lunchbox); or c) enhancing the food environment (e.g. planting fruit trees and growing seedlings to take home, or advocating for more nutritious options in the school canteen or tuck shop).

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<sup>21</sup> *School food* refers to all the food that is available (e.g. sold, provided and brought from home) within the school grounds and around the premises. For a full definition, see the Glossary.

## WHAT IS NEEDED?

There are a number of key needs to be addressed in order to exploit the potential of SFNE in education–environment interactions

### A food systems lens

SFNE needs to engage with and relate to the wider food system so that it not only promotes improved diets but ensures that children and adolescents perceive how the system works for (or against) human and environmental health, and can become agents of change to support, change or improve it. For instance, they may learn how food is produced and processed; packaged, marketed and sold; and then regulated and controlled, and with a focus on various relevant local livelihoods, such as farming, fishing, beekeeping, small-scale processing, sales and food services (Sadegholvad *et al.*, 2016; Sadegholvad *et al.*, 2017). They should not only be able to develop the basic skills and capacities that all people need (such as cooking, selecting produce and budgeting and planning for nutritious meals), but also to consider and build up learning experiences across the multiple roles that integrate a food system (as consumers, primary producers, processors, decision makers and investors).

School meal programmes, as well as other school-based policies and interventions – such as nutrition, health, and water, sanitation and hygiene (WASH) programmes – can present unique opportunities to exploit linkages between food and nutrition education, environment and food supply. They have the potential to promote learning and encourage positive changes in behaviour and attitude, for example by enriching students’ mealtime experiences with activities such as gardening, cooking and classroom lessons, all with the aim of understanding the connections between food, personal and community health, and the natural world (Centre for Ecoliteracy, n.d.; National Farm to School Network, 2017). If there are no school meals, other opportunities for practical experiences (such as school or community gardens, home meals and snacks) can be similarly exploited.

FAO’s approach to school food and nutrition was developed to guide action within these types of programmes (see “What is FAO’s framework for action” in the Introduction). It focuses on the most effective options and on the synergies between promoting a healthy school food environment (including school meals) and integrating effective food and nutrition education – where possible also stimulating inclusive procurement and value chains for school meals. These synergies aim not only to make nutritious foods accessible, but to foster healthy food practices and, when feasible, to favour local food systems in the process (for an example of this model, see Box 2.4).

#### Box 2.4. Example from Latin America

The “Sustainable School” model used in Latin America integrates procurement linkages with smallholder local farmers; active participation of families and communities; improvement of school meal menus; school gardens, and food and nutrition education (FAO, 2017).

Other frameworks that emphasize education–environment linkages in schools include the World Health Organization (WHO) Nutrition-Friendly Schools Initiative, and the Schools, agencies, systems For Recovery, Engagement, Social Inclusion and Health (FRESH) Basic Framework for an Effective School Health and Nutrition Programme (FRESH, n.d; WHO, nd).

## Synergistic policies and actions

To create the enabling conditions for enhanced impact on children’s and adolescents’ diets, food practices and understanding of the food system, a suite of integrated and synergistic SFNE and food environment policies and actions is required.

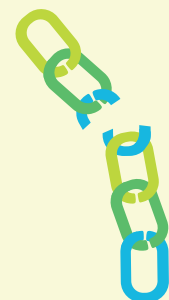
For instance, there are various ways in which governments can shape school food environments to be more supportive of better diets and nutrition, including by developing and enforcing nutrition standards for school meals and school food, subsidizing fruits and vegetables, and restricting the sale and advertisement of food products rich in fat, sugar or salt in the school. Voluntary efforts are also relevant, though less successful. These include guidelines for healthy foods offered, the reformulation of food products, and the creation of codes of conduct for marketing and advertising (Micha *et al.*, 2018).

Too often, however, policies and strategies that aim to improve children’s and adolescents’ food environments are not designed to include SFNE. (For an example in the context of school meals, see Box 2.5). If done well, SFNE can be used to explain why such policies are in place and help children perceive their significance, add value and engage with them – as part of an overall package. This may require coordinated actions at national, subnational and local levels, or it may involve a relatively simple agreement for interaction between the education sector and an NGO (for example, to provide schools with information or lesson outlines on the planting of fruit trees). It also requires reinforcing SFNE across other relevant subject matter areas, which will in turn require appropriate professional development programmes (FAO, 2005; FAO, in preparation). (See Theme 3 and Theme 4.)

Schools can also champion initiatives aligned with national or federal policies, in consultation with parents and children, to regulate food sold on the premises (for example, by vendors and in vending machines), and to make educational use of the school’s exposure to nearby food vendors and outlets. Such linkages are examples of synergistic action that can achieve impact on children’s practices and outlooks.

### Box 2.5. Common misconceptions: missing links

Providing food through school meals may not, in itself (i.e. through mere exposure), automatically foster healthy habits in children. There are many reasons why this pathway is not direct. For instance, there may be a lack of choice in the food offered; the food might be culturally unacceptable; there may be no educational link (for example, if there is no discussion or assessment of meals and no information about their ingredients); there may be no link to home practices; and parents or caregivers may not be involved.



Furthermore, wherever the government sets controls or national regulations that are visible to children and families, they can become ingredients for the education curriculum. Since food and nutrition education is conditioned by food environments, observing, exploring and interacting with these environments is fundamental.

Conversely, SFNE can also spark action to improve the food environment, for instance through awareness raising, advocacy, activism or social mobilization (Tsui *et al.*, 2012).

## Purposeful interactions, integration and complementarity

Theme 1 stated that SFNE can interact positively with other interventions and programmes, such as food security, nutrition, social protection, WASH, physical activity, health and mental health. But such interaction is not always automatic or easy to achieve. Planning and careful consideration are needed to understand firstly what kinds of interactions are required, and secondly what is required to achieve them in a meaningful and efficient way.

Examples of how such interactions may be strengthened include using large-scale programmes (such as school meals and micronutrient supplementation) as platforms for complementary SFNE; ensuring interventions have explicit, mutually reinforcing objectives, elements and benefits; and engaging educators and other front-line staff as multipliers of SFNE. An important initiative that SFNE stakeholders can learn from is the worldwide effort to integrate WASH and nutrition actions at global, national, subnational and municipal levels (SUN and SWA, 2017; ACF, 2017).

Specific guidance is needed on how SFNE can work for and magnify external interventions and how these in turn can support SFNE educational effects.

## Summary of needs

In designing, implementing and evaluating SFNE, there is a need to explore and understand what happens in these environments, what influences children's and adolescents' practices and outlooks, and how. Integrating SFNE with food environment action and interaction supports a whole-school approach that makes sense of the environment and ensures it is well used. This concerns all stakeholders from policy makers to parents.

## CHALLENGES

Ensuring that school systems can achieve education–environment integration requires confronting a range of challenges:

### Education–environment links: an important disconnect

In most school contexts, the links between education and the food environment are rarely exploited to their full potential<sup>22</sup>, and in many cases, this kind of disconnect may even result in conflicting messages that further undermine SFNE efforts (Oostindjer *et al.*, 2017; Birch, Savage and Ventura, 2009).

### Disconnect between school-based food and nutrition education, the food environment and external interventions

A global survey recently conducted by FAO highlighted that school food environment elements (including the procurement of foods, the meals and foods provided, the foods sold on school premises, canteen facilities and vending machines), are not often linked with SFNE. In cases where they are, the type and quality of foods that are available and provided are not always consistent with what is taught in the classroom (FAO, forthcoming).

Food environments are not widely recognized as settings in which learning takes place. SFNE activities are therefore often removed in time and space from school food, school meals and visible food policy actions (Oostindjer *et al.*, 2017).

Furthermore, when SFNE is actually planned as a support to food environment policies and external interventions, these often end up being implemented independently (with separate objectives, activities and staff), instead of complementing or interacting with each other. The lack of guidance on how to meaningfully integrate SFNE into nutrition and other interventions is noteworthy.

### Disparity in the implementation of food environment policies

School food environment policies have been endorsed in many countries, but important challenges remain for their adequate implementation (see examples in Box 2.6). Broadly, these relate to ambiguity in policy language, the lack of guidelines on operationalization, the absence of institutional monitoring and accountability mechanisms, and weak departmental coordination – for example, between the ministries of health and education (Holthe, Larsen and Samdal, 2011; Reeve *et al.*, 2018).

When school food environment policies and interventions are poorly or unevenly implemented, the actual use that SFNE can make of these interventions becomes compromised, and likely to be dependent on the interest of individual schools or motivated teachers.

<sup>22</sup> Either these links are not considered from the very beginning (i.e. during the design phase of programmes or interventions), or when they are, there is no clear understanding of how they may be operationalized to serve a purpose.

### Box 2.6. Examples from the Philippines and the Islamic Republic of Iran

A recent qualitative policy analysis undertaken in the Philippines found that a lack of resources (human and financial), ambiguity in policy implementation and enforcement methods, and the influence of food companies all impaired effective school food policy development and implementation (Reeve *et al.*, 2018).

In the Islamic Republic of Iran, a cross-sectional study in the southeast of the country found that schools that were labelled “health-promoting” did not differ significantly from others in the quality of their environments. Key barriers included the inability to enact school food policies, differing interpretations of a healthy food environment, a top-down approach, and inadequate infrastructure (Feyzabadi, 2017).

### Limited consideration of home, community and market environments

Good formative research, strong market understanding and the involvement of parents and caregivers in the design and implementation of SFNE curricula, programmes and projects are often limited or non-existent. This narrows the understanding that professionals and practitioners have of children’s home, community and market environments, and limits the potential for extending SFNE’s reach beyond the school.

At the same time, both the school and the family are to be recognized as food and nutrition “educators”, and unless the food environments both at school and at home reinforce school learning, SFNE will have a reduced impact on children’s food practices. Specific challenges include resource constraints, cultural factors that keep school and home separate, the lack of time, the lack of mechanisms that allow for parents, community members and organizations to be involved in a meaningful and long-term way (FAO, 2007; Perera *et al.*, 2015), and the absence of homework – whether carried out at home or in the community environment of SFNE learning programmes.

Another important challenge involves the potential disconnect between the SFNE curriculum and the realities of the home food environment for many children. The dietary diversity and food choices available to children and adolescents is often severely limited by food insecurity. This further supports the need for an adequate assessment of the situation and needs (see Theme 1, Theme 3 and Theme 4), and for complementarity with programmes that aim to improve households’ income and food access (de Brauw *et al.*, 2015; INCAP, 2020).

School meal programmes with social control mechanisms provide a valuable opportunity for involving the community in SFNE, yet all too often the actual linkages are not well exploited, or they are implemented quite independently of their learning potential – not only for children but also for parents, communities and schools.



In addition, school-level actors are only just beginning to understand how modern market influences impact and shape children's and adolescents' food practices, and how to counteract these influences. Some lessons can be learned however, from a few countries that have implemented countermarketing strategies<sup>23</sup> in schools (Johnson, Johnson and Freudenberg, 2016).

Furthermore the failure to account for or to combat the negative influences that some food companies exercise inside and outside schools – through the sale and marketing of particular products, and through the provision and financing of nutrition education materials with company logos or product placements. These tactics can raise important conflicts of interest (Mozaffarian *et al.*, 2018; UNSCN, 2017) that can affect the vision and aims of SFNE in a given country or locality.

### Limited views and perceptions of the food system

To date, certain aspects of the food system have traditionally been neglected in SFNE; these include waste, packaging, distribution and the environmental impact of diets. This reflects a missed opportunity to integrate systems-related issues to support more responsible food choices among consumers and producers – both current and future.

The neglect is due in part to the fact that those who design and implement SFNE curricula, programmes or projects are unfamiliar with food systems concepts and frameworks and their relevance to children's nutrition and well-being. For instance, curriculum developers may not have food systems in mind, they may not consider trying to influence the status quo (for example, by reducing food waste schools), and they may not recognize that children can be involved in assessing and improving their own environments. This can limit the scope of many regular SFNE activities, from purposefully formulating food systems-related competences (see Theme 3), to using food environments as areas of food learning.

### Evidence and assessment: research gaps

Research in LMICs has focused largely on the measurable parameters and outcomes of food environments, with few high quality studies of how children actually interact with their food environments outside the home (Engler-Stringer *et al.*, 2014). Another key research gap relates to the impact of school food environment interventions with and without associated SFNE (Jomaa, McDonnell and Probart, 2011).

<sup>23</sup> These refer to strategies to identify, analyse, and resist the effects of marketing on food preferences and choices.

## RECOMMENDATIONS

As implied above, strengthening education–environment connections requires advocacy, policy revision and/or change, collaboration between ministries and departments, negotiation with NGOs and agencies, changes in the curriculum (including objectives, time allocated and methodology), and models of good practice and professional training. The following recommendations apply to various levels of the school system. Potential outputs are underlined.

### Gather and use evidence and data

#### Assessments

- Conduct a landscape analysis of school food environment policies and school-based interventions that can support or be supported by SFNE.
- Develop or adapt existing simple tools that can be used to assess and compare various types of school food environments and the ways in which they relate to SFNE, along with clear and realistic action points.

These assessments can be carried out by mid-level ministry staff or by integrating a component in relevant ongoing national or international cooperation projects.

#### Research

Link with universities and research institutions to conduct research on education–environment linkages at school level, and ensure that their results inform SFNE curriculum development and learning programme design. Some priorities follow:

- Conduct formative research into:
  - emerging environmental influences on children’s and adolescents’ food behaviour (including advertising, social media, money, barriers, and perceptions of school food), particularly perceptions and responses to formal and informal market influences; and
  - children’s and families’ existing knowledge and skills in the food system (including production, processing, marketing, transport, prices, food loss and waste).
- Undertake studies to determine the impact of school-based interventions implemented with and without a complementary SFNE component.
- Carry out research to assess the level of implementation of SFNE–environment linkages and expected outcomes in order to identify elements of success.

### Advocate for education–environment linkages

Assemble available evidence and arguments (see Theme 1) and build a brief using examples and models of policies, SFNE curricula, and learning and training materials that adequately and effectively link to food environment actions. Aim to demonstrate not only the benefits of such linkages, but also the ways in which to effect them, for example through school meals, school gardens, WASH programmes, physical education and health interventions. This brief can be adapted and used to conduct advocacy with various key groups, including policy makers, legislators, curriculum developers and programme planners.



## Extend the school-based food and nutrition education model to link with food environments and complementary interventions

The SFNE coordinating institution or assigned ministry can:

- Set mechanisms at different levels to ensure that SFNE fits the needs of the context and considers children’s home and community environments. This not only includes good situation analyses (see Theme 1), but also requires the local-level adaptation of learning objectives and programmes.
- Engage stakeholders from relevant sectors in drafting or amending school policies, programmes and operational guidelines that:
  - explicitly link SFNE and school food environments, for example through new or adapted curriculum outputs (including lesson plans or projects related to school food vendors, handwashing and lunchboxes) and manuals for SFNE related to school meals and school gardens (see Theme 5 and Theme 6);
  - promote school gardens for SFNE to enable children (and families) to grow a variety of foods, to extend and improve diets with home-grown foods, and to increase preferences for and consumption of fruits and vegetables (see Theme 6);
  - produce or adapt a list of healthy school food environment actions that can be linked to SFNE (see Supplement 2.1), with the aim of promoting a well-rounded, healthy school food environment policy;
  - support healthy or “green food zones”<sup>24</sup> around schools, in close synergy with existing SFNE and school food policies; and
  - promote collaboration between and within sectors (including education, health, agriculture and social protection) and connect with agencies that work in schools, considering both the challenges and opportunities of multisectoral and multistakeholder collaboration<sup>25</sup> (SPRING, 2016; FAO, 2019; Kuruvilla *et al.*, 2018).
- Support and provide guidance for curriculum developers and materials writers to enhance linkages between SFNE and the food environment (recognizing potential tensions). In particular:
  - undertake small initiatives that capitalize on education–environment linkages (for example, to showcase how valued learning targets can be achieved with family and school support), with a view to subsequent scale-up.
  - exploit and publicize small opportunities to try out or improve approaches to enhance education–environment linkages (for example, offering small non-financial incentives for exemplary school projects).
  - incorporate systematic awareness of local, national and/or international food systems into the SFNE curriculum and shape it to combat ongoing negative influences in food environments.
  - prioritize the involvement of parents and caregivers<sup>26</sup> in a productive and

<sup>24</sup> Defined physical areas around schools where “junk foods” cannot be sold or promoted.

<sup>25</sup> For example, how different sectors see problems, ownership and accountability, as well as differences in structures, mandates and the negotiation of responsibilities.

<sup>26</sup> Schools need to consider existing levels of contact and collaboration with parents and caregivers: Where there is already a close relationship, it will be easier to interest and involve families in SFNE. If the relationship is not already robust, it is best to start small and proceed gradually.

sustainable way and ensure that SFNE plays an active role in children's interactions with the home and community, for instance through adapting and supplementing existing learning materials, homework, outreach activities and projects (see Theme 6).

- experiment with easy options to enhance SFNE–food environment synergies,<sup>27</sup> for example:
  - » introduce students, schools and parents to relevant food environment information sources;
  - » actively engage children, and particularly adolescents, in setting their own agendas and prioritizing their concerns regarding healthy food practices outside the school;
  - » arrange visits to local farms, local food production facilities, community gardens, food distribution centres and/or farmers markets to explore different aspects of local food systems;
  - » have children and adolescents assess their own food environments in the home, community, school and markets; and
  - » engage students in exploring local and studying global food systems – either as educational projects or more informally (for example, as they walk to school, through documentaries or through informal talks with food system actors).
- Assess and address potential conflicts of interest to decide if and how to partner with private sector stakeholders that are interested in SFNE and school food environment actions. Recommended measures include a well-defined rationale for engagement, risk assessment, balancing risks and benefits, risk management and evaluation, and accountability (WHO, 2017; UNSCN, 2017).

Agencies with school-relevant interventions can follow best practices and guidelines to adequately integrate SFNE, for enhanced joint outcomes. (For general guidance on linking SFNE with nutrition and other relevant interventions and programmes, see Supplement 2.2.)

Finally, it is recommended to gradually build a long-term national framework that exemplifies the principle of education–environment actions across the educational system. For this, it is necessary to consider the stakeholders who must be involved (including policy makers, parents, teachers, children, curriculum developers, writers, vendors and school meal organizers) and the environmental settings for action and interaction (i.e. the school, market, and home and community food environments, including playgrounds, gardens, food stores, kitchens, and so on).

<sup>27</sup> Given some practical guidance, models and institutional support, SFNE activities relating to the food environment are not difficult to devise or implement. In many communities, key actors and stakeholders have relevant experiences and opportunities to share with schools.



## Useful tools and links

Nutrition education in primary schools: a planning guide for curriculum development (FAO, 2005)

<http://www.fao.org/docrep/009/a0333e/a0333e00.htm>

Setting up and running a school garden: Teaching Toolkit (FAO, 2010)

<http://www.fao.org/docrep/012/i1118e/i1118e00.htm>

NOURISHING database (WCRF, 2019)

<https://www.wcrf.org/int/policy/nourishing-database>

Operationalizing Multi-sectoral Coordination and Collaboration for Improved Nutrition (SPRING, 2016)

[https://www.spring-nutrition.org/sites/default/files/publications/briefs/operational-multisect\\_0.pdf](https://www.spring-nutrition.org/sites/default/files/publications/briefs/operational-multisect_0.pdf)

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## Supplements

2.1. Promoting a healthy school food environment: school-level actions

2.2. Integrating SFNE with nutrition and nutrition-sensitive interventions



THEME

3

# Competences in context

“Education is a social process; education is growth; education is not preparation for life but is life itself.”

-John Dewey



# A new educational paradigm for effective school-based food and nutrition education in low-and middle-income countries



**Formulation of  
target food and  
nutrition  
competences**



## Target audience

The work of identifying and formulating SFNE “competences” often devolves on a project design team or on a national curriculum development task force – which also assembles and publishes the curriculum itself (see Theme 4). But identifying the needed competences is key to SFNE renewal as a whole; hence this theme is aimed at all those involved in the process, from policy advisors and donors to education officials, materials writers, schools and teachers.

Themes 1 and 2 asserted that school-based food and nutrition education (SFNE) can make a significant contribution to sustainable development (including support for goals on nutrition, health and social justice, among others), as a powerful agent of both individual and collective social change, especially in synergy with enabling food environments.

As indicated in Theme 1, SFNE aspires to a world of food competent, reactive and proactive people that are well-equipped to make use of their resources for their own health – as well as for the health of their families, society and the environment – and to enact change. As a result of SFNE, these competences<sup>28</sup> should therefore manifest clearly in the real-life food practices and outlooks<sup>29</sup> of children and their families – that is, in what they actually do, say and think – from the very beginning of a child’s school life. As eloquently summarized by John Dewey in the epigraph to this theme, education is not preparation for life; it is life itself. This applies very particularly to food and nutrition education.

The question is, how do we get there? Most current SFNE does not result in the achievement of these real-life competences or cannot be seen to do so. This is partly because existing educational approaches are often based on genuine misconceptions among the public and in the education service (see Box 3.1). To address such misconceptions and to achieve real, appreciable and lasting results, SFNE needs an educational design that will enable a successful shift in the paradigm. Theme 3 illustrates the essential process of such a design, its targets and its core elements.



### Box 3.1. Misconceptions about SFNE

Many believe that:

- education influences food practices mainly by increasing knowledge in food and nutrition;
- all necessary knowledge can be learned in the classroom; and
- not much classroom time is needed to cover the basic facts of good diet and nutrition.

## BACKGROUND

SFNE aims to help children, adolescents, families, and communities adopt and maintain health-promoting and sustainable food practices and outlooks (such as nutrition-sensitive shopping, cooking, snacking and gardening, as well as keeping food safe, interpreting food advertising, appreciating dietary diversity and noticing or assessing what others eat), and eating patterns (related for example to foods typically consumed and typical portion sizes). Food practices and outlooks are influenced by personal, cultural and societal norms and values, and are also conditioned by people’s resources and by their physical environments.

<sup>28</sup> Competences are clusters of abilities, commitments, knowledge or skills that enable a person (or an organization) to act effectively in a real-life situation.

<sup>29</sup> Food practices and outlooks: In this white paper food practices refer to all habitual food-related activities which may impact nutrition and other aspects of sustainable development, including specific food behaviours and eating patterns. Outlooks refer to the mental, affective and psychosocial dimensions of food practices that are explored in formative research and behaviour change theory, and that represent a critical dimension of SFNE. Examples include ideas of good diet, perceptions of food practices, and self-efficacy in making and maintaining changes. For an explanation on the choice of these terms, see the Glossary.

## Target competences

These food practices and outlooks are the targets of SFNE and represent the main components of the SFNE curriculum (see Theme 4). Educational aims are often called standards, learning objectives, learning aims or learning outcomes, but when oriented to real-life outcomes, as in SFNE, they are generally known as competences (see Box 3.2) in order to highlight their basis in practical action. SFNE competences are demonstrable, sustainable food-related targets that are widely recognized as being necessary competences for children to achieve and maintain in real life. Their achievement can be assessed by the general public, by parents and teachers, and by participants themselves, as well as more precisely by monitoring and evaluation teams.

### Box 3.2. Examples of target school-based food and nutrition education competences (practices and outlooks)

- Students see the risks of unbalanced, unvaried diets.
- Students plan positive changes in their diet, take action, monitor progress, and maintain change.
- Students can budget and shop for food with good nutrition in mind.
- Students pass on healthy food practices and outlooks to younger children at home.
- Students advocate for changes in food policy at local level.

## Support competences

Achieving target competences depends on children and adolescents mastering a range of practical skills, life skills, perceptions, understanding, and motivations and intentions, in addition to learning from experience. For example, becoming a competent family cook requires not only cooking skills but also recognizing and responding to individual nutrition needs and preferences, planning well-balanced meals, observing good hygiene, and so on. As such, these building blocks serve as the support competences or educational supports for becoming a competent family cook (see Figure 3.1).

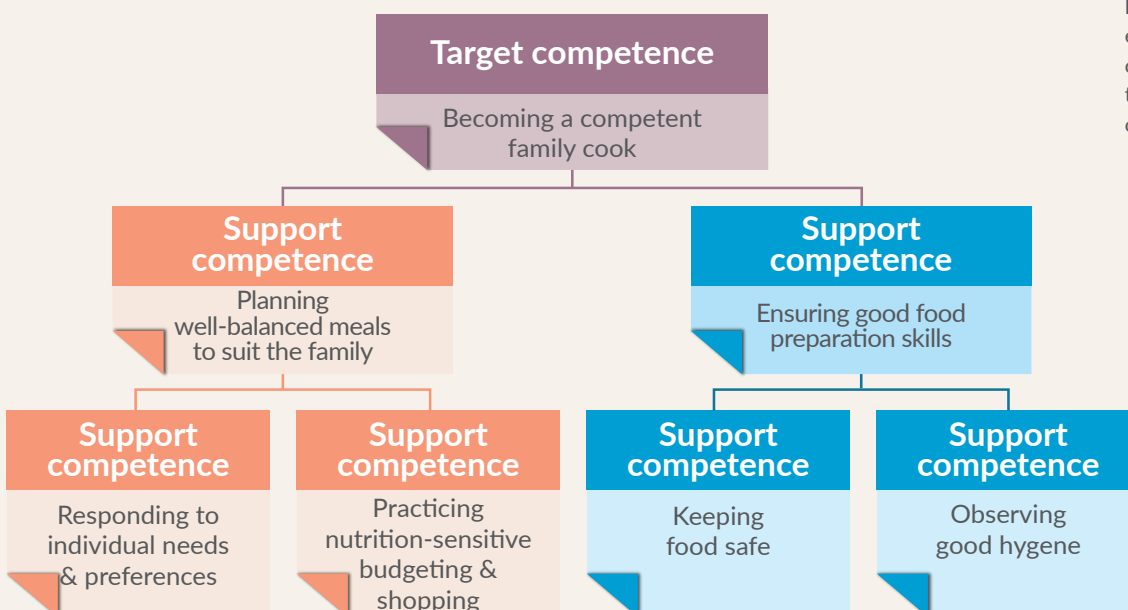


Figure 3.1. An example of support competences building towards a target competence

## How competences are built up

Every target competence can have its own hierarchy of support competences: in the case of becoming a competent family cook (in Figure 3.1), it builds from multiple smaller competences such as knowing market prices, appreciating fresh vegetables, using knives with care, and recognizing the risk of food contamination from houseflies. Any competence may serve as a main target or as a support in a given learning programme. For example, the habit of separating raw and cooked food or of covering cooked food may be a target competence for young children who help in the home. But for older children and adolescents, it would reflect only one element of food safety routines, and would therefore be a support competence.

Such supports can contribute to building the educational foundations for not just one, but a range of real-life target competences. For example, in returning to the food safety scenario previously described, a child's understanding, perception and practice of hygiene not only make safe cooking and handwashing meaningful and familiar, but also helps in storing and preserving food safely, in perceiving the risks of water contamination, and in avoiding disease.

## Kinds of support competences

In SFNE, knowledge and understanding of food and nutrition are one kind of educational support: if the aim is to change what you eat, it certainly helps to know why and how. But the scope of SFNE has always encompassed much more than the mere dispensation of facts on nutrition. The potential for SFNE to affect personal and social behaviours, capacities and outlooks goes far beyond factual knowledge and the physical classroom, to encompass students' motivations, actions, practices and skills, as well as their interactions with environments, each of which can be described as follows:

*Motivations:* Motivations of all kinds inspire and maintain changes in practice, and help to develop long-term outlooks. The words of Mary Swartz Rose (see Box 3.3) offer key insights into different kinds of motivation, through the meanings and associations they conjure: "interest", "arouse", "intense", "intimate", "confidence", "inspire", and finally, "sense of responsibility", or in other words "self-efficacy" – the belief that you yourself can make a difference in your life (Bandura, 1997). SFNE has the potential to influence motivations through the following:

- *Belief:* Belief in the importance of a sustainable healthy diet or of particular eating patterns is a competence that grows cumulatively, as it is increasingly bolstered by understanding and perception.
- *Perceptions:* The habit of direct perception (for example, of social attitudes, practices, roles, personal risks and benefits) enables children to respond critically to and take action in their environments.
- *Food and nutrition knowledge and understanding:* These are often necessary, though not usually sufficient, for achieving changes in food practices and outlooks.
- *Direct experiences:* These can include physical, emotional and fictional experiences, and enhance understanding and motivation.

### Box 3.3. The scope of school-based food and nutrition education

In a booklet on Food Lessons for Nutrition Classes, Mary Swartz Rose (1922) wrote: “The interest aroused [in food and nutrition] must be intense enough to carry over to the home environment. There must be intimate personal contact with each child in order to gain his confidence and inspire him/her with a sense of responsibility for his own health”.

*Action and practice:* SFNE calls on many competences in this area:

- *Practical skills:* These enable children and adolescents to develop healthy and sustainable food practices. For children to “carry over” what they learn in the classroom into their daily lives, they need repeated practice and hands-on experiences that help them see exactly what they need to do and how to do it.
- *Action/capacity for change:* Direct experience of changing practices builds capacity for change and for maintaining change, which can then be applied to other challenges as they present themselves.
- *Proactive responses to the food environment:* Critical perception of the food environment, including the school, can lead to action to protect or improve it, or to advocate for change. (See for example, Government of Chile 2017).
- *Other skills:* All actions may involve other skills, including life skills such as teamwork, planning and decision-making, and communication skills such as questioning and explaining. (For a checklist of support competences in SFNE, see Supplement 3.1.)

*Environmental supports:* Enabling environments in the home, school, community and markets, as well as in broader settings make it easy for children to put what they learn into action. SFNE programmes can encourage children to observe, learn from and interact with what people do and think in these familiar settings. Without such enabling social and physical environments however, SFNE may be largely fruitless, because food practices only establish themselves when they link to real-life settings. A “whole-school” approach to food and nutrition – involving school food, school gardens (and other elements of the school food environment), school premises, school rules and routines, water, sanitation and hygiene (WASH) and health interventions, and parents – is part of this enabling environment (see Theme 2).

## Head, heart, hands and context

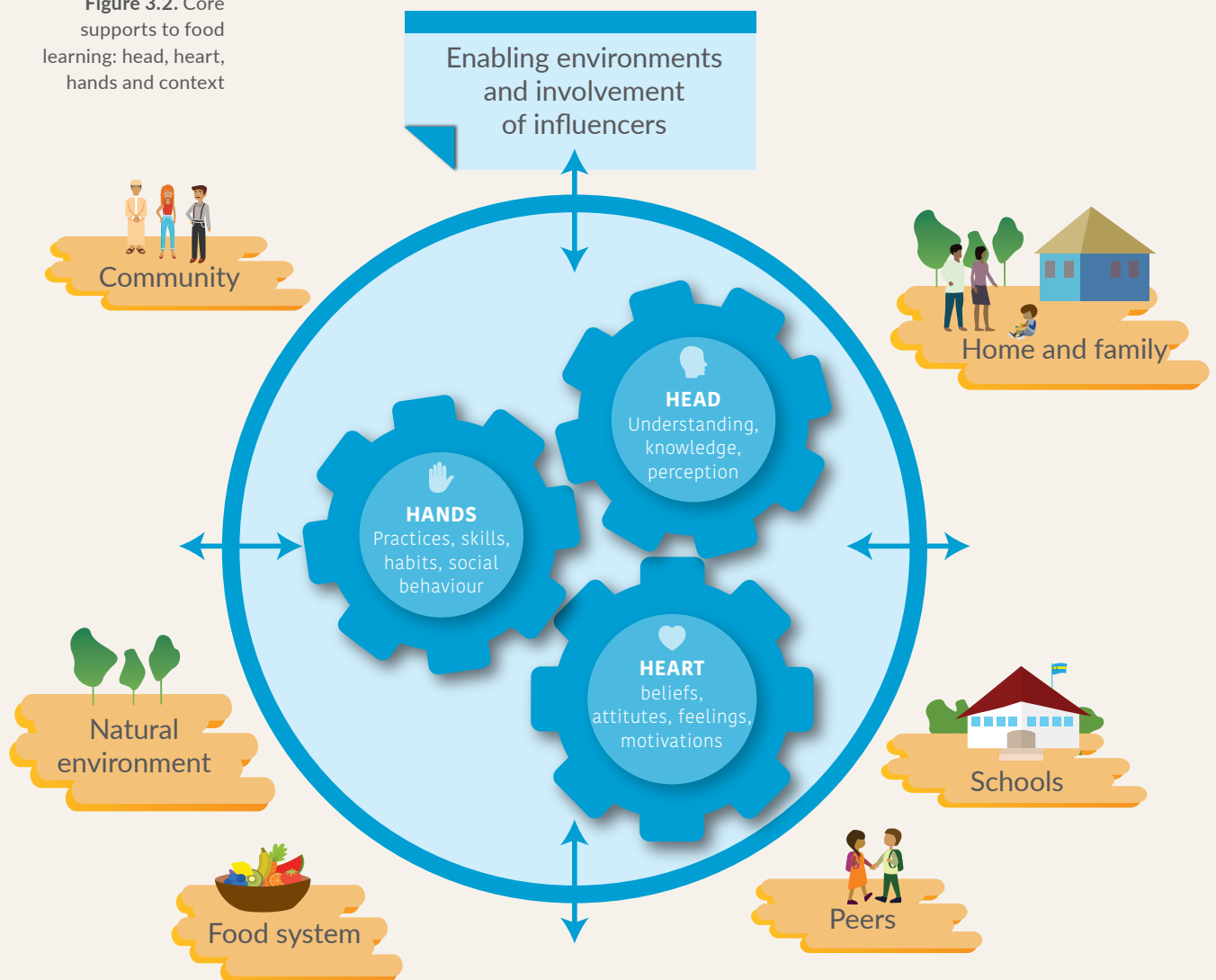
Effective SFNE therefore needs knowledge and understanding, but also a great deal more. It must be action-oriented, holistic, experiential and situated. Developing healthy food practices and outlooks involves the whole person – head, heart and hands – in all contexts (see Figure 3.2).

Recognizing these elements and their interactions is essential to any learning programme that aims at changes in real-life food outlooks and practices. When SFNE does not connect with students in relevant and meaningful ways, it is likely to be ineffective. Stripped of its real-life social and physical contexts, it becomes merely a classroom activity that is left in the classroom. **By contrast, when SFNE is done well, students build on what they already know through new experiences, actions and insights, and take what they learn out of the classroom to apply it to their day-to-day lives.**

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Yet identifying and formulating SFNE competences is challenging work, and school learning related to food and nutrition is sometimes implemented without clear direction. This theme aims to present and discuss a framework for developing SFNE competences that can be applied in any type of SFNE programme/intervention, whether mounted by an external organization or fully integrated into a country's educational system.

**Figure 3.2.** Core supports to food learning: head, heart, hands and context





# WHAT IS NEEDED?

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## Learning needs analysis and formative research

Depending on the type of intervention to be implemented, the learning needs analysis may be broad or narrow in scope.

- A narrow scope is suitable for projects with a remedial focus, which concentrate on one or a few specific issues and practices in a restricted target group; for example, a project on anaemia and the consumption of iron-rich foods among teenage girls, or on the consumption of sugar-sweetened beverages (SSBs) among schoolchildren (see Supplement 3.3). A narrow focus is also convenient for research projects.
- Other learning programmes are broader in scope, aiming at pre-emptively establishing healthy and sustainable food practices and outlooks. They tend to emphasize capacity development, and will reach out to family and community, as well as older and younger age groups.

SFNE can integrate broad and narrow approaches (see Theme 4), by aiming to achieve specific target competences that spring from a wide thematic base. For example, a personal project on eating more vegetables can exist within a larger theme of exploring healthy diets, which in general develops familiarity with local foods and an understanding of their nutritional value, as well as increased engagement with families and others, for instance through the sharing experiences of healthy and appetizing meals and snacks with pre-school children.

## Core process for identifying and formulating school-based food and nutrition education competences

The core process is useful no matter who initiates or funds the programme/intervention, or what groups or partners are involved (for a list of the various types of SFNE programmes/interventions, see Table 1 in the Background of the Introduction). It has three main steps (see also Figure 3.3):

1. Analyse the learning needs and determine the main practices and outlooks that need to be established, changed or reinforced, as well as the factors that influence them. These will become the target competences of the learning programmes.
2. Identify the support competences and environmental actions needed to promote and support changes.
3. Adapt to children's age and interests.

**Figure 3.3.** Identifying and formulating SFNE target competences and required supports

Source: Adapted from Contento, 2016, DESIGN procedure



## STEP 1

### Analyse learning needs and determine target competences

The first step is an essential part of learning needs analysis. As illustrated in Figure 3.3, it consists of four areas of enquiry and associated questions, which together help to identify and formulate SFNE competences and their supports, before establishing a baseline for later comparison.

#### A. Determine food and nutrition problems

##### ⇒ What are the main food and nutrition problems?

The first area of enquiry identifies the main food and nutrition problems in the country (such as anaemia or childhood obesity), and/or situations and trends (such as increased sugar sweetened beverages, a shortage of safe drinking water, or food waste). An enquiry into one specific target group (such as adolescents, see Box 3.4) may identify specific food risks and needs related to age, lifestyle and outlook. As recommended in Theme 1, this enquiry should draw on national and subnational data and research, and form part of a preliminary situation analysis (Contento, 2016).

#### Box 3.4. Focus on adolescents!

Adolescents in low- and middle-income countries (LMICs) are:

- at risk of overweight, anaemia and other micronutrient deficiencies;
- growing fast both in body and mind, and often hungry; and
- generally active (at work, studying, or looking after households), and in need of instant energy.

(WFP, 2018; Brown et al., 2015)







## B. Identify target competences

⇒ **What existing practices contribute most to these problems?**

⇒ **What healthy and sustainable existing practices should be promoted?**

The second area of enquiry calls on formative research to identify the “behavioural focus” of the problems (Contento, 2016) – that is, the particular food practices that SFNE aims to change, improve or promote in order to address the determined food and nutrition problems. Research has shown that a behavioural focus gives SFNE a greater chance of success than a purely information focus; it is therefore important to start by looking at *what people do* (Contento, 2016).

Existing practices can be identified through methods such as focus group discussions (FGDs), direct observation, KAPP surveys (of knowledge, attitudes, practices and perceptions), rapid rural appraisal (RRA) techniques, target group profiles, reviews of evidence and intervention reports, and the sharing of professional experience. (For further details on what to explore, who to talk to and the modalities to adopt, see Supplement 3.2).

**Negative and positive:** A review of evidence can identify food practices that contribute directly to the relevant food and nutrition issues – for example, frequent consumption of foods high in sugar (see example in Box 3.5) is demonstrably associated with overweight and obesity (Keller and Bucher Della Torre, 2015). Formative research can also look at “positive deviances” – that is, individuals/groups/schools whose uncommon behaviours or strategies help them to cope better or find better solutions to problems than others in the same context and with the same resources. Positive deviance inquiries have been commonly used for infant and young child feeding, but they can also be tailored to the school setting (Positive Deviance, n.d.).

### Box 3.5. Reducing sugar-sweetened beverages: a target competence

Let’s say a country has a national dietary guideline on decreasing the consumption of added sugar. The regular consumption of sweetened beverages among children would count as a contributing behaviour. Drinking less soda and other SSBs would therefore serve as a target competence (see Supplement 3.2). Achieving this change would help to support public health, individual diets and other issues.

**Sensitivity to context:** Enquiries must be sensitive to contextual aspects such as regional differences, gender and intra-household food practices. In many LMICs, for example, girls may be responsible for preparing meals and feeding younger siblings. Large countries may have significant regional variations in diet and food practices. And in some regions, traditional household food sharing practices may neglect the nutrition needs of infants, adolescents or pregnant women.

⇒ **What food practices should be prioritized as SFNE target competences?**

This area of enquiry helps to identify the competences that SFNE should aim to achieve. Where they exist, national food-based dietary guidelines (FBDGs) can serve as good starting points for identifying target practices in this regard (FAO, 2018). As an example, FBDGs in Brazil, Norway and the United States of America form the basis of national food and nutrition education programmes, as well as of nutrition standards for school meal programmes (FAO, forthcoming). (See Box 3.5.)

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The main SFNE learning agenda will then be set by the broad crucial competences that children should achieve by the end of their schooling – for example, eating an ample supply of fruits and vegetables each day, consuming adequate sources of sustainable plant- and animal-based protein foods, drinking safe water, limiting their consumption of SSBs, basic cooking and food safety, responding appropriately to commercial marketing, and getting acquainted with community practices and perceptions. Phrased as recognizable, achievable real-life practices and outlooks, **this set of competences can act as an action manifesto for the whole school and community** (see Theme 4).

### C. Explore influences on food practices and determinants of behaviour change

#### ⇒ What are the influences on existing food practices, outlooks and decisions among students and families?

The learning agenda is now refined by exploring the influences on – and thus the reasons for – existing practices, thereby illustrating what is needed to bring about change. This will help to build the pyramid of competences (see Figure 3.1) and hence shape the learning programme.

Some influences are rooted in the immediate or wider environment (for example, income and resources, facilities, convenience and food security), but others are within reach of direct education (see Box 3.6 and Box 3.7). These may include food beliefs, values and spending priorities; social norms; the outlooks and actions of key players (such as parents and teachers); and the wider personal and social motivations that play a role in food choices, such as perceptions of risks and benefits, and self-efficacy. (Many of these are endorsed by psychosocial theories such as social cognitive theory and the theory of planned behaviour. For a summary of relevant theories, see Contento, 2016.)

#### **Box 3.6. Reducing sugar sweetened beverages: influences on their consumption**

The habit of consuming SSBs may have an array of influencers. People who drink SSBs regularly may perceive the health risks, but they may drink them anyway for the following reasons:

- because they are part of their cultural norms (which may also be shaped by advertising or peer practices);
- because they are uncertain about the safety of their drinking water; or
- simply because they are cheap, tasty and readily available in the places where they socialize most.

All these influences can be tackled in a learning programme aimed at reducing the consumption of SSBs.

The importance of situated, participatory formative research: These influences can be explored using the formative research methods noted above (see “Identify target competences” earlier in this section). But it may not be enough to simply ask, why do you/they do this? It is not always easy to establish with certainty which influences have the most weight, and people are often unaware of all the reasons for their own actions.

Answers may therefore need to be triangulated from several sources. Research that is truly formative – that is, instrumental in shaping learning programmes – widens the area of

enquiry by exploring the networks of actors, social practices, attitudes and environmental factors that influence particular practices. For example, in the case of children's snacking routines (including purchase, consumption and frequency), it is revealing to look at:

- settings and participants (when, where and with whom);
- what other main actors do (for example, whether parents, teachers and/or peers share the same food habits, offer sweets as treats, provide pocket money, etc.); and
- how practices are perceived (whether nice, necessary, prestigious or pernicious).

This kind of enquiry also supplies convincing and often surprising input for learning activities.

Some RRA activities (see for example, Freudemberger, n.d.) – such as mapping, walk-throughs, diagrams, ranking and demonstrating processes – tap into participants' knowledge and experience and are highly effective for revealing motivations, influences and existing knowledge and expertise. They can also be adapted as school activities. **Though well established in community development, they are rare in SFNE.**

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⇒ **What would promote change?**

⇒ **What are the barriers to change?**

What would make children and families invest in healthy and sustainable food practices? What obstacles will they face when they try to change? How could changes link to children's and families' main interests and life goals? Where can they get information and advice? What skills and motivations will they need? What resources, environmental changes and social support could facilitate change?

### Box 3.7. Focus on adolescents! Findings of formative research

How do adolescents feel about food? What influences their choices?

A series of studies carried out in LMICs paint a complex picture of young teenagers who:

- are susceptible to the attractions, convenience and availability of street and fast foods;
- are looking for variety and a change from the home routine;
- desire freedom and have a little pocket money with which to express it;
- are sensitive to food status and highly influenced by their peers; and
- are generally informed about healthy and unhealthy options, but have many more immediate and pressing concerns (such as identity, jobs, exams, sports and social and personal relations).

Adolescents say:



(WFP and Anthrologica, 2018; Brown *et al.*, 2015)

A wide range of positive motivations for change can come from linking to children's and families' interests and life goals (for example, in relation to excelling at sports and other physical activities) and from opening up experiences and perceptions. Family support is important to the success of SFNE. On the other hand, a significant part of SFNE programmes consist of countermeasures against negative influences, such as increasing or reducing access to particular foods in the school environment, and enabling children and adolescents to see risks and benefits and to try out alternatives.

Some powerful barriers to change are environmental and attitudinal, but barriers are also inherent in the change process itself, as most people know from personal experience. Force of habit, especially food habits, can be a major obstacle. Changing habits is even harder if we do not know how to go about it, are acting alone, have no experience of alternatives, do not believe it can be done, or have already tried and failed.

These are some of the “determinants of behaviour change” (Contento, 2016) that can be explored in formative enquiries (see Box 3.7 and Supplement 3.2) to help determine the pathways to the target competences (see Step 2).

#### D. Establish baselines

Formative research is also often used to establish behavioural or attitudinal baselines against which progress can be measured – for example, the number of SSBs consumed weekly, prevailing attitudes to food waste, handwashing routines, or the frequency of family discussions about food. Baseline data are essential in formal research. Simple, approximate measures and counts are also appealing to children and their families, as tokens of change and success. (See also Theme 8.)

## STEP 2

### Identify and formulate support competences and environmental supports

After identifying the target competences, the next step is to determine the supports that will contribute to building them. The question to ask is, what do children need to perceive, understand, feel, experience, and most importantly, do – in order to achieve this target competence? In other words:

⇒ **What knowledge, experience and perceptions will move students and families to action for change?**

⇒ **What know-how, skills, experience and practice will guide action for change?** For example, to move towards reducing SSB consumption or increasing dietary diversity, students may need to:

- find out food and nutrition information through food labels (know-how and knowledge);
- assess the effect of food marketing on their own and others' behaviour (skill in interpreting advertising);
- decide what to do personally to change their practices and track progress (action, life skills);
- share findings (life skills, perception, knowledge) with peers, siblings or neighbours; and
- assess foods available and provided in the school (environmental awareness, knowledge of food and nutrition).

Supports fall into the areas of head, heart, action for change and environmental support (see Figure 3.2).<sup>30</sup>

- *Motivation for action (heart and head)*: Children's existing experiences, perceptions, knowledge, understanding, food preferences, feelings and social awareness help to inspire and drive change.
- *Action for change (hand and head)*: Children's practice and experience help to plan, initiate, guide, maintain and self-regulate action for change. Practical skills and know-how contribute to change, as do many other active skills such as life skills, scholastic skills and communication skills (for a checklist of support competences, see Supplement 3.1). School curricula in many countries recognize the need for such skills across all subjects (see Box 3.8).
- *Interaction with environments*: Children's informed observation and exploration of their own food environments opens their eyes to the possibilities for change. Enabling environments improve their opportunities for trying out food practices, developing skills, and interacting with the family, community and other groups.

It is important not to overlook critical success factors such as personal observation and hands-on experience, familiarity, the opportunity for choice, the need for self-confidence and encouragement, repeated experience, and the simple enjoyment of good food. A checklist of specific support competences helps to avoid neglecting key elements (for example, see Supplement 3.1).

### Box 3.8. Connecting school-based food and nutrition education in schools

These cross-cutting skills are very relevant to SFNE's aims of developing real-life practices and outlooks. Many school curricula require them in all subjects.

Scholastic and cognitive skills	Life skills
<ul style="list-style-type: none"> <li>• Reading</li> <li>• Writing</li> <li>• Comprehension (spoken and written)</li> <li>• Numeracy</li> <li>• Critical thinking</li> <li>• Sense of history</li> <li>• Science enquiry</li> </ul>	<ul style="list-style-type: none"> <li>• Thoughtful reflection</li> <li>• Empathy</li> <li>• Collaboration</li> <li>• Social interaction skills</li> <li>• Communicative competence<sup>1</sup></li> <li>• Planning</li> <li>• Self-management</li> <li>• Self-efficacy and confidence</li> </ul>

<sup>1</sup> Communicative competence in SFNE is as much about social interaction as it is about one-way messaging. Effective SFNE is full of interactions (e.g. sounding out parents, talking to vendors, sharing experiences, describing own actions), and children and teachers need to develop a range of communicative talents (including linguistic, socio-linguistic, discursive and strategic) that are both receptive and productive.

#### ⇒ What environmental and social interactions will encourage action for change?

*In schools*: Many communities and schools have a challenging food environment in which fresh, safe, nutritious food is limited or hard to find, or where foods high in sugar, fat or salt is abundant and tempting (see Theme 2). It behoves school authorities to do

<sup>30</sup> The World Health Organization (WHO) and others identify the main learning areas as "knowledge and skills", but the WHO philosophies of Health Promotion and Health Literacy also include motivations, action, practice and self-efficacy.

their best to create school environments that encourage healthy eating and lifestyles (for example, the Nutrition-Friendly Schools Initiative; see WHO, n.d.). A checklist of actions to support a healthy school food environment is a useful adjunct to the SFNE curriculum (for example, see Supplement 2.1).

*Environments beyond the school:* Despite the efforts made by schools, children’s principal ongoing “education” in food and nutrition remains mainly outside the school: in the home and community, and through markets, media and public information. At the same time, these are also the familiar settings in which students apply new understanding and take action for improvements in diet and health, for example when observing foods on sale in the market or when learning to grow or prepare food at home (see food literacy in Theme 1, and Vidgen and Gallegos, 2014). For each target competence therefore, the questions centre on what supporting motivations and actions can be developed *outside* school: who can support them, how, where and when.

- Who?
  - Peers, families, siblings, younger children, neighbours, vendors, cooks, gardeners and farmers.
- How?
  - As interlocutors, interviewees, sounding boards and audiences; as objects of observation; as sources of experience, knowledge and expertise; and as mentors and demonstrators.
- Where and when?
  - In homes and neighbourhoods, youth clubs, farms and gardens, shops and markets, food outlets, restaurants and health centres.

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The answers to these questions will shape the “outside activities” of the learning programme. **As such, the leveraging of this kind of “homework” in outside environments is a main endeavour of effective SFNE.**

### Adapt to age and interests

STEP  
3

The different stages of child development can be used to sequence age-appropriate knowledge and skills that will enable students to achieve the competences. Some age-appropriate experiences, activities and skills for SFNE are listed below (Koch, 2016).

- For children aged 8 and younger, growing, tasting and cooking food can make for very captivating and inspiring experiences, while also building skills and habits for eating more fruits, vegetables, pulses, seeds and wholegrains. These also align well with educational goals that require students to have experiences with collaboration and lifelong learning.
- Children aged 9 to 12 are also captivated by hands-on experiences, but are more cognitively advanced and can handle more complex explorations. They are therefore ready to participate in conversations and debates, for example on how drinking fewer SSBs or having a more diverse diet can affect their health and the health of the planet. These can provide experiences with critical thinking and science enquiry skills.

- Adolescents 12 years and older are ready for even more complex discussions, for example on the relationship between climate change and food. They can interact with more confidence with the wider world through projects and exploration, and can picture and practise their own adult “navigations of the food environment”, for example in providing for future families. This can build process skills to interact in society, lifelong learning and advocacy skills.

Supplement 3.3 (on reducing consumption of SSBs) is organized into age-appropriate activities.

The potential is vast. Today is not too soon to get started.  
When we integrate education for the head, hand and heart,  
children have an “I can” mindset and believe “change  
is possible and they are driving it”. (Design for Change, n.d.)

## Summary of needs

To meet these needs, SFNE has to explore the current situation in order to identify the problems (see Theme 1); determine what existing practices and outlooks contribute to them; review the existing educational priorities for the country; and finally, determine the main competences that children need, the learning needed to enhance motivation or facilitate action for change, and the environmental supports required. It should also establish the baseline data needed for evaluation purposes. This analysis should result in an outline of target competences and supports (educational and environmental), as a blueprint for the curriculum (see Theme 4) and for other SFNE interventions. For more detail on learning needs analysis and formative research in SFNE, see Supplement 3.2.

## CHALLENGES

The process of identifying, formulating and adopting SFNE competences as learning outcomes may present challenges of concept, know-how, technical expertise, management, liaison and communication, if it is to result in a product that is acceptable to professionals and to the public, and is seen to respond to food, nutritional and educational needs.

A dedicated task force is required to lead the process of change. This may be a team working with a local project, a group running school extramural activities, or school specialists in a national campaign. Within the education system it will likely be part of the curriculum development department of the ministry of education, and will consist of senior education professionals who have extensive experience with the education system, its populations, procedures and rules.

The challenges described here will affect and be affected by all those involved in the entire chain of action to strengthen SFNE, from policy through implementation, to assessment.

### Learning model: lack of a coherent, shared learning model

What is frequently lacking is a shared, across-the-board model of effective SFNE, including its aims, values, development processes and approaches. There is also a related lack of guidelines, examples and experience to point the way to change (see Theme 1). Two specific conceptual challenges relate to:

- *The knowledge transmission paradigm*: The default “knowledge paradigm” (see Box 3.9) governs much current SFNE. It tends to be classroom-bound, and to neglect children’s own experience, practices and perceptions.

#### Box 3.9. The knowledge transmission paradigm

The education system and other stakeholders may be wedded to the belief that nutrition facts, delivered top-down, are enough to change food practices. But the accumulated research evidence (Contento, 2016) shows that to achieve changes in practice, SFNE must explicitly *aim at changes in practice and take steps to this end*. The challenge is that such action-oriented SFNE may seem to be outside the schools’ scope, foreign or even frivolous to many players – including teachers, parents and even children themselves.

- *Inert environments*: Children’s physical and social environments (see Theme 2) can model and facilitate good practice, provide sources of information, and open up settings for action. However, these interactions are not generally envisaged as integral to SFNE and to the process of identifying and formulating competences.

### Capacity, experience and familiarity: lack of exposure and practice

Seeing SFNE learning outcomes as competences in context rather than topic-based targets is still relatively rare. This means a lack of exposure, experience and practice in the professional community (including curriculum developers, materials writers, learning programme designers, teacher educators, teachers, school managers and other stakeholders), which in turn results in low levels of interest, conviction and acceptance.





Several kinds of capacity therefore need strengthening to ensure quality and efficacy in SFNE learning targets. These include:

- knowledge and understanding of food and nutrition issues – both national and local;
- technical expertise (for example, in conducting needs analysis and formative research, writing action-oriented learning materials, and making full practical use of formative research findings); and
- experience and familiarity in formulating educational competences, designing competence-based learning programmes and implementing them.

### Formative research and programme design: intrinsic challenges

Learning needs analysis and formative research present several practical and political challenges:

- the traditional absence of such research for school subjects;
- the expense – both in terms of money and time;
- the possible dependence on (expensive) outside experts who may not know the context or the concept;
- the need to apply findings throughout the system, if this is not already a regular practice.

The *logic model* (i.e. the assumptions behind the learning needs analysis and the course design) often needs to be well worked through if the elements in learning programmes are to be given appropriate weight and balance. For example, each of the following assessments will affect the learning path for children, but may be difficult to include:

- Assessing strong causal links or correlations between specific practices and outlooks and their real-life nutrition and health outcomes, for example, to establish which food practices make the most significant contribution to a nutrition problem such as overweight (chips with everything? sedentary lifestyles? frequent SSBs?) – especially in light of conflicting claims. Are taboos on eggs a significant factor in girls' growth? Can we identify the main dietary practices associated with stunting? (Leroy and Frongillo 2019).
- Identifying the strongest influences on specific practices. For example, is low fruit consumption due mainly to price, taste, availability, competing snacks, lack of knowledge or simply household habit? Narrow survey designs may exclude key players or areas of enquiry, or have weak strategies for exploring mental landscapes.
- Weighing the strength of specific obstacles and incentives. For example, how strongly embedded are social dietary values such as prizing red meat and disliking vegetables?

All these assessments will affect children's learning path.

### Change management

- *The power of the status quo*: Changes in professional practice are often intimidating for practitioners. Other parts of the education system may not be ready, willing or able to work with changes in programme design based on target competences and supports.

- *Vague or incomplete terms of reference:* These may not reflect a full understanding of essential task demands (such as formative research, liaison with other units, field-testing and feedback).

### Collaboration

Collaborations outside the education system are important for SFNE (see Theme 1 and Theme 2), but present their own challenges. Stakeholders may have significant differences in priorities, capacities and working styles, as well as in the interpretation of terms and social norms. The ministry of health may lack understanding of educational competences and be more involved in direct interventions (such as distributing micronutrient supplements and deworming), and the ministry of agriculture may not be interested or have the staff to support school gardens. Non-governmental organizations (NGOs) may also have their own agendas, for example in dental health or sanitation.

## RECOMMENDATIONS

The aim of the process is not only to identify high-priority competences and their supports, but also to establish favourable expectations for competence-based learning among all those involved in the SFNE system. As such, the task force in charge of SFNE competences should first ensure that the vision and the conditions for this process are in place; that it has the needed capacities; and that it is in touch with stakeholders and with partners and colleagues working on curriculum, teacher education and materials production – and through them with end-users (including teachers and school staff, parents, children and adolescents). Recommended outputs are underlined.

### Ensure fail-safe starting conditions with adequate coordination

Ideally, promote that certain preconditions are in place before the team starts work. If not, the team may need to enlarge – or limit – the scope of work. These fall into three general categories, as listed below.

Support from above and readiness down the line. This includes:

- enabling policies, ministerial support and budget, including an adequate timetable time for SFNE;
- a comprehensive programme involving curriculum and learning programme design, materials production, teacher education and evaluation;
- a coherent overall strategy and guidelines for interaction and coordination between the education units and among stakeholders, services and partners; and
- alignment of school and non-school food and nutrition education (FNE) initiatives.

Useful input documents: As recommended in other themes, these include:

- a policy, policy brief, concept note and guidelines detailing the needs, the process to be followed and the roles of other stakeholders (see Theme 1);
- assessments of practitioner capacity and attitudes (see Theme 7);
- advocacy documents for use with colleagues and partners;
- a checklist of food and nutrition actions for school environments (e.g. Supplement 2.1);
- guidelines for external organizations and services on how to contribute (e.g. Supplement 2.2);
- samples of others' SFNE learning needs analyses, competences and learning programmes; and
- existing SFNE curricula and learning materials.

Overall vision and strategy: Start with:

- agreement on the overall vision and strategy for strengthening SFNE (see Theme 1);
- realistic estimates for the scope of work, time frame, costs, expertise and resources (see Box 3.10);
- adequate terms of reference for the different tasks (data-gathering, literature review and learning needs analysis, as well as identifying competences, liaising with other groups, getting feedback and revising competences); and

### Box 3.10. Cutting the coat according to the cloth: some ways to compromise with limited resources

- Start with a few critical, high-profile competences.
- Review and revise just one part of the existing curriculum each year.
- Make use of competence charts from similar countries.
- Get partners to pick out competences they can support with learning materials; share costs, resources and tasks with them.
- Cultivate interest among local universities in analysing learning needs.
- Maintain the consultation base and use it for regular feedback and review.

- an assessment of the capacities needed for the different tasks in relation to
  - food and nutrition issues;
  - children’s and families’ practices, outlooks and circumstances;
  - learning needs analysis and formative research;
  - SFNE learning models and best practices; and
  - formulating competences.

### Collaborate and consult

Collaborate and consult with education colleagues and external bodies to promote the learning model, improve the competences, and test their feasibility and acceptability. In particular, as part of the process of analysing learning needs:

- work closely with other education task forces (such as curriculum development, teacher education, monitoring and evaluation and early childhood development) and related projects (such as community nutrition and youth training);
- liaise and collaborate with potentially relevant programmes and organizations (such as school health, school meal services, interested NGOs, universities, parents’ associations and nutrition associations);
- find easy, economical and effective mechanisms for ongoing consultation (for example, through the regular meetings of already established committees, fora or working groups, as well as with existing networks and personal contacts);
- promote a shared vision and strategy of SFNE that is grounded in competence-based learning, and communicate and consult regularly with stakeholders on the process of formulating and promoting competences; and
- engage with stakeholders to discuss the roles they can play and invite them to undertake and report on tasks in their respective fields (for example by consulting with their end-users, assessing existing materials/practices, contributing to the archive, choosing competences to which their organizations can contribute, and field-testing).



## Analyse learning needs and identify and formulate target competences and supports

Ensure as much as possible the completion of key steps (as discussed throughout this theme and summarized below):

1. Determine food, nutrition and other relevant problems.
2. Identify existing practices and outlooks that contribute to the given problems or that need strengthening. If an outcome evaluation is planned, select some data as a baseline.
3. Use a range of strategies to identify the influences on these practices and outlooks.
4. Process the needs analysis findings, circulate and discuss.
5. Formulate a set of high-priority target competences, using national dietary guidelines if possible.
6. Identify the educational support competences (for example, knowledge, motivations, experience, skills and actions) needed to build the target competences.
7. Identify environmental supports needed from schools, families and communities, and possibly from other agencies, services and organizations (such as school meal programmes, school health interventions, NGOs, and food security and nutrition projects).
8. To integrate SFNE with other schooling, review educational priorities and cross-cutting competences for the curriculum (such as literacy, numeracy, critical thinking and life skills).
9. Adapt the competences for different age groups (for example, see Supplement 3.3).
10. Circulate the competence blueprint to stakeholders/end-users for comment and field-testing.
11. Discuss and decide strategies for the use of the competence blueprint as a foundational document.
12. Revise and publish the competence blueprint.

## Produce, disseminate and discuss outputs

Ensure that the content and style of output documents take into account their various target audiences and the different roles they will play in advocacy, policy and programming, training and briefing, as well as in developing the curriculum and teaching approaches. At a minimum, the following outputs are recommended:

- the needs analysis report shared with a circulation list, including an outline of the process for identifying competences, showing rationale, aims, process and roles;
- a blueprint of the main competences relevant to the country's needs, to be used for designing learning programmes and curricula, as well as for advocacy and promotion;
- a checklist of support competences (for example, see Supplement 3.1); and
- links to useful documents for developing curricula, learning programmes, materials and teacher education; for example, a checklist of food and nutrition actions for school environments (see Supplement 2.1); guidelines for outside organizations and services on how to contribute, and sample materials and curricula (see Supplement 2.2).

**Promote research, conduct assessments and use evidence and data**

Establish needs analysis and formative research as a recurring programme to support monitoring, evaluation and curriculum review.

Include process evaluation measures to assess the capacities for designing competences, the quality of the competences, their adoption and implementation in programme design, and their acceptance by participants in learning programmes.

Identify research questions arising from the competence formulation exercise, for example, regarding the logical chain of development, and the usability and “face validity” of the competences:

- Which dietary/food practices make the most significant contribution to food and nutrition issues?
- Which influences on existing practices are the most critical?
- How teachable are the competences?
- Are the competences generally recognizable as real needs?

If possible, engage local experts to explore such questions.

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## Supplements

- 3.1. Support competences: a checklist
- 3.2. SFNE learning needs analysis and formative research
- 3.3. Examples of specific support competences for a target competence: reducing the consumption of sugar-sweetened beverages (SSBs)





THEME


4

# The school-based food and nutrition education curriculum

“School-based food and nutrition education programmes encourage and empower children and their communities to take ownership of their own diets and food choices, and become agents of change in local food systems.”

-FAO

# Developing competence-based integrated curricula



Development of  
competence-based  
curriculum/plan



### Target audience

Theme 4 is [particularly/ primarily] targeted at those involved in school curriculum development and revision. Furthermore, recognizing the potential of positive interaction with other interventions outside of the formal curriculum context, the theme is also meant [more generally] for all practitioners involved in strengthening SFNE for greater impact.

Theme 3 laid out the process to identify some of the main building blocks of effective school-based food and nutrition education (SFNE) – that is, the competences which enable schoolchildren and their families to improve particular food practices and outlooks, to adapt to and contribute to their own food environments, and to support others to do so. Theme 4 discusses the ways in which this core set of needs-based learning targets (i.e. the competences) is embedded in the school curriculum (as a broader architecture of learning and experience that carries institutional authority) and the process through which the potential for change can be realized, on whatever scale is practicable and acceptable.

## BACKGROUND

### Subject curricula and their outputs

A school subject curriculum is a systematic, coherent and fairly comprehensive learning plan, usually spanning across several years. Some of its core output documents include:

- a rationale presenting goals, principles and cross-cutting dimensions;
- a “scope-and-sequence chart” which groups and prioritizes learning areas, showing the main topics and sub-topics, the main learning targets, objectives or outcomes in each topic, and the ways in which the learning targets are recycled and extended through the different age groups; and
- briefing notes, supports or guidelines on support, and so on.

In situations where the subject curriculum is to be reviewed and significant changes are planned, curriculum documents may also include other outputs to promote, illustrate or explain the curriculum content, to guide practitioners, or to link with non-school-based programmes (see Supplement 4.1).

### Why the curriculum matters for school-based food and nutrition education

On the roadmap from national policy through implementation to assessment, the curriculum is both a flagship document and a potentially powerful pedagogic instrument. It interprets policy, embodies principles, articulates strategy, and helps to create institutional consensus. Since it is certified to make changes, it can also innovate. Typically, regular reviews are officially in place in ministries of education, and subject curricula are updated every few years by specialist teams in a dedicated unit. The curriculum can also help coordinate and support national non-school food and nutrition education (FNE) initiatives and extracurricular activities, as promoted for example by health services, NGOs, youth clubs, civil society organizations and community programmes.

Developing a new curriculum or reviewing the existing one is therefore an important step towards breathing new life into SFNE as a whole. The subject curriculum can affect how SFNE is handled: it proposes the subject rationale and pedagogic strategy; it groups, prioritizes and distributes learning through the different age groups; and it provides the blueprint for developing SFNE learning programmes and materials, along

with the criteria for assessing progress. It is therefore organically linked to the work of other task forces in teacher education, materials and learning programme design (see “Underpinning considerations” in the Introduction). The SFNE curriculum can also extend these institutional roles outward, through links with food environments, homes and communities, thereby guiding and integrating interventions such as school meals and school health measures, and providing briefings and materials for advocacy and awareness-raising, both within the education service and beyond.

## The situation on the ground

In an effort to better comprehend the national SFNE curriculum situation and to identify potential challenges and opportunities for enhanced impact and a broader scope, FAO conducted a global survey in 30 low- and middle-income countries (LMICs) (FAO, in preparation). Respondents commented on a range of topics, including for example:

- *Location in the school curriculum:* In about half the school systems, SFNE is mainly extracurricular (and mostly in school gardens).
- *Quantity:* Less than half the school systems allow 10–20 hours a year (on average, about half an hour to an hour per week); well over half allow only 0–10 hours a year (on average, about a quarter of an hour to half an hour per week).
- *Needs base:* About half the curricula are “based on needs to a limited extent”, while about a quarter are based on a “comprehensive needs analysis”.
- *Assessment:* There is regular assessment of progress in about half the school systems, but no detail on how it is done. Lack of monitoring and evaluation remains one of the top challenges.
- *Settings for activities:* Most SFNE activities take place in classrooms and school gardens; a few at home or in the community.

Food environments: Linkages of SFNE to food environments are perceived as weak; this is seen as a general challenge to effective SFNE.

The survey also brought to the front the learning models that are most prevalent in the design of SFNE programmes, particularly with regard to expected outcomes and their assessment. SFNE learning models have been evolving rapidly from simple knowledge delivery towards more functional, action-oriented approaches (see Box 4.1), and are becoming more relevant, purposeful, participatory, and closer to lived experience, with greater potential to change lives.

However, a large majority of respondents reported that expected learning outcomes were still mainly related to *knowledge* or *understanding* (for example, of nutrients, nutritional value of food, food safety, food needs, and the relationship between diet and health). A few mentioned applying such knowledge, but not how this might happen. One described a new curriculum aiming at achieving active competences (see quotation on “A new learning model”).

### A new learning model

“In the new curriculum learners will be expected to make appropriate food and drink choices to improve their health. The learners should also be able to act as change agents in their homes on food and drink choices. They are also expected to observe food hygiene and food safety strategies to avoid food poisoning or toxicity.”

(FAO, forthcoming)

**Box 4.1. The evolution of learning models: a simplified picture**

<b>Programme activity</b> (what the programme does)	<b>Supporting model</b> (what the programme is usually based on)	<b>Expected outcomes</b>	<b>Assessment</b> (if any)
<p><b>Disseminate core nutrition information</b></p> <p>For example, about deficiency diseases, nutrient functions and food sources of nutrients</p>	Simplified knowledge of nutrition	Knowledge and understanding	Factual questions and answers
<p><b>Discuss topics relating to food needs</b></p> <p>For example, on clean water and healthy snacks</p>	Formal or intuitive analysis of critical food practices and outlooks	Knowledge, understanding and attitudes	For example, the Likert Scale for attitudes, and multiple-choice questions about good practices
<p><b>Disseminate messages and advice</b></p> <p>For example, on food-based dietary guidelines (FBDGs) and essential nutrition actions (ENAs) for improving specific food practices</p>	Formative research into practices, outlooks and influences, resulting in carefully crafted, pre-tested messages	Reach of messages and action outcomes	Documented action outcomes
<p><b>Develop and deliver messages as part of a wider package</b></p> <p>Including face-to-face communication, emotional responses, community participation and support groups</p>	One or more theories of behaviour change; formative research into practices, outlooks and influences; and evaluation of relative impact of channels, “doses”, frequency and other critical factors	Reach of messages, action outcomes, competences, community support and maintenance	Documented action outcomes and impact evaluation of maintenance of practices; data on relative impact of different strategies
<p><b>Build competences</b></p> <p>For example, complex food and nutrition target actions, with a pathway of support competences, social and environmental interactions</p>	Learning needs analysis into practices, outlooks and influences, including social and environmental influences (see Theme 3) and ongoing feedback from activities	Competences outcomes, contributory skills, motivations, perceptions and knowledge, self-efficacy, capacity for change, increased social awareness and sustainability	Documented outcomes (all), and participants’ perception of progress

Note: Any of these models can be used in conjunction with other activities such as income generation, agricultural production or training, social protection schemes and health programmes.

# Questions to ask and answer about a school-based food and nutrition education curriculum

The process of developing or reviewing an SFNE curriculum requires basic understanding of a series of questions which underpin its potential functions and planned powers. The main questions are explored below. (Supplement 4.2 elaborates further with an assessment checklist of desirable features.)

## Components, audiences and uses

1. *Components*: What are the main and subsidiary components of the curriculum package? (See subsequent points and Supplement 4.1.)
2. *Users and uses*: How are the components to be used and by whom? How are they adapted to their audiences and purposes?
3. *Participation in the process*: Who is involved and consulted in the process of SFNE curriculum development/revision, and how? What non-school players are interested?

## Status, coherence and integrity

4. *Goal*: What is the expressed goal of the curriculum? What is driving change?
5. *Location*: Where is the subject located in the overall curriculum, i.e. in what subject area/s? This reflects how the subject is perceived and affects its coherence, its content, and who teaches it.
6. *Quantity*: How much time is given in the SFNE learning programme (in number of sessions, frequency and/or length)? How is it distributed over the years?
7. *Integrity and coherence*: How does the subject cohere and develop through the years?

## Relevance and content

8. *Needs base*: How does the content respond to identified learning needs?
9. *Alignment*: Is it aligned with national legislation and policies, priorities and perceptions of need?

## Learning aims and assessment

10. *Learning aims*: What kind of learning outcomes (including knowledge, awareness, attitudes, skills and competences) are expected and how are they expressed in the curriculum?
11. *Assessment*: How are the learning outcomes assessed? How is progress made visible and to whom?

## Learning model

12. *Assumptions*: How are the learning outcomes achieved? What are the roles of motivation, experience, knowledge and practice in the students' learning agenda?
13. *Activities and settings*: What kinds of activities will fulfil the aims of the SFNE learning programme, and where (for example, in the school, home or community) should they take place?
14. *Environments*: What environmental/social supports are needed to make learning effective? How are school, home and community involved?
15. *Participants*: Are other outside groups involved in the SFNE learning programme? In what roles?

## The case of Country X: a running example

The starting point for curriculum revision can be exemplified by the case of Country X, which recently undertook to revise and renew its SFNE curriculum.<sup>31</sup> It will be taken here as a running example of the curriculum change process.

The economy of Country X is based mainly on rural agriculture. Home gardens are widespread. The diet is often monotonous and the level of diversity varies considerably with the seasons. Clean, safe drinking water is a real challenge. The cities are in the throes of the nutrition transition, and child obesity is increasing. At the same time, micronutrient deficiencies are prevalent among young children and adolescents, and maternal mortality remains high.

Box 4.2 presents some data from the existing curriculum document for Country X. Though relevant to country needs, this outline curriculum is very basic: It averages 4 hours per year, it does not appear to develop from year to year and it skips some years altogether. It does not say what practical outcomes are expected, how the subject is to be approached or who might be involved.

The new curriculum task force for Country X acknowledged the practical relevance of the existing curriculum's content, with its emphasis on water and a balanced diet, but identified some aspects that needed more attention and therefore more school time. For example, achieving more dietary diversity, growing nutrient-rich foods (especially in home gardens), increasing consumer awareness to cope with the nutrition transition, preventing micronutrient deficiencies, and monitoring and improving community water supplies.

In their approach to revising the curriculum, the task force aimed at more visible and practical goals with a focus on action; more coherence and development through the whole school programme; more engagement with families and communities; and more use of food environments and of children's own experiences. In light of these needs, they pressed for dedicated classroom time rather than cross-curricular integration only<sup>32</sup>. They summarized these and other key elements in a seven-point reform agenda:

1. Timetabling and training;
2. Stronger needs base;
3. Wider coverage of learning needs;
4. Behavioural orientation (competence-based);
5. Spiral curriculum and reinforcement;
6. Range of support competences, including life skills; and
7. Tripartite approach involving school, home and community.

<sup>31</sup> The case of Country X is based on internal FAO reports about an existing country. It is not intended as a model, but as an example of modest changes that can be achieved with limited resources.

<sup>32</sup> Cross-curricular integration (i.e. dealing with a subject across and through a range of other relevant subjects rather than as a subject in itself) is often proposed for SFNE, with various reasons cited; for example, because many school subjects are relevant to food, because there is no room in the timetable, or because teachers are not trained in SFNE. Cross-curricular integration can be a bonus for SFNE, but it is not sufficient in itself for building action-oriented competences, as these require coherent long-term development and implementation in real-life settings.



### Box 4.2. The case of Country X: the existing school-based food and nutrition education elementary school curriculum

Year	Time allowed	Topics covered
1	8 hours	Sources and uses of water, the kinds of foods we eat, our senses and food
2	5 hours	Foods that we need, meal frequency, breakfast and food hygiene
3	-	
4	-	
5	9 hours	Food and nutrition, food groups, balanced diet, eating habits, cooking and preserving
6	1 hour	Regional dishes

*Total* 23 hours over 6 years

The lessons were taught (often by different teachers) in these subject areas:

- Integrated Studies (a core subject)
- Physical Fitness (non-core)
- Home Economics (non-core)

## Room for improvement

From the situations described above it is clear, first, that there is significant room for purposeful improvement if schools are to produce the citizens with life-long capacities envisaged in the goals of SFNE (see Theme 1); and second, that many needs are already recognized in professional communities, that some priority changes are easy to identify and that some positive reform is under way.

# WHAT IS NEEDED?

## Status, coherence and integrity

As in the case of Country X in the section above, a greater SFNE presence in the national school curriculum is often needed. One priority of the political advocacy mentioned in previous themes is to ensure sufficient, dedicated time throughout the school years, in order to establish a coherent and progressive SFNE learning programme, to brief and induct teachers on a regular basis, to set up children's activities and engage parents, and to show encouraging results. Since all school subjects compete for timetable space, this requires not only policy support and a seat at the table, but also some strong arguments that stress quality as much as quantity (see Box 4.3 and Theme 1).

### Box 4.3. Arguments for a regular, continuous and coherent school-based food and nutrition education presence in the timetable

- Developing SFNE competences involves purposeful sequences of activities leading to visible achievements, rather than one-off lessons scattered through several different subject areas.
- Since SFNE aims at real-life actions, every classroom hour can be matched by action at home or in other food environments.
- What matters is regularity and frequency. Even half an hour once a week can produce results.
- One or two high-priority, successful and memorable projects every year, implemented through the whole school, can be effective in building student capacity and community awareness.

## Relevant, needs-based content

Relevant SFNE curriculum content is determined at the outset by national food, nutrition and other relevant issues and by food practices (see Theme 1 and Theme 3), with situation analyses, literature reviews, national databases (and intuition) then suggesting the critical areas for action.

Although different SFNE curricula divide and organize their content differently, they have much in common. General trends include the following: food, rather than nutrients, has become the main focus; food systems and consumer behaviour and awareness are more prominent, as they affect the environment and community as well as personal health; and gender issues, which affect household dynamics, have become a cross-cutting issue.

*Curriculum threads:* An SFNE curriculum generally organizes content into “threads” (sometimes called themes or topics), with subheadings. Box 4.4 presents a typical set of curriculum threads with a food system perspective, from the national curriculum of the United Kingdom of Great Britain and Northern Ireland.

#### Box 4.4. Curriculum threads for school-based food and nutrition education

- *Diet (food and drink)*: variety and balance, adequate drinking water and dietary needs;
- *Consumer awareness*: food sources, food production, food processing, environmental impact;
- *Food choice*: preferences, choices and influences on them (including cost and marketing) and informed choices;
- *Food labelling*: making use of labels in food choices;
- *Food preparation*: recognizing ingredients by taste, using equipment correctly, preparing foods in healthy meals, avoiding food waste and improving recipes;
- *Food safety*: hygiene in food preparation, food storage, date-marking and food safety risks;

(Food Standards Agency, 2016)

#### Different contexts, different priorities:

However, different contexts mean different needs. High-income countries generally take the prevention of childhood obesity as one of their main goals, and tend to give special attention to food environment policies and consumer choices that are geared towards preventing non-communicable diseases (NCDs), avoiding highly processed food<sup>33</sup>, reducing portion sizes and getting more physical activity.

In some low-income countries however, the range of targets may be very different. Walking to school for example, may be an unavoidable necessity rather than a healthy choice, and the consumption of red meat may be seen as something to be valued for its nutritional content rather than something to be reduced for its potential effect on health and the environment (GLOPAN, 2016)<sup>34</sup>.

While many LMICs are also increasingly plagued by the obesity crisis, they are generally looking at a wider spectrum of malnutrition, its causes and its victims (Global Nutrition Report, 2017; FAO *et al.*, 2018; ASEAN *et al.*, 2016), including for example, the effects of the nutrition transition and rising levels of obesity, stunting and micronutrient deficiencies; intra-household food needs and distribution; children's roles and gender issues in the household food cycle; the needs of vulnerable groups; drinking water, street food, food prices and the overall challenges of poverty; and the lack of education and access to reliable information (which is fundamental to the right to food).

In the case of Country X, gaps in the existing curriculum were tackled by expanding its topic areas and establishing a set of curriculum threads that address country concerns (see Box 4.5). Similarly, these and other topics are reflected in the updated curricula of various LMICs (see Box 4.6; readers may want to add to the list).

<sup>33</sup> E.g. sugar sweetened beverages, sugary breakfast cereals, industrial bakery products, chips, candy, fast foods, etc.

<sup>34</sup> The GLOPAN report notes a complex and sometimes counterintuitive picture in LMICs, including for example, the prevalence of deficiencies of at least seven essential micronutrients in adolescent girls, the double-edged sword of economic growth in its effect on diets, and the trade-offs between healthy diets and sustainable diets.

### Box 4.5. A first step in Country X: establishing the curriculum threads

Four main threads were first indicated by the existing curriculum's content headings: Our diet, Functions of foods, Specific foods and dishes and Drinking water. Three more threads were then added, inspired by the pressing needs of a poor rural economy with high levels of infant and maternal mortality: Special food needs, Food security (including food hygiene) and Getting food.

### Box 4.6. Examples of curriculum threads/topics in LMICs

#### Diet and food choices

- dietary diversity
- micronutrient-rich foods
- child feeding
- anaemia and diets for adolescent girls
- breakfast/snacks for schoolchildren
- school meals
- street foods (content and safety)
- highly processed foods / high-calorie, low nutrition value food products

#### Information and marketing

- sources of reliable food information
- food marketing and promotion
- food labelling

#### Food preparation, household practices and roles

- cooking fuels and cooking methods
- household food distribution and other practices
- handwashing
- food loss and waste
- basic cooking skills

#### Food sourcing and the food system

- nutrition value for money in local foods
- clean water (safe sources, handling and treating)
- urban food sources and delivery
- diversifying food gardens to improve diet
- food production and marketing
- climate change

## Relevant, recognizable and achievable learning aims, expressed as competences

### The shift to competences

In Country X, the curriculum reform agenda proposed expanding the existing topic-based learning aims (*sources of water and regional meals*) to reflect a “behavioural orientation” through real-life competences. (For more detail, see Country X’s new basic SFNE curriculum in Supplement 4.3.) For each curriculum thread, the task force discussed what exactly children should aim to perceive, understand, feel, experience and, most importantly, do – and listed the answers as “practical targets” for children to achieve, paying careful attention to wording.<sup>35</sup> Box 4.7 features the target competences they formulated for the curriculum thread on safe drinking water, which is a major problem in both rural and urban areas of Country X.

#### Box 4.7. Country X’s new target competences for drinking water

Curriculum thread	Practical targets
Clean, safe drinking water	
<ul style="list-style-type: none"> <li>• water pollution</li> <li>• local sources of water</li> <li>• sterilizing water</li> <li>• responsibility for safe water</li> </ul>	<ul style="list-style-type: none"> <li>• recognizing how water is contaminated</li> <li>• avoiding risky water sources and warning others</li> <li>• knowing how to draw water, sterilize it and store it</li> <li>• monitoring/improving the community water supply</li> </ul>

This shift in focus reflects a general global trend<sup>36</sup>. Curriculum developers are adopting real-life practices in familiar settings as central learning aims, whether identified by rigorous formative research (see Theme 3) or through discussion and consultation, as in Country X. “Key messages for action” have been adopted for some curricula (Government of Australia, n.d.; Government of Zambia, 2004), and national food-based dietary guidelines (see Theme 3) – which are meant to be actionable – are attracting attention as potential outline syllabi (see the example of South Africa in Nguyen *et al.*, 2015; the examples of Brazil and Norway in FAO, forthcoming, b; and USDA, n.d.). Typical target competences that have been adopted include healthy snacking (Sarlio-Lähteenkorva and Manninen, 2010), increased vegetable consumption (Government of New Zealand, 2007)<sup>37</sup>, healthier food habits (Nguyen *et al.*, 2015) and active use of outside information sources (Government of Australia, n.d.). Cooking and food preparation, which had disappeared from some curricula, are also back in strength (Government of the United Kingdom of Great Britain and Northern Ireland, 2014; Food Tank, n.d.).

<sup>35</sup> The wording of competences often creates confusion among curriculum developers. For a detailed discussion on this, see Supplement 4.5.

<sup>36</sup> Reviewers of the white paper have suggested that this behaviour-oriented paradigm may be of value in other school subjects. It already applies of course, to practical subjects such as gardening, cooking and (usually) maths, but many other more academic subjects can also benefit from a behavioural focus. Professional training in any field should consist of an interaction between theory and practice in the proportion of at least 1:4. For an example of this empirical approach to FNE professional training, see The ENACT Course (FAO, n.d.).

<sup>37</sup> See the section on “Primary schools”, “Levels 1 and 2: Example of a unit of learning” at <http://health.tki.org.nz/Key-collections/Healthy-lifestyles/Food-and-nutrition-for-healthy-confident-kids#Primary>.

## The range of competences

### Knowledge and behaviour

In the past, SFNE curricula have traditionally aimed at children's knowledge and understanding. But knowledge and understanding alone cannot effect change where it is most needed: in everyday real-life food practices, interactions, experiences and perceptions. An exclusive "knowledge diet" in SFNE has been likened to providing children's heads, hearts and hands with a lot of empty calories and no exercise (Nordin, 2016)<sup>38</sup>, leaving them educationally malnourished – hence the new behavioural emphasis. In this white paper, Theme 1 emphasized the need to focus on *practices* and *outlooks*, Theme 2 expanded this to *active engagement* with the environment, and Theme 3 illustrated how to identify priority *action competences* for children through formative research.

There is no denying however, that in the context of food and nutrition, knowledge and understanding (or misunderstanding) interact with experience and practice, to shape social and individual outlooks and practices. As such, knowledge and understanding must be appropriately balanced with direct experience, action and practice. In each curriculum thread, a focus on core knowledge and understanding is interwoven with the development of specific competences. The emphasis now tends to be on how knowledge is put to use in achieving action outcomes, for example:

- *What do children need to know to achieve a particular competence?* Knowledge (for example, knowing the sugar content of sugar-sweetened beverages) can clearly contribute to achieving many specific practical outcomes.
- *How do they learn it? Will the learning be interiorised/appropriated?* Knowledge needs to be constructed and owned; reinforced by personal enquiry and observation; shared and repeated, and combined with memorable experience. Knowledge, familiarity and understanding become strong motivators if linked with social interaction, practice and pride. For example, young children like washing their hands free of "invisible dirt"; children of all ages enjoy exhibiting their individual food expertise and know-how; and bite-sized pieces of information are easy to practise in quizzes and demonstrate in tests, making a good impression on parents.
- *What else do they need to know?* A broad base of core knowledge, concepts, everyday skills, understanding and practice is needed as a general grounding for many action outcomes. For example, understanding microorganisms plays a big role in the practice of food hygiene, food storage, processing and preservation. Familiarity with locally available foods (including production, seasonality, cost, taste, social status, storage, nutrition value and use in local dishes) is necessary groundwork for choosing healthy snacks, planning and preparing meals, or increasing dietary variety.

### Defensive competences

Exploring the influences on food practices has done much to reveal the "hidden curriculum" – the silent messages from social and physical environments that are implicit in the attitudes, action (or inaction), facilities and services of schools, homes, communities and markets (see quotation on "Messages from the environment", as well

### Messages from the environment

"While school is an important setting for influencing children's health behaviour [...] wider influences (from the family, community, media and the food industry) have a greater effect than any school-based intervention."

(Adab *et al.*, 2017)

<sup>38</sup> This study promotes the Danish IVAC (Investigation–Vision–Action–Change) paradigm for school health education (i.e. democratic as opposed to moralistic). See also Jensen, 1997.



as Theme 2). These environments are extended classrooms that enjoy a great deal more time, exposure, resources, variety and attraction than the traditional classroom, and their impact only strengthens from infancy to adolescence (Iyalomhe *et al.*, 2018).

Hence many SFNE target competences are now defensive and preventive as well as proactive. They aim to resist and undo poor practices; encourage children to “interpret” the food environment and interact with it; establish self-protective skills such as the interpretation of advertising, the reading of labels and the checking of sources; and combat the consumption of highly processed foods (Nestle, 2018).

### The social dimension

Because social norms strongly influence food practices, competence-based curricula increasingly indicate how children can explore what their families and communities think and do about food, and get their support. Some curricula apply the principles of social learning across the curriculum (Kupolati, MacIntyre and Gericke, 2018), while others structure the curriculum for a social focus that widens with each progressive school year (from self, through peers and family, to community and onward to national and global concerns), with expectations of growing proactivity at each stage (Government of Australia, n.d.; FAO, 2005). In addition to the importance of teachers as role models, school events, helpful neighbours, food vendors and local farmers can all reinforce children’s learning.

### Can children act for themselves?

The move to competence-based curricula raises questions about agency as well as aims. Competences are worded to reflect what children themselves do, see, think and feel (such as “bring healthy snacks to school” and “reduce household food waste”): they assume that children can act to change their own food practices and outlooks.

This assumption has been challenged on the grounds that children have little control over their diet (see example in Box 4.8), especially in lower-income countries. However, it may be a question of how high the bar is set and what the essential aims are. Some counterarguments include:

- Even socio-economically vulnerable children can and do change what they eat and drink. The same teachers quoted in Box 4.8 noted the low-nutrition value snacks that schoolchildren were buying from snack vendors at the school gates.
- Many water, sanitation and hygiene (WASH) interventions have improved handwashing practices in schools.

#### Box 4.8. Can children change their ways?

South African teachers discussing SFNE explained that “for learners to set their [own] goals was difficult for them because they did not have a choice; it was what their parents gave that they would eat”. The teachers hoped that even “if they [the children] couldn’t practise what they learned now because they couldn’t afford the foods, they would be able to use the knowledge to benefit their lives in future”. (Kupolati, MacIntyre and Gericke, 2018)

- A recently developed NGO poster (Children for Health, 2018) features a range of nutrition actions that schoolchildren in lower-income countries can undertake.
- Even at a young age, many children are already expected to develop food competences at home (see the example from Zambia in Box 4.9). SFNE learning programmes can extend these roles, often to the great gratification of both children and households (Sherman and Muehlhoff, 2007).
- In adolescence, the scope for independent action expands greatly (see the example from Eastern Africa in Box 4.9).
- In some cases, children can act as change agents in their households (Fornari *et al.*, 2013; He *et al.*, 2015; Gunawardena *et al.*, 2016).

### Box 4.9. What schoolchildren can do for healthy diets

What rural upper primary school children can do, in their own words (Government of Zambia, 2004)

- *Eat a healthy diet:* “We make small improvements in what we eat.” “We tell people about good local foods.” “We avoid some foods which are not healthy.” “We try some new foods and discuss them.”
- *Observe good hygiene:* “We show younger children when and how to wash hands.” “We know several ways to kill bacteria.” “We cover cooked foods and store other foods safely.”
- *Drink clean water:* “We know how to purify drinking water and keep it clean.” “We warn younger children about any contaminated water they might drink.”
- *Prepare healthy meals:* “We can and do help to prepare family food.” “We make healthy snacks to take to school.” “We learn two new things to cook each year.” “We economize on cooking fuel.”
- *Shop:* “We know which foods in the market are good nutrition value for money.” “We always check that salt is iodized.” “We can tell if food has gone off [e.g. groundnuts, fish, beans and dried maize].”
- *Grow and preserve food:* “We have learned food skills from local experts [e.g. for raising chickens and milking goats] and know where to find out more.” “We know how to preserve some local foods.”

#### What adolescent girls can do

In the *Girl Guides Anemia Prevention Badge Project* for Eastern Africa (FANTA and World Association of Girl Guides and Girl Scouts, 2007), which is designed for adolescent girls, activities are divided into three areas: knowledge, action and outreach. Guides make use of local sources of information and expertise (including teachers, family members, staff from local clinics and patients), and share tasks with their peers in order to:

- identify the dangers of anaemia and understand local risk;
- recognize the signs of anaemia;
- understand the causes;
- identify local, low-cost foods that are rich in iron;
- find such foods at the market;
- help others to prevent anaemia;
- prepare acceptable iron-rich dishes or snacks;
- plan meals for the family and for picnics, etc.; and
- get information from the health clinic and find out what is being done.

Activities are discussed and recorded in a workbook, which is then assessed for the “Anaemia Prevention Badge”.

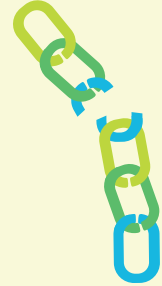


- Most importantly, in terms of learning, it is **not the extent of the change that matters as much as the experience of achievement, the process, the ownership and the sustainability** (see Box 4.10).

Innovative  
practice & insight

#### Box 4.10. Common misconceptions: change and the capacity to change

The conviction that the size and speed of change are significant factors is common in development interventions, and is built into measures of cost-effectiveness. Bigger and faster are often seen as better. But from an educational point of view, what matters as much or more is *developing the capacity to change*. This happens through an individual's personal and repeated experience with small, successful and owned changes, which combat the sense of helplessness generated by poverty, and build the confidence to try again and show others.



### Organizing competences by scope and sequence

When the curriculum specifies what competences should be achieved in each curriculum thread, the result is a matrix known as a scope-and-sequence chart. This shows how learning in each thread develops vertically and is reinforced in each school year (for examples, see Government of Australia n.d. and Government of New Zealand, 2007, as well as the sample scope-and-sequence chart in Supplement 4.4). Since SFNE needs to connect continuously to growing children's widening real-life experience and increasing responsibility, it has a natural affinity with the spiral curriculum (EPI, 2012) which recycles and expands competences through successive school years.

**Scope-and-sequence charts provide a strong, coherent, flexible framework; this in turn results in potential motivations for end-users and benefits for education programme managers.** Such charts are easily interpreted and help to avoid the kind of arbitrary fragmentation seen in Country X's original curriculum (see Box 4.2). They can show well-constructed, visible advances in learning towards recognizable outcomes, and they can be used flexibly, for example to prioritize some curriculum threads over others, isolate one thread as a stand-alone project, deal with a single competence simultaneously through the whole school, "farm out" a thread to extracurricular activities, or select threads according to context (for instance, whether a school is urban or rural, whether or not school meals are provided, whether the population is more or less vulnerable, and according to different regional food practices). (See Theme 3.)

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### Assessment

Systematic assessment of real-life competences is rare within the scholastic framework, but it is relatively easy to identify suitable indicators of achievement and progress in actual performance and outlook, which can then become a routine part of scope-and-sequence charts (for example, see Government of Australia, n.d. and Supplement 4.4). Simple systems of assessment (such as counting of the different varieties of daily foods and checking for handwashing) also help to convince children and the wider school community that they are making progress.

## A curriculum that reflects and enables an effective learning model

A needs-based, competence-oriented SFNE curriculum is a good start but, like any document, is less than half the battle. It is more concerned with end-results than with the processes through which they are achieved – that is, with the pathways to competence. The effective operationalization of learning (including learner activities, their sequences and settings, the media and the actors involved), is up to designers of SFNE learning programmes, materials writers, teacher educators, teachers, parents and children (see Theme 5 and Theme 6).

However, all these groups take their cue from the curriculum documents, which should derive from and promote a coherent learning model. Based on the trends described above, some characteristics of this model follow:

- It builds on existing knowledge and experience (i.e. known starting points).
- It is based on food and nutrition needs (as curriculum threads) and related practices and outlooks.
- It can respond flexibly to the needs of different contexts.
- It formulates visible, recognizable and realistic target competences and support competences (motivations, perceptions, specific knowledge and skills). These include cross-cutting skills as specified by the national curriculum (for example, life skills, literacy, communication skills and vocabulary). (See Theme 3.)
- It can identify indicators of progress and achievement.
- It develops competences coherently and progressively, step by step through all school years, through extended practice and experience.
- It allows adequate time.
- It builds a broad foundation of knowledge and experience to support children's competence development.
- It promotes ownership of change (for example, by framing aims in terms of what children themselves do and achieve, and making these visible to children, teachers and parents).
- It has a strong social dimension, as well as community and family support.

The following elements, as mentioned in other themes, can also be endorsed and highlighted by the curriculum:

- Supportive food environments (see Theme 2).
- Background information for teachers on issues, current practices and learning approach, as well as references to sources of further information (see Theme 7).
- Children's extensive interactions with food environments (including observation, enquiry, practice and imitation) within and beyond the school (see Theme 2 and Theme 3).

These are key elements for an “enabling curriculum”. As an illustration, see Supplement 4.4, which gathers many of these into a sample scope-and-sequence chart for the target competence to “Increase variety and appeal in your daily food”, within a main thread on healthy diets.



## A curriculum to fit audiences and uses

The usual product of a curriculum review team is a revised main curriculum document, with slight changes of content and emphasis. But a new SFNE curriculum aims to promote other changes through the system, for example in classroom approaches, more whole-school involvement and outside participation and collaboration. In this case, the scope of the curriculum team's activities and outputs needs to be extended.

### Users

Several groups will use the new curriculum in several different ways. These include ministries, donors, NGOs and district education services; food and health services (including school meal programmes); other task forces (including teacher educators and designers of SFNE learning programmes and their materials); and end-users (such as teachers, school staff, parents and children). Other groups involved in health and education in the community (especially with families and young people) may also want to be associated with the process. There is good reason therefore, to consult with and consider the needs of all stakeholders and end-users during the process of curriculum revision, and to conduct field-testing on curriculum products with regard to transparency, appropriacy, usability and suitability of tone, style and length.

### Outputs

Some will use the curriculum for reference, but most will use it as a manual and guide to their own actions. The main output is of course the official curriculum, along with an introduction, scope-and-sequence charts, and so on. (For a sample scope-and-sequence chart, see Supplement 4.4). Additional outputs that may prove useful and are therefore worth considering include:

- Guidelines, examples, links and sources to support practitioners and task forces (including teacher educators, materials writers and researchers).
- Guidelines for other players (such as school meal services, health services, NGOs and youth clubs) on how to align with, contribute to and benefit from the main curriculum (see example in Supplement 2.2).
- Guidelines for schools on “enabling” the school environment for SFNE (see example in Supplement 2.1), collaborating with parents for children's better health, and liaising with local communities.

For a full list of possible curriculum outputs, see Supplement 4.1.

### Advocacy uses

Since the learning model and the form of a revised curriculum may be new to several user groups, advocacy will be needed at several levels (see Theme 1). The curriculum development team can contribute by producing, for example, attractive one-page summaries (of the rationale, of the curriculum, or of separate threads) for several user groups and levels (including policy makers, professionals, schools and parents), and suggesting how to use these documents.

But for this strategy to be both successful and cost-effective, it must have an ongoing ripple effect – such that each advocacy instrument plants the seeds for further advocacy (for example, by asking questions, eliciting suggestions and proposing actions and follow-up).

## Coordination and collaboration with initiatives outside the scope of the curriculum

In both high- and low- and middle-income countries, many interesting FNE initiatives for school-age children take place outside the formal school context (McCarthy *et al.*, 2018). (See also the Background in the Introduction.) Some of these may take place in schools (for example, through health clubs, school gardens, peer education schemes and classes in food preparation for parents), while some figure as part of larger non-school-based interventions, such as Junior Farmer Field and Life Schools, Guides and Scouts, community nutrition projects, faith-based initiatives, youth employment training and maternal health programmes that engage the whole family.

These initiatives are often driven by the perception that needs are not being met by the formal education system, because it may lack resources, class time, materials and relevant training; it may see other educational priorities as more urgent; and it may be slow to change. But necessity is not the only driver, and informal FNE has many attractions. It is generally low-cost, user-friendly, flexible and free to experiment; it is sometimes well-funded; and it is adaptable to context and open to community and family engagement and participation. It often relates to activities in other sectors (including health, agriculture, livelihoods and community development) which reinforce food and nutrition education through direct experience and action. Some drawbacks, include the soundness of the technical basis and content, lack of sustainable funding, unreliable staffing and inconsistent quality in facilitation, fragmentation, and the lack of coordination with state education systems.

However, curricular or extracurricular should not be an either/or choice, and there is significant scope for partnership, collaboration and coordination, when the potential for synergies is recognized. The expertise of local and international non-governmental organizations (NGOs), though very diverse, is growing, and the education service can learn from promising extracurricular and non-school-based initiatives. In return, the official curriculum can (if successful) contribute political recognition, demonstrate the continuity of learning programmes, shape consensus on needs, aims and approaches, share learning materials, and widen the range of interested services and organizations.



## Summary of needs

In summarizing the needs for this theme, a first step is to underscore that if the SFNE curriculum is thin and patchy, not much can be done without changing its status in the broader school curriculum, in order to give it more scope for development.

Second, an SFNE curriculum must identify and respond to a range of relevant learning needs, for both general healthy and sustainable living as well as for specific food competences, and it must organize them through the whole school. It must also draw on a coherent learning model that opens up clear pathways to these competences – that is, through essential perceptions, actions, skills and supports that will turn aims into real-life practices.

Finally, an SFNE curriculum should clearly relate to its many users and potential partners, including professional task forces, stakeholders and end-users (such as schools, teachers, parents and children), and to the uses they want to make of it, and consult them in the process of development.

## CHALLENGES

A range of challenges in SFNE curriculum development/revision have been identified by practitioners and consultants (FAO, 2011; FAO, in preparation; Kupolati, MacIntyre and Gericke, 2014; Lee and Hong, 2015). Moreover, and judging by older reports, many of these have not changed substantially over recent decades (see Olivares *et al.*, 1998 and Sherman and Muehlhoff, 2007).

### The demands of a new learning model

As discussed in the Background for this theme, the knowledge-based curriculum model that is still widely in place today is unlikely to be effective in realizing changes in children's practices and outlooks. But at the same time, the programmatic demands of a more effective learning model are significant. These include the need for convincing evidence of impact that is visible to all, a stronger mandate for change, a response to real needs and more relevant subject coverage, more space in the school timetable, links to food environments and school food, coordination between and within government services, well-coordinated involvement and links with reliable and well-briefed external agencies and partners, assessment / monitoring and evaluation, and social and environmental support.

### Capacity, experience and familiarity: institutional capacity and professional practice

In order to design and implement more effective SFNE curricula, several other areas of institutional capacity need to be galvanized across the chain of implementation and according to varying country contexts. These include the general belief in the need for food and nutrition education; familiarity with new models; relevant expertise and experience to lead change (as well as the opportunities for acquiring such expertise and experience); parental engagement and parent-school relations; and supportive social, material, information and media environments, IT connections and skills.

Moreover, paradigm changes of this kind, when proposed in professional practices, may also challenge the established habits or values of those who implement the curriculum (for example, teachers, teacher educators, materials writers, school managers and staff).

### Change management: barriers to successful change in food practices and outlooks

#### General challenges in the education system

All education initiatives in LMICs have common challenges. These can include weak institutional infrastructure and capacity; poor school facilities; lack of resources and materials; an overloaded timetable; poor teaching conditions, understaffing and absenteeism; large classes; lack of training and expertise; difficulties with meeting (such as transport costs); little scope for individual initiative; and lack of access to reliable information (UNESCO Institute of Statistics, 2019). Overcoming these challenges is generally beyond the capability of a curriculum team, but they need to be borne in mind when advising on the scope and pace of change.

### **Specific challenges to school-based food and nutrition education**

The process of introducing new food practices or changing old ones brings with it intrinsic difficulties. It may entail disturbance, inconvenience and deskilling, it may challenge household practices and expertise, and it may even undermine livelihoods (for example, of school food vendors). Food behaviour is emotive and social as well as practical, with many natural brakes on change (including habit, convenience, food preferences and costs). At the same time, the broader determinants of poor food practices (such as poverty, food insecurity and misleading advertising) remain in place in the wider environment, constantly renewing their influence and impact.

### **Change processes**

Theories and models of behaviour change, change management and skills development (see for example, Mulholland, 2017) agree on many of the features needed for successful long-term change, such as time needed, belief and buy-in, incremental steps, models and mentors, experience, demonstration and practice, frequent reinforcement, feedback and good communications. However, these are seldom factored into the change agenda. There is the permanent danger of ignoring the wide gap between policy and implementation, by assuming that the act of deciding what needs doing and promulgating it will naturally result in voluntary and effective changes in practice, without any recourse to guidance or experience.

## RECOMMENDATIONS

Change in large, departmentalized institutions can be slow and faulty, but status and urgency are important in promoting SFNE. A recurring recommendation throughout the themes of this white paper is therefore to promote initiatives for discussion and emulation that are small or incremental, easily achieved and appreciated, and – if possible – highly visible/memorable.

At the same time, however, institutional changes must be made. Small is beautiful, but big is necessary. SFNE curriculum development/revision is essential to providing the framework for all related interventions, and to raising national capacity and awareness. Recommended outputs are underlined.

### **Establish the aims of the school-based food and nutrition education curriculum and the roles of curriculum developers**

#### **Aims**

In light of the challenges identified, the main aims of the SFNE curriculum development/revision process are to:

- organize the identified learning needs and their supports into usable and acceptable forms that can be readily adopted and implemented in SFNE learning programme design;
- promote and ensure familiarity with the learning model (see “A curriculum that reflects and enables an effective learning model” in this theme and Theme 5);
- build the capacity of users, including within the curriculum development/revision team itself;
- set the pace and scope of change (change management); and
- organize or propose research to gather data on implementation.

These aims will affect the content, process and products of curriculum development/revision.

#### **Curriculum content**

The content of the curriculum should:

- respond to the outstanding issues and learning aims of the main curriculum threads;
- aim for acceptability, feasibility, visibility and ease of application; and
- include action-oriented target competences and support competences, scope-and-sequence charts (with appropriate competences distributed across the age groups), briefings for practitioners on needs and learning approaches, recommended social and environmental supports, notes on prerequisite knowledge and concepts, and essential vocabulary for each target competence. (See the sample scope-and-sequence chart in Supplement 4.4.)

(For an assessment checklist of desirable features, see Supplement 4.2.)



## Curriculum development/revision process

During the process of curriculum development/revision it is key to:

- aim for consensus on the SFNE model, support at all levels, and access to essential documents and literature, along with awareness of the situation on the ground and of professional needs and capacities (including those of the curriculum task force), a realistic and achievable pace and outcomes, ongoing consultation with stakeholders and end-users, and pre-testing, revision and follow-up;
- contribute to the professional development that will follow publication, for example by producing various versions of the curriculum for different audiences and purposes, advising practitioners on the challenges of change, and making creative suggestions about the role of schools and of children's interactions with their food environments;
- identify and track research questions as they arise and discuss how they can be explored; and
- publish and promote the new curriculum.

## Products

These can include:

- one-page summaries of the main SFNE curriculum or of its separate threads, developed for different audiences (such as policy makers, professionals, parents and children), along with notes on their use for advocacy and for discussion aimed at schools (see the example of Country X's new curriculum in Supplement 4.3);
- guidelines for various users including schools, teachers, teacher educators, writers, NGOs, school meal services and parents (for a full list, see Supplement 4.1); and
- a list of research questions.

## Adapt and follow the outline procedure

The following outline procedure shows the curriculum development/revision process, which certainly needs to be adapted to context, capacity and resources. (For suggestions on conditions and coordination, useful government documents, capacity required, consultation mechanisms and activities, see the Recommendations for Theme 3.)

## Model and mandate

Authorities from the ministry of education need to:

- Secure an outline mandate for curriculum change to promote SFNE goals.
- If possible, establish or negotiate regular dedicated time for SFNE in the timetable (see the Recommendations on enabling policy frameworks in Theme 1).
- Establish a time frame for the revision process that includes consultation with end-users, pre-testing and follow-up.
- Assemble a like-minded innovation team and broadly assess its capacity for the task (see the Recommendations for Theme 3).
- Establish the aims and scope of the task, for example:

- to produce an influential, user-friendly curriculum in line with national policies and learning needs, that aims at real changes in practices and outlooks and uses an explicit rationale;
  - to draft or propose other outputs that will facilitate change, help to create demand and support, and accommodate heterogeneous outside interventions (for more on possible curriculum outputs, see Supplement 4.1); and
  - to build consensus, buy-in and readiness among all stakeholders through consultation, briefings, collaboration, review and feedback.
  - To agree on what main and ancillary outputs can be produced for various audiences (see Supplement 4.1), what needs they should fulfil and who should produce them.
- Establish the conditions of the exercise, as well as the tasks, work plan and timeframe (including background research and review, actions, consultations, pre-testing, publication and dissemination).
  - During the process of SFNE curriculum development/revision, ensure ongoing consultation, collaboration and communication with all of the following: education task forces (including designers of learning programmes and of materials, teachers, teacher educators and schools), end-users (teachers, parents and children), government services (such as health, school food and WASH), other relevant FNE initiatives and other stakeholders (including publishers, NGOs, donors, academia and nutrition institutes).

Once the task team is formed, members should:

### Inputs

- Ensure that the essential input is available: a blueprint of high-priority target SFNE competences, as identified through a formative learning needs analysis of some kind (see Theme 3).
- Identify other useful literature such as policy briefs or concept notes, advocacy documents, capacity assessments, checklists of environmental actions (for example, as in Supplement 2.1), guidelines for organizations and services (as in Supplement 2.2), samples of others' learning needs analyses, curricula and learning materials, and advice on parent-teacher collaboration and on extracurricular activities. If some of these do not yet exist, they may be included as extra outputs of the curriculum development exercise.

### Preparation, participants and planning

- Agree on the SFNE concept and learning model to be adopted, and on how they will together form the basis for the curriculum.
- Review and assess the existing SFNE curriculum and extracurricular activities (see the assessment checklist in Supplement 4.2) and identify areas for improvement. Review examples from other countries.
- Discuss and consult on implementation needs, capacities, training, resources, and the overall readiness of the education system and its clients (parents and children) to accept and implement change. This will affect the content of the curriculum, the pace of change, the level of detail, and briefing information in the curriculum.

## Developing/revising the curriculum

- Assemble learning needs, expressed as can-do competences, and gather briefing information that underscores their importance to health (see Theme 3).
- Organize competences into thematic threads and identify support competences with the help of a checklist (see Supplement 3.1).
- Build the competences through the age groups, ensuring they are recycled, developed and expanded in line with age-appropriate learning.
- Draft scope-and-sequence charts for each target competence. Ensure realistic targets and activities, action in real-life settings, and scope for choice and adaptation to context. For each main target competence, include in the chart a brief rationale, indicators of progress and achievement, desirable social and environmental supports, essential concepts and vocabulary, and prerequisite knowledge and experience (see Supplement 4.4).
- Draft an introduction outlining the rationale and nutrition issues, and describing, explaining and illustrating the recommended learning approaches.
- Produce other outputs as required, for example, guidelines for teacher educators and materials writers, suggested extracurricular activities, checklists for school environments, guidelines for school–parent collaboration and summaries of the curriculum for different audiences (see Supplement 4.1).
- Review drafts with stakeholders and end-users and discuss ways to “enable” (support) the curriculum and contribute to outputs, piloting and revision.
- Pre-test the outputs with end-users.
- If possible, keep in touch with partners and stakeholders for involvement in downstream development (including materials production, teacher education, further research, teacher reactions, and monitoring and evaluation in schools)

### Identifying research gaps: promote research, conduct assessments and use evidence and data

Note research questions that arise during curriculum implementation, especially those relating to monitoring and evaluation. For example:

- How easy is it for teachers, teacher educators and writers to apply the new/revised SFNE curriculum? What are the operational difficulties?
- Can the indicators be used for research purposes as well as for assessing participant satisfaction?
- What prerequisite knowledge and experience is expected for each competence? Are the expectations realistic?

If possible, the implementation of the revised curriculum should be linked to action research<sup>39</sup>, as part of in-service teacher education.

<sup>39</sup> Action research is a disciplined process of inquiry conducted by and for those taking the action. The primary reason for engaging in action research is to assist the “actor” in improving and/or refining his or her actions. See: [www.ascd.org/publications/books/100047/chapters/What-Is-Action-Research%C2%A2.aspx](http://www.ascd.org/publications/books/100047/chapters/What-Is-Action-Research%C2%A2.aspx).

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## Supplements

- 4.1. Possible curriculum outputs
- 4.2. Assessing the existing curriculum: a checklist
- 4.3. Country X's new basic SFNE curriculum
- 4.4. Scope-and-sequence chart for the competence "Get more variety and appeal in your daily food"
- 4.5. Competences and learning outcomes: terminology and wording



THEME  
**5**

# Learning pathways and approaches


“I hear, and I forget; I see, and I remember; I do, and I understand.”

**-Attributed to Confucius\***

\* Although commonly attributed to Confucius, this quotation is more likely to have come from the Confucian philosopher Xunzi. It emerged around the middle of the twentieth century as a slogan for the learning-through-experience movement. It should be noted however, that it does not consider the effect of combining the three forms of learning.



# Filling the methodology gap



**Design of  
learning  
programmes**



## Target audience

This theme is targeted at designers of learning programmes, materials writers, schools, development organizations, district education offices and head teachers, as well as teacher educators (who may provide early guidance for teachers and monitor their progress). In some cases, the learning programme designers/writers and the classroom implementers are the same people; however this theme focuses on the design aspect only.

One way of looking at purposeful food and nutrition education is as a journey – from where we are to where we would like to be. Figure 5.1 shows a professional practitioner’s idea of the children’s pathway<sup>40</sup> towards increased food competence. In particular, the figure reflects:

- the distant hills of health and well-being;
- children and adolescents, along with their social groups and their contexts, including the home, school and community environments, and elements of the food environment (such as shops, farms and markets); and
- the route between the two, including the barriers, supports, diversions and influences along the way, as well as the various guides and advisers – including theorists, “old hands” with long field experience, and schools of thought and practice (STPs) – that can offer instruction and guidance on the route, how best to travel it, and what steps will help to achieve the outcomes.

The preceding themes looked mainly at the beginning and end of this path: they discussed existing food practices and outlooks, as well as goals, primary supports and staging posts – that is, how to identify food and nutrition issues, how to analyse the situation and identify needs-based and action-oriented target competences, and how to organize competences into a curriculum, ensuring they develop step by step, fit the different age groups and have adequate external supports.

This theme explores the pathway itself – that is, the learning programme and the suite of inputs, activities and supports that are required to achieve the competences and turn the written curriculum (see Theme 4) into real-life practices and outlooks. The question of what makes a school-based food and nutrition education (SFNE) learning programme feasible and effective is attracting increased attention from practitioners, as seen in the recommendations from the International Expert Consultation on SFNE (FAO, 2019), quoted throughout this theme. Some self-evident starting principles include acceptability, transparency, ease of use and intuitive appeal, while other design and implementation principles are discussed in greater detail below. (They are also summarized in Supplement 5.1.)

**Figure 5.1.** Pathways to increased food and nutrition competence



<sup>40</sup> The figure reflects only the immediate influences on the design of learning programmes. It could also include wider external influences, such as regulatory and policy environments, the food security situation, the level of community health, the information environment, school meal and health services, and contributing agencies and organizations.

# BACKGROUND

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There are three elements on the pathway in Figure 5.1 that raise questions about the demands of the learning process. The answers to these questions, as discussed below, suggest potential approaches to the path, or they indicate information still missing and assumptions still to be tested.

- Children and adolescents: Where are they starting from? What “food learning” do they bring to school?
- Theories, STPs and their related learning models: What do they say about how to achieve the goals?
- Inputs and aids: Which ones are in popular use? Why are they chosen? Do they work?

## Children and adolescents: Where are they starting from? What “food learning” do they bring to school?

By the time young children start school, the real-life learning they have assimilated about food and food practices (whether health-promoting and sustainable or not) is varied and deep, and has been shaped by a range of influences and processes (Paroche *et al.*, 2017). Familiarity is key, as children get accustomed to certain sensations of taste and satiety, which in turn shape their food preferences. They get ideas about what is normal, and learn to like what they are used to, even if it is monotonous. Food habits, practices, skills and know-how are learned performatively, by observing, imitating, acting, and through direct repeated experience in real-life settings. They develop associations with the home environment, with peers, culture and social aspirations, as well as with identities, emotions, hopes and fears, and they are shaped by conversations and talk in social settings as well as in the media.

This food learning occurs slowly and easily over several years. Children come to recognize that what they eat depends on the time of day, where they are and who they are with. Young children also form some explicit food and nutrition ideas (whether false or factual), for example, about food groups, sources and food values picked up from their surroundings or their own experience. They start to construe what they see around them, and where possible, they begin to make their own food choices. While they may sometimes use their knowledge in their choices (or see it used), most of their choices are not deliberate, but rather products of unconscious taste development or force of circumstance; for example, where resources are limited, not much “change capacity” is acquired. Most children however, have some scope for change, whether for better or worse (see Theme 4), as well as some room to act for themselves, help with home tasks, extend their skills, and observe and talk about what their community does.

Once children begin school, they therefore have at least five years of learned food expectations, habits and preconceptions, and their bodies, hearts and minds reflect a complex mix of all this, along with experience, knowledge, practice and expectations.

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Hence SFNE, more than most school subjects, **does not start with a blank slate** upon which it may inscribe a simple scholastic agenda. **It is influenced from the start by what children already perceive, understand, feel, experience and, most importantly, do, as well as with how they have acquired these capacities, and their real-life influences** beyond the school. These include their family life and early childhood learning, as well as learning from their social environment and peers – both of which continue to reinforce their food learning through action, experience and talk on a daily basis, right through to adolescence and adulthood.

These parameters suggest some elements of an effective SFNE learning programme, which needs to relate to the existing context and environment, and integrate easily into children’s hearts, minds and practices (see also Supplement 5.1).

## Theories, schools of thought and practice and their related learning models: What do they say about how children arrive at the goals?

### Key principles of SFNE development

“Call on processes of learning and behaviour change, skills learning, experiential learning and life skills.”

Recommendation 6,  
Stepping up SFNE:  
International Expert  
Consultation

(FAO, 2019)

There are many guides on what moves people to action and how they establish, manage and maintain new practices. These include theories of behaviour change, learning models<sup>41</sup>, and schools of thought and practice (to operationalize the learning models), as well as best practices and, last but not least, examples of what doesn’t work (many of which are not formally published, but are nevertheless valuable and instructive). Practitioners have to decide what to follow and how.

Among such theories and models, several that are especially influential for food and nutrition education have to do with social, skills and experiential learning, as well as with knowledge and understanding, learner-centred education, health beliefs, and stages of change<sup>42</sup>. Some are more comprehensive than others (such as social learning theory (Bandura, 1971) or cast a wider net (such as the social ecological model (Contento, 2016); some have been extensively tested empirically (for example, skills learning); and some are better at explaining outcomes than at predicting them or informing design (see NICE, 2007). They are more or less socially or individually oriented, deal to different extents with external influences, favour integration with health, agricultural, or social protection interventions, and centre more or less on motivation (i.e. influences and perceptions) or on action (i.e. practice, habit formation and maintenance).

No one theory fits all contexts however, and theories are often difficult to operationalize (see Box 5.1), as “the context is complex and infinitely variable, hence very difficult to predict with a theory” and continuous feedback is therefore needed (CORE Group, 2016). This puts some limits on the advance planning of learning programmes, and makes it important for children and families to be enabled to customize some of their actions to their own needs and resources, and report back.

<sup>41</sup> An in-depth discussion of theories and learning models is beyond the scope of this theme; however, Supplement 5.2 features a brief list, along with notes on relative emphases and uses. For detailed descriptions and discussions of specific theories and learning models related to food and nutrition, see for example Contento, 2016 and FAO, 2016. More general theories of human learning are also summarized in Ormrod, 2012.

<sup>42</sup> A model that determines a person’s readiness for intentional behaviour change.

### Box 5.1. The difficulty of operationalizing theories in different contexts: an example

Social learning theory – along with parents' daily experience – shows that children learn naturally by emulating others, including when it comes to some food practices and outlooks. But with any given group of children, the question is, who and what will they be inspired to imitate? The range of possibilities is wide – from parents and peers to rock stars, sports celebrities, cartoon characters and more.

This is one of the many kinds of implementation questions faced by designers of SFNE learning programmes, teachers and materials writers.

Among professionals, there is general and broad agreement (see for example SNEB, 2016) on many of the essential elements of the SFNE learning model, such as the links to participants' prime motivations, the main phases of the process, the response to social influences and to material and physical environments, and the potential for adaptation to context (see Supplement 5.1). They do not always agree however, on the relative importance of the different elements or on the balance to be achieved among them (for example, whether to focus on more messages, more emotion, more practice, more material support, more nudges, more participation, different facilitators, etc.). One common assertion is that some theory is better than none, but at the same time, another is that theory alone is insufficient and needs to work alongside local knowledge, common sense and existing professional expertise. At best, the learning models adopted in SFNE interventions are in a constant state of development and testing, and **there remains a strong need in the professional community for reliable predictive models to help in designing learning programmes.**

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## Inputs and aids: Which ones are in popular use? Why are they chosen? Do they work?

Another challenge for practitioners and learning programme designers is how to select channels, aids and devices that will help to achieve competences. The difficulty of operationalizing learning models in varying contexts reflects a general uncertainty about the rationale for choice of inputs.

Figure 5.2 revisits the pathway from Figure 5.1, with a closer look at some of the inputs, aids and related activities that are used and promoted by food and nutrition education (FNE) and SFNE interventions, based on the assumption that they are appropriate, effective, fast, economical or scalable vehicles for achieving targets. (Readers may want to consider which of these they have personal experience with and how effective they are, or what they can add to the picture.)

Figure 5.2. A sample of SFNE inputs and aids



### Rationale and evidence of impact

Limited attention has been paid to the relative effectiveness of the inputs and activities illustrated above. Indeed, current SFNE methodology at this level does not often have a clear rationale (see Box 5.2). All too often, studies, reports and descriptions of programmes:

- fail to give details on the actual educational activities (for example, they note that “nutrition education was conducted”, but not how it was conducted);
- cite a theory of change (such as the Health Belief Model (Becker, 1974)), but fail to explain why it was selected;
- mention, describe or list activities, materials and channels (including groupwork, SMS, TV, games, songs, tasting sessions, grocery store tours and visual aids) but fail to explain why they were chosen;
- assume that a single medium, strategy or input (such as TV, messages or comic books) will suffice (see Box 5.2); and
- above all, fail to monitor the implementation or measure the relative impact of approaches or mixes of approaches, or to consider transferability to other contexts and audiences.

This has come to be known as the “methodology gap” – an important element in the “black box of implementation” (Pelletier, 2017) that has drawn the attention of implementation research scientists and professional practitioners (for example, Pelletier, 2017; Michie *et al.*, 2009; Fabrizio, van Liere and Pelto, 2014; USAID, SPRING and GAIN, 2014; SNEB, 2016). It reflects some weak assumptions in current theories of change (see Supplement 5.2) as well as in project logic (*What do we do to get there?*) – and hence in guidance for developers of learning programmes.

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### Box 5.2. Misconceptions about methods

A prevalent assumption is that a single strategy can achieve sustained dietary improvement, for example, through:

- the provision of nutrition knowledge, including through talks, leaflets and posters (tested by Contento *et al.*, 1995);
- stand-alone media campaigns (reviewed by Graziose *et al.*, 2016);
- individual behaviour change, as driven by personal willpower and counselling;
- motivational messages (reviewed by Kwasnicka *et al.*, 2016)
- fun and games.

How well do these strategies work? All are still used and recommended, but are seldom tested for comparative impact or long-term sustainable effects.



# WHAT IS NEEDED?

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The preceding section of this theme (see Background) discussed the need for a practical model for the design of an SFNE learning programme that will suit all parties. This model should build on children's and families' experiences of food learning in their own environments, call on familiar learning processes, and allow for adaptation to individual and social contexts. It should give all participants something they want, something to aim at, something to do, and some opportunity to achieve and assess success.

At the same time, the model should satisfy professionals and practitioners. It should respond to known theories and best practices, embody phases, steps and supports known to be significant in SFNE learning, have strong predictive value in programming, and be able to demonstrate a strong rationale for the choice of inputs and activities. It should recognize the working needs of designers, practitioners and end-users, and promote the discussion and testing of approaches.

This section explores these and other requirements for such a model, along with the feasibility of meeting them.

## A model of school-based food and nutrition learning for programme designers

The model proposed here has responded to these needs by reviewing current theories and best practices, and integrating them into a simple unified model of the FNE learning process (see Figure 5.3 below and also Box 5.6 at the end of this theme for a diagrammatic visualization). It is presented and examined here to explore its potential value for guiding learning programmes, and to highlight areas for further enquiry.

The model is intended to be transparent and easy to interpret. At its core, it highlights what children need to perceive and do as they move towards achieving food competences in their own contexts, along with the inputs, contextual factors and other players that may support their progress.

The learning model in Figure 5.3 represents a pathway which is taken by children and adolescents, with adult support, in synergy with their environments (see Theme 2). None of the elements in the model is revolutionary, but some of its implications are relatively novel in SFNE learning programmes: these are shown in italics in the description below.

Figure 5.3. Learning pathway







## The main learning path

- The central path shows the actions and perceptions of the *children themselves*. The assumption is that the pathway is theirs, while educators and learning materials act as guides.
- The elements are *grouped into three areas according to the ends they serve: motivation, then action* (Contento, 2016; see also Theme 3), and finally a phase of review, evaluation and extension. The model gives considerable attention to all three areas, each of which is amplified with recommended actions such as planning, sharing, consulting and practising.
- Although the elements form a path, they *are not strictly sequential*: they may often be concurrent or cyclical, or occur in a different order (for example, motivation may follow action as well as vice versa). Similarly, *their [relative] proportions will vary* according to circumstances and experiences.

## Inputs and context

- An array of possible inputs to the process are featured as arrows to the left and right of the path. The range is wide, multisourced and context-related, and comes from children's previous experience, their current activities and environments, and from the planned learning programme (for example, books and teachers).
- The inputs link to and promote the core actions, which in turn supply some of their rationale. For example, stories can model behaviour and promote discussion; children's family discussions affect their decisions; and mentions on community radio act as encouragements.
- The illustrations show some of the environments and actors that reinforce and enable learning through children's observations and interactions (as sources of information, advice, opinions, skills, models and discussion).

## Implications of the model

This section assesses the validity of some of the elements in the model in light of experience and research, and raises questions about implementation and further research.

### Is there a need for ownership?

Some ownership of process and outcomes is implicit in the model, which allows for varying levels of control by children, adolescents, parents and teachers.

In discussions about empowerment in community health (for example, Odugleh-Kolev and Parrish-Sprowl, 2018; Aubel, Packard and Sherman, personal communication, 2017; Anderson, Brown and Jean, 2012), the arguments for ownership and engagement are not so much ideological as educational, practical and motivational: the claim is that, in comparison with top-down or short-term "messaging to persuade", ownership of the process has high potential for action and maintenance by participants.

The same applies to SFNE: where children and their environments are themselves the subject matter of the learning programme, some choice, independence, confidence and pride in achievement are likely to be essential for sustainable change. It seems natural and compelling for children (in line with their age and experience) to frame some of their own actions, try things out with help and guidance, and eventually look back at what they have done and consider what to do next. However, the assumption needs to be tested by comparison with less engaging approaches, and user feedback is needed.

## What makes a valid overall framework for achieving competences?

The model's pathway reflects a design framework, with the following aims:

- For all users, to structure a simple, recognizable process of change and change management, while allowing for individual choice and response to context.
- For learning programme designers, to propose a rough order and balance in the different phases, and extend the possibilities of process and outcome evaluation for research and design improvement<sup>43</sup>.

## What are the essential phases and what is the balance between them?

The first main phase in the model (motivation/perception) is extensively supported by behaviour change theory, and features in most FNE interventions. The second phase (action / practice / maintenance) is strongly endorsed by other education theories oriented to practical action (for example, skills learning, experiential learning and social learning), but tends to be neglected in FNE and SFNE. The third phase (evaluation/extension) is a natural wrap-up, with many educational benefits, but again is generally lacking in SFNE learning programmes, even though it can arise naturally as the programme develops through the school years.

Interventions are easily characterized and differentiated by the balance of attention given to the phases, and can therefore be comparatively assessed.

## On what basis are inputs selected/created and how are they used?

The model proposes a range of inputs which include relevant information, children's own observations, experiences, enquiries, existing knowledge and skills, and stories or cases that extend the picture. These feed into the main action pathway, entailing a range of activities in which children explore their own and others' practices and outlooks, and discuss fictional or reported lives and experiences (see Theme 6).

What characterizes these inputs is their relevance for enabling the core activities. This is in line with educational theories of experiential learning, constructivism and situated learning. For example, narratives are strongly recommended in health education as "ways of knowing" (see for example, Gray, 2013; Hinyard and Kreuter, 2007; Neeley, 2016; Aubel, 2017), along with paradigmatic knowledge (including concepts, facts and data), and direct experience and observation.

This varied and purposeful use of inputs is of great benefit to SFNE in personalizing and extending children's experience and perception. Protocols, practice and local examples are therefore needed to develop them.

## How much action and practice is needed to achieve competences? How can it be organized?

The model assumes that children typically learn to do things by doing them: they choose what to do, plan, consult, practise, troubleshoot, share, discuss, keep going and pass on what they learn (see steps 4–8 in Figure 5.3 and in Box 5.6).

<sup>43</sup> The model assumes that professionals, practitioners and participants are all involved in the same process, and can at different levels and in different ways explore the situation, choose target competences, monitor progress and assess outcomes.

There is strong support for this premise from theories on skills development, experiential learning, behaviour change and social learning, all of which confirm the need for direct experience, action and practice when aiming at changes in practices and outlooks. A strong behaviourist case can even be made for learning first through action and experience, and rationalizing or finding motivations later (if at all). As in a quote often attributed to Millard Fuller: “It is often easier to act yourself into a new way of thinking than to think yourself into a new way of action”. (See also UNICEF, 2018.)

For SFNE, the *prima facie* arguments for building routines to the point of habit, with home and school support, are that children are exposed to competing habits both outside the school and at home all year long and for most of every day, and that habit-building itself is something that needs to be learned. In SFNE models and learning programmes therefore, the agenda for practice and routinization deserves much more attention.

### How can exploration, consultation and adaptation be part of the learning programme?

Upfront learning needs analysis (see Theme 3) contributes broadly towards adapting programme design to needs, culture and context, but it is a rough accommodation and one size cannot fit all. The “children’s action” model allows for frequent adjustment to homework activities through classroom discussion and through questions to be taken home.

Both strategies have been endorsed by the International Expert Consultation on SFNE (see quotation). Leading practitioners (for example, CORE Group, 2016) have emphasized the need for a sensitive response to context, and have noted that continuing feedback from participants can accelerate behaviour change.

There is also anecdotal evidence of the negative effects on schools’ relationships with households due to lack of consultation: for example, teachers offending parents by sending children home with instructions on what to cook, or parents shocked at their children being “made to work” in school gardens, which in their own youth represented hard labour.

In SFNE, continuing exploration and consultation by children and their parents (who are the only experts of their own contexts) enable them to localize and fine-tune their actions, and help schools to avoid being overly prescriptive. Insofar as SFNE requires parental and peer support and has to respond to individual and family circumstances and resources, this may be essential as well as desirable.

### How important is children’s action and interaction in real-life settings? How can it be managed?

It is implicit in the proposed steps of the model and in the roles it requires of adult outsiders that children interact in real settings with real people in SFNE. The most feasible and productive way to integrate such interactions is through homework or “outside activities”<sup>44</sup> – to be used as a preliminary or follow-up to classroom sessions (see Box 5.3).

#### Key principles of SFNE development

“SFNE should be based on the situation on the ground: nutrition issues; diet and food practices; participants’ knowledge, attitudes, practices, motivations and perceptions; and influences, resources and obstacles.

These should be reviewed professionally, but also (informally and continuously) with children and their families.”

Recommendation 5, Stepping up SFNE: International Expert Consultation

(FAO, 2019)

<sup>44</sup> Practitioners and participants may want to choose whether to use the term “homework” or “outside activities”.

### Box 5.3. Some examples of school-based food and nutrition education homework (as presented by teachers)

“The next lesson is about a healthy diet. For homework, ask any adult what he/she thinks is “good food” and why, and write down the answers. In class we will decide which are the best answers and why.”

“Discuss with a friend your experience of street vendors who sell cooked food. How hygienic are they? Are plates, cutlery, hands and cups clean? Is food covered or wrapped? Are there flies? Is the food freshly cooked or reheated?”

“Next week we are going to talk about food storage. Do you know how to store cassava, groundnut powder and tea? Find out how this is done at home and why. Draw or take a picture.”

“On Friday the school will have a talk from the district school meal organizer. What questions shall we ask her? Ask your family what they know about school meals and what they would like to know. We will review all the questions before the talk.”

There are many arguments for such “outside activities”:

#### Practical

- If well managed, they increase time spent on SFNE and take pressure off the classroom.
- To a large extent, they enable the lessons to run themselves, with input from children.
  - They represent a relatively effortless way for teachers to stay informed about what is going on in their communities.
- They are cost-free.

#### Motivational

- Children respond well to the visual, experiential, communicative and social elements.
- They may be done individually, in pairs or in groups, and at all levels and ages.
- They bring children to school ready to contribute their own experience to the lesson.
- They set up a regular and natural channel of communication with parents, and enable them to monitor the learning programme and comment on it. This may be the most successful way of engaging their interest (Diallo *et al.*, 2014), and is certainly the most economical in terms of both time and effort.

#### Educational

- They enrich the curriculum by exploiting the most significant educational resource available: the objects, attitudes and practices in children’s own environments.
- They increase awareness and understanding through direct experience.
- They put classroom learning directly into practice.
- They are a long-term safeguard against negative food influences in the outside world.
- They facilitate the sharing of experiences and the spreading of ideas and insights.

Such homework is easy to organize and motivating, as well as educationally necessary. It needs to be expanded as an integral part of SFNE learning programmes, and its feasibility and effectiveness need to be tested in a range of forms and contexts.<sup>45</sup>

### How can parents and others be effectively and sustainably involved in school-based food and nutrition education in a given context?

The International Expert Consultation on SFNE (FAO, 2019) endorsed involving all those who directly influence children's food practices and outlooks (see quotation) but did not specify how they should be involved. The model lists a range of roles for people interacting with children and adolescents outside the school – as informants, interlocutors and commentators, sources of expertise, objects of observation or examples of practices and attitudes. Especially valuable contacts are people with considerable experience or with authority, close relatives and peers, food system actors, health workers, skilled cooks, and so on.

These human resources can enrich SFNE learning programmes and therefore need to feature regularly in homework or “outside activities”. The involvement of parents in particular is recommended in the literature for many good reasons: they are the principal household food decision makers and the children's main food guides outside the school; they have home authority, adult knowledge, experience and skills to share. They are therefore both primary educational resources and gatekeepers of change, partners to be consulted at key points in SFNE learning programmes, and supports, monitors and assessors of outcomes.

The question again is how. Success with parental involvement varies. In any given context there is a need to explore ways to maximize parents' continuing interest, support and success, while also minimizing demands on their time and resources. Children's homework remains a favoured channel (see for example, Diallo *et al.*, 2014).

### What kinds of communication are important in school-based food and nutrition education and for which tasks?

Communication by children, mostly oral, is also implicit in the model, which speaks of “talking the talk” as well as “walking the walk”. The range of communications goes well beyond asking and answering questions in class. It includes describing and comparing, enquiring, discussing, reporting, explaining, analysing, recording and even presenting, acting and conducting tours (for example, of school gardens).

The communicative demands of SFNE tasks have not often been examined in the literature, but professional insights confirm the value of including dialogue in FNE interventions. Mass media interventions, for instance are often recommended for reach and cost-effectiveness (Wilkinson, 2017), and have some effect if well designed (Graziose *et al.*, 2016), but their impact appears to be enhanced if purely receptive viewing is extended into dialogue and action. Examples of demonstrated positive impact include: a reality TV show with follow-up question-and-answer messages via SMS on preparing dishes (Shamba Chef, in Kenya); TV spots packaged together with interpersonal communication (SPRING, 2014); radio and TV shows with phone-ins

#### Key principles of SFNE development

“Involve all those who directly influence children's food practices and outlooks, in particular the family, the school as a whole, teachers and the community.”

“SFNE should be low-cost, easy to run and easily replicated.”

Recommendations 2 and 4, Stepping up SFNE: International Expert Consultation

(FAO, 2019)

<sup>45</sup> Some reviewers have pointed out that engaging families and community members is often easier and possibly more productive when children are involved together with their families in community-based projects. The scope of this white paper however, is limited to a focus on school-based education (see the Introduction and the section on Food and nutrition education settings for school-age children in Theme 4).

(Beale, 2016), and online messaging suggesting immediate follow-up visits to local clinics (Chong *et al.*, 2016).

If interactive “food talk” is found to be integral to effective SFNE, then “talk practice” (for example, re-telling stories and explaining food needs) can be built into learning programmes as a support competence. In particular, homework assignments involving communication will need to conform to transactional and social norms, and some may need to be rehearsed by children beforehand.

### What research is needed?

This discussion has raised several questions about the feasibility and effectiveness of several implementation elements of the sample model. These questions highlight the need for implementation research into effective methodologies, and for systematic process monitoring of what works with particular age groups in specific contexts.

#### Box 5.4. School-based food and nutrition education, school environment, home and community

##### Project A.

##### Combating obesity in the community

For the five-year community initiative entitled Be Active Eat Well (2011–2016), schools in the state of South Australia worked out their own programmes. One school aimed to change community norms on school food and sports by involving community and families in programme design and activities. They transformed the school canteen menu, hired new sports coaches, started a new physical education curriculum, and used school garden produce to make and sell healthy snacks. Children helped to carry out before and after “lunchbox audits” and food and nutrition education was conducted through a Peer Leaders programme. There were also FNE projects for teachers, parents and father-son groups.

##### Project B.

##### School gardens linked to SFNE

A widely used school gardens manual (FAO, 2010) includes SFNE lessons linked to the garden cycle:

*Planning:* Children propose food crops to grow and get advice from local gardeners and agricultural experts. They discuss the different options (Do we like this food? Is it good for us? Can we grow it? How can we eat it?) and then make their choice on what to grow.

*Growing:* Once the crops have been planted and are being tended, the children form teams, each of which chooses one crop to become “expert” on. They gather information and advice (on food value, perceived value and use in local dishes, as well as growing and preparation methods), present findings to the class and discuss how to use their harvest.

*Pre-harvest:* Children plan and prepare a garden tour. They map and signpost crops, rehearse the story of the garden year (including problems, experiments and successes), prepare garden refreshments, invite visitors and conduct the tour.

## Examples of school-based food and nutrition education learning programmes in action

Box 5.4 and Box 5.5 feature three examples of learning programmes in action, all of which were designed for schools but could also be implemented in extended youth programmes. The two examples in Box 5.4 mix classroom learning with a broad range of participants and settings as well as experience, enquiry, action, interaction and talk, and improvements in the school environment. Project A was a makeover project with some dedicated funding, whereas Project B is part of a regular annual school programme.

Box 5.5 illustrates some of the principles discussed above (such as participation in design, action-based focus, sequence, balance, appropriate activities and an owned

### Box 5.5. Cooking survival kit for preadolescents

The following points reflect a lesson sequence designed for sixth-grade students in Zambia. Children work in teams of three, teachers contribute their own experience to discussions, and parents are consulted on the programme before it starts. (The programme can be trimmed or expanded as needed.)

1. *Do we need to cook?* At home and in class, children discuss what the “essential basic cooking skills” for survival are. They ask two adults when, why, what and how they learned to cook, and report back.
2. *What can we cook?* In class, children establish personal levels of cooking skill with a quiz. They design and award a cardboard badge for the best cook. They take questions home to try out on siblings and report back.
3. *Who cooks?* First at home and then in class, children discuss attitudes to food preparation; gender roles and access to resources; livelihoods in cooking and jobs in catering; and finding skilled cooks locally. They hear about “survival cooking” from students living away from home, nightwatchmen, travelling salespeople, and so on.
4. *What will we cook?* Children share recipes from home. They decide what to learn to cook (with a view to foods that contribute to a healthy diet and are locally available, and recipes that are delicious, economical and a little bit challenging), and sign up on a class chart.
5. *Keeping it clean.* In class and at home, children review and practise food safety and hygiene in preparation for cooking.
6. *Cooking methods (optional).* Children review recommended cooking methods and fuel prices.
7. *Find a mentor.* Children choose their own cooking mentors from the community and approach them for advice.
8. *Cook!* Children prepare two new dishes, which are photographed if possible, certified by mentors and assessed by family.
9. *Report.* Children discuss problems, successes and family reactions, and present photos and brief reports.
10. *Conclusions.* Children express and support personal opinions on the kinds of cooking skills that are needed in life, by whom and why. They continue these discussions with the family or community and make recommendations for cooking education.

(Government of Zambia, 2004)

process) through a lesson sequence aimed at extending and valorizing basic cooking skills. Other objectives involve cultural attitudes, livelihoods and communication skills necessary for certain tasks (enquiring, reporting, expressing and supporting opinions, sharing experience and getting advice). The programme is aimed at 11–12-year-olds, who already have some basic skills and are beginning to have more adult needs.<sup>46</sup>

## Summary of needs

The Background to this theme identified the need for a practical model of SFNE which builds on children's and families' existing experiences, skills and perceptions, deals with all significant elements of the learning process, explains and determines the choice of inputs and activities, applies educational best practices, and provides a framework for discussion and testing to meet the working needs of practitioners.

The model or pathway presented aims to meet these needs. It reflects what children need to perceive and do in order to achieve SFNE competences in terms of three overlapping phases: interest and motivation, action and practice, and maintenance and review. The pathway takes children into familiar environments within and beyond the school: exploring and observing, planning and strategizing, interacting with known settings, getting and giving support and feedback, and discussing, evaluating and publicizing achievements. Parents and teachers, as well as the school and community all help to support the process.

This model has several benefits: it is simple and recognizable for all users; it focuses on what children and adolescents do and understand; it establishes the critical balance between the phases; it validates inputs and activities that support the process; it promotes ownership of process and achievement, and gives children and families flexibility in their choice of actions; it assesses progress in terms of real-life change; it provides a framework for learning programme design and discussion; and it is open to testing and improvement.

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<sup>46</sup> A school cooking programme for nine-year-olds has had great success in high-income Germany (Buening, 2018).



## CHALLENGES

### Profile and advocacy: overall challenges

As noted in other themes, the overarching challenge relates to the sparse and ineffective use of SFNE in many countries today. It is a fight to get it recognized as an important part of the curriculum with sufficient timetable time. There is little in-country advocacy, few fora for exchanging experiences and building professional solidarity, and rarely any national professional cadre, recognized qualifications or institutional presence. These issues are reflected across the education system in hazy policy and thin curriculum coverage, as well as insufficient learning materials, teacher education and extracurricular activities. The institutional outlook is often shared by communities, school management, school services, teachers and parents, who may not see the point of diverting time and energy from core educational or health activities such as learning to read, passing exams, and getting children fed or dewormed.

### Concept and learning model

A key drawback relates to the lack of a shared concept of the goals, value, importance and nature of SFNE, and of the potential value for schools to implement it. More specifically, consensus is needed on the model that will guide the elements and phases of the learning programme; the level of ownership; the types of input and their use; the weight given to the practice of target competences, reflection, direct experience, actions and interactions in real-life settings; the roles of other actors (especially parents); and the need for communication skills.

In addition, there are few practical and testable models of effective SFNE learning that can help in developing learning programmes and supporting research.

### Education–environment links: interactions with physical and social environments

Although food and nutrition education needs to be sensitive to context, SFNE learning programmes seldom encourage children's observation of and interaction with food environments, or enlist the support of other players (such as parents and the community).

### Evidence, data and assessment: the learning model

- There is a global methodology gap in the professional understanding of the inputs, steps and activities required to achieve food competences, and of how to adapt them to local and personal contexts.
- Existing models/frameworks for developing learning programmes (see Box 4.1 in Theme 4) are often adopted by default, and their specific elements are seldom examined and assessed.
- There is a lack of comparative research on the inputs, steps and activities that best facilitate progress towards food competence.
- Informal feedback from schools, teachers and parents is seldom gathered and used, and action research by educators is not often part of in-service teacher education programmes.

### Capacity, experience and familiarity: the classroom paradigm

- Practitioners (including course designers, teachers and teacher educators) may lack familiarity with and expertise in the kind of learning programme design required for effective SFNE, and they may lack experience in implementing it easily and economically. There is a shortage of real examples – particularly those that are local or contextually relevant – to show the way and inspire confidence, imitation and adaptation.
- Some key features of effective SFNE may be foreign to prevailing classroom cultures, – for example, aiming for competences, practice in real-world settings, environmental interaction, involvement of families and community, choice in children’s tasks, activating learning inputs, and more management and less exposition.

### Change management: support through the system

Well-designed learning programmes are unlikely to succeed if they are introduced piecemeal and if they are not supported by coherent and effective changes throughout the curriculum, as well as in teacher education and school policy. At the same time, if too much is expected at once then the amount or scale of innovation at all levels may seem overwhelming, not least for schools and teachers.

## RECOMMENDATIONS

Despite the challenges described, there are many positive points to note. SFNE deals with a subject of broad interest (i.e. food) that everyone can relate to. It offers great potential for children to learn from and in food environments, and for such learning to progress from year to year. It is intrinsically easy on classroom management, and it can even make time by shifting learning activities outside the classroom, as it can benefit from unofficial auxiliary educators (including parents and community members).

The following recommendations are aimed at the SFNE coordinating institution or assigned ministry and at learning programme designers.

### Establish a model of effective food and nutrition education

Develop, adopt or adapt a provisional model of effective SFNE learning to assist in design, implementation and assessment of the learning programme, taking into consideration the end-users, the process and the framework, as well as links with environments. If possible, this should be done in consultation and collaboration with curriculum designers, teacher educators and other stakeholders. The model should:

- be based on children's own actions;
- respond fully to (and, explore, discuss and make use of) children's and families' existing knowledge, experience, perceptions, motivations and skills in relation to food practices and outlooks;
- aim to build confidence and capacity to deal with all aspects of food in real life;
- emphasize a movement towards "owned change";
- make sense to all users, and use natural learning processes that children are already familiar with;
- use ongoing consultation and feedback to ensure it is adaptable to many contexts and needs;
- focus on what can practically be achieved and maintained by individuals, groups and communities;
- be supported by theory, good practice and examples;
- demonstrate a convincing logical framework for achieving results;
- demonstrate the need for the main phases, the balance of such phases and the essential steps;
- choose learning inputs and activities on the basis of a principled rationale and/or empirical evidence;
- lend itself to design and to the assessment of learning (for example, by planning lesson sequences and by ensuring room for review of progress), as well as to discussion and revision of the model itself;
- make full educational use of children's food environments and outside resources (including home kitchens, school meals and community food skills) for observation, interaction and practice of target competences in real-life settings;
- promote a range of communicative competences in SFNE tasks;

- involve parents, peers and the community in respectful, enabling, fulfilling and economical ways and in a variety of roles; and
- build on educators' and schools' strengths (for example, the management of large classes, rules about handwashing and gardening or sports expertise).

### Plan and manage change

As far as possible, learning programme designers should plan strategically and note the key elements for successful change in practices; these include getting support, planning long-term with the end in mind, starting small, getting it right, taking it slow, practising, sharing, evaluating and trying again. Some recommended strategies are to:

- Push for support within the system (see Theme 1 and Theme 7). Coherent and coordinated support for renewing SFNE should be available through: policies, guidelines and products; capacity development; links with other services and organizations; advocacy, monitoring and evaluation. If these are not in place, programme designers should push for them as far as possible, and find out who to contact for clarification and advice.
- Go for change that is long-term, incremental, experiential and shared; for example:
  - Agree on a charter of what should be achieved in the long term.
  - Set a feasible level and pace of incremental innovation, one step at a time.
  - Work with other groups both within and across departments, and liaise with those working in FNE beyond the immediate context (including early childhood development programmes, community groups, and so on).
- Find easy entry and growth points, for example:
  - Start with younger children. They are more receptive and their teachers are used to “teaching the people, not the topic”.
  - Start with a single food competence (for example, better breakfasts) that will build confidence and expertise in all players and show results. (See also Theme 3.)
  - On a small scale, use the full project apparatus: formative research, target competences, ongoing consultation, dedicated materials, “outside activities”, teacher education, parent involvement, monitoring and evaluation, participant feedback, publicity and promotion.
  - Start with a few opt-in schools and run the project for maximum publicity, so as to create public interest and models of good practice in the national context. Take photographs, film activities, interview participants, post blogs, get media coverage and produce training videos. Celebrate achievements, publish internationally, then expand the programme.

### Strengthen professional capacity, experience, familiarity and motivation

Capacity in developing learning programmes requires work experience, in particular collaboration and consultation, exposure to good practice, on-the-job learning, demonstration and mentoring, sharing of experiences, monitoring and feedback, and a cycle of revision and improvement both in terms of the model and its approaches. (See also Theme 7.)

## Formative research and programme design

- *Collect learning resources and models of good practice:* Build an accessible ongoing archive of examples, including learning programmes, models, materials, teachers' manuals, inputs and activities linked to learning targets. If possible, make the archive available to practitioners via an online platform.
- *Assess the existing situation:* This can include a focus on the attitudes and expectations of participants (schools, teachers, children and families); existing models of SFNE learning as evidenced in the curriculum, current SFNE practices, approaches and materials; teacher education in SFNE; and schools' relationships with families, services and outside organizations (for an example, see the assessment checklist in Supplement 5.3).
- *Inputs: Work with:*
  - a concept of SFNE aims and approaches that is agreed and shared across the education system and the professional community (see Theme 1), an established set of target competences, and an idea of what can realistically be achieved in terms of school time and existing professional capacity; and
  - an agreed model of the learning process for effective SFNE, based on developing pathways to needed competences.
- *Capacity:* Assess the capacity of the task force in charge (see "SFNE transformation: an interconnected process" in the Introduction and theme 3) for developing action-oriented, competence-based learning programmes (for example, by critiquing existing materials or brainstorming effective classroom and homework activities).
- *Collaboration and consultation:* Establish mechanisms for liaising with teacher education departments and with a selection of schools for consultation in the process of development and for the piloting of products.
- *Develop the learning programme in line with the agreed model:* Throughout programme development, consult with schools, teachers, parents and children, as well as other education units (including curriculum, teacher education and materials production) and related FNE initiatives (such as youth groups, early childhood development and community nutrition).
- *Field-test the programme:* Ensure testing in real-life conditions and allow time for monitoring and revision.

## Assessment, evaluation, monitoring and research

Schools have some natural advantages (as well as drawbacks) as laboratories for research, monitoring and evaluation, and for testing different approaches. Their programmes are repeated yearly; they have permanent staffing, wide reach and thousands of roughly parallel programmes that are often centrally controlled; and they have in-service teacher education programmes that may be open to undertaking action research. In this context, efforts at assessment, evaluation, monitoring and research should, as far as possible:

- Aim for research which will carry conviction and be usable, without draining resources.

- Establish regular monitoring and evaluation, and ensure that results and findings are both well-publicized and well-used.
- Include participant interest and support, as well as ease of delivery among the assessed outcomes.
- Limit the use of costly expert evaluation to specific purposes and small samples.
- Promote professional research into the comparative impact of different implementation strategies.
- Test others' successful learning strategies in local conditions.
- Pre-test new learning programmes, gather feedback during implementation and revise periodically.
- Promote an "evaluation" outlook (that is, an interest in assessing outcomes) in families, teachers, schools and children; incorporate simple informal assessment by participants into learning programmes (see Theme 8).
- Promote action research by teacher–parent–child groups.
- Compare findings across formal and informal assessments.

## Useful tools and links

### Schools of Thought and Practice relevant to SFNE:

<ul style="list-style-type: none"> <li>• Could Behavioural Economics Help Improve Diet Quality for Nutrition Assistance Program Participants? (Just, Mancino and Wansink, 2007)</li> </ul>	<p><b>Community nutrition education</b></p> <ul style="list-style-type: none"> <li>• Community Nutrition Education (CNE) Logic Model (USDA, 2015)</li> <li>• The Manoff Group Approach (The Manoff Group, 2018)</li> <li>• The Effectiveness of Community-Based Nutrition Education on the Nutrition Status of Under-five Children in Developing Countries. A Systematic Review (Majamanda, Maureen, Munkhondia and Carrier, 2014)</li> </ul>	<p><b>Design</b></p> <ul style="list-style-type: none"> <li>• Improving the diets and eating patterns of children and adolescents: how can nutrition education help? (Contento, 2012)</li> </ul>	<p><b>Food and nutrition education</b></p> <ul style="list-style-type: none"> <li>• Food and Nutrition Education (FAO, 2018a)</li> <li>• Professional training in nutrition education (FAO, 2018b)</li> </ul>	<p><b>Social and behaviour change</b></p> <ul style="list-style-type: none"> <li>• What is Social and Behavior Change Communication? (The Health Communication Capacity Collaborative, 2015)</li> <li>• Social and behavior change (USAID, 2018)</li> <li>• Designing a Social and Behavior Change Communication Strategy (Health Communication Capacity Collaborative, 2018)</li> </ul>	<ul style="list-style-type: none"> <li>• What is social marketing? (NSMC, n.d)</li> </ul>
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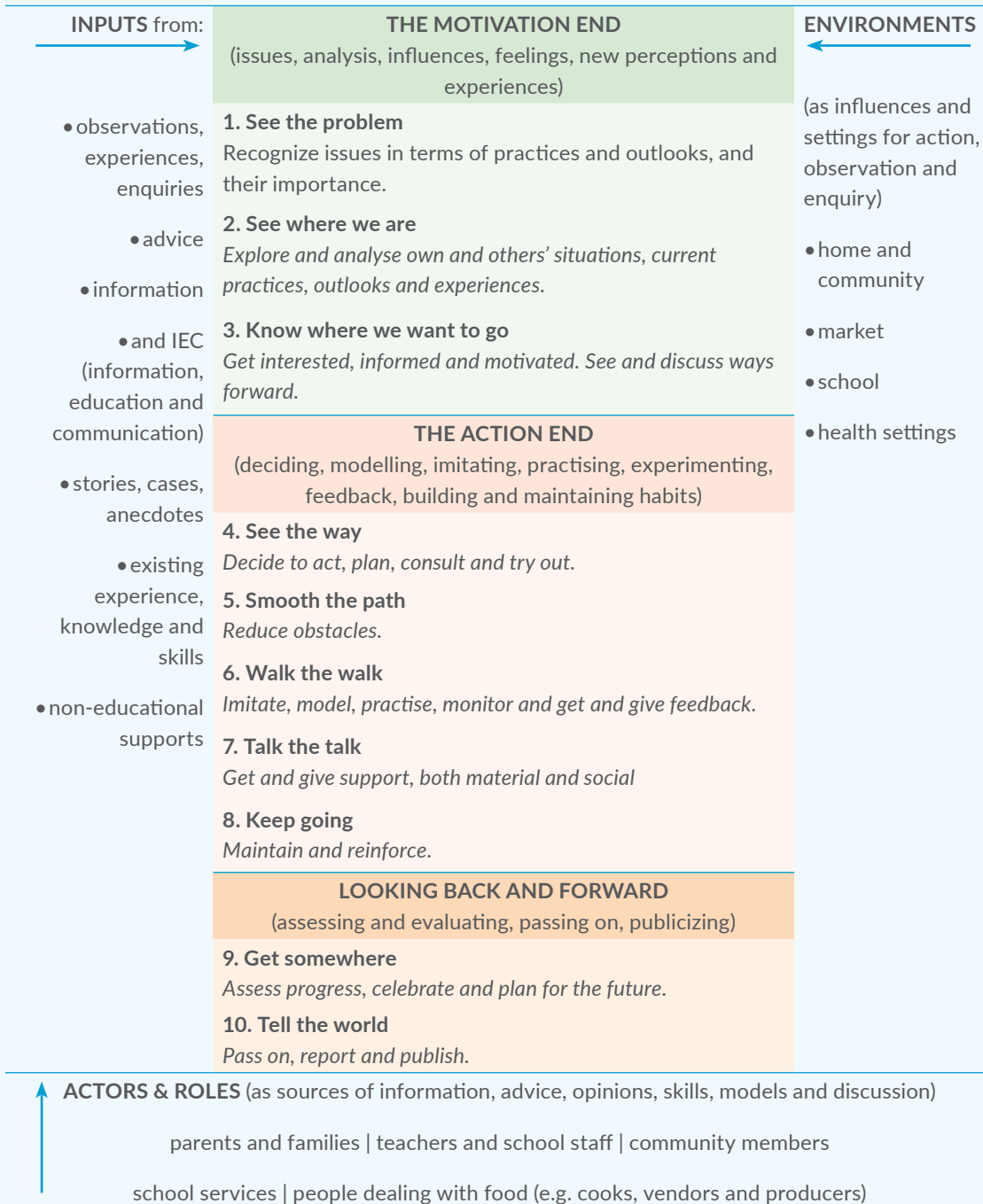
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## Supplements

- 5.1. What makes an effective SFNE learning programme?
- 5.2. Theories, models and best practices
- 5.3. Assessing SFNE models and learning programmes: a checklist

**Box 5.6. Elements of the learning process: a unified working model**

(Adapted from FAO, 2010)

THEME  
**6**

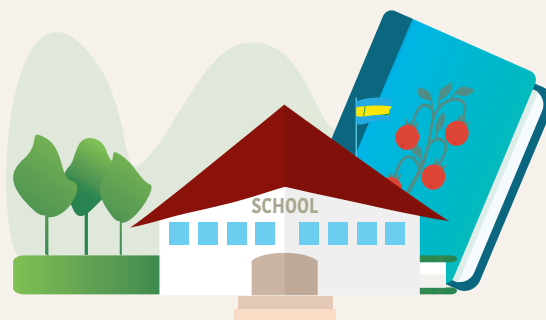
# Effective school-based food and nutrition education activities

“Cease conceiving of education as mere preparation for later life, and make of it the full meaning of the present life.”

-John Dewey

## Action, reaction and interaction

**Design of learning materials and activities fit for purpose**



### Target audience

As in Theme 5, this theme is targeted at those who design, set up, implement, manage, monitor and evaluate learning activities and materials. This includes teachers, head teachers, other front-line educators, materials writers, district education officers, teacher educators and staff of development organizations, all of whom aim to promote food competences, believe that some long-term change is possible within existing constraints, and are ready to adopt promising methodological principles and criteria for developing the pathways towards that change.

Citizens who are fully capable of “navigating the food environment” (Vidgen and Gallegos, 2014) have mastered a range of target competences, such as might appear in an action-oriented curriculum for school-based food and nutrition education (SFNE). (See Box 6.1, as well as Themes 1, 3 and 4.)

Theme 5 proposed a learning model of effective SFNE – based on theories and best practices – that underpins such a curriculum and covers the essential steps to competences, as well as the social and environmental interactions involved.

Following on from this, Theme 6 aims to explore the kinds of learning sessions, activities and materials that may be used to implement such a model, the challenges they raise, and the ways in which such challenges may be tackled. It also features extensive examples of SFNE activities, to demonstrate how the learning model can be applied through a range of relevant activities – that is, activities that are “fit for purpose”.

Both here and in previous themes, the assumption is that the activities and learning materials are meant to implement a new or revised curriculum and learning programme – one that is focused on food and nutrition issues and learning needs, and aimed at competences in food practices and outlooks. However, even if such a curriculum and learning programme are not in place, the comments and criteria explored here remain valid.

### Box 6.1. Examples of school-based food and nutrition education competences

Curriculum thread	Learning outcome
Food safety	<ul style="list-style-type: none"> <li>Wash hands routinely before eating.</li> </ul>
Food environment	<ul style="list-style-type: none"> <li>Find out the nutrition value of the food available in school.</li> <li>Separate facts from persuasion in food advertising.</li> <li>Grow some ingredients for a nutritious meal in the school garden.</li> </ul>
Diet	<ul style="list-style-type: none"> <li>Start the day with a healthy breakfast. Choose nutritious snacks.</li> </ul>
Environmental sustainability	<ul style="list-style-type: none"> <li>Make compost using organic scraps.</li> <li>Plan meals to reduce food waste.</li> <li>Promote biodiversity in the local diet.</li> </ul>

## BACKGROUND

What school-based activities will help to build the kinds of competences and capacities discussed throughout this white paper? The challenge is not only to introduce more (and more relevant) SFNE into schools, but also to make it more effective, and to extend and improve what is already there.

As an example, consider the competence related to washing one’s hands before eating: Box 6.2 reflects a classroom approach as observed in a rural school in a lower-income country. In the syllabus, the lesson objective listed that “*Children are able to explain the importance of washing hands before eating*”, although the preamble in the curriculum explains that the aim is to encourage the habit of handwashing.



### Box 6.2. Teaching the importance of handwashing: a traditional approach

- The teacher writes up: “Why is it important to wash hands before eating?” Children copy down the question, then give a few answers orally.
- The teacher explains that hands should be clean “to avoid transferring bacteria to the food”, which could cause disease. Using gestures and mime, he demonstrates moving food to his mouth with one hand, while the other hand enacts bacteria climbing aboard the food. He is a bit of an actor; the children laugh.
- He asks the question again; the children chorus the answer and repeat it until they get it right.
- He writes up the following words, in jumbled order: “germs”, “avoid”, “transferring”, “the food”, “to” and “diseases”. The children (who are used to this game) put the words in the right order to construct the correct answer and write it down next to the question.

(J. Sherman, personal observation, 2011)

In contrast, Box 6.3 features three alternative learning programmes – along with activities – that are more hands-on.

### Box 6.3. Establishing routine handwashing through education

A story of hands: a classroom lesson in Zambia	An institutional approach in the Lao People’s Democratic Republic	A government programme in India
<p>The teacher tells the story of one girl’s day (Aisha). A volunteer mimes the actions, while the class keeps an eye on “Aisha’s” hands. The story is then re-told: pupils interrupt wherever they think Aisha should wash her hands, and explain why. For homework, pupils re-tell the story to younger children. They also monitor the handwashing habits of other children at school and at home, and report back.</p> <p>(FAO, 2007a)</p>	<p>The WinS (WASH in Schools) handwashing programme has no classwork. It focuses instead on activities in the school grounds, to establish and maintain handwashing skills, daily routines and habits. It builds on existing school systems and practices, along with community support.</p> <p>(Siegmund, 2016)</p>	<p>A child-friendly group handwashing programme has been introduced to accompany the Indian Government’s school meal programme. It involves explanation, promotion, demonstration, practice, and the establishment of routines and peer monitoring, all run by older schoolchildren through a “Child Cabinet”.</p> <p>(UNICEF, 2013)</p>

## Principles and criteria

It is easy to see the differences between the examples in Box 6.2 and Box 6.3. In Box 6.2, the class atmosphere was good, the children were attentive, the activities were carried out easily and the lesson objective was in fact accomplished – “explaining the importance of washing one’s hands before eating” is exactly what the children learned to do, word for word. But the action is class-bound and unlikely to promote the habit (though it may help with spelling). Any parent knows that copying down words, repeating them and organizing them into a sentence will not do much to get children to wash their hands regularly before eating. In short, the learning activity is not “fit for purpose”.

The approaches in Box 6.3 however, are more likely to have an impact on practices. They involve several elements of the action-in-context learning model that was presented in Theme 5 (including observation, motivation, action, interaction, habit formation, passing on and taking responsibility).<sup>47</sup> They are based on the assumption that children develop capacities by actively and purposefully going through the process of perception, practice and maintenance; by building on what they know and do (mainly in real-life settings and with support); and by learning through actions and experiences that directly build competence. For a range of relevant cross-cutting principles in this context, see Box 6.4.

### Innovative practice & insight

**Effective and “fit for purpose” activities are the heart of SFNE innovation at the chalkface<sup>48</sup>.**

For this reason, it makes sense to express activities not as instructions to teachers (for example, “Ask children to ...” and “Tell learners to write down ...”), but in terms of what learners themselves do (“Children say if they agree with Maria in the story”). When activities are worded for what children do and perceive rather than what teachers do, they align with learning outcomes and serve as a basis for assessing both processes and outcomes (see the checklist for SFNE learning activities in Supplement 6.1). Focusing on what children do is a good discipline for materials writers, makes learning materials understandable for children and parents, and situates educators as “guides on the side” rather than “sages on the stage”.

<sup>47</sup> Work has also been conducted on the emotional motivations for handwashing in community interventions (see for example, The Lancet TV, 2014).

<sup>48</sup> I.e. the work of teaching in a school, especially classroom teaching.



### Box 6.4. What school-based food and nutrition education activities should do: some cross-cutting principles

#### Bring it home

- Personalize learning (to the individual, the home and the context).
- Call on learners' experience, knowledge and skills.
- Make it realistic or lifelike.
- Make it "portable" and therefore repeatable outside school.

#### Offer ownership

- Give choices and invite responsibilities.
- Generate pride and self-importance.
- Attract commendation and interest.
- Appeal to all participants – children, adolescents, families and practitioners.

#### Pin it down

- Ask for real examples and reasons for important points.
- Make activities precise and limited (for example, "Think of three foods that are nutritious and underutilized", etc.).

#### Make it easy

- Go point by point and step by step.
- Provide frequent checks and recaps.
- Work with existing classroom practices.<sup>1</sup>
- Hold regular discussions to identify and explore individual actions that are feasible and practical.

#### Practise talking about food

- Make "food talk" a target competence (such that children should be able to describe their own diet, promote plant-based meals, explain the journey of a food from farm to table, debate on and so on).
- Practise conversation and discussion as essential tools (including the practice of giving examples, asking questions and finding things out, writing a report, telling one's family and so on).

#### Interact

Recognize that food practices are social, and students:

- Work together to explore local practices.
- Ask questions at home, in the community and through social media.
- Share experiences, findings and opinions.
- Discuss what to do and how to do it.

<sup>1</sup> Many transformative teacher education programmes have found that once teachers return to their working contexts, their old practices reassert themselves – conditioned by resources, habits, and social and professional expectations.

## Assessing activities and approaches

The checklist in Supplement 6.1 provides further detail on the elements of this framework, and may be used to assess and design learning activities and approaches. As an example, the checklist has been used to assess the two activities described in Box 6.5.

### Box 6.5. Assessing activities: two examples

**Nutrition summer school:** A summer school focuses on planning good meals with plenty of vegetables. There are games and a lot of action, and a mountain of bananas for snacks. Children plan colourful balanced meals on paper plates and explain them to each other; then they take the coloured plates home to explain them to their families (Johnson, 2017).

**Assessment:**

- *Strengths:* An enjoyable activity with a narrow focus and a high impact; it involves shared action and makes healthy snacks available. It also involves (some) simulated expertise, talk practice and a takeaway for families at home.
- *Limitations:* Possibly one-off, short-term or high in cost. It is unclear whether it will have a permanent impact.

**Food experts:** In a school garden lesson, teams select a local food and are given a generic questionnaire to fill out. Some questions include: Is this food grown in our area? Is it good for us? Do people like it? Do they think it is nutritious? How much does it cost? How do we grow it? How do we cook it? As homework, teams do further research on the food, by pooling knowledge, asking around and gathering opinions, observing, and consulting food factsheets or seed packets. Finally, the teams present their findings on a poster and then quiz the class on the facts presented (the teacher corrects errors) (FAO, 2010a).

**Assessment:**

- *Strengths:* Uses knowledge of local foods as the basis for choosing what to grow and cook, and includes active engagement and sharing through real-life experience, as well as extension into the community – at no cost. Uses and strengthens a hands-on school gardening programme centred on food, and can be recycled through age groups.
- *Limitations:* This groundwork contributes to many food practices, but needs to be supplemented with actions towards those specific real-life competences.

# WHAT IS NEEDED?

This section discusses what is most needed to ensure learning sessions, activities and materials that support an effective model for SFNE; in particular:

- a programme of well-structured units of learning and a working formula for planning lesson sequences;
- purposeful and age-appropriate activities, that engage learners and others in action, reaction and interaction in realistic or real-life contexts, and that provide opportunities for practice and achievement;
- where possible, supporting learning materials (homemade if necessary); and
- practitioners with the interest and capacity to develop such packages and/or implement them.

## Programme structures

### Units

SFNE is best broken down into units, with a main target competence and related support competences (see Theme 3 and Theme 4). **It is best to think of a learning unit not just as a series of activities on a theme, but as a *package* consisting of**

1. a framing plan or guidelines (such as a scope-and-sequence chart) featuring essential learning elements and conditions;
2. a finite, progressive sequence of class lessons/sessions, with learner activities pointing the way to the outcome competence;
3. an equivalent amount of semi-structured independent experiences, events and activities outside the lesson/session, leading both into session and from it, some of which will be maintained beyond the unit as a whole; and
4. a concluding test, review or celebration of achievement, and if possible an outcome assessment.

Such units broadly follow the purposeful structure and process exemplified in Theme 3 and Theme 5: learners become aware of the current situation and of what people do and think; they gather new knowledge, experiences, perceptions and motivations; they plan action, practise it, troubleshoot and share their experiences; and they maintain changes

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### Box 6.6. Focus on adolescents! A teenage programme

The EatFit programme encouraged a healthy diet and lifestyle among adolescents aged 11–15, based on the concepts of self-efficacy, outcome expectations and self-regulation. Nine “experiential lessons” featured food preparation, tasting sessions, and simulations of choosing dishes in fast food restaurants. Students kept food diaries and tracked their own progress towards personally chosen and declared motivations. Most made at least one lasting improvement in behaviour.

(Horowitz, Shilts and Townsend, 2004.)



and pass them on (see Box 5.3 in Theme 5, and the “survival” cooking programme in Box 5.6 of Theme 5). At the same time, they build up a base of knowledge, understanding, experience and familiarity (see Theme 4).

The content and activities of units should respond to the needs, interests, circumstances, age and history of the target population. Adolescents, for example, may have long-established food habits, more scope for personal action, more peer pressure and more interest in establishing independent identities than younger children (see Box 6.6). All of these may influence their food practices positively or negatively.

### Lessons/sessions

Any single lesson/session in the sequence may focus on one or more of the steps in the process (as above). At the same time however, lessons/sessions need their own regular internal structure or framework of activities, for example as in the seven-step template below:

1. *Recap of previous session:* Teachers and learners together recall what happened at the last session. This resets the frame, recycles the learning and highlights gaps or misconceptions.
2. *Input from experience:* In relation to the upcoming topic, learners pool observations, knowledge and findings from their own experience and/or from preparatory homework. This establishes the learning baseline, informs teachers, primes interest, ensures that children come to class with something to contribute, and leads into the new topic. It also eases the teacher’s workload, as it largely runs itself.
3. *New topic:* The teacher introduces the topic through its main question or objective, along with a picture or icon and an outline of where the session is going. Pupils comment briefly.
4. *New experience:* Children engage with and use new input to enlarge their experience and perception and to increase knowledge and motivation. New input may consist of a range of observations, stories and information, as well as the experiences of others (see Theme 4, Box 5.3 in Theme 5 and the input-activity packages section below).
5. *Further activities:* These reinforce, extend or apply new input. For example, children and adolescents begin to activate the input; they may discuss it, decide what to do about it and compare it to their own situation.
6. *Preparing takeaways:* Learners discuss what “portable” nuggets (games, mnemonics, stories and small demonstrations) to take away from the session, to be reused at home or with peers. This is not only a form of revision, but a way for children and adolescents to own content, and to carry insights to wider audiences.
7. *Homework / “outside activities”:* This includes preparing, rehearsing or planning as necessary. Homework can include a) follow-up to reinforce or extend the content of the session, for example by finding examples or completing exercises; b) practising target actions in real-life contexts, with feedback notes; and c) preparatory homework – to explore the topic of the next session – conducted in the home or wider community.

## “Fit for purpose” activities

Activities should serve these frameworks by supporting the overall process for developing the target competences, while at the same time shaping the process to the context (including socio-economic group, age, teacher and resources). That is, they should be activities that are “fit for purpose”. This section looks briefly at such activities, focusing on a few which are particularly valuable in SFNE, along with examples and tips. Box 6.7, for instance, gives two examples of activities that are more or less fit for their intended purpose.

### Box 6.7. Misconceptions about activities

#### What is the activity good for?

Activities about food do not necessarily lead to healthy food practices.

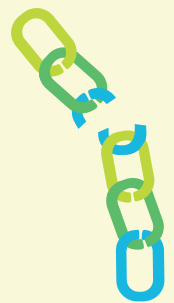
*Example:* Learners do crosswords about vegetables, draw pictures of broccoli or read about vitamins. These activities may improve vocabulary, observation or knowledge, but are unlikely to result in children eating more vegetables.

*Instead:* Students grow vegetables, taste them, study them, cook them, talk about them and promote them at home and in the community.

The format of the activity (for example, group-work, miming, role plays, field trips, games, competitions and quizzes) may be intrinsically stimulating, but may not necessarily do the job required of them. They need a visible purpose and follow-up.

*Example:* Learners act out a textbook dialogue about steaming and stir-frying, then go on to other things. This may start the process of understanding, but does not follow it through into practice.

*Instead:* The class’s two best cooks mime and talk through three different ways of cooking vegetables. The class discusses which methods are better and why, and undertake to try them out at home.



### Activities for exploring the real world

Previous themes have emphasized that learners need to explore the real world in order to establish and compare existing practices and attitudes; perceive risks and advantages and find alternatives; identify or develop strategies for change; and pass on and publicize what has been done (for examples, see Box 6.8). Hence “**outside activities**” – **assigned in the form of regular homework** – are potentially very “fit for purpose”. A little groundwork may be needed to ensure that the environments are enabling and the actors receptive – for example, so that school cooks expect a visit from class delegates, tippy taps<sup>49</sup> are in place, vendors know that children will be asking about prices, and parents know what questions or activities children will be bringing home so they are ready to engage.

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<sup>49</sup> See <http://www.tippytap.org/build-a-tippy-tap-manual>.

### Box 6.8. The “Find Free Fruit” project: examples of “outside activities”

- Children keep diaries or records, for example of weekly fruit consumption in the family.
- They discuss perceptions with families, for example: Is fruit nutritious food? Is it necessary?
- They observe fruit trees, for example by taking note of the seasonal mango surplus and what people do with it.
- They monitor the media for mentions of fruit (including on TV, local radio and the internet, as well as in newspapers).
- They collect and record information, for example on the presence and number (or on the absence) of advertisements for fresh fruit, or on fruits mentioned in commercial drink labels.
- They interview adults, for example health workers about feeding fruit to babies; farmers about growing pineapple; and others about preserving seasonal wild fruits.
- They find out how to grow bananas and keep them producing from year to year.
- They map fruit availability and accessibility (cost) in community markets and shops.
- They serve fruit for the family and record their comments.
- They prepare a healthy fruit snack, write out the recipe, and present samples in school.

### Input-activity packages

Informative or motivational input tends to get much more attention in SFNE than action and practice does. Hence the range of inputs is wide (see Theme 5), with the most common being messages, pictures, posters, talks and demonstrations. Other forms of input include “realia” (objects and material from real-life, such as foods, labels and food waste); videos and TV clips; comic books or illustrated dialogues; blogs and social media posts; factual texts, food guidelines, diagrams and tables; recipes, stories, songs and drama; as well as the views from the classroom window.<sup>50</sup>

Each of these inputs varies in potential. But the important questions relate not only to the kind of input, but to how it is used or activated – What is this input good for? What do learners do with it? What does it lead to? – that is, to their potential as input-activity packages. (For examples, see Box 6.9.)

<sup>50</sup> Does the school garden have any peas or beans? Sending a student out to take a look and report back can keep a whole class awake and alert until the messenger returns. Conversely, it is extraordinary to see a class working with a poster picture of a village/community, when their own village or community is right outside the door.



### Box 6.9. Input-activity packages: examples (inputs are underlined)

#### Realia

Some objects from real-life (such as food advertisements, labels or potatoes) are intrinsic to particular SFNE competences, and related activities emerge naturally; for example: collect and analyse advertisements and construct counterads; decode labels and act on them; peel potatoes and grate them over water to see the starch precipitate.

#### Channels (e.g. SMS, TV, social media and radio)

Even with well-developed content, media are vehicles which need to be activated by purposeful activity and human contact. For example, adolescents receive online advice on anaemia and iron, and they also learn that staff at the local clinic stand ready to give them a friendly welcome, along with information and iron supplements (Chong *et al.*, 2016). Thus the messages are linked to immediate choice and action.

#### Recreating videos

If schools have video – even if only on a smartphone – activities can be built around very short videos on specific topics (such as lunchboxes or food waste), recreated and translated for the local culture (for example, see Watershed Management Group, 2011, and Oliver, 2017).

#### Analysis (of TV and social media food advertising)

Children, adolescents and parents together analyse TV and social media food advertisements at home. This has considerable impact on understanding, awareness and children's market requests (Hindin, Contento and Gussow, 2004).

#### Visuals

Pictures, TV and comic strips are good for presenting discussions and information, telling stories and showing behaviour in context. As follow-ups, learners may continue the discussion and invite questions; adopt characters and explain their actions; compare their behaviour with others'; continue the story or plan the prequel; or copy the format – for example by running a simulated phone-in on a new subject.

#### Springboards

Some inputs are designed to fuel specific activities. For example, an illustrated dialogue shows two doctors at lunch disagreeing about the effects of regular meat consumption. Learners identify with one point of view and give their reasons, then take the question home to ask their families.

### Activities using narratives (fiction and non-fiction)

Although they are relatively underexploited in SFNE, stories of all kinds – both real and fictional – including drama, anecdote, mime and dialogue, are magnets for children's attention and serve as proxies for direct experience. Stories in particular are good for creating new perceptions in SFNE: they are able not only to bring the outside world into the classroom (for example, with foreign food, food processing and so on) but also to “body forth” or externalize invisible or internal processes (such as digestion); they can deal with sensitive issues (such as overweight) at a safe distance; they model food practices and attitudes vividly through real or fictional characters; and they are easily remembered and carried away to share.

Moreover, everything to do with food is a narrative – from digestion and food decay to the day’s meals and the making up of food packages. Everyone has a personal food story to tell; there are always new stories on the grapevine and the media; and all pupils, given characters, settings and a few questions, can make up their own stories. If there is access to video in the classroom, teachers and students can find dozens of movie scenes featuring food practices for comparison and discussion. (For examples, see Box 6.10).

### Box 6.10. Narrative in school-based food and nutrition education activities: examples

*The class invents fictional children* to be used as running characters from session to session. They can be represented by anything – from a picture/photo to a wooden spoon painted over with a face and name. Teachers and children provide them with names, homes, parents, schools, teachers, problems, needs, food habits and lifestyles. The fictional children do what the class does, talk about their experiences, voice opinions, act as positive or negative models, and are advised by the class.

*Teams invent characters* with a range of food attitudes, and describe their different food days – for example, lots of monotonous food for one character, plenty of junk food for another, a day of “fast” or hurried food (all on the move) for a third, and finally a character whose day is filled with nutritious, diverse and delicious food.

*Learners and teachers tell their own stories* of cooking accidents, terrible meals, shopping mistakes, and so on, and gather other stories from home. As positive follow-up, the class can make and illustrate poster-sized “pages” for a “book” to be displayed on the classroom walls, or for a “wall newspaper” filled with weekly food news, or they can write cooking guidelines for beginners.

*Learners do walkthroughs* of different narratives, for example, they play the roles of different foods and condiments and come together to make good meals; they mime how drinking water gets contaminated when people fetch it, carry it home, store it and use it; or they show how intensive farming affects biodiversity.

*Learners and families supply endings* to unfinished stories (Aubel, 2017) that are meant to raise issues and questions – for example, how did they cook the turnip after they pulled it up? Or Learners vote on the most relevant ending and explain their choices.

#### The “Rot Race”: a very inexpensive activity

Learners leave out leftover food scraps, monitor them for a week, and then describe and explain what happened and how it could have been prevented or how they could be used as compost.

### Good educational and classroom management practice

Successful activity sequences are shaped by good educational practice. Part of the trade of experienced educational practitioners consists of a range of well-tested good habits. These include building on previous learning, staging and grading, group work, advancing step by step, frequent recycling and the use of mnemonic devices and memorable actions, alternating old with new, varying pace and focus as well as inputs (visual, tactile, kinetic, auditory and verbal), adjusting activities to a range of learning levels, giving learners classroom responsibilities, and ensuring encouragement, pride in achievement and opportunities for display. While this theme cannot explore them all in depth, Box 6.11 considers four aspects of learning management that are particularly relevant to SFNE.



### Box 6.11. Learning management: four questions

1. Does effective SFNE cost a lot? SFNE activities in low- and middle-income countries (LMICs) need to be low-cost and easy to set up. Fortunately, the most useful resources for SFNE are cheap or free. These include learners' own exercise books, flipchart sheets and big pens; songs, chants and mnemonics to take home; streets, markets, homes and the people in them; and the classroom and school grounds, which can when needed serve as imaginary kitchens, shops, homes, water sources and villages.
2. Does SFNE mean a lot of extra work for teachers? It is not cynical to say that learners should do most of the work. The teacher is one and the students are many, and the do-it-yourself approach is one of the best ways to learn at all ages. For example, conscientious teachers need not carry bags of food to school (instead, each child in the class can bring in a small item of food) or create elaborate "food cards"<sup>1</sup> from scratch (a class can produce a workable set in a fraction of the time). And instead of making dozens of coloured swatches to represent micronutrient-rich fruits and vegetables, students can work in teams to create their own from fruit peels and vegetation, and make them again at home to show their families.
3. How can we organize homework feedback? Feedback from "outside activities" must be well used: it should not take long, but all contributions should be noted by the class and lead naturally to the next step. Experienced classroom managers use various techniques to handle this challenge in large classes; for example, a few students report and others make a show of hands; teams of four share findings and report on interesting points; or learners tick a chart as they arrive or vote in labelled boxes.
4. How can we mark out lesson content for review and revision? Questions are powerful tools, not only to check learners' retention, but also as content capsules, triggers for memory, and keys for learners to find things out and spark discussion. There should be fewer closed questions (where the teacher knows the answers) and more open questions (where teachers or learners actually want to know the answers), and topic questions should form the backbone of each unit/session (see Box 6.12).

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<sup>1</sup> "Food cards" of familiar local foods – with a picture on the front and accumulated information on the back – are useful for discussing food meal combinations, sorting foods into groups or identifying foods rich in particular micronutrients, choosing foods to study individually, and so on. Cards made by the class are perfectly usable if they are carefully introduced.

### Box 6.12. Using topic questions: examples

*Adopt a topic question as the title of each session/lesson*

For example: “How can we prevent anaemia?” Write the question on a large sheet of paper and put it up for display (store it after the lesson). Use topic questions to introduce each lesson, to display progress through the unit and to recap lesson content at any time. A list of topic or session questions can serve as a mini-poster for the school and for parents, a revision syllabus, and a trigger for learners to display what they know.

*Treat the answers to topic questions as packages of answers, examples and explanations*

For example, for “How can we prevent anaemia?”, the answers may include: a) avoid malaria (because...); b) eat iron-rich foods regularly (such as...); and c) take iron supplements if necessary (if the health centre advises...). Learners can record answers on the backs of question cards, borrow or copy the cards and take them home to display and quiz their families and friends.

*Organize or break down the content of the session with sub-questions*

For example: “How do you know if you are anaemic?”, “Who needs extra iron from food?” and “How can we make our diets rich in iron?” Put the questions on cards and hand them out to teams to gather answers during the session, and to then quiz others. Each student chooses one question to take home to ask family and friends.

*Use pre-questions or predictions*

These give a purpose and ensure a follow-up to reading, viewing or looking at pictures. Examples of all-purpose pre-questions include “Why should we read / view / look at this?”, or (judging by the title / picture / first sentence), “What do we think this is going to say?”

### School food environment activities

School policy and actions for a healthy food environment are listed in Supplement 2.1, the FAO publication on Nutrition education in primary schools: a planning guide for curriculum development (FAO, 2005a) and the Nutrition-Friendly Schools Initiative (WHO, n.d.). (See also Theme 2.) SFNE curricula should include guidelines on school food environment action. The question is how these initiatives can enrich not only the physical and social environments themselves, but also the interactions that learners have with these environments, and what activities can help. The answers are not always obvious (see Box 6.13).

#### School food

School meals are cited as a “valuable opportunity” and “an ideal venue” for SFNE (Pérez-Rodrigo and Aranceta, 2003), for example because cafeterias/canteens have scope for developing tastes and modelling food choices outside the school (Azeredo *et al.*, 2016). In many countries there is a movement to link SFNE with school meals (see for example, Oliver, n.d.), and to promote school cafeterias/canteens as supplementary classrooms

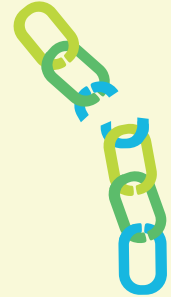
### Box 6.13. Misconceptions about school meals, school gardens and parent involvement

“Growing food and eating good school meals are sure to develop good food practices in learners.”

The reality is that these activities may help, but on their own, they may not be able to change practices and mindsets.

“Parents have a duty to support SFNE with action and attention.”

While all parents are genuinely concerned about their children’s health, they may not have the time or the trust to follow what schools prescribe



(Benn and Carlsson, 2014; Teachers College Columbia University, 2014). School staff, as de facto role models, are encouraged not to show dislike for school meals, or to be seen consuming junk food.

There are examples of freestanding extracurricular programmes – such as clubs – promoting healthy traditional diets (see for instance, Woo, 2015), and of programmes that have integrated food and nutrition education with food production and school meals, such as Brazil’s National School Feeding Programme (PNAE, for its acronym in Portuguese). However, there are few descriptions of SFNE activity sequences that are closely linked to school meals.

It is important to note that school meals are not universally available: only 12 percent of children in low-income countries receive them and 37 percent in upper middle-income countries (Alderman, 2017). SFNE therefore needs to also ensure a focus on other food sources on or near school premises (such as food vendors at the gates, vending machines, drinking water and lunchboxes), and build a school culture of practice around them. Some generic activities can be agreed with parents and carried out regularly by each year’s new students (see Box 6.14).

#### School gardens

Combining education and agriculture seems to work for better nutrition (Ruel, Quisumbing and Balagamwala, 2017). The question is whether this holds good for school garden programmes. Many benefits have been noted in high-income countries (HICs), including impacts on knowledge, attitudes and consumption of fruits and vegetables (McAleese and Rankin, 2007; Ratcliffe *et al.*, 2009; Morgan *et al.*, 2010; Davis, Spaniol and Somerset, 2015; Dudley, Cotton and Peralta, 2015). Some secrets of success include: using food and nutrition competences as learning targets (see FAO, 2010a); initial and ongoing exploration of interest and capacity; multisided approaches; gradual opt-in programmes; material benefits (such as taking food or seedlings home along with skills); building capacity; hands-on practice in gardening, food preparation and possibly marketing; the appreciation and valuing of local skills and expertise; and the modelling of home food gardens (FAO, 2010b).

For LMICs however, although some large-scale school garden programmes have claimed success – for example, see IIRR (n.d.) in the Philippines and Plenty International (n.d.) in Belize – and some partial successes have been reported (Lander, 2013; Inocian and Nuneza, 2015; Laurie, Faber and Maduna, 2017), overall the evidence is still mixed.

### Box 6.14. Generic activities related to school food: examples

#### *Questions about school meals*

“What is in our school meal?” “Where does the food come from?” “What does it do for us?” “Is it well-balanced?” “What do people think of it?”

School meal programmes should provide full information about their meals to the school, the parents and the learners. Children and parents can then explore the above questions together at home, and follow up in class and in parent–teacher association (PTA) meetings.

#### *School food vendors*

Food vendors in school areas typically sell junk food; leading many children to their first independent experiences in making poor food choices. Making healthy snacks accessible and desirable needs to be a joint project of the government (e.g. through subsidized fruits and vegetables), education and health ministries (through school food environment policies), schools (which have some control over vendors), parents (as sources of pocket money and as role models), vendors (who need to make a living) and consumers (that is, the learners or students themselves).

#### *Lunchboxes*

Learners discuss with parents, peers and teachers what to put in lunchboxes, and draw up an advisory leaflet. Students compete for a month to win a class prize for Best Lunchbox of the Week. The following year’s class consults families again and improves the advisory leaflet (see for example, Oliver, 2017).

#### *Drinking water*

As part of a year-to-year project on clean drinking water (recognizing, sterilizing, storing and sourcing), older learners trace the source and treatment of school tap water with help from the local water board, and are invited to present their findings to other classes, the school board or the PTA.

Before embarking on a national school garden scheme, some situation analysis is usually needed to show what is acceptable and realistic, for example through feasibility and KAPP (knowledge, attitudes, practices and perceptions) studies of local attitudes to school gardens and their history, learners’ activities, capacity in the schools, education outcomes, costs, management and impact, and through analysis of how school garden learning is integrated or reconciled with the agricultural cycle, the curriculum and the school year. Some of the resulting gaps can be addressed through the use of school garden manuals (for example, as in Box 6.15).

### Engaging parents and homes

Parental support is cited as a key to SFNE success (see Theme 1 and Theme 2). Schools need to involve parents because they have experience and local knowledge, and because home diet is a sensitive issue (see Theme 5). In HICs there is good evidence that some form of parental involvement and support can enhance the impact of SFNE (Blom-Hoffman *et al.*, 2008; Contento, 2016; Robert Wood Johnson Foundation, 2017). The year’s work may also include optional activities for parents, such as explaining shopping choices to their children at the market or analysing food advertising with them (see Hindin, Contento and Gussow, 2004).



### Box 6.15. Setting up and running a school garden: an FAO manual for teachers, parents and communities

This much-used manual, developed mainly for LMICs, outlines the process for setting up and running a school garden. It has a reference section on common home-grown foods and an accompanying Teaching Toolkit with illustrated activities on planning and growing food crops, market gardening, preparing garden food and snacks, cooking in the garden, and preserving food. (For a related school garden curriculum outline, see Sherman, 2009.)

(FAO, 2005b and 2010a)

While more evidence is needed on how best to involve parents in specific contexts, some general guidance exist. For example, simply giving information to parents is insufficient (Luo *et al.*, 2012); instead, more active, synchronized engagement between the school and home can help, as seen in the “impressive record” of the teacher–child–parent approach in Philippine elementary schools, in which teachers present nutrition and health messages in class for children to convey home (Solon, 2006). Support from parents can also enlarge the scope and variety of homework interactions; for instance children in Zambia take home questions, observation schedules, stories and exercises to finish, as well as requests for opinions and demonstrations, all of which are meant to be addressed or completed in consultation with parents, neighbours and friends (FAO, 2007a). Some parents’ reactions can be a revelation; for example, one group particularly appreciated children bringing home hand-copied messages and questions from their lessons (“Are eggs good for small children?”, and so on), displaying them around the house, reading them out and explaining and discussing them along with neighbours who were called in to witness and join in.

#### Large, one-off, multipurpose activities

Schools sometimes have opportunities and funding for field trips and visits, national competitions, summer schools, festivals or other large-scale events featuring food and nutrition (see for example Box 6.16). Such experiences are bound to have a positive effect on improving the profile of SFNE, and possibly also in other areas other than nutrition. On the other hand, their impact on children’s and families’ daily food practices and outlooks may be difficult to assess. Schools and organizers therefore need to use these precious opportunities to the full, ensuring that all participate and prepare, tracking specific takeaways, and following up on each event and spreading its impact.

### Box 6.16. Drama, poetry and song

Schools in Uganda held a competition in which children performed plays or wrote poems/songs as part of the Music, Dance and Drum Festival, a national cocurricular activity organized by the Ministry of Education, Science, Technology and Sports. The 2016 theme was “Stop child marriage and poor nutrition for better learning”, and the winning poem was about diverse diets and stunting. The poem was printed in the national newspaper and the initiative was broadcast on national TV (TV West and Bukedde TV).

(SNV, 2017)

## Learning materials: products and process

Learning materials and resources may consist of students' books and teachers' books; posters, cards and flipcharts; videos and TV programmes; lesson plans, guidelines and tips for classroom management; and briefing sheets for parents and teachers. Information and communication technologies (ICTs) can further expand choices, for example with downloadable materials at teacher centres, SMS messages, social media and e-books, as well as online research for students who have internet access. Any or all of these may be limited or lacking in some countries. It is therefore important to consider and prioritize the materials that are most essential for SFNE.

### Exemplary materials: recipes for success and tools for professional development

Effective, accessible learning materials, videos of good practices and guidelines for teachers are extremely effective in showing the way forward. They can be used to set standards for pre-service teacher education as well as for in-service workshops on classroom practice or on producing or adapting materials. To fill this role, however, some materials and guidelines must be exemplary:

- *Learning materials:* These should be based on insights into the target populations (see for example Box 6.17). They should be well-designed and illustrated, with practical, appealing and culturally acceptable activities; they should be aligned with the curriculum and with SFNE principles and sustainably supplied (i.e. not only for short or one-off projects); and perhaps most importantly, they should be available for children and adolescents to take home. (Supplement 6.2 outlines a checklist for assessing existing learning materials, which complements the checklist for learning activities in Supplement 6.1.)
- *Teachers' notes, guidelines and videos:* These are extremely valuable for teacher education, and require special attention because their input and advice come in small packages, lesson by lesson, and are immediately put into practice. If they are the central or sole tool for professional development, they need to encompass a hands-on learning programme for teachers (see Theme 7), with guidelines on communicating and relating to parents and on school food-related activities, as well as lesson briefings on issues and learning challenges for children, questions about the local situation, and step-by-step notes that line up clearly with children's learning materials.

### A fail-safe process of materials production

Whether electronic or hard copy, producing exemplary materials requires a fail-safe process, for example and as a first step, finding demonstrated local expertise in writers, illustrators, editors and consultants,<sup>51</sup> then establishing a budget, gathering sample materials, assessing what is already in place, agreeing on learning models, lesson frameworks and purposeful activity formats, and pre-testing and revising as outlined in Theme 5.

<sup>51</sup> If available and affordable, valuable contributions to learning materials can also be made by experts in behaviour change, communication, child development and marketing.

## Low-cost materials

Take-home learning materials are particularly valuable in SFNE. They act as documents of record, workbooks for homework, instructions for “outside activities” and communications to home and family (parents who help with homework say they learn a great deal). Many countries cannot afford elaborate provisions, especially for what is often thought of as a “marginal” school subject. SFNE therefore needs strategies and activities that will compensate for the absence of coursebooks (for example, ways to create homemade materials, display information in class, carry it beyond the school, and present individual work), many of which are at least as educational and engaging as higher-cost learning materials. (Some approaches are listed among the Recommendations for this theme.)

## Professional development

Since good learning materials are one of the most effective instruments of teacher development, capacity in this field is a high priority. There is a need for writers and teachers to develop their capacities in assessing and adapting existing materials, designing new ones, and implementing new approaches (see Theme 7). In this sense, it may be a good idea to seek new talent among practising teachers to mix with and enrich the existing pool of established writers, course developers and relevant specialists.

Building professional capacity is a difficult and demanding endeavour. In some education fields (such as ICT and language learning) where there is high demand, visible utility and extensive expertise, changes in learning approaches can be accelerated with the use of good learning materials. But this kind of fertile environment is more difficult to achieve for schools in under-resourced education systems. However, compromise strategies are possible.

### Box 6.17. Focus on adolescents! Two publications on adolescents as target populations

#### *Bridging the gap: engaging adolescents for nutrition, health and sustainable development*

This study includes a section on food and nutrition, with an excellent survey on adolescent food attitudes, food practices and food literacy in several LMICs, covering factors such as food status, the gathering of food waste, and attitudes towards monotony and variety. It consults extensively with adolescents, highlights their voices (see quotation) and draws conclusions on how to engage them (WFP and Anthrologica, 2018).

#### *Life is my ambition: a small target group profile of Zambian 6th grade students*

A project developing SFNE materials for young teenagers took a questionnaire to learners in local schools, to explore their interests, pleasures and leisure activities, and their hopes, fears, ambitions, as well as their role models and spending habits – “looking for hooks to hang motivations on, scenarios which would ring true, tensions that needed airing [...] and messages that would resonate”. The answers were of great use in designing the learning materials for this age group as part of the project (Sherman, 2007).

*"Even at night when I'm sleeping, I don't have peace. I sleep thinking what the family will eat the next day. So, I wake up at 4am to go for firewood, to make sure the younger children have something to eat."*

17 year old girl, Moroto, Uganda



## Summary of needs

As with many learning programmes, effective SFNE depends on activities developed through an ongoing analysis of learning needs embodied in a competence-based curriculum and learning programme. These activities must be well-organized, staged in finite steps, regularly recycled; they must involve established roles and responsibilities and routines along with novelty and variety, and they must be able to have both general and personal application. Beyond this, SFNE's own special needs – particularly in light of the “methodology gap” – are for activities that are genuinely “fit for purpose” in that they visibly enhance children's food practices and outlooks, and make sense to all participants. Such activities involve children interacting actively with their food environments and with social settings outside the classroom, sharing their experiences and tailoring their individual choices to their circumstances. Exemplary piloted and culturally appropriate learning materials can serve as valuable guides for practitioners implementing these approaches and educating teachers, schools and families, as well as children and adolescents. However, such materials may be difficult or expensive to produce and maintain in LMICs, and low-cost educational strategies are needed to fulfil the key functions of such materials.



## CHALLENGES

In terms of general challenges, it should be noted that changing paradigms, practices and institutional culture take a long time, and piecemeal improvements (for example, focusing only on teacher education or exclusively on new materials or only on school briefings) are not often sustained (see Theme 7). The process requires capacity, comprehension, experience and know-how, as well as coordination, collaboration and funding.

### Concept and learning model: blind spots and gaps

- *Insufficient exposure:* Practitioners are often not sufficiently familiar with the importance of SFNE and its potential impact. This is typically because there are few local examples, limited discussion and/or no good models. Similarly, there is a lack of direct experience and practice in the different approaches that are required.
- *Persistent misconceptions:* The most prevalent of these include the idea that food practices and outlooks can be improved through supply-side activities alone; the conviction that children have little scope or capacity for change (see Theme 4); and that the involvement of the family and community is peripheral.
- *Lack of professional incentives:* School and teaching environments are often lacking in intrinsic professional motivations for change, for example through visible success and encouragement, professional development and certification, popular status or demand and, above all, specific improvement in skills and know-how.

### Education–environment links

*The support of parents and community:* Parental support may be key to SFNE success. But food is a sensitive issue and relationships between parents and schools can vary from mutual respect to open hostility. Even in the best of circumstances, many parents have little time to spare. Schools may therefore need to proceed gradually and with care.

“How dare you – how dare you suggest I’m a bad parent for letting my kids eat food they enjoy?”

*-Angry mother to food educator.*

*School food:* Where school meals are provided, the expressed aim is usually to get nourishing food into bodies. Even when education is part of the remit, specific SFNE activities are seldom mentioned (FAO, forthcoming). (See also Theme 7).

The educational potential is also restricted by the meals themselves. All too often, schools are not provided with full information on ingredients, nutritional value, preparation and sources. Meals may not offer choices or they may not meet nutritional standards, and in some cases even when they are nutritious, if their ingredients are unknown then they cannot serve as models for home meals or vice versa.

Nutritious and varied school meals cannot be relied on exclusively to change food practices and outlooks. Since they comprise a fraction of a child’s total food life, their behavioural impact is constantly mitigated by the wider food environment. It is therefore an uphill battle for school meals alone to combat negative attitudes, practices and circumstances in the home and community (see Oliver, n.d.).

Other sources of food on school premises (such as lunchboxes, tuck shops, vendors and vending machines) may have potential for education, but are not often seen as part of the school's official responsibility.

*School gardens:* The sustainability of school garden schemes depends on local context and history; perceived aims; sustainable resources (including time, equipment, inputs, land and water); holiday maintenance; parental support and community engagement; and last but not least, teachers' skills and interest. (As Alderman [2017]) has noted, "today's teachers have often never touched a hoe and never wanted to.") Where subsistence agriculture is still a reality, school gardens may be associated with cash crops or with drudgery (FAO, 2007b). Recurring programme questions centre on how to integrate school gardening into the school timetable, the curriculum and the agricultural cycle.

### Formative research and programme design: learning materials

High-quality, transformative learning materials are capable of leading the way in children's learning while also serving as professional development tools, but there are many challenges.

In general, learning materials from HICs cannot be imported into other countries' classrooms as they stand (although they can sometimes be adapted). Producing effective new local materials however, makes high demands on resources, implementation and sustainability. They require a thorough process of development and revision; a budget for national production and distribution; and favourable conditions of use in schools. Some specific hurdles involve:

- *Models:* Models of effective materials are often lacking, especially when it comes to local examples.
- *Use:* In some schools, books are not used regularly in the classroom and learners do not have their own copies; sometimes they are even kept under lock and key in the principal's office for safety. This lack of books reduces the scope for independent groupwork and for takeaways to show family and friends.
- *Cost:* The costs of producing hard copy materials (especially in colour), distributing them to all schools and replacing them periodically are too high to be borne by most donors or by parents in LMICs. Electronic materials and channels that could reduce these costs are not yet universally accessible.
- *Production process:* An assessment of existing practices and resources is required, along with consultation with colleagues and end-users, and field-testing.

### Capacity, experience and familiarity

Producing effective learning materials also requires various kinds of capacity (see Theme 7). This includes extensive knowledge of existing educational resources; professional experience and expertise in education, SFNE, materials design, illustration and editing; and with a good understanding of local culture. Particular challenges in this context involve:

- *Illustration:* Bringing real and fictitious worlds into the classroom is costly. There is a need for educational illustrators who can prioritize meaning and clarity along with interest and vitality.

- *Existing capacity:* Approved ministry writers are often senior subject teachers used to traditional approaches who may not have experience in developing and delivering SFNE products. On the other hand, hiring consultants is costly and does not develop local talent.
- *Media productions:* These are expensive and require technical expertise, which needs to be supported in turn by expertise in how to make best educational use of mass media for SFNE.

## RECOMMENDATIONS

The recommendations for this theme follow on from those proposed in Theme 5, with more detail on the design of learning activities and lesson formats. The aim is to build healthy and sustainable food outlooks and practices, both economically and engagingly, within the framework of existing resources, constraints and opportunities, through a chalkface action programme that does not disrupt normal school procedures or add significantly to teachers' workloads. This process can be supported by good pedagogic practices, purposeful activities and learning materials that are attractive, easy to use and not overly demanding. Recommended outputs are underlined.

### Establish the model of effective food and nutrition education

Adopt or adapt a learning model of SFNE, such as the framework proposed in Theme 5, that aims at building food competences, through planned learning programmes (such that learners become aware of the current situation and what people do and think; gather new knowledge, experiences, perceptions and motivations; plan action, practise it and troubleshoot; and maintain practices and pass them on). Follow this model in designing all learning materials and activities.

### Extend the model to link with food environments

#### School food

- Relate SFNE activities (such as observation and practices) to all food on the school premises (including lunchboxes, vendors in/around the school grounds, tuck shops, drinking water and eating areas as well as school meals), to build awareness and scope for independent action. Consult with parents, school food providers and school management (see Supplement 2.1).
- Request school meal providers to inform schools about ingredients, nutritional value, preparation and sourcing. Prepare clear and simple materials on how schools/teachers can use these in SFNE.

#### School gardens

If school garden programmes exist:

- Consult existing school garden manuals, schools and local experts for advice on planning SFNE activities through the agricultural cycle and the school year.
- Liaise with organizers of school garden programmes to embed SFNE in key gardening activities in line with the curriculum.
- Assess and flag student achievements in school gardens and ensure they are communicated throughout the whole school and to parents.

If school garden programmes are planned:

- Recognize the need for situation analysis and consultation to explore feasibility and attitudes; programme designs that circumvent practical problems; activities that support the SFNE curriculum; pilot schemes; and the careful selection of school garden models that reflect varying school circumstances.

## Parent involvement

- Ensure a culture of value and respect for parents' knowledge, skills and authority as equal partners in their children's education, and include them in evaluations of SFNE interventions. Give them access to an outline of each term's work, with details about take-home activities.
- Review existing school-parent relations, parental availability and the kinds of support that are seen as normal, as well as the knowledge and skills that parents can share, and incorporate general advice accordingly in teachers' lesson notes.
- Consult regularly with parents, for example through annual or biannual briefings on the SFNE programme, including discussions on its value and feasibility and the ways in which it can be best supported by the school and home environments.
- Build home consultation, discussion, enquiry and action with parents and adults in the home environment, and monitor the response.

## Promote formative research and effective programme design: the process of developing learning materials

Follow the suggestions on learning programme development in Theme 5. This includes agreeing on the concept and the learning model; establishing an archive of sample materials and useful websites; assessing existing materials, learning programmes and approaches (see Supplement 6.1 and Supplement 6.2); exploring target audiences; establishing budget, support and work plan; setting up consultation and collaboration with other task forces; developing materials; and carrying out field-testing and revision for usability and impact.

In assembling the writers' team:

- Ensure that the selection and recruitment of writers and other experts includes a review of previous work in diverse settings, or requests for samples to be produced to specification.
- Look for
  - writers with working experience of SFNE, expertise in materials production and a realistic sense of what children and adolescents can accomplish;
  - illustrators who understand the supportive and motivational functions of educational illustration and the importance of realistic cultural detail;<sup>52</sup> and
  - consultants (including nutritionists, education professionals, behaviour change experts, communications specialists, parents and school managers) who know the culture and the context.

In planning the materials:

- Agree on a standard lesson format that applies best practices for education in its principles and routines.
- Map out the learning units for each target competence lesson by lesson. Develop

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<sup>52</sup> *This is not my back yard!* Because SFNE is intimately linked with daily life, learners can be fussy about authentic detail in illustrations. Field-testing in one project resulted in having to rename and reclothe characters, make the houses round instead of square and replace tables with eating mats.

them as packages consisting of a declared aim, a progressive sequence of sessions, inputs, purposeful learner activities, semi-structured independent experiences, events and activities, and a final review of achievement.

- Agree on the contents and layout of the teachers' guide/notes, including guidelines on relating to schools and parents, unit-by-unit briefings on food and nutrition issues and the SFNE approach, questions for teachers to explore, challenges faced by learners and lesson plans.

In drafting the materials:

- Draft learning activities that:
  - are addressed directly to children as the prime actors;
  - are “fit for purpose”, i.e. help to achieve the target competences and at the same time shape them to the context (socio-economic group, age, resources);
  - make use of stories and cases to enlarge proxy experiences;
  - include “outside activities” through which children engage with real-life environments, including the home, family and community; and
  - link to the school environment (including school gardens, school food and other school-based interventions) as far as possible.
- Ensure that students' books and learning materials are aligned with teachers' guides/notes.

### Low-cost strategies

In cases where there are budgetary or cost restrictions to producing, publishing and distributing comprehensive school-wide learning materials, the following compensatory strategies may be considered:

- Produce some exemplary learning materials each year (in hard copy or online) – for example, enough for a small project to achieve one target competence. These can then be used to set standards and serve as models for teacher education and for pilot projects in schools. If possible, include a demonstration video.
- Hold in-service workshops on adapting existing materials or on planning lessons for different curriculum elements.
- Produce teacher's guides that can be field-tested, revised, and easily renewed and extended. They should contain step-by-step lesson plans, guidelines, briefings and some large-format black-and-white visuals or short texts that are easy to copy and use in class.
- Design materials and classroom activities to minimize costs and maximize existing class resources and student abilities, for example:
  - Learners complete essential steps at home (for instance, rehearsing dialogues, memorizing stories and questions to ask and copying out messages for home display);
  - Important questions and observations are memorialized in “wall newspapers” or on large flashcards that the class can make for its own use;
  - The class makes renewable learning materials (such as food cards), which can also

- be taken home;
- Children collect “realia” (such as food wrappers) and store them in boxes for use in the classroom;
- The class artist (there is usually one) is occasionally co-opted to create and display fictional characters, foods and settings for posting on walls;
- Each child has one small, dedicated SFNE exercise book, handed in from time to time, to record take-home questions and individual observations outside the classroom; and
- A few key posters are supplied to the school (and to health centres) with notes on how to use them at different age levels.

### Strengthen professional capacity, experience and familiarity

Use the following strategies (see also Theme 7) to support and encourage teachers, and to get expert help in devising learning materials, which are a powerful instrument in teacher education:

- Gradually extend the existing team or task force (see “SFNE transformation: an interconnected process” in the Introduction) working on materials (including writers, illustrators, programme designers and editors<sup>53</sup>) by identifying new talent among teachers (through workshops, competitions and in-service training).
- Liaise with those in charge of in-service teacher education (see Theme 7) to discuss how learning materials can be used, for example:
  - to break teachers in gently, demonstrate good practices and provide opportunities for practice;
  - through in-service workshops for adapting or developing materials;
  - to educate teachers in each unit through short briefings on food and nutrition issues, existing practices and outlooks, and learning challenges; and
  - as the basis of demonstration videos.
- Use learning materials to maximize interest and minimize apprehension, for example, by:
  - showing how to organize activities so as to reduce the workload;
  - reminding teachers to show interest and to praise and encourage children’s contributions;
  - suggesting that they share their own food experiences with the class, and try some homework activities along with children; and
  - proposing a choice of publicity activities for each unit (for example, posters to display in the school and health centre; demonstrations on school open days, guided tours of school gardens, interviews with community media, posts on social media and so on).

<sup>53</sup> If possible, the task force may also include experts in behaviour change, communication, young child development and marketing.

## Useful tools and links

Nutrition Education in Primary Schools: a planning guide for curriculum development (FAO, 2005a)

Setting up and running a school garden: a manual for teachers, parents and communities (FAO, 2005b)

Setting up and running a school garden: Teaching Toolkit (FAO, 2010a)

A new deal for school gardens (FAO, 2010b)



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## Supplements

- 6.1. SFNE learning activities: a checklist
- 6.2. Assessing SFNE materials: a checklist

THEME  
**7**

# Systemic capacity

"Capacity is a critical aspect of  
development"

- FAO

# Developing capacities throughout the system for managing sustainable school-based food and nutrition education



**Capacity  
development**



### Target audience

This theme is targeted at all institutions and stakeholders that are interested in, plan for, manage and require SFNE capacity development – in particular SFNE coordinating entities, ministry staff, training institutions, policy advisors, curriculum developers, non-governmental organizations (NGOs) and international organizations.

Themes 3–6 discussed the key principles and elements that define the process of effective school-based food and nutrition education (SFNE). Theme 7 makes the case for gradual and systemic capacity development, which is crucial for enabling, managing and sustaining this process.

## BACKGROUND

Capacity development, like SFNE, is driven by country actors, and anchored in national systems and local expertise and specific to the local context. It needs to be undertaken in partnership with multiple stakeholders and requires long-term interventions rather than stand-alone short-term events. It focuses on strengthening not only individual capacity but organizations and institutions while creating an enabling policy environment.

The lack of capacity in nutrition and in food and nutrition education in low- and middle-income countries has long been considered a key barrier to achieving population nutrition goals and to sustainable development in general. As a result, it has been an important focus of international support over the past decade. But there remains a need for such efforts to be scaled up, and to respond to a common understanding not only of the type of capacities needed, for whom, and at what levels, but also of the capacities that are already available and in place (FAO, 2011; Shrimpton *et al.*, 2013; Gurinovic *et al.*, 2014; Shrimpton *et al.*, 2014; Sodjinou *et al.*, 2014; HLPE, 2017).

**Capacity development is “the process whereby individuals, organizations and society as a whole unleash, strengthen, create, adapt and maintain capacity over time” (FAO, 2018a).**

For SFNE in particular, emphasis (and often pressure) has traditionally been placed on the “front-line” educators – mainly teachers whose capacity has been noted as a key element for programme effectiveness (Murimi *et al.*, 2018), community workers and other staff that implement or facilitate SFNE programmes and interventions (see “What type of SFNE programme/intervention is the subject of this white paper?” in the Background of the Introduction). Yet, many capacity development interventions involve little more than one-off training sessions for these groups (see an example in Box 7.1), often without significant impact on the overall effectiveness of SFNE or on the development of actual capacity.

This lack of impact results partly from the assumptions and underlying paradigms that define capacity development in this field. Firstly, as described in previous themes, the success of SFNE depends on the capacities of many actors that collaborate across the system – from policy makers, curriculum developers, learning materials writers and teacher educators to teachers, parents and food service staff. Thus, capacity development for **SFNE cannot be restricted to any one group in particular.**

Secondly, **capacity development processes do not take place in isolation;** individuals therefore require institutional processes and an enabling environment that allows them to put their capabilities into action (FAO, 2018). For example, even if teachers receive adequate training, they may face obstacles, including for instance a lack of dedicated

### Box 7.1. The case of country Y

The health promotion division of the Ministry of Education in country Y requested support from an international organization to integrate SFNE into a health-focused extracurricular subject in 4 000 schools. The subject is available for grades 1–9 and has a time dedication of about one hour per week after school hours.

The ministry officials agreed on a strategy focusing firstly on the development of technical guidelines to support curriculum developers in integrating the new content into the extracurricular subject, and secondly on centralized training of trainers for specialized teachers. The aim was to train as many teachers as possible in one year. The government covered the costs of the training sessions and the workshops for the curriculum developers.

Although the strategy had some strong points, there were important gaps that significantly affected the sustainability of the investment:

- There were no enablers in terms of the additional time required for the updated curriculum or in terms of any specific policy action that recommended the integration of SFNE into schools.
- The process of integrating SFNE into the health-focused extracurricular subject was not linked with the revision of the national curriculum, which occurred during the same year.
- There was no consideration of what actually happened after the teachers were trained, in terms of tracking the application of what was learned through the training, and the available incentives to do so.
- There was no provision for monitoring and evaluation. As a result, there was no information on the quality and results of the training sessions, or on the actual implementation of the new curriculum.

classroom time, of regular support, or of materials; they may also face indifference in social and institutional environments, which can further hinder the application of their strengthened capacities.

And lastly, the **development of capacities requires much more than technical training**. This is because the very nature of the capacity to be developed or strengthened varies according to changing context, target actors and aims, and because – apart from technical knowledge – it requires motivation, practice, observation, functional skills development, and more (Porter *et al.*, 2017).

The process is often non-linear and involves long-term change in which no single factor (such as information, education and training, technical assistance or policy advice) can on its own address the development of capacity. In the international development arena therefore, a broader paradigm for capacity development has gradually been adopted. When assessing and planning for capacity development in specific fields, three interlinked dimensions are commonly considered: the individual, the organization and the enabling environment (see figure 7.1) (FAO, 2018).

In terms of SFNE, this means not only developing expertise in food and nutrition education at the individual level (of the various groups), but also developing the overall motivations

Figure 7.1  
FAO's capacity  
development dimensions



and organizational capacity of schools, and of the system as a whole (see Theme 1), to gain political legitimacy and to be recognized as an important national and regional system. Box 7.2 summarizes FAO's capacity development process, which is the basis for this theme.

### Box 7.2. FAO's capacity development process

In FAO's view, capacity development is driven by country actors, consistent with national priorities and the local context, and anchored in national systems and local expertise. Capacity development needs to be undertaken in partnership with national, regional and international players and requires long-term interventions rather than stand-alone short-term events.

The key elements of the FAO recommended capacity development process include:

- Multidimension/multilevel capacity needs assessment (see box 7.10): "a useful way to look inside a "country's capacity system" and initiate a focused dialogue between resource partners and national and local actors about meaningful interventions to strengthen national capacities to drive development. It creates the basis to link country capacity assets and needs to overall development goals." At minimum and through a mix of methods, FAO recommends that capacity assessments involve:
  - identification of main problems to address and country context (see theme 1);
  - understanding and engagement of stakeholders involved in the key issue at country level (through stakeholder mapping and analysis); and
  - comparison of existing capacities with desired capacity levels and identification of feasible strategies to close the resulting gaps.
- Multidimension/multilevel capacity development strategy or plan of action based on identified targets and objectives, focusing on the "right mix" of modalities and activities and using a participatory and adaptive implementation approach.
- Monitoring and evaluation of the process and expected capacity targets.

(FAO, 2015 & FAO, 2018)

Box 7.3 presents some examples of specific action areas within each of the capacity dimensions. These examples are meant to illustrate the range of areas of scope for capacity development intervention. Moreover, it should be noted that while the mechanical elements of the education system may reflect the best of intentions, they cannot bring about effective SFNE in the absence of a widespread conviction of its value, some direct shared experience of how it works, and mechanisms for coordination and dialogue. These are all essential aspects of the process for capacity development.



### Box 7.3. Capacity development for school-based food and nutrition education: examples of areas of scope across all three dimensions

Capacity dimension	Areas of focus and action for capacity development (examples)
Enabling environment	<ul style="list-style-type: none"> <li>• National and subnational information systems on the food and nutrition situation of schoolchildren and adolescents (including individual food consumption, health status and food security analyses).</li> <li>• Existence and implementation of policies and legal frameworks favourable to the integration of SFNE in education systems and school meal programmes (for example, national curriculum policies, national nutrition policies, school feeding laws, social protection plans, national development plans and childhood obesity prevention strategies).</li> <li>• Availability and adequacy of government budget lines for SFNE.</li> <li>• Resource mobilization strategies for SFNE (from donors, international organizations, various ministries and communities).</li> <li>• Political commitment and endorsement of SFNE.</li> </ul>
Organizational	<ul style="list-style-type: none"> <li>• Roles, priorities and processes of institutions related to SFNE (including schools, training centres, ministries and universities).</li> <li>• Periodic revisions of curricula and materials.</li> <li>• Documented institutional SFNE processes and guidelines.</li> <li>• Job descriptions relevant to SFNE.</li> <li>• Available SFNE training schemes.</li> <li>• Programme-related capacities such as design of behaviourally focused SFNE and application of best practices.</li> <li>• School system characteristics (such as availability of SFNE for various grades, format of SFNE delivery, time dedicated to SFNE during the school year, learning approaches used, main topics addressed, school garden objectives and assessment of progress and results).</li> </ul>
Individual	<ul style="list-style-type: none"> <li>• Competences needed for SFNE in relevant target groups (including teachers, curriculum developers, food service staff, NGO staff, programme planners and learning materials writers).</li> <li>• Training and learning opportunities and certifications available for individuals (for example, pre-service, in-service, professional development, project-based, and so on).</li> <li>• Feedback mechanisms and supports (such as online platforms, learning resource hubs and systems for sharing practices).</li> </ul>

# WHAT IS NEEDED?

## Leadership and management

Informed and effective leadership at the policy level of the education, health, agriculture and other relevant sectors can significantly enhance the priority of SFNE in the national agenda and ensure there is an ongoing programme for workforce capacity development and monitoring (Fanzo *et al.*, 2015).

Moreover, leadership is needed all along the system, including at institutional, local and school levels, particularly for initiating and legitimizing SFNE programmes and interventions (Porter, Koch and Contento, 2017). In general, there is a need to win hearts and minds throughout the system – to show that SFNE is important, that it is a shared responsibility and that a range of existing and effective strategies can make a difference.

In parallel and as with any organizational improvement process, the vision and process of SFNE described throughout this white paper requires competent management from all coordinating/responsible entities to be feasible and recognized. This includes promoting and advocating widely for the concept of SFNE; carrying out formative enquiries and using the results; coordinating institutional collaboration and liaising and negotiating with partners to encourage and make good use of their input and collaboration; building professional expertise; implementing change in realistic amounts and time frames; and monitoring implementation and assessing outcomes.

Change management can also be a useful strategy in adopting the new vision of SFNE, in that it can support the redirection of resources and budget allocations, adopt new mandates and protocols, and recognize, allow for and manage resistance to change.

## Consideration of the varying levels and range of actual and potential players

There is a range of stakeholder groups that affect and influence the priority given to SFNE as well as the extent of what is done, how and when. These groups may work at the national or subnational level, for example as policy makers, ministry staff, and high-level managers of school meal programmes; or at the local/school level, for example as principals, local or community leaders, food service staff, school inspectors, members of parent–teacher associations (PTAs), and health facility staff. They may also support key parts of the SFNE process (as curriculum developers and learning materials writers); support or engage in professional training (as university staff, professional associations or teacher education departments); or manage, fund or provide technical support to projects and other SFNE interventions (as donors, UN agencies and NGOs). Parents, parent organizations and student associations should also be engaged in order to emphasize the importance of diets for physical and cognitive development, and to build collaborative efforts between schools and households.

There are of course differences between these groups, particularly in the way they are involved with or affect SFNE (i.e. the formal and informal functions they have). Still, they

### Box 7.4. School-based food and nutrition education functions and competences by group: examples

Policy makers need to:

- Develop actionable policies that prioritize and enable the implementation of effective and innovative SFNE at school level; and
- Coordinate and consult with other task forces and groups.

Curriculum developers need to:

- Use results from assessments of the nutrition, health and dietary situation of schoolchildren to recognize priorities and set key behavioural goals;
- Create sequences and structures that follow strategically from key goals;
- Develop action-based SFNE curricula following the core principles of motivation, action and environmental supports; and
- Coordinate and consult with other task forces and groups.

Learning materials writers need to:

- Develop contextualized materials that follow a coherent sequence, with adequate and action-based activities;
- Promote the application of food learning across the various settings that are familiar to children; and
- Coordinate and consult with other task forces and groups.

Food service staff need to:

- Provide basic information about meal composition and communicate it effectively to students and families;
- Apply basic marketing skills to promote healthy school meals;
- Actively promote the benefits of a sustainable healthy diet; and
- Coordinate and consult with other task forces and groups.

are all targets for capacity development (see Box 7.4 and Box 7.5) because they all need the specific competences, know-how and motivation to be engaged, interested and able to carry out their functions effectively and to encourage others.

The long-term goal should be that all these groups share not only a coherent vision for SFNE (see Theme 1) but also the responsibility for its implementation, monitoring and evaluation. The need is therefore **to identify these actors (both actual and potential) across the system and assess, in a participatory way, their main functions, along with their existing practices and outlooks, while also assessing the capacities required for them to carry out those functions efficiently and well. This will ensure truly coordinated capacity development that engages all participants in building and sharing capacity together.**

Innovative  
practice & insight

### Box 7.5. Focus on adolescents!

Adolescents can help to support food learning among younger peers. This strategy has been used in several SFNE interventions, mostly with positive results in knowledge, self-efficacy and attitudes towards healthy eating, as well as improvements in diet and (in some cases) in anthropometry (Yip *et al.*, 2016).

In the context of peer food learning, adolescents are therefore a key target group for SFNE capacity development.



## Models, methods and materials for effective capacity development

First and foremost, a multidimensional model of capacity (see figure 7.1) is needed to frame SFNE capacity development strategies and interventions, to ensure that these are not only effective, but have a chance in being institutionalized and thus are sustainable in the long term.

Beyond technical food and nutrition knowledge, the SFNE-related functions of the various players require modalities of capacity development that provide exposure, observation and plenty of opportunities for skills development, practice and self-assessment, as well as testing, demonstration and discussion.

In particular, modalities for capacity development of SFNE workforce are best selected to reflect the motivation and skills development techniques that they in turn will use to help influence the behaviours of children and adolescents. This implies that they need to develop the know-how, skills and pedagogy to promote learning with a focus on practical skills and behaviour change (see Box 7.6). As an example, the steps below reflect the Capability, Opportunity, Motivation and Behaviour (COM-B) model (Michie, van Stralen and West, 2011; NICE, 2014) adapted to a SFNE teacher training scheme:

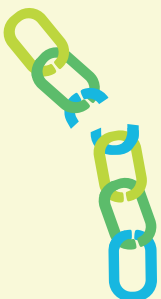
- a. Illustrating the urgency of the situation with basic data and food facts, including participant observations of local foods, food practices<sup>54</sup> and a survey of families and children;
- b. Agreement on aims and responsibility for intervention/education;
- c. Exploration of own knowledge, experience and practices;
- d. Exploration of children's and households' knowledge, outlooks<sup>55</sup> experience and practices;
- e. Involvement of schools and parents;
- f. Models of what to do and how to do it (including model teaching materials);
- g. Practice, with peer comments;
- h. In-classroom try-outs and mentoring;
- i. Feedback, with shared experience and discussion; and
- j. Maintenance and extension with the support of schools, parents and local education authorities.

<sup>54</sup> In this white paper, food practices refers to all habitual food-related activities which may impact nutrition and other aspects of sustainable development, including specific food behaviours and eating patterns. For a full definition, see the Glossary.

<sup>55</sup> The term "outlooks" refers to the mental, affective and psychosocial dimensions of food practices that are explored in formative research and behaviour change theory, and that represent a critical dimension of SFNE. Examples include ideas of good diet, perceptions of food practices and self-efficacy in making and maintaining changes. For a full definition, see the Glossary.

### Box 7.6. Common misconceptions

Assumptions about developing professional capacity are often rooted in the notion that providing instructions, guidelines or rules is enough, and that changes in practice can be accomplished easily and quickly. But as with changing food habits, any change in practice requires conviction, motivation, modelling, observation, experimenting, experience and practice, as well as getting feedback, sharing and discussing, and seeing results (FAO, 2016).



Training materials and other resources (including protocols, “how-to” videos and lesson aids) are important in the development of SFNE capacities. However, many capacity development interventions focus more than necessary on the materials as an outcome, without adequately considering their actual use and impact; this is reflected all too often in the lack of evaluation mechanisms.

If well-harnessed, the process of developing training materials can also support learning in itself, by involving a wide range of actors, assessing the needs and expectations of end-users, including real-life cases and experiences as examples, and enabling regular practice and feedback (see Theme 6).

FAO has extensive experience supporting countries in different parts of the world in reviewing and developing learning materials for SFNE. In Zambia, for example, FAO supported the integration of food and nutrition topics across the primary school curriculum, as well as the development of teaching and learning materials, and of an in-service training programme for primary school teachers, teacher educators and education officials. The teachers’ guides were used in the training programme and included: a) a background briefing explaining the situation in Zambia; b) suggestions for carrying out lesson activities; c) suggestions for in-class assessment of learning; and d) suggestions for class displays, projects, and other events to reinforce and publicize student learning (Sherman and Muehlhoff, 2007).

## Mechanisms and schemes that enable the process

Incorporating SFNE capacity development into institutionalized or existing schemes can be one of the most effective ways to enhance priority, guarantee sustainability and ensure that SFNE efforts reach the intended groups at the intended time. Examples of such schemes (at different levels) include international and regional platforms (see Box 7.7), professional pre-service and in-service training programmes for primary school teachers, university exchange programmes, certifications for school food service staff, regular school briefings for parents, and continuous learning programmes for ministry staff and NGOs.

### Box 7.7. Regional Nutrition Capacity Development and Partnership Platform

Responding to the double burden of child malnutrition and to identified capacity gaps, eight countries in Central Asia and the Caucasus launched the “Regional Nutrition Capacity Development and Partnership Platform” in 2018. Supported by FAO, the United Nations Children’s Fund (UNICEF), the World Food Programme (WFP) and the World Health Organization (WHO), the platform aims to strengthen capacities and governance for improved nutrition and food security in the region.

SFNE has been included as a key priority for capacity development within the platform area for a “functional, trained and specialized workforce for nutrition at education, policy and programming, and service delivery levels” (UNICEF, 2018).

Currently there are plans to conduct a landscape assessment to document and analyse school nutrition experiences, including nutrition education in selected countries of the region, in order to inform policy reform and to help identify key capacity development needs.

In parallel, mechanisms that facilitate multistakeholder coordination and cooperation can help support and manage SFNE capacity development strategies and capitalize on coherent and synergistic action in other areas (such as broader nutrition, health education, school meals, etc). Examples include multisector committees; multistakeholder platforms; joint in-service programmes; joint planning, shared budget allocations and accountability frameworks; as well as joint vision development and consensus building.

According to education associations and experts (Education International, ASCD and International School Health Network, forthcoming), a sustainability strategy and action plan can showcase long-term planning and highlight steps for “ongoing staff training, especially for new personnel, succession planning, financial planning for scale-up and program maintenance, renewing agreements on coordination, intersectoral participation and strategic dissemination of reports and anecdotal examples.” Depending on what is already in place, this can significantly contribute to sustaining SFNE policy and leadership support.

## A mix of methods to measure change and progress

Formal and informal monitoring and evaluation methods (see Theme 8) are needed throughout the capacity development process to ensure a clear picture of overall system improvements, as well as of specific capacities that have (or have not) been strengthened, their application and remaining gaps.

At the individual level, personal assessments and self-reviews, though often underestimated, are important—enabling individuals to measure themselves against established standards and to share feedback with peers. In tandem with more formal assessments (e.g. measuring the level of change from baseline capacity markers), they can also increase their confidence in carrying out SFNE functions. Curriculum developers, programme designers, materials writers and teacher educators in particular should be engaged throughout the monitoring and evaluation process, to understand how their products are being implemented in schools and to take note for the future of any adjustments needed.

Regular and participatory performance measurement and reporting, together with information on the achievement of set SFNE-related organizational targets, in terms of relevance (e.g. changes in institutional roles and mandates), effectiveness and efficiency will help to focus potential reforms and continuous improvement in the institutions involved with SFNE (FAO, 2018).

In the longer term, improvements at the individual and organization levels of capacity should be complemented with measures of potential changes at the wider policy level, for example, looking at total budget allocated to SFNE, political commitment changes, policy reformulation favourable to SFNE or improvements on policy implementation (FAO, 2018).

In a more general sense, evidence of SFNE effectiveness is important for demonstrating the value of capacity development at all levels of the system. Such evidence can be



shared through situational and progress reports, as well as through published results, all of which may be generated not only through dedicated review processes, but also as part of any regular action on identified challenges and issues. At the same time, the documentation of SFNE lessons learned as well as “failures” is useful to support process improvement and experience and knowledge exchange.

## Summary of needs

A “capable” and well-managed system needs to be built and maintained to achieve the goals and enable the processes for effective SFNE portrayed in the previous themes. In other words, experience, know-how, guidance, support and coordination at all levels and in all parts of the process, along with monitoring and evaluation, are crucial to achieving SFNE renewal and innovation. All of these elements need to be planned for gradually and realistically, and with a view to meeting promoting satisfaction and matching expectations across the capacity dimensions.

## CHALLENGES

The picture presented in the previous section reflects the ideal. But in low- and middle-income countries (LMICs) in particular, the process of addressing what is needed for a fully capable SFNE system faces a range of challenges. Many of these challenges are inherent to the education system, and have been discussed in preceding themes. This section explores challenges that are especially relevant to achieving systemic capacity.

### Change management

#### Challenging the status quo

Three overarching challenges relate to a) the “business as usual” approach and the typically low priority assigned to SFNE at all levels; b) the limited perception of capacity development (for example, as one-off training for specific and separate groups); and c) the preference and value given to knowledge-based academic outcomes rather than to practical application and skills / life skills development.

In addition, there may be significant difficulties in deciding where to start and how to tackle resistance to change. These can often discourage the adoption, management and maintenance of innovative SFNE capacity development models and interventions.

Issues of leadership are also pertinent: many high-level officials in key national positions do not have experience or interest in SFNE that is often required to spearhead change. And along with others who are usually charged with leading such processes, they are not often considered as being in need of capacity development themselves.

And finally, the recognition that SFNE capacity development is needed for various groups – beyond front-line educators – is still lacking in many countries. Respondents from a global survey of SFNE in 30 LMICs (conducted by FAO in 2018-2019) noted that it is mainly staff from school meal programmes that have access to SFNE training opportunities, while other key groups are not usually considered (FAO, forthcoming, a).

#### Ensuring systemic capacity development

Planning for systemic capacity development may seem discouraging in terms of the sheer magnitude of the task, and the competition for already limited resources – whether human, institutional and/or financial. Stakeholders or institutions may not know how to manage the different levels of the system (including policy, curriculum, schools, training and parents) to ensure their vision is aligned and their work coordinated. In particular, there is often a lack of understanding of baseline capacities, and of what constitutes a system in SFNE (for example, who needs to be involved, why and how).

The FAO survey (FAO, forthcoming, a) mentioned above asked respondents to report on the availability of capacity development opportunities for entities involved in SFNE (to design, deliver, monitor and evaluate SFNE initiatives). The majority of countries (n=17) reported that some training efforts exist but that they are not regular or effective. Country respondents also indicated that the majority of SFNE training is only for front-line educators and that it is sporadic or one-off, with some rare cases in which it is integrated into pre-service and in-service training schemes.



## Capacity, experience and familiarity

There are significant challenges related to capacity development for key groups. Just as the SFNE curriculum faces competition for timetable space from other subjects, there is often competition for the training time of teachers from other sectors – including water, sanitation and hygiene (WASH), health and agriculture – as well as from the heavy workloads of the teachers themselves (Nguyen *et al.*, 2015; Education International, ASCD and International School Health Network, forthcoming). Hence the recommendations of many projects and programmes to train teachers may not be fulfilled or may just “scratch the surface”.

Themes 4–6 discussed some of the key challenges in developing SFNE capacities among teachers. These include difficulties in changing established paradigms of practice, limited familiarity with implementing effective SFNE learning activities, a lack of examples to demonstrate the SFNE learning model and a lack of professional incentives, as well as a range of issues related to fostering long-term parental involvement.

At the same time, the targeting of other groups (such as health workers, community volunteers and NGO staff) presents its own issues, as they may not be familiar with how the education system works, or with pedagogy in general. This often results in training that is overly technical or limited to nutrition alone, with no consideration for how to actually support learning.

Another common issue across the various groups is that all too often their concerns, perceptions (see Box 7.8) and priorities, as well as their existing experience and capacities, are neither assessed (through learning needs analysis) nor considered when developing training or other forms of capacity development. This can lead to efforts that are significantly less effective, overly generic, unmotivating and impractical – and is one of the reasons why most of what is called “professional training” does not work.

### Box 7.8. Teachers’ perceptions in South Africa

Very little research has been done in LMICs to understand the state of teacher training in SFNE. Among the few studies that have been conducted (albeit with small samples) is an enquiry into teacher perceptions and challenges in South Africa, which highlighted that high-quality in-service training and adequate materials are not available for all, and that confidence in SFNE is low (Kupolati, Gericke and MacIntyre, 2015; Kupolati *et al.*, 2016).

In general, capacity development efforts are usually far too short and isolated or one-off in nature (in part because they may depend on outside budgets), focus mostly on presentations and talks (rather than on-the-job practice and experiential learning for the long term), are not evaluated, and are rarely enhanced by discussion, reflection, modelling, mentoring and repetition – all of which are essential to changes in practice.

## RECOMMENDATIONS

Fostering systemic SFNE capacity development is not an easy undertaking, particularly in light of the challenges presented. The following recommendations – aimed at SFNE coordinators, training institutions and ministry staff – are meant to support gradual but multilevel actions for supporting a capable system.

### Conduct capacity needs assessments

Conduct needs assessments that take into account all three dimensions of SFNE capacity (the organizational and individual dimensions and the enabling environment). As a starting point for defining the most critical and immediate priorities, ensure a good understanding of the context, and of the gaps and strengths in capacity across each dimension (see for example Box 7.9).

#### Box 7.9. Assessing capacity needs in the Pacific Islands

In 2018, an SFNE capacity needs assessment was conducted in 14 Pacific Island countries. The assessment highlighted key issues impacting the success of SFNE interventions. These included a lack of overarching enabling policies, poor implementation of existing policies, a lack of SFNE teaching standards and of contextualized teaching and learning resources, high staff turnover, limited integration of SFNE in professional training and an overreliance on teachers, as well as a generally fragmented and poor approach to the institutionalization of SFNE interventions (Burkhart, 2019).

At a minimum, a capacity needs assessment provides a baseline and blueprint for the needs that are both most pressing and most feasible or realistic to address. But it also serves to engage the various stakeholders in a process of reflection, discussion and agreement (see Box 7.10) which can, in turn, inform the development of enabling policies (see Theme 1) and further the shared vision of SFNE.

#### Box 7.10. FAO's capacity needs assessment tool

FAO has developed a tool to assess capacities across all three dimensions (the organizational and individual dimensions and the enabling environment), for use at country level. The tool is meant to be applied by a national or subnational consultative group, and provides: a) an overall picture of the existing capacities, strengths and gaps for developing and implementing successful SFNE programmes and interventions; and b) a basis for designing effective, feasible and coordinated SFNE capacity development (FAO, forthcoming, b).

Ideally, the assessment process should be led and driven by country stakeholders across the various levels – from national leaders and policy makers through to the front-line workforce and parent representatives. If this is not feasible, seed money can be used to gather the data (possibly with the support of academic or research institutions) and multistakeholder workshops can be run to validate and complement the results, conduct the participatory assessment and define the way forward.

In situations with very limited resources, financial and technical support for assessments can be requested from international organizations, NGOs and through South-South cooperation. However, this can only be sustainable if the existing system and its stakeholders have been actively involved throughout the whole process and are ready and willing to implement the recommendations from the assessments.

## Plan and manage change at the organizational and broader environment level

- As part of the capacity needs assessment, conduct a stakeholder mapping to identify key actors and to get an overview of stakeholder and organizational landscape for SFNE (see FAO, 2015).
- Raise awareness of key institutions and stakeholders on the need to envision SFNE capacity development beyond the training of a few front-line groups.
- Promote the integration of SFNE capacity development across relevant national policies and strategies including nutrition, education, health and social protection (see for example Box 7.11 and Theme 1).
- Use change management strategies (for example, creating a sense of urgency and need, having a clear roadmap for gradual and progressive action, identifying and addressing barriers and resistance, ensuring effective communication among staff) to support the SFNE transformation process (see Theme 1), particularly at the organizational level (for example, the ministry of education, teacher-training institutions, and so on).
- Plan for and leverage organizational restructuring or review of education institutional processes to advocate for an adequate integration of SFNE capacity development.
- Account for intrinsic school system barriers and constraints – these include existing organizational relationships, bureaucracy and resistance to change within core education functions (FAO, 2019).
- Identify and map main organizations that support/provide capacity development in food and nutrition, and assess their interest and potential to address specific capacity development gaps in SFNE (see “Strengthen professional capacity, experience, familiarity and motivation” below).
- Capitalize on relevant nutrition initiatives at the international level (such as the UN Decade of Action on Nutrition and Scaling Up Nutrition) and at the regional level (for example the Central Asia and Caucasus Regional Nutrition Capacity Development and Partnership Platform), as well as on financial and technical support mechanisms to undertake systemic capacity development strategies for SFNE.

### Box 7.11. The example of Vietnam

The National Nutrition Strategy (2011-2020) of Viet Nam specifies that nutrition education should be gradually incorporated into the school curriculum at all levels, and that the Ministries of Education and Health should work together to coordinate the capacity development plan to meet this goal (Government of Viet Nam, 2012).

## Strengthen capacity considering all dimensions

### Address the multiple dimensions of capacity

- Develop capacity targets in a participatory and open way (engaging the range of relevant institutions and representatives of key groups). This may take longer, but it will ensure that the targets are both feasible and responsive to actual needs.
- Ensure that front-line educators or any other single group do not bear all the responsibility for SFNE programme/intervention success, and that they receive responsive oversight, institutional support and advice throughout the process.
- Promote multidimension capacity development strategies, in particular by:

- disseminating SFNE capacity needs assessments results to relevant ministries and institutions, focusing especially on the need for capacity interventions that go beyond the mere training of individuals;
- advocating for the adoption of a long-term school food and nutrition capacity development strategy, in which different partners can support priority gaps in a coherent and coordinated way;
- mapping projects with SFNE or related capacity development components, and creating partnerships that bridge gaps at different levels; and
- purposefully supporting leadership skills development for SFNE programme directors, managers and middle managers.
- Explore opportunities to simultaneously (and sustainably) address the development of capacities across various key groups. This can be a cost-effective and feasible way to reach different levels at once, support communication and understanding, and promote a shared vision, in addition to enabling technical learning. Some examples include:
  - capitalizing on existing multistakeholders mechanisms and platforms to open up discussions on SFNE training;
  - arranging regular school-level visits for decision makers, policy makers and advisors to better understand potential challenges and opportunities on the ground;
  - supporting exchanges and discussions between education and non-education staff (for example, between teachers and health workers) through extraordinary meetings, online fora and buddy systems;
  - publicizing successful capacity development processes, results, and case studies, and involving local and national media;
  - promoting active participation and involvement of ministry officials, local supervisors, municipal officials, head teachers and regional office staff in teacher-training efforts (see Box 7.12);
  - consulting regularly with front-line staff and parents in the design of training programmes and materials;
  - extending and repurposing existing activities for various groups; and
  - involving curriculum designers, teacher educators and materials writers in monitoring the implementation of their products.

#### **Box 7.12. An example from Chile**

A regional training center in Chile launched a course on school health and obesity prevention that targeted different stakeholders, including national and local government staff, food service staff, teachers, principals, parents and other school staff. This resulted in a good exchange of priorities and challenges across the different levels, and allowed decision makers and others at higher levels to have a better understanding of issues and opportunities at school level.

### **Improve the quality of capacity development at the individual level**

Use best practices for planning, implementing and monitoring capacity development strategies at the individual level. These include:

- Identifying main groups who influence / should influence SFNE processes (see Box 7.2) and developing capacity standards and indicators, at a minimum, for priority groups among these (see Box 7.13).
- Promoting assessments of learning needs, preferred learning methods and existing learning materials, as well as of existing challenges (in terms of both daily routines and management or supervision) as a first step in all projects and programmes that aim to develop capacities. These can range from formal assessments supported by academic and research institutions, to more informal self-assessments with simple checklists or questionnaires, through which individuals can organize their own goals.
- Aiming for a gradual and progressive expansion of skills, through incremental, well-modelled and regular undertakings.
- Targeting technical know-how and skills, as well as more functional skills, such as leadership, communication and advocacy.

### **Box 7.13. School-based food and nutrition education standards in the United Kingdom of Great Britain and Northern Ireland**

In 2015, Public Health England created a framework of standards, expectations and requirements for qualified primary and secondary school food teachers. The standards are rooted in the national school curriculum and have been used to review and plan courses for trainee teachers and set out expectations for qualified teacher status; audit existing teacher practices and support performance-related development; support professional reviews among colleagues; and plan and run professional training courses to support best practices (Public Health England, 2015a; Public Health England, 2015b).

- Considering existing motivations and confidence among target groups and building on them by promoting improvements that matter to them.
- Promoting plenty of opportunities for practising and trying out what is learned over an appropriate period.
- Fostering regional champions (see Box 7.14) as mentors, helpers, motivators and points of contact.
- Promoting regular and easy peer feedback loops on the ground.
- Exploring possibilities for integrating SFNE training into other relevant, complementary and well-funded schemes (such as health-promoting schools, health training, WASH and school meal programme training) and negotiating to support synergies and avoid competition.

Even though teachers are the most common targets for SFNE capacity development (as the main providers of formal SFNE), there are still obstacles that may impede the effectiveness of efforts. Recommendations for this group include:

- Supporting the integration of basic SFNE training for both initial teacher education and in-service training (for example, through regular in-service meetings and discussions that are supported by and relevant to briefings included throughout teachers' books/notes). In-service training has the advantage of a built-in practicum

### Box 7.14. The role of champions

When placed at the heart of an SFNE programme, champions can work with school staff, children, parents and other stakeholders as leaders of SFNE interventions and change. A champion may be a senior teacher, a principal or a parent. Through the School Food Plan, a national programme in the United Kingdom of Great Britain and Northern Ireland, champions are provided with key resources, monthly video webinars and email/phone support, enabling them to lead prioritization processes and conduct action planning, implementation and monitoring. The programme demonstrated the speed with which change can occur when people are given leadership roles, along with the resources and support that are needed for such roles (Government of the United Kingdom of Great Britain and Northern Ireland, 2013).

and regular contact with reality, as well as a longer potential time span than other types of course. Much in-service professional development can be self-organized (with briefing sheets and specific tasks), and features strong social and professional incentives (including group meetings, certification, career points and paid opportunities to produce learning materials).

- Aligning functions and required professional capacities not only with SFNE curriculum standards and children's expected competences (see Theme 3), but also with the hidden curriculum (that is, what is observed and experienced).
- Using staff sharing, cascade training and self-supporting networks (whether face-to-face or online) to extend reach, maintain motivation and create sustainability. Moderated online communities, for instance, can provide self-sustaining and low-cost leadership and support mechanisms to share best practices and resources, offer assurance and advice to those who need it, and create momentum (Bright Ideas Food and Health Consulting, 2018).
- Planning teacher support in conjunction with professional bodies or associations (such as nutrition associations and specialized teacher groups), that can play an ongoing role in developing policy, planning curricula, writing training resources, delivering teacher education (pre-service and in-service), providing mentoring and managing accreditation processes.
- Ensuring a participatory approach (for example, including head teachers, administrators and supervisors in any teacher training planning).
- Promoting, where feasible, a formal basic certification or accreditation process and continuing professional development requirements to provide additional quality assurance.

### Use training resources and materials effectively

(See also Theme 6 and Supplement 6.2.)

- Bearing in mind that training materials are not meant to be the final outcome of capacity development, take stock of those that have already been used (and their results) as well as those that are needed (in line with learning needs assessment results). Make good use of existing learning materials (for example, by extending or adapting them).

- Involve end-users and influencers in the process of developing and validating SFNE training materials.
- Promote discussion, consultation, collaboration and alignment between curriculum developers, materials writers, teacher educators and teachers.
- Develop a checklist with the most important quality criteria (appropriate to the target group, context-specific or adaptable, simple and user-friendly, focused on behaviours and practices, and rich in tips and examples of use) that can be used as a handy tool to both develop and assess training materials (for a sample checklist for student learning materials, see Supplement 6.2).
- Explore the most cost-effective and feasible ways to develop materials and resources (for example, centrally generated with criteria for local adaptation, or locally developed, etc.).
- Plan for simple schemes that allow for monitoring of their use and evaluation of their impact.
- Create demonstrations and simple videos of target groups using the materials to support training of other groups and/or in other regions.
- Explore possibilities for establishing a platform to make materials accessible to all target groups.
- Use good materials for promoting institutionalization of training schemes.

## Useful tools and links

School-based food and nutrition education capacity needs assessment tool (FAO, forthcoming, b)

Capacity development (FAO, 2018)

[www.fao.org/capacity-development](http://www.fao.org/capacity-development)

ENACT course in nutrition education (FAO, 2016)

[www.fao.org/nutrition/education/professional-training/enact](http://www.fao.org/nutrition/education/professional-training/enact)

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THEME

8

# Evaluation for school- based food and nutrition education practice

*"If you do not measure results, you cannot tell success from failure; if you cannot see success, you cannot learn from it; if you cannot recognize failure, you cannot correct it; if you can demonstrate results, you can win public support."*

*-Osborne & Gaebler*

# Capturing effectiveness and implementation, and making refinements



### Target audience

This theme is targeted at the stakeholders who are directly or indirectly involved with SFNE programming, including practitioners – such as government staff from relevant ministries, teachers and school staff, non-governmental organizations (NGOs) and UN agencies – external evaluators, researchers and donors. It is not intended as a comprehensive how-to guide for designing SFNE evaluations; rather it recommends the use of additional resources wherever technical guidance is needed, on specific aspects of evaluation (including evaluation research, research design, impact/process indicators, data collection tools, instrument design/validation and statistical analysis).

The school-based food and nutrition education (SFNE) best practices and principles described in the preceding themes have a good chance of replication and institutionalization, if their design and implementation features – as well as their corresponding effectiveness – are clearly demonstrated through optimal evaluation practices.

This theme therefore reviews key principles and elements that may help in planning, designing, implementing and reporting on the results of SFNE evaluations. It also discusses the main challenges that may be encountered in evaluating SFNE in low- and middle-income countries (LMICs), along with recommendations to address such challenges. Overall, this theme aims to provide a basis for relevant stakeholders to strengthen the linkages between the SFNE intervention design process and the planning and execution of formal and informal SFNE evaluations.

## BACKGROUND

“Evaluation assesses what has been achieved compared with what was intended and helps to explain why this has happened so that lessons can be learned for the future” (Dixey *et al.*, 1999). The emphasis on accountability in nutrition, as well as on learning about what works, why, when, and how, has made evaluation increasingly important in recent years (Contento, 2016; Cates *et al.*, 2014; WHO, 2017).

There are various approaches and types of evaluation, many of which can be identified through a logic model to better guide SFNE efforts. Three major types as discussed here are: formative evaluation, process evaluation, and outcome and impact evaluation (Cates *et al.*, 2014; USDA, 2005).

Each type has its own purpose, occurs at different stages of an SFNE intervention, addresses different questions and requires different methodologies (see Boxes 8.1, 8.2 and 8.3). But regardless of type, the evaluation must be relevant, appropriate, accurate, useful and (most importantly) feasible, in order to be applied in school systems in LMICs (CDC, 1999; Contento, 2016; Rossi, Lipsey and Freeman, 2003).

## Types of evaluation and their uses in school-based food and nutrition education

As discussed early on in this white paper (see the Background of the Introduction), an effective SFNE intervention aims to:

- Identify needs, in terms of national and subnational food and nutrition issues, food practices and outlooks, target audiences, supporting policies, learning needs, and input/capacity needs (see also Theme 1, Theme 3 and Theme 7).
- Formulate target competences and design a curriculum, as well as learning programmes, materials and activities that effectively address the identified needs (see also Themes 3–7).
- Implement the programme or intervention/s in a meaningful way, within a capable system and enabling environment, to achieve the intended goals and outcomes (see also Themes 1, 2, 5, 6 and 7).

Moreover, as discussed in Theme 2, most SFNE interventions require the involvement of multiple actors, as well as strong linkages and interactions with food environment actions, in order to maximize the potential of achieving the outcomes.

**Each of these processes are crucial for the success of SFNE; each therefore requires an appropriate evaluation strategy to ensure its effective execution** (see Boxes 8.1, 8.2 and 8.3).

Innovative  
practice & insight

To better understand how the three types of evaluation link and respond to the abovementioned processes, the following sections briefly describe each type, along with examples (see Boxes 8.1, 8.2 and 8.3) that illustrate and support SFNE quality practice (Cates *et al.*, 2014).

### Formative evaluation: aiming to design/develop

Formative evaluation, also known as formative research, addresses the question of what is needed and how such needs should be addressed, as its primary purpose is to inform the design of an SFNE intervention. It occurs before and/or early in the development of an SFNE intervention, and in some cases it continues throughout the implementation process (Baker *et al.*, 2014; Cates *et al.*, 2014; CDC, 2012; Contento, 2016). Among its key benefits is the provision of detailed information with which to identify the needs, formulate the target competences and design the different elements of an intervention in a more participatory, strategic, culturally appropriate and efficient way.

#### Box 8.1. Examples of formative evaluations

- A situation and needs assessment to identify the needs of the target audience and to prioritize the problems and determinants of behaviour that the SFNE intervention will seek to address (see Themes 1–3).
- A learning needs analysis, using a coordinated enquiry at school level, to identify the competences that need to be achieved through SFNE (see Supplement 3.2).
- A capacity needs assessment to examine all the resources that are needed and available to deliver an SFNE intervention, and to serve as the basis for designing effective SFNE capacity development (see Theme 7).
- A feasibility/pilot study, with a sample of educators and/or students to test and refine the accuracy, relevance, acceptability/receptivity, feasibility and affordability of the different components of an SFNE intervention, prior to implementation (see Themes 4–6).
- A baseline study to measure an agreed set of indicators as relevant to SFNE, to be compared with achievements at the end of the intervention/s.

#### Typical methods and tools used

- *Landscape analysis*; surveys, focus groups and/or interviews with relevant stakeholders; multistakeholder consultations; expert reviews; curriculum content analysis; curriculum reviews; and published reports of situation analyses and formative research, of pilot studies and/or of research on SFNE interventions (Baker *et al.*, 2014; Contento, 2016).

#### Recommended reading

- *Australia*: What should be taught in secondary schools' nutrition and food systems education? Views from prominent food-related professionals in Australia (Sadegholvad *et al.*, 2017)
- *Brazil*: Health and nutrition in public and private schools in the city of Recife (Bezerra *et al.*, 2017)
- *United States of America*: Health Education Curriculum Analysis Tool (HECAT): healthy eating module (CDC, 2012)

### Box 8.2. Examples of process evaluations

- SFNE curriculum analysis to determine whether curriculum considerations (such as relevance, competence-based learning strategies, behaviour change strategies, and environmental and social supports) are consistent with the needs analysis and the proposed intervention's aims / learning process / theory of change (see Supplement 4.2).
- Checklists to analyse and score fundamental areas / best practices of SFNE programmes both in terms of their presence and quality (that is, how well they fit the purpose). This includes linkages with school policies and with environments, involvement of school staff, community and families, activities outside the classroom, educators' guidance and preparation, curriculum design, learning materials/activities and evaluation methods. (See Supplement 5.3, Supplement 6.1 and Supplement 6.2.)
- Assessment of the quality / types / frequency of SFNE capacity development opportunities (see Theme 7).
- Assessment of teachers and educators, for example in terms of the skills, abilities and expertise required to facilitate the SFNE intervention, the quality of implementation, the influence of teachers as role models, and the barriers and opportunities they perceive in their work with respect to SFNE.
- Assessment of aspects related to implementation fidelity such as reach (percentage of the target population that participated in the SFNE intervention), intensity (exposure to the SFNE intervention in terms of duration, frequency and session length), and compliance and responsiveness, in order to assess how close the intervention implementation was to its design.
- Assessment of aspects related to appropriacy and innovation. These may involve student enjoyment and satisfaction, contextual suitability, and the availability and quality of resources.
- Assessment of engagement among government and non-government stakeholders (including donors, civil society, NGOs, academia, celebrities and football stars, etc.), in terms of number and type of stakeholders and their corresponding role in SFNE.
- Assessment of SFNE delivery system characteristics. These include school climate, supporting policies, available budget, connections with the family and community, and linkages to other related interventions such as water, sanitation and hygiene (WASH), school gardens and home-grown school feeding programmes.

#### Typical methods and tools used

- Review of programme documentation, including budget and expenditures documents; review of curriculum, teaching and learning materials/activities; review of training plans; competence tools; onsite observations, field notes and checklists; photographs and videos; and interviews, focus groups, reflections and/or feedback from participants, teachers / front-line educators and other relevant stakeholders (Aboud, Yousafzai and Nores, 2018; Baker *et al.*, 2014; Contento, 2016).

#### Recommended reading

- Burkina Faso and Benin: Pilot project of the Nutrition-Friendly Schools Initiative (NFSI) in Ouagadougou, Burkina Faso and Cotonou, Benin, in West Africa (Delisle *et al.*, 2013)
- Mexico: An ecological and theoretical deconstruction of a school-based obesity prevention programme in Mexico (Safdie *et al.*, 2014)
- United States of America: Using a systematic conceptual model for a process evaluation of a middle school obesity risk-reduction nutrition curriculum intervention: choice, control & change (Lee, Contento and Koch, 2013)

## Process evaluation: aiming to improve

Process evaluation is involved with understanding the nature of the intervention and the ways in which it works (“what is the intervention and how is it working?”); its main purpose is to provide ongoing analysis on an SFNE intervention, and to further assess the link between implementation and outcomes. It occurs primarily during the implementation stage, but it can also occur at any point before or after the implementation (for example, in the design stage, or during follow-up intervention/s). (Aboud, Yousafzai and Nores, 2018; Baker *et al.*, 2014; Cates *et al.*, 2014; CDC, 2012; Contento, 2016.)

Process evaluation can serve as a powerful tool in developing the capacity to understand how and why SFNE works and how to make it work better, particularly in real-world settings (Aboud, Yousafzai and Nores, 2018; Yousafzai and Aboud, 2014). Too often however, decision-making processes are based solely on the interpretation of impact data, instead of on a combination of impact and process evaluation data. As a result, decision makers / researchers may indicate that an SFNE intervention is ineffective, when in fact the issue was not the strategy/intervention itself, but poor implementation (Contento, 2016). These types of conclusions can be very costly, and moreover misleading (for example, with interventions that might actually work, if and when implemented as originally designed and planned, i.e. with implementation fidelity). There is however, a positive outcome to this otherwise problematic tendency, in that now more than ever, researchers are exploring opportunities to integrate implementation science (which includes different dimensions of process evaluation), into food and nutrition education and behaviour practice and research (Swindle, Curran and Johnson, 2019).

## Outcome and impact evaluation: aiming to demonstrate

Outcome and impact evaluations focus primarily on understanding whether the intended SFNE goals and outcomes are/were being met, the range of impact and effects on participants, and the degree to which such effects are/were a result of the intervention. Their primary purpose is to ensure that an SFNE intervention is on track for achieving its intended outcomes (whether short-, medium- or long-term), in terms of food and nutrition practices and outlooks, target competences and support competences (Baker *et al.*, 2014; Cates *et al.*, 2014; Contento, 2016; Hernández-Garbanzo *et al.*, 2013).

In general, both outcome and impact evaluation occur at the end of the SFNE implementation stage. An impact evaluation however, is normally conducted after an outcome evaluation, as its focus is more on measuring long-term outcomes such as changes in nutrition-related habits, consumption patterns and/or nutritional status. Another difference is that unlike outcome evaluation, impact evaluation requires as part of its research design a control/comparison group, an experimental model, and rigorous data collection and analysis tools/methods to control for confounding factors (Cates *et al.*, 2014; CDC, 2012).

As mentioned previously, the real value of a well-designed outcome or impact evaluation is achieved when it is combined with implementation and process evaluation data (Aboud, Yousafzai and Nores, 2018). Taken together, these different types of evaluations can produce a range of benefits. They accurately inform decision-making processes, especially with regard to the allocation of resources; they advance research, practice and policy in SFNE; they lead to better SFNE programming and scale-up of effective SFNE approaches; and most importantly, they contribute to achieving the overarching SFNE goal – that is, children and families with health-promoting and sustainable food practices and outlooks.

### Box 8.3. Examples of outcome and impact evaluations<sup>a</sup>

- Formal and informal assessment of short- and medium-term outcomes among students and families, i.e. the achievement and performance of specific support competences (as building blocks towards recommended target competences). (See Theme 3.)
- Formal and informal assessment of medium- and long-term outcomes among students and families, i.e. regarding changes in / maintenance of target competences as seen through food practices and outlooks (see Theme 3).
- Assessment of improvements in the food environment and/or of efforts that schools, families, communities, government and non-government institutions are making to support the integration of SFNE and to serve as role models for children and adolescents.
- Assessment of the effectiveness of system-wide changes including government policies, planning, financing, capacity development and multistakeholder partnerships that can contribute to the achievement of SFNE goals.
- Assessment of the role of SFNE in achieving intended food and nutrition outcomes among students, families and the environment, through multicomponent school-based interventions.
- Assessment of the effectiveness of different SFNE methodologies for achieving food and nutrition outcomes. Such methodologies include facilitation techniques, types of learning models and types of teaching/learning and training materials and activities.

#### Typical methods and tools used

- For formal assessment (a pre-planned type of assessment that is usually teacher-based and uses a scoring system): food and nutrition education surveys and questionnaires (including KAPP questionnaires, i.e. on knowledge, attitudes, practices and perceptions), visually enhanced food behaviour checklists, food frequency questionnaires, 24-hour dietary recalls, brief food intake screeners, observations of food intake, and plate waste data.
- For informal assessment (a more spontaneous type of assessment that focuses on daily interactions and therefore tends to be not only more child-centred but also more frequent): self-assessments, cooperative learning activities, teacher observations, learning stories, performance activities/projects, open-ended questions, group discussions, photographs, videos and audio-recordings, reflective journal writing and art prompts.

#### Recommended reading

- Bhutan: School gardening in Bhutan: Evaluating outcomes and impact (Schreinemachers *et al.*, 2017)
- Tunisia: School-Based Intervention as a Component of a Comprehensive Community Program for Overweight and Obesity Prevention, Sousse, Tunisia, 2009–2014 (Maatoug *et al.*, 2015)
- United States of America: Evaluation of a USDA nutrition education program for low-income youth (Townsend *et al.*, 2006)
- Global: Guidelines for assessing nutrition-related knowledge, attitudes and practices (Fautsch and Glasauer, 2014).

<sup>a</sup> The examples of outcome or impact evaluation provided in in Box 8.3 can vary widely in their aim, design and data collection/analysis tools. For example, a scoping review of SFNE interventions in LMICs showed that the selected evaluative studies varied in terms of using controlled vs uncontrolled trials, randomized designs vs non-randomized designs, quantitative vs qualitative research methods, and in terms of follow-up period, unit of assignment, number/types of intervention arms, and sample size/characteristics (FAO, forthcoming, a). Regardless of these differences, the indicators, methods and instruments to be used to measure SFNE outcomes should be fully aligned with the type of SFNE intervention



## School-based food and nutrition education evaluation in LMICs: the current situation

To date, there is no standard or recommended evaluation system that appears to be widely adopted in LMICs, to adequately produce quality evidence on what works and what hinders success for SFNE (FAO, forthcoming, a). In fact, results from a global FAO survey and scoping review revealed that in the majority of the cases, evaluation of SFNE was either non-existent or weak, with results that are assessed to a limited extent and/or without any further use or follow-up action. Moreover evaluation was mainly concerned with approaches that demonstrate whether the intended long-term outcomes were met, without providing enough details on the intervention itself, and on how implementation features were associated with outcomes (FAO, forthcoming, a; FAO, forthcoming, b). (See also “Rationale and evidence of impact” in the Background of Theme 5.)

Such weaknesses can be traced back to a variety of factors, one of which is that nutrition education programmers and practitioners do not often have the appropriate skill set and resources with which to identify, develop, adapt and/or implement evaluation methods and measurements to demonstrate the public value of SFNE (Franz, Arnold and Baughman, 2014). In addition, evaluation is not often seen as a need in SFNE; even when it is, it is considered as a final step or afterthought to programming (see Box 8.4), and/or as an overly complex or onerous procedure.

In short, the overall context for SFNE evaluation undoubtedly limits possibilities with regard to: a) knowing how to choose, adapt and/or implement at scale the right mix of SFNE intervention components in a particular country context; b) understanding the mechanisms and pathways to improve children’s food practices and outlooks in a more sustainable way through SFNE; and c) recognizing SFNE’s contribution to multicomponent school-based food and nutrition approaches (Dickin, Hill and Dollahite, 2014; Jerling *et al.*, 2016; Jomaa, McDonnell and Probart, 2011).

### Box 8.4. Methodological limitations in country school-based food and nutrition education evaluation: a case study

After a year of implementing SFNE as a component of a food security project, the project team sought technical assistance to support its evaluation. An external evaluator met with the team to discuss the main elements of the SFNE intervention and its corresponding theory of change. As a result of this meeting, the external evaluator identified three key limitations:

- First, evaluation had not been foreseen in the design of the project; therefore, there were no needs assessments to inform the SFNE programme design, no baseline data, no outcome/process evaluation tools in place and/or insufficient financial resources with which to conduct an appropriate evaluation.
- Second, the project team was not clear on the appropriate and relevant types of measures or tools for conducting an outcome and/or process evaluation of the SFNE intervention. Their main concern was to report improvements to the donor for specific impact indicators (children’s nutritional status and children’s dietary intake).
- Third, the impact indicators included in the project’s logical framework were not aligned with the type of learning approach and total duration of the SFNE intervention, which was short-term (less than six months) and knowledge-based (focused on the “basics of human nutrition”), rather than competence-based. This added a level of complexity with regard to project reporting on intended changes (in dietary intake and nutritional status).

# WHAT IS NEEDED?

## Balancing evaluation design with context and available resources

An important principle for SFNE in LMICs relates to the need to balance the evaluation focus, design and methods with the context and available resources. In other words, the emphasis should be on choosing the right evaluation design for the context (best available evidence), rather than the best overall evaluation design (best possible evidence). This ensures not only a tailored evaluation approach, but also recommendations for SFNE interventions that are credible, feasible, and have the potential for full-scale implementation (Dickin, Hill and Dollahite, 2014; Major, 2011).

Given that the evaluation of SFNE interventions can range from simple to highly complex, countries need to consider the minimum evaluation necessary to satisfy the expectations of a given SFNE intervention and move forward. Minimum evaluation requirements can include practice-based approaches; these use a range of evaluation methods (such as formal/informal assessments, observational studies and participatory research) beyond randomized controlled trials to reflect on the real-life context in which the SFNE intervention is conducted (Dollahite, Fitch and Carroll, 2016; Dickin, Hill and Dollahite, 2014).

## Capacity development and a positive climate for evaluation

Determining the best way to evaluate SFNE practice can be challenging, and the capacities of programmers, managers, practitioners and researchers must therefore be developed to effectively plan and implement both formal and informal evaluations for national and/or subnational SFNE initiatives.

These individual capacities should be supported by an enabling environment, and by organizational capacities that generate and share data to support SFNE evaluation (see Theme 7). Such capacity development actions will then help promote an “evaluation outlook”, where relevant stakeholders at all levels (including teachers, families and children) appreciate the value of different forms of evaluation, where sufficient resources are allocated for evaluation, and where data are produced and used to inform important decision-making processes for SFNE (Baker *et al.*, 2014; Dollahite, Fitch and Carroll, 2016; Van den Berg, Naidoo and Tamondong, 2017). (See also Box 8.5.)

### Box 8.5. Capacity development for evaluating school-based interventions in low- and middle-income countries

“The International Initiative for Impact Evaluation (3ie), through their capacity development and skill-sharing strategies, is a good example of technical support provided to LMICs in the area of programme evaluation. 3ie collaborates with different partners, to improve governments’ skills to commission, manage, quality-assure and use evaluation evidence to address critical evidence gaps in multiple thematic areas, including WASH promotion in school...” (International Initiative for Impact Evaluation, n.d.).

## Participatory school-based food and nutrition education evaluation

The SFNE evaluation cycle needs to begin with a strategy for engaging the primary users of the evaluation (including students, parents, school leaders, teachers, producers, community members and government institutions) through participatory approaches. Engagement of users is needed to:

- ensure that their perspectives are understood;
- ensure that important concepts and indicators relevant to SFNE are measured;
- review and field-test the SFNE evaluation tools;
- facilitate their buy-in for the implementation and evaluation process;
- improve the potential usability of the evaluation findings; and/or
- enhance the overall SFNE learning process (CDC, 1999).

This is in line with the SFNE learning model discussed in Theme 5, where all key actors are actively involved and own the SFNE process in different ways, from formative research through to implementation and evaluation. Through a participatory approach, for example, students are encouraged to collaborate with teachers in using a variety of assessment methods (see examples of informal assessments in Box 8.3) to enhance and enrich the SFNE learning process. Likewise the evaluation of multicomponent interventions (for example, where SFNE is integrated into home-grown school feeding programmes) can greatly improve through activities such as joint selection of relevant indicators, practice-based research on the degree of alignment and coherence between SFNE and other school-based strategies and mutual learning to fully advocate for SFNE (FAO, 2013).

Box 8.6 provides a brief description of an evaluation framework, which aims to help programme-level, research-level and policy-level users to assess farm to school implementation and outcomes with different participants, including students, food service staff, food service directors, educators and other stakeholders. This framework

### Box 8.6. Evaluation for transformation: a cross-sectoral evaluation framework for Farm to School

“Farm to School” is a programme in the United States of America, through which schools buy and feature local and regional farm-fresh food (much like home-grown school feeding), and provide food- and farm-based education and experiential learning opportunities through school gardens.

“Evaluation for transformation” is an evaluation framework designed to support farm to school planning, evaluation, research and reporting. It provides a common language to define the farm to school core elements, supplemental elements and actors; guidance on programme articulation and tools to track implementation; guidance on priority outcomes, indicators, and measures for four key sectors (public health, education, community economic development and environmental quality) and for three different types of users (at the programme level, at the research level and at the policy level); as well as a compilation of evaluation tools and resources. (Joshi *et al.*, 2014)

was the result of a participatory approach through which multiple stakeholders were engaged both formally (over 50 people) and informally (over 250 people) to identify broad areas and content to guide the development and testing of the framework (Joshi *et al.*, 2014).

## Early and coordinated evaluation design

All too often it is only after an SFNE intervention is up and running that attention is focused on developing an evaluation strategy (Issel and Wells, 2017). (See the case study in Box 8.4.) Instead it is crucial to design the evaluation concurrently with the SFNE intervention and in full alignment with the SFNE vision and core principles (see Theme 1), the target competences and support competences (see Theme 3), the curriculum design (see Theme 4), the learning approaches (see Theme 5), the learning materials and activities (see Theme 6) and with professional/organizational capacities (see Theme 7).

In addition, there is a need to consider the existing education–environment connections, as described in Theme 2 (which generally involve multiple actors and multilevel initiatives within the school system), while planning and implementing the evaluation (Baker *et al.*, 2014; Issel and Wells, 2017).

Coordinated planning will strengthen the linkages between the SFNE design and the evaluation, will help to realistically identify the evaluation requirements for a given type of intervention and will definitely result in a more cost-effective approach.

## Selecting appropriate evaluation measures (based on the logic model) for effective evaluation

Linking the evaluation plan with an intervention logic model, as shown in the example in Box 8.7, is key to ensuring a better understanding of where the evaluation should focus. It is likewise important for ensuring coherence between the different evaluation questions, measures, indicators and tools and the main intervention components for which different types of evaluation will be needed (see Box 8.1, 8.2 and 8.3).

Before selecting an evaluation approach (with its corresponding indicators, measures and tools), the logic model can therefore be used to provide clear guidance and description regarding the pathways that lead to the intended goals/outcomes (see Box 8.7). In this exercise, designers of SFNE interventions and evaluations should share descriptions of the intervention components and agree on what can realistically be achieved in the short-, medium- and/or long-term. For the case of competence-based SFNE interventions, food practices and outlooks are usually the most appropriate/realistic measures of impact, as they are not only the main targets (see Theme 3) but also the main components of the SFNE curriculum (see Theme 4).

*Indicators:* The development/selection and use of effective indicators for SFNE evaluation requires:

- having adequate indicators for the different audiences (including children,

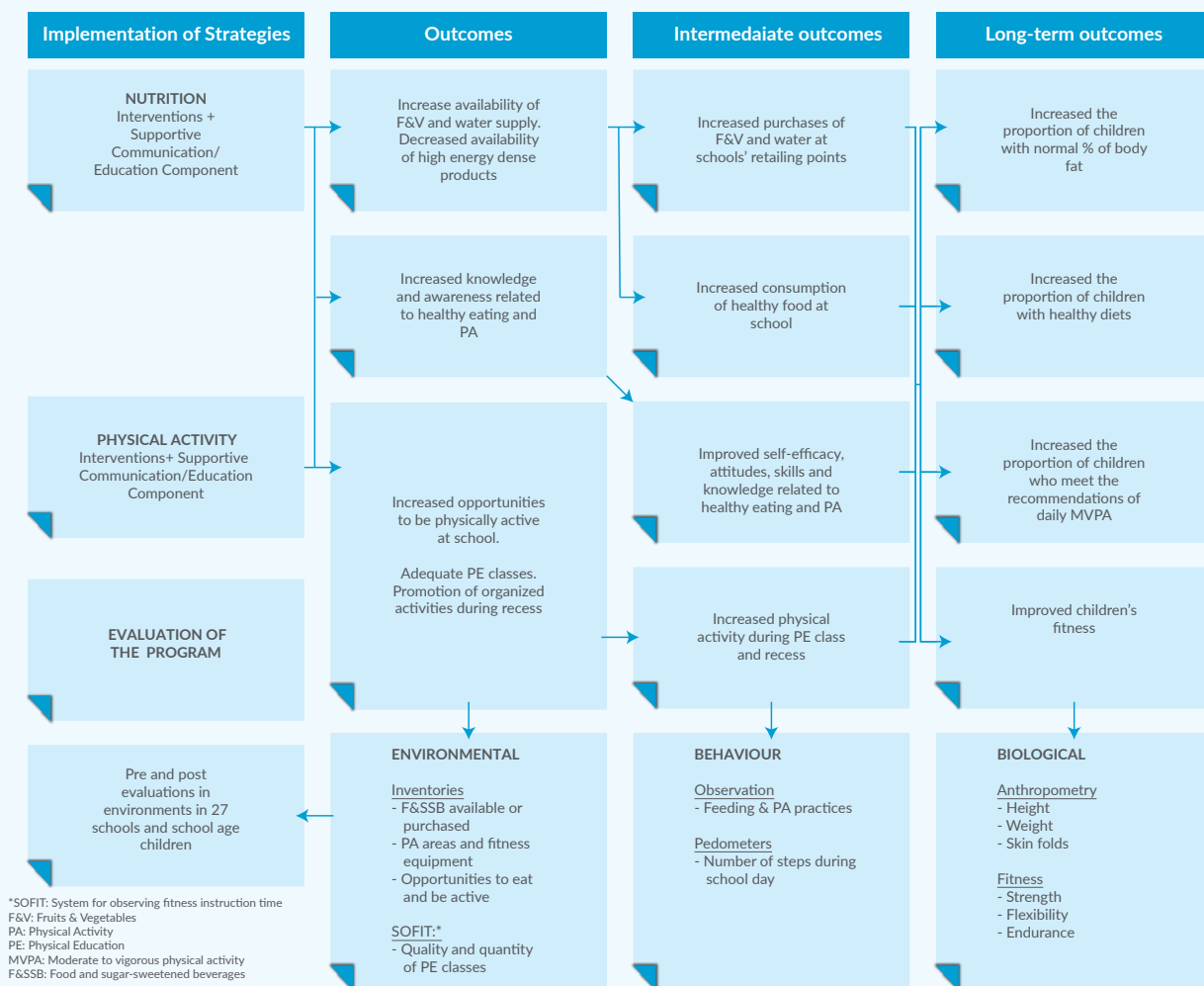
adolescents, families, teachers, staff and government) and levels (including individual, environment and policy) that are involved in the SFNE intervention;

- establishing both quantitative and qualitative indicators (“what”, “how much”, “how” and “why”) for each input, process, output and outcome described in the SFNE intervention logic model / theory of change; and
- identifying the right type of outcomes to be measured in line with the target/support competences, as well as the type and duration of an SFNE intervention (see Box 8.10).

*Data collection tools:* A careful selection, development, adaptation and/or validation of data collection tools for SFNE evaluation is needed so that such tools are not only valid and reliable, but also practical and easy to administer and work with, culturally appropriate, suitable for the given age group and level of development, and fully in line with the SFNE intervention approach as designed and planned.

### Box 8.7. Linking evaluation with the logic model: an example

The figure below illustrates how an evaluation plan was linked with the logic model of a multicomponent childhood obesity prevention programme in Mexico.



(Safdie et al., 2013)

## Integrating implementation science into the evaluation process

Given the current interest in implementation science for understanding what works, why, when, and how for SFNE, it is important not to limit evaluation questions/measures to the outcomes represented in the logic model, but to expand them to the process / outputs / inputs that may contribute to the outcomes. Box 8.8 features a good example of an evaluation model designed for the “Choice, Control and Change Curriculum”, which “conceptualized the major process evaluation components as being in a series of steps linked to the intervention outcomes” (Lee, Contento and Koch, 2015; Lee, Contento and Koch, 2013).

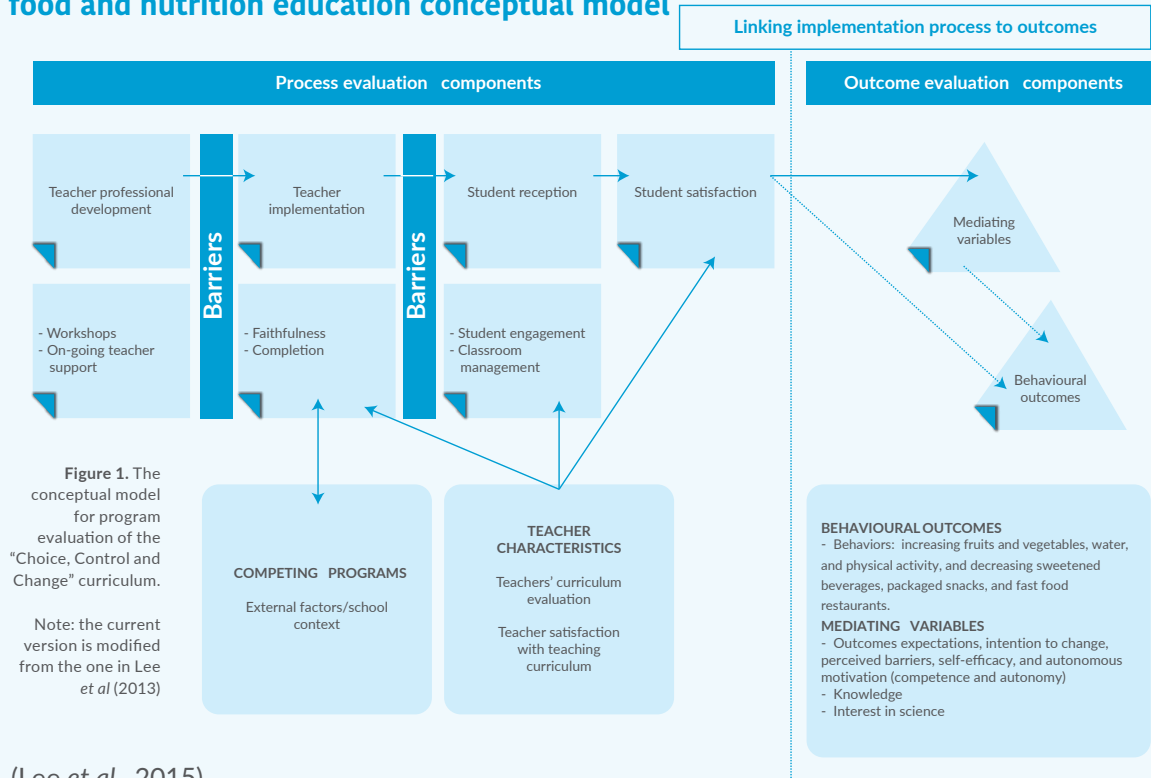
### Disseminating and using evaluation results

“Above all, an evaluation must provide usable information. It must enable project directors, for example, to guide and shape their projects toward the greatest effectiveness”

(W.K. Kellogg Foundation, 2004)

Finally, an optimal SFNE evaluation plan needs to include a strategy for analysis, reflection and communication with stakeholders, to ensure that SFNE progress and findings are made visible, acted upon and put to good use.

### Box 8.8. Linking implementation to outcomes: an example of a school-based food and nutrition education conceptual model



(Lee *et al.*, 2015)

## CHALLENGES

### Change management: pre-evaluation challenges

*General challenges:* Even before evaluation begins, there are some general challenges that can impact the planning and preparation required for an effective SFNE evaluation:

- Evaluation is not often seen as a need; thus it is not appropriately planned and budgeted for.
- Sites may lack or have limitations on the time, funding and capacity required for effective evaluation.
- There may be conceptual barriers with regard to the different stakeholders involved in formal evaluation, for example the fear and/or perception that evaluation is a difficult and overly technical process.
- There may be concerns related to designing and implementing an SFNE intervention worth evaluating.
- Evaluation goals and designs may not be relevant to the context, feasible or realistic, and/or may not fit well within a given SFNE intervention.
- There may be little value assigned to and perceived in certain types of evaluation (such as process evaluation, for example) and in different forms of assessment that go beyond standardized tests/measures (such as informal assessment, for example).
- There may be issues relating to the actual know-how required to use the evaluation results and communicate them in a comprehensive and accurate way (for example, to avoid bias against publishing failures), as well as in ways that can reach and be understood by different target audiences (for example, policy makers).

### Evidence: a lack of evidence on school-based food and nutrition education impact and on effective methodologies

As discussed earlier in this theme, to date there does not seem to be any standard or recommended evaluation system in wide adoption across LMICs, to adequately produce quality evidence on what works and what hinders success for SFNE (FAO, forthcoming, a).

Within the school system, apart from tests and examinations, programme evaluation is generally not practised, and the assessment of outcomes relevant to SFNE is not often seen as the responsibility of the education system. Hence there are limited opportunities for evaluating SFNE policies and programmes, for example in terms of contact hours, curriculum integration, learning strategies, teacher training and practical linkages with the food environment and school meals (see also Theme 1). As a consequence, there is a global “methodology gap” in professional understanding of the steps, inputs and activities that will achieve food competences, and in how best to adapt them to different country contexts and age groups.

In this regard, a review of school meal programmes in LMICs noted that most studies lack in-depth research to assess whether children are receiving culturally and developmentally appropriate nutrition and health education lessons to complement the benefits gained from providing nutritious school meals (Jomaa, McDonnell and

Probart, 2011). This kind of disconnect between SFNE and related interventions in the school system (such as WASH and home-grown school feeding programmes) limits the possibility of assessing education–environment linkages and coherence, and the potential multiplier effect of SFNE when it is integrated into multicomponent food and nutrition approaches (see Theme 3).

### Capacity, experience and familiarity: what and how to evaluate

#### What to evaluate: issues in aligning the evaluation with the school-based food and nutrition education strategy

Even in high-income countries (HICs), when resources are available to conduct rigorous evaluations, the evaluation designs often tend to be poorly developed. This is usually due to the lack or absence of a clear description of the SFNE intervention, for example through a narrative, logic model and/or theory of change, which in turn increases the risk of selecting evaluation questions and indicators/measures that are not fully aligned with the planned SFNE target competences, curriculum design, learning model, materials and activities. Such flaws and limitations in logical alignment can often lead to programme/project failure (see Box 8.9).

#### Box 8.9. Logical alignment of the overall school-based food and nutrition education strategy and project success

- *A successful strategy:* Good theory of change + Good implementation + Good evaluation strategy = Leads to intervention success
- *Theoretical failure of the project:* Incorrect theory of change + Good implementation + Good evaluation strategy = Leads to intervention failure
- *Failure in implementation:* Good theory of change + Failure in implementation + Good evaluation strategy = Leads to intervention failure
- *Failure in evaluation:* Good theory of change + Good implementation + Failure in evaluation strategy = Leads to intervention failure
- *Absolute failure:* Incorrect/illogical theory of change + Failure in implementation + Failure in evaluation strategy = Leads to intervention failure

(Guijt and Woodhill, 2002)

#### How to evaluate: issues with using appropriate, feasible and available evaluation methods

One of the most important challenges related to the “how” of conducting an SFNE evaluation involves the lack of commonly understood and widely validated outcome and process indicators and data collection tools that are relevant both to SFNE and to the context of LMICs.

The development/selection and use of indicators for SFNE evaluation can be a complicated task. Often the outcomes to be measured are overestimated for the type of SFNE intervention. Focusing on measuring changes in nutritional status and/or other health outcomes in the short- and medium-term may provide “false results” on the effectiveness of SFNE, as these changes may be expected “only after educational



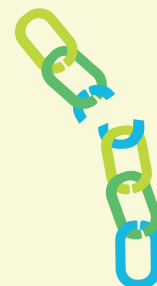
interventions of considerable quality and/or duration” – for example through SFNE interventions implemented in a five-year, whole-school programme (Baranowski, 2006; Brug, Oenema and Ferreira, 2005; Contento, 2016; Kalafat, Illback and Sanders, 2007). (see also Box 8.10).

Furthermore, valid, reliable, practical, culturally appropriate, suitable tools that are fully in line with competence-based SFNE interventions are rarely available in LMICs – or when available have limited psychometric properties. This can jeopardize the findings of the evaluation and its reported effectiveness (Contento, Randell and Basch, 2002; Hernández-Garbanzo *et al.*, 2013; Townsend *et al.*, 2003).

### Box 8.10. Common misconceptions: overestimating intended outcomes

Traditional or knowledge-based SFNE interventions that are short-term in duration (delivering one or more sessions over a period ranging from six months to a year) tend to overestimate in their evaluation designs and in their power or potential to achieve medium- and long-term outcomes, for example in body mass index (BMI) or in dietary intake.

Instead, the evaluation design should realistically reflect the scope of the intervention. For example, an SFNE intervention limited to promoting knowledge of and benefits from fruits and vegetables (through a short-term approach involving the dissemination of nutrition messages, rather than a long-term competence-based approach – see Theme 4) should also limit its evaluation to the assessment of short-term outcomes such as changes in knowledge and/or in the perceived benefits of fruits and vegetables (Cates *et al.*, 2014; FAO, forthcoming, a; University of California Davis, 2019a; USDA, 2005).



## RECOMMENDATIONS

The following recommendations recognize and address key challenges to ensuring effective evaluation for SFNE, and are mainly aimed at evaluators, researchers, academics, programme planners and practitioners.

### Ensure preconditions are in place before starting

The following preconditions should be in place before the evaluation of an SFNE intervention begins:

#### Enabling environment for evaluation

- Prioritize coordinated evaluation efforts that are in alignment with the design / revision / update processes of SFNE interventions.
- Allocate a definite proportion of the intervention budget to evaluation, and/or find external sources for financing the evaluation. Alternatively, when there are serious budget constraints, complementary and practice-based evidence approaches (including both formal and informal types of assessment) can still provide valuable evidence.
- Allocate enough time and ensure realistic deadlines for the evaluation process in their work plans. This includes agreeing on the evaluation's purpose, scope and design, as well as expertise/resources needed, and logistical arrangements for data collection, data analysis and reporting.

#### Recommended inputs

- A contextual analysis to establish and understand what is available to support an appropriate evaluation, and to inform its corresponding design, implementation, learning and reporting.
- An evaluation team, with clear terms of references, to be responsible for the development and implementation of evaluation plans for SFNE interventions. Members of the evaluation team may reflect a range of profiles, from evaluation practitioners with academic backgrounds and/or field experience on programme evaluation, to teachers with extensive expertise in both formal and informal classroom-based assessments.
- Participation of relevant stakeholders (including teachers, parents and children) at every step of the evaluation process (through regular meetings, consultative processes and/or interviews), to discuss the planning, design, implementation and use of the evaluation findings, and to determine their specific roles.
- Clear and concise descriptions of the main features of the SFNE intervention to be evaluated. This includes the needs addressed; the goal, target competences and support competences; the activities/outputs (including the learning model, curriculum and the learning materials and activities, along with capacity development); the context within which the intervention operates; and how the intervention is linked to other school-based interventions and external programmes (CDC, 1999).

- The logic model and/or theory of change describing the relationships and pathways between the intervention's activities and its expected changes.
- Agreements between the intervention designers and evaluators on the description of the SFNE intervention, and on what can realistically be achieved in the short-, medium- and long-term.
- Useful literature and documentation, with samples (from both HICs and LMICs) of existing SFNE-related indicators, data collection tools and evaluation methodologies. These may be revised and/or adapted to inform the evaluation design and process (see Boxes 8.1, 8.2 and 8.3, as well as the "Useful tools and links" at the end of this theme, which feature examples of evaluation tools used in SFNE-related interventions).

### Overall evaluation strategy

Given that evaluations of SFNE interventions can range from simple to highly complex, the minimum recommendation for conducting a strategic evaluation is to **apply formal and/or informal types of assessment to document the effect of an SFNE intervention in terms of achieving its intended short- and medium-term outcomes** (the "does it work?" approach), and to **complement these findings with implementation data** (the "how does it work?" approach) (Aboud, Yousafzai and Nores, 2018; Issel and Wells, 2017).

Innovative  
practice & insight

### Strengthen professional capacity, experience, familiarity and motivation

(See also Theme 7.)

#### Strengthen professional capacity in school-based food and nutrition education evaluation

- Expand capacity needs assessments to focus on evaluation capacity and evidence needs.
- Develop practical guidance materials and conduct professional training workshops that emphasize best practices for evaluating SFNE interventions, as implemented in the context of LMICs. (To learn more about free online certificate programmes aimed at developing research and evaluation skills, see the "Useful tools and links" at the end of this theme.)
- Seek technical assistance, through collaborations with UN agencies, NGOs and academic and/or research institutions, to support the development of an SFNE evaluation framework with adequate indicators and measures, in consultation with stakeholders from sectors relevant to the field of SFNE (Joshi *et al.*, 2014; Turner *et al.*, 2017).

#### Strengthen the motivation towards evaluation

- Facilitate multistakeholder processes to develop collective commitment for SFNE evaluation and to underscore the importance of collaborating and aligning SFNE with other external interventions. This is particularly important as evaluation results showing these multisectoral/multicomponent associations may help to increase attention and action for SFNE.

- Maintain momentum with respect to evaluation and cultivate an “evaluation outlook” in SFNE through regular training, meetings and/or webinars to ensure that all relevant stakeholders have a shared and consistent understanding of the evaluation vision, purpose, benefits and methodologies.
- Advocate for the importance of evaluation and measurement to demonstrate the public value of SFNE, especially in the context of progress towards the Sustainable Development Goals (SDGs).

### Build a strategic evaluation plan and design

The recommendations below should be adapted to the context, capacity, resources and purpose of the given SFNE evaluation.

#### Ensure a robust planning process

- Assemble an evaluation team and provide technical guidance on SFNE evaluation as needed.
- Identify and engage stakeholders as relevant to the SFNE evaluation process. This can be done through a mapping exercise and/or through consultative meetings, and should aim to enhance and confirm the purpose, relevance, cultural competence, feasibility and usability of the selected evaluation approach.
- Understand the context and potential for evaluation, to determine if the SFNE intervention meets the preconditions for an evaluation.
- Design the evaluation plan concurrently with the SFNE development process (and not as a concluding add-on or afterthought to the intervention/programme).
- Establish the aims of the SFNE evaluation and the type/s of evaluation needed. These can range from various types of formative assessment to process evaluations and outcome/impact evaluations (see Boxes 8.1, 8.2 and 8.3).

#### Select useful, coherent and appropriate measures and indicators

- *Useful*: To develop useful evaluation measures and indicators, identify from the beginning the purposes of the evaluation (for example, programme improvement, accountability, knowledge generation, etc.) and the potential users of its findings (for example, donors, policy makers, practitioners, researchers, schools, children and families).
- *Coherent*: To ensure coherence when developing evaluation measures and indicators, refer to the logic model / theory of change, as the measures/indicators should directly respond to the core characteristics of the SFNE intervention – for example the type, goals, target/support competences, curriculum and learning approaches, intervention duration and intensity, and so on. (See also Themes 2–7.)
- *Appropriate*: To ensure that selected indicators and measures are appropriate, consider:
  - having indicators for the different audiences (for example, children, families, teachers, staff and government) and the different levels (including individual, environment and policy) that are involved in the SFNE intervention;
  - having – for each input, process, output and outcome – a combination of quantitative and qualitative indicators; and

- agreeing on what outcomes are realistic to measure for a well-designed SFNE intervention.

### Decide on appropriate evaluation methods, data collection design and procedures

- Capitalize on existing and practical evaluation methods or designs (such as practice-based evidence approaches) to support the SFNE evaluation.
- Use a triangulation of evaluation methods, if possible, to enrich the quality and capacity to learn from the evaluation results. This could include a combination of outcome and process evaluation measures, formal and informal assessment procedures, and qualitative and quantitative data collection tools.
- Avoid “reinventing the wheel” with regard to data collection tools. As a core principle, always evaluate the suitability of existing evaluation data collection tools first, adapting them whenever possible and developing new tools only when necessary. (For examples of evaluation tools used in SFNE, see the “Useful tools and links” at the end of this theme.)
- Ensure that data collection tools – whether existing/adapted or new – are validated, at a minimum through expert reviews and pilot or testing techniques.
- Develop a data collection plan and/or matrix for effective management. This can include information on the purpose of the evaluation, the type of evaluation to be undertaken, the evaluation timeline, the evaluation budget, the evaluation team, the existing data sources to review, the outcomes to be measured (along with corresponding indicators, data sources/data collection tools, data analysis and dissemination procedures).

### Disseminate and act on evaluation results

- Draft a communication and outreach strategy to share the evaluation findings and accomplishments as they emerge (both mid-project and at completion) with multiple stakeholders as relevant to SFNE.
- Schedule multistakeholder consultations and/or follow-up meetings with intended users and decision makers to reflect on evaluation findings and to translate the main recommendations and conclusions into appropriate actions for modifying and improving the SFNE intervention.
- Customize the format or channel of dissemination based on the needs of the different stakeholders and potential users of the evaluation findings. For example, researchers, programme planners and managers from government and non-government institutions may need detailed data and analysis on outcomes, as well as feedback on process/implementation, whereas the general public (including children and families) and the media will need highlights provided in bite-sized nuggets, as well as infographics, headlines and stories.
- Understand the cognitive styles of decision makers and politicians, for whom oral presentations and simple reports that are tailored to their needs may be most appropriate (see Theme 1).
- Produce short reports on research and evaluation procedures and/or findings, with specific follow-up suggestions. Get media coverage if appropriate.

- Publish research and evaluation procedures and findings (along with specific follow-up suggestions) in international scientific journals.

### Identify research gaps

Promote research to address identified SFNE evaluation gaps. These include:

- Different forms of formative evaluation, as needed to provide the basis for designing curriculum competences, learning models, materials and activities and systemic capacity development approaches for SFNE (see Box 8.1).
- Implementation science integrated into SFNE evaluations (as indicated in Box 8.2), to assess different process evaluation variables. These include the quality of the competences, curriculum and learning strategies that are foreseen in the intervention design; implementation fidelity components (including perceived barriers and supports for delivering SFNE); and the type, number and quality of capacity development approaches, partnerships and other factors as relevant to SFNE implementation support (for example, the school climate, supporting policies and linkages with other external programmes).
- Effectiveness and role of SFNE in multicomponent school-based food and nutrition interventions (see Box 8.3).
- Effectiveness of different SFNE methodologies, including facilitation techniques, types of learning models, types of teaching/learning and training materials and activities on food and nutrition outcomes among students, families and the environment (see Box 8.3).
- Development and validation of indicators and data collection tools as relevant to SFNE and to the context of LMICs.

### Useful tools and links

<p>Core Curriculum and Evaluation Tools with SMART Objectives (University of California, 2019b)</p> <p><a href="https://uccalfresh.ucdavis.edu/sites/g/files/dgvnsk2286/files/inline-files/FY19_SMART_Objectives_FINAL_19.pdf">https://uccalfresh.ucdavis.edu/sites/g/files/dgvnsk2286/files/inline-files/FY19_SMART_Objectives_FINAL_19.pdf</a></p>	<p>Fresh Nutrition Education: Youth Evaluation Tools (University of California Davis, 2019a)</p> <p><a href="https://uccalfresh.ucdavis.edu/evaluation/youth">https://uccalfresh.ucdavis.edu/evaluation/youth</a></p>	<p>FAO: Guidelines for assessing nutrition-related Knowledge, Attitudes and Practices (Fautsch and Glasauer, 2014)</p> <p><a href="http://www.fao.org/docrep/019/i3545e/i3545e.pdf">www.fao.org/docrep/019/i3545e/i3545e.pdf</a></p>	<p>Evaluation for Transformation: A Cross-Sectoral Evaluation Framework for Farm to School (NFSN, 2014)</p> <p><a href="http://www.farmtoschool.org/Resources/Evaluation_Transformation_FINAL-Web.pdf">www.farmtoschool.org/Resources/Evaluation_Transformation_FINAL-Web.pdf</a></p>
<p>Youth Expanded Food and Nutrition Education Program (EFNEP) Evaluation Tools (USDA, 2015)</p> <p><a href="https://nifa.usda.gov/resource/efnep-evaluation-youth-program">https://nifa.usda.gov/resource/efnep-evaluation-youth-program</a></p>	<p>Health Education Curriculum Analysis Tool (HECAT) (CDC, 2012)</p> <p><a href="https://www.cdc.gov/healthyyouth/hecat/index.htm">https://www.cdc.gov/healthyyouth/hecat/index.htm</a></p>	<p>Certificate program aimed at developing research and evaluation skills in West Africa (USAID, 2018)</p> <p><a href="https://www.usaid.gov/west-africa-regional/press-releases/jan-25-2017-usaidwa-e4d-launches-free-online-certificate">https://www.usaid.gov/west-africa-regional/press-releases/jan-25-2017-usaidwa-e4d-launches-free-online-certificate</a></p>	<p>Addressing the Challenges of Conducting Effective Supplemental Nutrition Assistance Program Education (SNAP-Ed) Evaluations: A Step-by-Step Guide (USDA, 2014)</p> <p><a href="https://fns-prod.azureedge.net/sites/default/files/SNAPEDWaveII_Guide.pdf">https://fns-prod.azureedge.net/sites/default/files/SNAPEDWaveII_Guide.pdf</a></p>

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# GLOSSARY

Term	Definition
<b>Baseline / baseline data</b>	A measurement of conditions at the start of an intervention/programme, against which subsequent progress can be assessed (see Theme 3 and Theme 8).
<b>Capacity development</b>	The process whereby individuals, organizations and society as a whole unleash, strengthen, create, adapt and maintain capacity over time (FAO, 2018). (See Theme 7.)
<b>Capacity for change</b>	In this white paper it refers to capacity that is built through the direct experience of changing and maintaining practices and behaviours, which can be applied to other challenges as they present themselves (see Theme 3).
<b>Change management</b>	The discipline that deals with managing and guiding change in a systematic manner within an organization. There are various recognized approaches to change management, each with their own models and methods. Common features include recognizing the need for change, removing barriers, redirection of budget, etc.
<b>Climate change</b>	A change of climate attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is – in addition to natural climate variability –observed over comparable time periods. (UN, 1992).
<b>Competences</b>	A cluster of related abilities, commitments, knowledge and skills that enable a person (or an organization) to act effectively in a real-life situation (see Theme 3).
<b>Conflict of interest</b>	Exists when an individual or institution has a secondary interest that creates the risk of undue influence on decisions or actions affecting a primary interest (see Theme 2).
<b>Consumer behaviour</b>	The actions and/or decisions made by consumers at societal, household or individual levels, on what, where and how they procure, use and dispose of food and feed others (considering gender, age and social factors); as well as actions to promote changes in their food environments. Consumer behaviours are influenced by a complex myriad of factors ranging from personal beliefs to political structures.
<b>Curriculum</b>	The lessons and academic content to be learned/covered in a school or in a specific course or programme. Depending on how broadly the term is used, it can include learning objectives, learning activities, learning materials and assessments (see Theme 4).
<b>Dietary diversity</b>	The number of different foods or food groups consumed over a given reference period. Dietary diversity has been recognized as an element of high quality diets (Ruel, 2003).
<b>Eating patterns</b>	Habitual aspects of (individual and/or group) food consumption, e.g. foods typically consumed, meal frequency, timing, location, snacking habits and typical portion sizes (see Theme 3).
<b>Enabling food environment</b>	In this white paper it refers to a set of interrelated conditions which, when taken together, provide for and then facilitate appropriate food and nutrition practices, in order to ensure that children and adolescents develop positive lifelong eating patterns and overall healthy lifestyles. It involves smooth interactions and linkages between SFNE and the overall school environment, home, and community at large. In the school context, an enabling food environment is one that consistently promotes and facilitates the adoption of healthy/sustainable food practices in school, and supports multiple approaches through a variety of programmes and policies (see Theme 2).

<b>Environmental supports</b>	In this white paper they refer to the elements in the physical and social environments that make it easier to adopt healthy/sustainable food practices (see Theme 3).
<b>First 1000 days</b>	The 1 000 days between a child's conception and second birthday. This period represents a crucial window of opportunity to improve nutrition and development (Horton, 2008).
<b>Focus group discussions (FGDs)</b>	A research methodology and/or community consultation mechanism in which a small group of participants gather to discuss a specified topic or an issue in order to generate data. Key characteristics relate to the interactions within the group, and between the group and the moderator (Wong, 2008). (See Theme 3 and Supplement 3.2.)
<b>Food environment</b>	The physical, economic, political and socio-cultural context in which consumers engage with the food system to make their decisions about acquiring, preparing and consuming food (HLPE, 2017).
<b>Food literacy</b>	The everyday practicalities associated with navigating the food system and using it to ensure a regular food intake that is consistent with nutrition recommendations. Food literacy is the scaffolding that empowers individuals, households, communities or nations to protect diet quality through change and strengthen dietary resilience over time. It is composed of a collection of interrelated skills, knowledge and behaviours that are required to plan, manage, select, prepare and eat food in order to meet needs and to determine intake (Vidgen and Gallegos, 2014). (See Theme 1.)
<b>Food practices</b>	In this white paper they refer to all practices involved in the personal and domestic production, selection, acquisition, preparation, conservation, consumption, sharing, storage and disposal of food. Examples include shopping, cooking, gardening, food hygiene and responding to marketing. The use of food practices goes beyond dietary practices or food consumption. Food practices are influenced by personal, cultural, environmental, political and societal factors, as well as norms and values. The contribution of children's and families' food practices to nutrition and to other aspects of sustainable development is central to SFNE practice. In general, the white paper uses the term food "practices" rather than "behaviours" because they are frequently associated with context and culture, social practice, habitual routines and networks of related behaviours, all of which are closely related to the recommended SFNE learning process. As such, the white paper assumes that behaviours are covered by the term practices.
<b>Food security</b>	Exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, 2009).
<b>Food system</b>	Gathers all the elements (including environment, people, inputs, processes, infrastructures and institutions) and all the activities that relate to the production, processing, distribution, preparation and consumption of food, as well as the output of these activities, including socio-economic and environmental outcomes (HLPE, 2017).
<b>Formative research</b>	Uses qualitative and quantitative methods to help design or "form" learning programmes around specific practices (such as snacking, shopping for schoolchildren, and facilitating SFNE for teachers). It explores the existing practices, outlooks, skills and knowledge of priority groups – what influences them and what helps to promote change – calling on behaviour change and education theories. It may include a baseline study for assessing progress, and is therefore important for evaluation (see Theme 3 and Supplement 3.2).

<b>Hidden curriculum</b>	Refers to the unwritten, unofficial and often unintended lessons, values, and perspectives of social and physical environments which are implicit in the attitudes, action (or inaction), facilities and services of schools, homes, communities and markets.
<b>Highly processed foods</b>	Multi-ingredient, industrially formulated products, usually high in energy, fat, sugar and/or salt. Higher consumption of these foods has been associated with higher energy intake, poorer dietary quality and higher obesity prevalence. Examples include sugar-sweetened beverages (SSBs), salty and sugary snacks, processed meats, breakfast cereals, candy and sweets (Poti <i>et al.</i> , 2016).
<b>KAPP survey</b>	An assessment of knowledge, attitudes, perceptions and practices in order to determine participant needs, situation, resources, influences and motivations. This type of survey is also valuable for evaluation purposes (Fautsch and Glasauer, 2014). (See Theme 3.)
<b>Knowledge transmission paradigm</b>	Refers to the assumption that the transmission of information leads to increased knowledge and that the enhanced knowledge is sufficient to change behaviour.
<b>Learning activities</b>	In this white paper they refer to specific, structured or organized activities carried out by learners, with the purpose of extending and developing relevant knowledge, experience, perceptions, skills, habits and outlooks. For any given learning outcome, there will usually be a sequence of activities, with introductory and concluding sections, which contribute to building up the desired capacities. Activities therefore do not work in isolation, but play their part in strategies (see also “Learning strategies”). School-centred activities for SFNE may be pre-classroom, in-classroom, in the school environment, at home or in the community (see Theme 6).
<b>Learning needs analysis</b>	Aims to identify learning needs in specific groups. It may look at main topic areas by reviewing curriculum coverage or conducting surveys, and/or use formative research to explore the specific competences that need to be achieved, and what influences them (see Theme 3 and Supplement 3.2).
<b>Learning outcomes</b>	In this white paper they refer to specific competences that can be achieved within the school learning programme. Other similar terms such as learning aims, learning objectives and standards may involve the same content but differ in intention, ownership and position in the process: learning aims generally have a wider meaning and tend to be owned by the institution/programme (e.g. the programme’s aim is to improve children’s health); learning objectives are upfront and refer to teachers’ or children’s intentions; and learning outcomes are end-results which may be used in objective assessment. (See also “Competences”.)
<b>Learning programme</b>	In this white paper it maps or describes what is supposed to happen (inputs and actions) to achieve the learning outcomes. It may be embodied in course outlines, learning materials, teacher’s notes or workbooks.
<b>Learning strategies</b>	Essential components of a curriculum, functioning as bridges between competence (what you have to learn to do) and process (what you have to go through to achieve that result).
<b>Life skills</b>	Psychosocial abilities for adaptive and positive behaviour that enable individuals to deal effectively with the demands and challenges of everyday life, including how to manage social relations and own actions and reactions (for example, empathy and encouragement, collaboration, social interaction and planning).

<b>Motivation</b>	An internal condition that activates behaviour and gives it direction, energizing and directing goal-oriented behaviour. Some theories note that motivation ranges on a continuum from intrinsic to extrinsic. For example, motivation can come from experiencing intrinsic rewards that are inherent to the task or activity itself and the satisfaction of basic needs. It can also come from beliefs about the self, others, and the outcomes of the given behaviour. Extrinsic motivation comes from the desire to meet expectations from outside the self (Contento, 2016).
<b>Nudge/nudging</b>	Any aspect of the choice architecture that alters people's behaviour in a predictable way, without forbidding any of their options or significantly changing their economic incentives. To count as a mere nudge, the intervention must be easy and cheap to avoid. Nudges are not mandates. Putting fruit at eye level counts as a nudge. Banning junk food does not (Thaler and Sunstein, 2008).
<b>Outlooks</b>	In this white paper they refer to the mental, affective and psychosocial dimensions of food practices (including health beliefs, perceptions, attitudes, understanding, motivations, knowledge and feelings), that are explored in formative research and behaviour change theory, and that represent a significant dimension of food and nutrition education. In designing learning programmes, food outlooks are the "motivation area", as opposed to the "action area". (See Theme 3 and Theme 4.)
<b>Perceptions</b>	The mental mix of observations, interpretations, attitudes, feelings, experience and knowledge (right or wrong) that influence food practices. For example, broccoli is considered by some to be tasteless, but by others to be tasty, nutritious and worth buying. Perceptions are often included as a dimension of KAPP studies.
<b>Rapid rural appraisal (RRA)</b>	A systematic but semi-structured methodology (using a combination of tools) that is carried out in the field by a multidisciplinary team. It is designed to obtain new information and formulate new hypotheses about rural life (FAO, 1997). (See Theme 3 and Supplement 3.2.)
<b>Right to food</b>	The right to food is realized when "every man, woman and child, alone or in community with others, has physical and economic access at all times to adequate food or means for its procurement". As indicated in the <i>Right to Food Guidelines</i> (Guideline 11), the right to food includes the right to education and awareness on food and nutrition security (FAO, 2019a).
<b>School subject curriculum</b>	A systematic, coherent and fairly comprehensive learning plan for a single school subject, usually over several years (see Theme 4).
<b>Scope-and-sequence chart</b>	An overview of the competences to be achieved and the content to be covered at each level of a programme's curriculum, over a period of time (scope) and in a particular order (sequence). (See Theme 4.)
<b>Self-efficacy</b>	The belief in one's own capabilities to organize and execute a course of action that requires managing prospective situations. In other words, it is the confidence in one's ability to enact a behaviour (Bandura, 1982; Contento, 2016).
<b>School-based food and nutrition education (SFNE)</b>	In this white paper it refers to a series of coherent and progressive sequences of educational activities, with environmental supports, that will help schoolchildren (as well as school staff and parents) to make long-lasting improvements in their diets and other food-related behaviours, perceptions, outlooks and knowledge; to build the capacity to change and adapt to external change; and to pass on their learning to others (FAO, 2019b).

<b>School-based food and nutrition education learning model</b>	The SFNE learning model presented in this white paper encourages children to follow an action pathway leading to real-life competences. The pathway starts and ends with their own experience and their own assessment, and is situated mainly in real-life environments and settings and in their interactions with parents and peers. Key elements include: needs-based learning with practical, real-life aims; building on existing experience and expertise; plenty of observation and discussion; action and practice in real-life settings; interactions with physical and social environments in learning activities; consolidation and maintenance of practices; ownership of the process; family and community support and involvement; and enabling food environments. (See Theme 5.)
<b>School food</b>	In this white paper it refers to all the food that is available (e.g. sold, provided and brought from home) within the school grounds and around the premises. Examples include school meals, lunchboxes and snacks, food from street vendors and tuckshops, food from canteens, cafeterias and vending machines, drinking water, and food from bake sales, sports events and other school events.
<b>Spiral curriculum</b>	A way of organizing curriculum content through the school years to respond to the increasing complexity of the subject and to children's increasing experience and maturity. Key features of the spiral curriculum are: the student revisits a topic, theme or subject several times throughout their school career; the complexity of the topic or theme increases with each revisit; and new learning has a relationship with old learning and is put in context with the old information (EPI, 2012). (See Theme 4.)
<b>Support competences</b>	In this white paper they refer to learning outcomes (or building blocks) that help to build target competences. Examples include skills, knowledge, understanding, perceptions and attitudes (see Theme 3).
<b>Target competences</b>	In this white paper they refer to demonstrable, sustainable, food-related targets that are widely recognized as being necessary competences for children to achieve and maintain in real life (see also: Competences). These can be adopted as the main outcomes or benchmarks of SFNE learning programmes (see Theme 3).
<b>Target group profiles</b>	Holistic explorations of the knowledge, practices, attitudes and perceptions of specific groups, particularly in relation to their cultures and contexts, life goals and interests, and motivations and difficulties. They are very useful for informing educational approaches (see Supplement 3.3).



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# Supplements

## Useful tools and resources



# SUPPLEMENTS FOR THE INTRODUCTION

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## Supplement 1. Summary of school-based food and nutrition education challenges and recommendations

Each theme of the white paper expands on the main challenges to school-based food and nutrition education (SFNE) in low- and middle-income countries (LMICs), and proposes recommendations specific to the theme. This supplement gathers and summarizes all the challenges and recommendations, both as an overview and for easier reference.

### Challenges

#### Concept and learning model

What is needed: consensus on the concept, value and nature of effective SFNE.

- There is little awareness of the need for and value of SFNE at public, professional, institutional and government levels.
- There is limited consensus on the nature, scope and aims of effective SFNE, and limited familiarity with its key features.
- The most widespread learning model for SFNE is classroom-bound information delivery, which is often ineffective in improving food practices and diet. There is little consensus on the programme of action, its phases and the level of ownership; the types of input and their uses; the weight given to the practice of target competences, reflection, direct experience and actions and interactions in real-life settings; the roles of other actors (especially parents); and the need for communication skills.
- There are few practical and testable models of effective SFNE learning that can help in developing learning programmes and supporting research.
- There is a lack of publicly available case studies and examples, and of exemplary learning materials to show the way to more effective SFNE approaches and to inspire confidence, imitation or adaptation.
- SFNE is very different from other school subjects. Food and diet are heavily influenced by environments – both social and material; they have strong emotional, social and physical links with the home, culture, freedom of choice, and so on; they are governed by familiarity, convenience and embedded habits (hence difficult to change); and they involve invisible processes and slow outcomes – both good and bad (hence it is hard to see cause and effect).
- The programmatic demands of a more effective learning model are high, and apply across the entire education system.

#### Education–environment links

What is needed: recognition of the essential relationship and interaction between SFNE and food environments.

- There is a disconnect between SFNE and policies and interventions concerning the school food environment.
- SFNE programmes and interventions do not often recognize and respond to the power of the food environment in creating, reinforcing and maintaining food practices and perceptions.
- Food environments are not commonly exploited as learning resources and settings for action and interaction.
- The support of parents and other key influencers of food practices and perceptions (such as the community, school management and school services) is not often integrated into SFNE in a meaningful way.

### **Evidence, data and assessments**

What is needed: data, assessments and evidence to encourage institutional interest and motivate practitioners, as well as to identify successful SFNE methodologies and corresponding programmes for research, process and outcome evaluation.

- The evidence of SFNE impact is not extensive, and the evidence available is often compromised by inappropriate assumptions and indicators.
- There is a global “methodology gap” in the professional understanding of the inputs, steps and activities required to achieve food competences, and of how to adapt them to local and individual contexts. There is a corresponding lack of implementation research, making it difficult to design effective SFNE learning programmes. There is also limited research on the relative effects of different SFNE methodologies and activities, and on the promising interaction between SFNE and environmental interventions.
- There is no clear picture of the SFNE situation on the ground (including current practices, resources, hours, training and classroom approaches).
- Across the various tasks (policy formulation, capacity development, curriculum, learning needs analysis, learning design and implementation) most SFNE lacks the standard project framework (situation/needs analysis, formative research, and monitoring and evaluation) which focuses interventions on needs and assesses their efficiency, effectiveness and acceptability.
- There are several challenges related to appropriate outcome evaluation of SFNE in schools:
  - School learning is traditionally assessed through examinations, but SFNE is rarely an examination subject, and schools rarely assess real-life practices.
  - Mastery of knowledge and concepts is not a sufficient metric for effective SFNE.
  - Formal evaluations are costly and require expertise.
  - The value of evaluations depends on the readiness of the system to apply their findings.
- Process evaluation presents difficulties if it involves training educators in new methodologies while also monitoring the impact of the methodologies, since there are two independent variables to disentangle. (*How good is the method? vs How good are the educators?*)

- Action research by educators is not often part of pre-service and in-service teacher education.
- Informal feedback from teachers and parents is seldom collected or used.

### **School-based food and nutrition education profile**

What is needed: a higher SFNE profile at professional, institutional and policy levels and greater public awareness.

- Leadership, advocacy and advocacy tools for effective SFNE are usually basic and very limited.
- SFNE has a low profile in national and local policy. SFNE policies may be non-existent or fragmented, and even if policies are in place, they are not prioritized, or their implementation is limited and irregular.
- SFNE is sparsely represented in curricula, and dedicated learning materials are lacking.
- SFNE has to compete with other subjects in the curriculum for time, and with non-educational nutrition and other interventions (such as health, food security and social protection) for resources.
- There is seldom a strong institutional mandate for SFNE.
- SFNE is often fragmented and short-term: in many cases it is mostly extracurricular, with responsibility spread across several entities or organizations.
- There is little professional SFNE representation in institutions and discussion fora; likewise there is no professional cadre or established relevant qualifications.

### **Capacity, experience and familiarity**

What is needed: systemic capacity and experience in all SFNE tasks (policy, curriculum, programme management, learning material development and classroom approaches). The four main areas for capacity development involve a) a broad understanding of food and nutrition, diet, local needs and the food system; b) understanding, experience and practice in effective SFNE; c) specific technical capacities (for example, in formative research, curriculum development, learning programme design, materials production, teacher education and monitoring and evaluation); and d) management and leadership.

- It is seldom recognized that in the education service SFNE capacity is needed across the system, not just for front-line educators.
- Most of the professional cadre is often in need of capacity development in SFNE. Familiarity and experience with good SFNE practices, models and concepts is lacking, and there are few opportunities for practitioners to experience, observe or try out new approaches.
- Practitioners (including curriculum designers, course designers, materials writers, teachers and teacher educators) often lack familiarity and expertise in the kind of learning programme design required for effective SFNE, and the know-how to implement it easily and economically. And there are few real examples – particularly those that are local or contextually relevant – to show the way and inspire confidence, imitation and adaptation.

- Some essential elements of effective SFNE (such as the adoption of action outcomes, practice in real-world settings, choice in children’s tasks, involvement of families, more management and less exposition, etc.) are foreign to many classroom cultures and may be intimidating for practitioners.
- Resistance to change is as common in professional behaviour as it is in food habits.
- Schools’ are particularly in need of capacity development with regard to assessing their food environments, establishing nutrition-friendly school policies, and improving school–parent relationships.

### **Change management**

What is needed: capable management with sufficient authority, an enabling change environment and a systemic approach. A successful paradigm change requires careful long-term management and coordination. It needs an interconnected system in which the different parts or actors share a common understanding of the SFNE concept and are able to reinforce each other’s work.

- Innovation in SFNE is often introduced in a piecemeal fashion or along one link of the chain, without coordinating with other stakeholders or products and users down the line, and is therefore not sustainable. If change is not coordinated and supported, even well-designed policies, curricula, learning materials, learning programmes and capacity development risk failure.
- Few actors and institutions have the authority or the experience to effect changes across the system.
- There is often a lack of expertise in typical change management approaches and techniques (such as working incrementally, coaching and mentoring, and showing the way).
- Change management processes are seldom based on a realistic assessment of resource and capacity limitations in the system.
- There is often a risk of ignoring the gap between policy and implementation.

### **Collaboration**

What is needed: fruitful collaboration and partnerships with concerned and interested outside agencies, services and groups, both governmental and non-governmental.

- Many education services do not actively collaborate for educational purposes with “outside agencies” such as school meal services, health services, agricultural services, WASH programmes, NGOs, aid organizations and community groups.
- Conversely, most such agencies do not see education as part of or relevant to their work, and do not know how to go about it.

## **Recommendations**

### **Establish a model of effective food and nutrition education**

Recommendations for SFNE coordinating institution or ministry:

- Convene a multistakeholder meeting (even if small-scale) to discuss, develop and reach consensus regarding the new vision and main goals of SFNE in the country.

- Develop consensus on a model of effective SFNE, covering
  - vision, principles, aims and strategy;
  - a provisional model of effective learning, based on theory and good practice;
  - essential social, environmental and intersectoral support; and
  - approaches for curriculum, programme design and learning materials.
- In all processes, recognize the special needs of food and nutrition education in terms of motivation, direct experience, practice, situated action, social approval and support (see previous section on “Challenges”).
- In consultation with curriculum developers, materials writers, teachers and teacher educators, develop, adopt or adapt the provisional model of effective SFNE into a practical framework for developing learning programmes.

### **Extend the school-based food and nutrition education model to link with food environments**

Recommendations for the SFNE coordinating institution and programme planners:

- Engage stakeholders from relevant sectors in drafting or amending school policies, programmes and operational guidelines that explicitly link SFNE and school food environments, for example through new or adapted curriculum outputs and manuals for SFNE related to school meals and school gardens.
- Support and provide guidance for curriculum developers and materials writers to enhance linkages between SFNE and the food environment (recognizing potential tensions). In particular:
  - undertake small initiatives that capitalize on education–environment linkages, with a view to subsequent scale-up.
  - exploit and publicize small opportunities to try out or improve approaches to enhance education–environment linkages (for example, offering small non-financial incentives for exemplary school projects).
  - incorporate systematic awareness of local, national and/or international food systems into the SFNE curriculum and shape it to combat ongoing negative influences in food environments.
  - prioritize the involvement of parents and caregivers in a productive and sustainable way and ensure that SFNE plays an active role in children’s interactions with the home and community, for instance through adapting and supplementing existing learning materials, homework, outreach activities and projects.
  - experiment with easy options to enhance SFNE–food environment synergies (for example children assessing their own food environments or arranging visits to local farms, food production facilities, community gardens or food distribution centres).
- Support agencies that implement school-relevant interventions (for example, school meal programmes, health services and WASH programmes) to follow best practices and guidelines to adequately integrate SFNE, for enhanced joint outcomes.
- Assess and address potential conflicts of interest to decide if and how to partner with private sector stakeholders that are interested in SFNE and school food environment actions.





### **Promote research, conduct assessments and use evidence and data**

Recommendations for researchers, academics, programme planners and practitioners:

- According to the task at hand, carry out formal or informal situation and needs analyses of national nutrition issues, food practices and outlooks of target groups; policies and programmes, classroom approaches, activities and materials; institutional capacity; professional capacity across the board; and the involvement and attitudes of stakeholders.
- Compile an SFNE archive of available evidence and make it accessible to practitioners.
- Promote SFNE research into:
  - the impact of food environment policies with and without a complementary SFNE component;
  - effective SFNE methodologies / implementation strategies used in LMICs (as well as systematic process monitoring to better understand what works with particular ages and in specific contexts);
  - usability and “face validity” of SFNE competences;
  - implementation of SFNE curricula;
  - the findings of formal vs informal assessments of progress; and
  - action research by teacher–parent–student groups through in-service programmes.
- Prioritize evaluation and ensure that evaluation findings are put to work.
  - Use expert evaluation for specific purposes only: assess small samples and ensure both a high level of expertise and a training function (to extend in-country capacity).
  - Produce short reports on evaluations with specific follow-up suggestions, and get media coverage if appropriate.
  - Promote an “evaluation outlook” (i.e. an interest in assessing outcomes) among teachers, children, schools and families and incorporate simple, informal participant assessments into learning programmes. Find ways to publicize children’s progress that are both appropriate and likely to carry conviction with families.

### **Raise the profile of school-based food and nutrition education through advocacy and discussion**

Recommendations for policy advisors, ministry staff, coordinating and relevant institutions and civil society:

- Carry out advocacy to ensure that SFNE is purposefully integrated into (and not merely mentioned in) relevant policies and legislation and, most importantly, to ensure that adequate resources are allocated to its implementation and long-term institutionalization.
- Mobilize influencers (for example, champions, activists, teacher and parent organizations, professional associations and civil society organizations) that share a similar vision for SFNE within sustainable development.
- Produce briefing notes and media outputs for advocacy, to highlight the value and nature of effective SFNE.

- Open and maintain discussion with stakeholders at all levels to raise professional, institutional, and public awareness on the need for effective SFNE. Such SFNE discussions can be integrated into existing multisectoral platforms.
- Build local advocacy into SFNE activities, learning materials and school agendas.
- Ensure that advocacy, discussion and feedback are prioritized in the terms of reference and outputs of all task forces that support SFNE processes (see Box 3 below).

### **Develop or strengthen enabling policy frameworks**

Recommendations for policy advisors and ministry staff:

- Conduct a simple analysis of legislation, policies and programmes as relevant to SFNE.
- Develop a draft model SFNE policy document with clearly defined objectives and scope, main sectoral responsibilities, minimum standards of quality, main priorities to address, minimum time requirement in the curriculum and capacity requirements of front-line educators.
- Look for policy entry points in terms of shared or easily aligned objectives and relevant paradigms (including those based on rights, education, health and agriculture), to help ensure the best fit for SFNE.
- During policy processes, foster early discussions and negotiations on intersectoral collaboration models that are integrated within the school system.
- Create technical agreements with NGOs and international organizations to support the coherent integration and/or strengthening of SFNE into relevant policies and programmes.
- Negotiate for regular dedicated time for SFNE in the curriculum, and ensure adequate funding for its implementation.

### **Strengthen professional capacity, experience, familiarity and motivation**

Recommendations for SFNE coordinating and training institutions:

- Conduct a capacity needs assessment for SFNE through the system, taking into account the various dimensions of capacity (enabling environment, organizational and individual).
- Promote multilevel capacity development strategies and explore opportunities to simultaneously address the development of capacities across various key groups.
- Establish capacity standards and identify gaps (through an assessment of learning needs) for priority groups that influence SFNE processes, recognizing the time and practice required to achieve competence.
- Develop professional capacities where most needed (for example in curriculum development, learning programme design, materials production, formative research and evaluation, and/or educational administration) through pre-service and in-service training and certification (where feasible).
- Prioritize on-the-job learning, reinforced with formal input, mentoring, and monitoring and evaluation, all of which should be shared with colleagues and

supervisors. Use an ongoing experiential learning cycle (i.e. action, experience, reflection and action).

- In all fields, aim to build capacity at two levels: basic technical know-how and skills (including mentoring, leadership, communication and advocacy skills).
- Elevate the status of SFNE (for example, with incentives, career points, certification, further training, job mobility and media exposure).
- Use SFNE training materials as a tool for teacher education: to provide practice, briefings, advice and encouragement, as well as tips on classroom management.

### **Design effective curricula and learning programmes**

Recommendations for curriculum developers, programme planners and ministry staff, including as grouped by SFNE system processes: situation analysis, capacity assessment, advocacy, policy formulation/revision, formative research/learning needs analysis, identification/formulation of target competences, curriculum development, learning programme/course design, learning materials development, capacity development, implementation in schools, and monitoring and evaluation.

In general, all task forces within the system need to be concerned with:

- agreeing on a shared concept of SFNE and on a learning model;
- taking steps to promote the model and build capacity with colleagues and stakeholders throughout the processes, with an aim to review and improve it;
- assessing the existing school situation and the outlooks and needs of the main participants in relation to their own tasks (for example, practices, expectations, attitudes, resources and capacity, as well as their own food practices and beliefs);
- checking that essential policies, capacities, guidelines and documents are in place, coherent and coordinated, and that their terms of reference are clear and achievable;
- assessing the capacity of the task force and identifying where it needs to be reinforced;
- ensuring readiness along the line among the related departments;
- arranging to consult and collaborate with related task forces, services, stakeholders and end-users when planning, developing, piloting and following up innovations;
- assembling an accessible living archive of relevant evidence, models and materials that are linked or relevant to the given task;
- producing, publicizing and promoting products for several audiences and uses;
- field-testing the outputs, revising and reviewing regularly; and
- if possible, establishing regular monitoring and evaluation (both formal and informal), including assessment of participant interest and support.

The task force on learning needs analysis should:

- carry out some form of learning needs analysis (including formative research, consultation and literature review) to explore practices and outlooks which contribute to food and nutrition issues and the influences on them; and
- formulate priority competences and identify the educational, social and environmental supports which will move classroom learning into action.

The task force on curriculum development should aim to develop curriculum documents which:

- include needs-based, action-oriented target and support competences, scope-and-sequence charts through all age-groups, indicators of progress, briefings for practitioners on needs and learning approaches, recommended social and environmental supports, notes on prerequisite knowledge and concepts, and essential vocabulary for each target competence;
- aim for acceptability, feasibility, visibility and ease of application; and
- can be used for a range of purposes with a range of users.

The task force on learning programme design should:

- agree on a working model of SFNE learning for the task in hand, which includes the main phases of learning and the balance of these phases (e.g. motivation and action); “owned” progress towards food competence; the core inputs and activities; a range of social and environmental supports; children’s interactions with their environments; and assessment of outcomes.
- agree on and ensure alignment across the unit plan, lesson format and format of teachers’ notes;
- draft learning activities that:
  - are “fit for purpose”, i.e. help to achieve the target competences and at the same time shape them to the context (group, age, interest);
  - include homework and/or “outside activities” that develop competences by engaging with real-life environments;
  - link to the school environment; and
  - make good use of stories to enlarge experience and perception.
- if full learning materials cannot be developed, suggest low-cost strategies for enabling classes to create home-made materials, display information and present individual work, including for use beyond and outside school; and
- test sample learning programmes in schools, with a view to improving both the programmes and the model.

### **Plan and manage change**

Recommendations for ministry staff, SFNE coordinating institutions and all SFNE players:

- Plan change across the board both vertically and horizontally. A successful paradigm change for SFNE depends on interconnected change across all units of the education system (vertically), and across elements of the system as linked to outside groups (horizontally), together with a focus on shared concepts and coordination. Whatever the task, engage the participation and interest of other stakeholders, sectors and groups through briefings, advocacy, consultation and feedback.
- Take account of inherent limitations. For example:
  - be cautious about transferring successful but expensive strategies from high-income countries (HICs);

- build in scoping, long time frames and step-by-step progress;
- reduce costs for sustainability (for instance, through regional collaboration on curricula, demonstration videos with brief handouts instead of books, etc.);
- make use of free learning resources and capacities (for example, children's talents, teachers' classroom management capacities, skills in the home and community, and food environments and school gardens that can function as living laboratories).
- Plan interventions that factor in the requirements of successful paradigm change in terms of scope and quantity, pace, context, motivation and practice. For example, find easy entry and growth points, start small to show what can be done and to build confidence, go for high quality and high visibility, involve all levels of the system, and establish feedback and consultation mechanisms.

### **Recommendations for international action**

A framework for international action may include these measures:

- Conduct evidence-based advocacy on the need for making effective and context-based SFNE a priority in school systems, and for making SFNE available to all schoolchildren and adolescents, independent of age and grade. Discuss, agree and publicize a manifesto for SFNE.
- Seek strategic partnerships and collaborations to raise global visibility on the importance of SFNE for sustainable development, and to promote investment in effective and multicomponent approaches featuring SFNE. Liaise with other sectors and initiatives in behaviour change, nutrition education and school health.
- Develop and disseminate guidance documents that establish the essential elements of an effective SFNE learning model to deliver real and lasting changes in food practices and outlooks.
- Create or host workshops and training on policy, curriculum development, teaching, materials production, teacher education, evaluation and evaluation frameworks.
- Develop and maintain a global online platform and repository for SFNE (including examples and models of policies, training courses, formative research protocols, curricula, learning materials, evaluation instruments, checklists, guidelines, etc.) that can link to ongoing SFNE programmes and events, as well as associations and organizations that work in SFNE.
- Publish SFNE good practices and lessons learned and disseminate them to the international community through all appropriate channels and media.
- Promote evidence generation on the cost-effectiveness and sustainability of SFNE programmes and policies, and create/share a database of evidence for advocacy.
- Promote the integration of a food systems lens for SFNE (i.e. beyond personal diet and according to country and local contexts).
- Adopt/adapt professional competences in consultation with professional bodies.

# SUPPLEMENTS FOR THEME 2: EDUCATION– ENVIRONMENT LINKAGES

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## Supplement 2.1. Promoting a healthy school food environment: school-level actions

A healthy school food environment allows and encourages the school community (including students, families, foodservice and school staff) to make food choices that are consistent with better diets and improved well-being.

Though not exhaustive, this list below features a variety of actions that can be taken at school level to improve the school food environment. The actions proposed do not involve legislation, regulation, or other policies enacted at national or state level (such as bans on the marketing of highly processed foods, regulations on the sale of foods on school grounds, and nutrition standards and guidelines for school meals – or for school food in general); nor actions to promote physical activity. They do however range from low-cost to resource-intensive, and therefore depend on the context, priorities and possibilities of each school.

### Local school food environment policy

- The school has an established health and nutrition philosophy or vision.
- The school has a food environment policy (which includes a vision, goal, strategies and actions) that is actively and widely promoted.
- A school committee, (including representatives from school and foodservice staff, students, parents, teachers and others), is in place to routinely discuss policy implementation, monitoring and improvement.
- School food and nutrition is regularly on the agenda of parent–teacher committees.

### School food

- Served school meals follow national/federal nutrition guidelines and standards (if any).
- School meal menus are always on display.
- Information about the nutritional content, sources and preparation of school meals is supplied to the school management and teaching staff.
- Efforts are in place to support the nutrition needs and habits of vulnerable children (including for example, indigenous peoples, children with disabilities and children with food allergies).

- Students have a regular meal schedule and enough time to eat their meals.
- Canteens/cafeterias and tuck shops sell foods according to national/federal nutrition regulations (if any).
- Canteens/cafeterias use simple nudges and other behavioural techniques to promote healthy foods and discourage highly processed products.
- Recommendations on healthy lunchboxes are available and well-known to parents.
- Vending machines that do not offer nutritious options are not allowed on school premises.
- Recommendations on healthy foods are developed for school events, fairs, open days, bake sales / fundraising, sports events and staff meetings.
- Food vendors have guidelines on healthy school food promotion.
- Food waste is regularly tracked, quantified and classified.

### School gardens

- School gardens are set up with a primary pedagogic focus linked to the SFNE curriculum.
- School gardens are well tended and maintained year-round without overburdening students and teachers.
- If existing school gardens are productive, the produce should be used primarily to increase students' dietary diversity.

### Information, marketing and promotion

- Nutrition information about food available in the school is on display and easy to understand.
- Information, education and communication materials on healthy diets and national food-based dietary guidelines (if any) are displayed and promoted across the school premises (for example, on classroom walls, hallways and meal areas).
- No materials promoting and marketing highly processed food are displayed anywhere on school premises (including in cafeterias, canteens, tuck shops and kiosks).
- School awareness and communication campaigns routinely promote healthy diets.
- Rules regulating event sponsorship (including product placement, promotion and the marketing of highly processed foods) are developed and enforced.

### Health and sanitation

- Safe drinking water is available throughout the school premises.
- School grounds and facilities are hygienic (for example, in terms of waste disposal, washing and eating facilities).
- The school has established rules and routines on hygiene and sanitation.

### Other

- Food-related workshops, study tours and/or field trips are planned whenever

possible to support the promotion of healthy and sustainable diets.

- Nutritious local and traditional foods and meals are promoted through school events, meetings, study tours and field trips.
- Foods are not used as rewards, incentives or punishment under any circumstances.
- School health services routinely promote healthy diets.
- Model food practices and behaviours (in both students and school staff) are recognized and celebrated.
- Student enrolment packages include information and guidance on healthy diets.

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## Supplement 2.2. Integrating school-based food and nutrition education with nutrition/nutrition-sensitive interventions

When it comes to school-based interventions such as school meal programmes, micronutrient supplementation initiatives and other health programmes, food and nutrition education is often mentioned in the documentation, but is usually not delivered or is treated quite separately from the non-educational programme. In addition, there are many nutrition- or food-oriented community, local or national interventions which could benefit from a school component, but do not (see Box S2.2.1).

### Box S2.2.1. Food and nutrition interventions that are relevant to schools: examples

Interventions that are school-based, but not necessarily inclusive of food and nutrition education:

- Micronutrient supplementation initiatives
- Deworming initiatives
- Malaria prevention programmes
- Water, sanitation and hygiene (WASH) programmes
- School programmes focusing on physical activity
- School meal programmes
- School garden programmes

Interventions that are community-based (with or without education), but not generally involved with schools:

- Community home gardening
- Infant and young child feeding (IYCF) and maternal, newborn and child health (MNCH) interventions
- Public promotion of biofortified foods (such as golden rice)
- Fish management promotion
- Local value chain development

Public food education programmes or initiatives that are sometimes involved with schools:

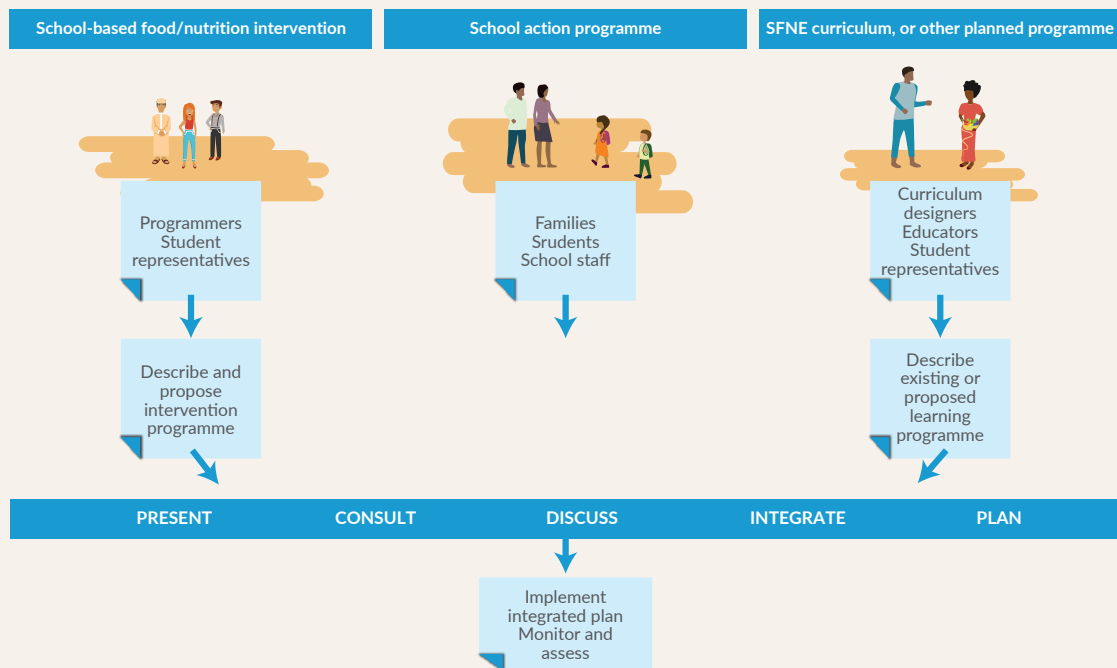
- Implementation of food-based dietary guidelines (see FAO, 2018)
- Public health campaigns (such as those related to iodized salt and 5-a-day fruit and vegetable consumption)

### Education–environment interactions

Emerging evidence from the fields of social protection, horticulture, IYCF and community development, supported by education theory, suggests that interactions between educational and environmental interventions can be reciprocally beneficial; i.e. that food and nutrition education (FNE) can magnify the impact of non-educational interventions (see Theme 1); and conversely, environmental interventions have the potential to enhance educational effects (see Theme 2).

For schools however, there is little evidence that this potential synergy is being exploited. Direct interaction is seldom envisaged or programmed, and combined impact is seldom assessed. For instance, children may receive school meals without learning much from them, or they may receive lessons for a balanced and varied diet without being able to put them into practice.

**Figure S2.2.1.**  
Planning integrated interventions



## Planning integrated interventions

A process is needed, such that SFNE and non-educational interventions can be integrated in a methodical way, and observations can be made about the relative impact of stand-alone and integrated interventions. A simplified possible approach for such a process is illustrated in Figure S2.2.1, and in the following steps:

1. Managers or programmers describe the non-educational intervention, including its framework, operating agencies, aims, timing, target groups, background research, rationale, strategies and assumptions, activities, costs, inputs and monitoring and evaluation procedures (see Schedule A).
2. Educational programme designers / educators describe the existing SFNE learning programme in the national curriculum / extracurricular agenda, or propose one to operate alongside the non-educational intervention (see Schedule B).
3. The two groups discuss how the programmes can interact, and consult stakeholders.
4. They agree on amendments to the two programmes.
5. Together with evaluators / researchers, they decide how to assess different treatment conditions, selecting from four possible approaches: intervention alone, education alone, the two together, or no intervention. Practical and ethical considerations may also play a part in this decision.
6. They schedule the interaction, and arrange monitoring and evaluation.

## Example: iron supplements for adolescents

### Schedule A: information on the nutrition intervention

Programme or project managers complete Schedule A with simplified information about the intervention, calling on concept notes, project documents, reports, and so on. At present the intervention has a small nutrition education component, but is not integrated with the school's nutrition and health learning programmes.



Table S2.2.1. Schedule A

<b>Type of intervention</b>	<b>Nutrition intervention (with small education element)</b> Weekly iron supplements, annual deworming and monthly nutrition education.
<b>Framework of intervention (policy, history)</b>	Nationwide programme, scaled up in stages.
<b>Leading and collaborating institutions</b>	Ministry of Health, Ministry of Education and Social Welfare Ministry, assisted by UNICEF.
<b>Aims</b>	To reach adolescent girls and boys with services to prevent anaemia.
<b>Target groups and related groups</b>	<ul style="list-style-type: none"> <li>• Adolescent girls and boys (10–19 years)</li> <li>• Student councils</li> <li>• Parent representatives</li> <li>• Teachers and school management</li> <li>• Health services</li> <li>• Community</li> </ul>
<b>Background information required and questions to ask (situation analysis, formative research and baselines)</b>	National survey showing endemic anaemia among adolescents, partly as a result of a mostly vegetarian diet. The resulting effects pose risks to different age groups at different points in the life cycle, in particular pregnancy and childbirth. A positive deviance study shows that good preventive practices do exist in high-risk groups, but that these are sparse and inconsistent.
<b>Rationale</b>	Regular intake of iron and folic acid supplements has been demonstrated to reduce adolescent anaemia.
<b>Strategy (e.g. logic model, principles/assumptions, duration, etc.)</b>	The programme will be effective in reducing anaemia if it focuses on areas of high anaemia prevalence, uses the school as a platform, and is supported with an education component.
<b>Training</b>	<ul style="list-style-type: none"> <li>• Head teachers (for sensitization and buy-in to the programme).</li> <li>• Teachers (trained at the start of the programme, with the aim of institutionalizing teacher education in pre-service and in-service curricula).</li> </ul>
<b>Activities (e.g. who, what, where, when and how often)</b>	Posters and leaflets are made available in schools. Students receive a monthly lesson, and line up in the playground to receive a weekly iron folic acid tablet. Some are interviewed about how they feel after taking the tablets.
<b>Results</b>	<ul style="list-style-type: none"> <li>• Blood test (sampling) shows increased levels of haemoglobin.</li> <li>• Student attendance improves.</li> <li>• There are other, more qualitative improvements among students (they are less tired, play more games, and are brighter and more responsive in class).</li> </ul>

Sources: Based on an Indian Government programme for anaemia prevention in adolescents, supported by UNICEF (see UNICEF, 2018 and WHO, 2018).

### Schedule B: information on anaemia education and healthy diets

Educators / curriculum / learning programme designers complete Schedule B with simplified information about the existing or proposed school learning programme on anaemia and healthy diets. At present the programme is not integrated with the nutrition intervention.

Table S2.2.2. Schedule B

Type of intervention	Relevant SFNE learning programme
	Competence-based programme, oriented to action outcomes.
<b>Framework of intervention</b>	School curriculum/programme and learning materials.
<b>Leading and collaborating institutions</b>	Ministry of Education, Ministry of Health and UNICEF, along with Ministry of Agriculture (where schools have direct links with food production).
<b>Aims (food practices and outlooks)</b>  (It is assumed that food and supplements complement each other.)	<ol style="list-style-type: none"> <li>1. Recognize the importance of a healthy diet, including iron-rich foods for energy, long-term health, safer pregnancies and child nutrition.</li> <li>2. Apply learning on healthy diets to the self, family and friends; perceive risks; recognize symptoms of anaemia in oneself or in others.</li> <li>3. Assess variety in own and others' diets, including sources of iron, such as animal source foods (ASFs), other iron-rich foods and supplements.</li> <li>4. Take action to increase consumption of iron-rich foods.</li> </ol>
<b>Target groups, related groups and roles</b>	<ul style="list-style-type: none"> <li>• Students / peers / student councils, as sources of information / experience / discussion.</li> <li>• Parents, as sources of information/experience and support for students' actions.</li> <li>• Teachers, as sources of experience and as managers of learning activities.</li> <li>• Health workers, as sources of information and case studies.</li> </ul>
<b>Influences on existing practices</b>	Little belief in the need for iron in the diet among families, communities and professionals (including health workers and teachers).
<b>Strategy (logic, principles/assumptions, duration)</b>	Assumptions: to be effective, learning through SFNE needs to be motivated, action-oriented, owned and shared, experiential, incremental and context-specific (see also SFNE Principles below).
<b>Activities (who, what, where, when and how often)</b>	See Box S2.2.2.
<b>Results and assessment</b>	Expected results reflect the aims.  Assessment: self- and peer-assessment, scholastic work, self-reporting and comments or feedback from families.
<b>Some SFNE principles</b>	<ul style="list-style-type: none"> <li>• The education programme aims at all the main groups involved (including students, teachers and parents) and at the interactions between them.</li> <li>• It focuses on what participants <i>do</i> and <i>perceive</i>.</li> <li>• It starts from participants' current knowledge, perceptions and practices.</li> <li>• Learners are involved in active exploration, observation and experience in their own environments (e.g. through stories, cases, discussions with neighbours, mothers and clinics).</li> <li>• Learners' decisions drive their independent action in real-life settings. They self-monitor, and can explain their decisions to others.</li> <li>• Learners try out and experiment with target practices; they troubleshoot, reflect, get and give feedback and assess progress. They discuss, share, pass on and help to shape social norms.</li> </ul>

Sources: Assembled from several sources, including FANTA and World Association of Girl Guides and Girl Scouts, 2007.

### Box S2.2.2. Existing learning programme on anaemia (not integrated with the nutrition intervention)

The programme is part of the curriculum topic area "Healthy Eating", and addresses students directly. It takes 4–5 lessons, along with several "outside activities" (i.e. observations and enquiries as homework).

Make a little booklet to keep a record of what you do: Cut six sheets of paper in two and staple together. Put your name on the front and choose a title for your booklet. As you proceed, your teacher will give you a title for each new section or part.

#### Motivation and understanding

- *Part 1: Why does iron matter?* Learn about causes, symptoms and risks of anaemia, and the need to avoid it – ask your family and others what they do and think. Gather stories/cases, share and discuss in class.
- *Part 2: How does this affect us?* Ask the following of yourself and of others:
  - a. Do you think you are or have been anaemic? (Can you find out your status?)
  - b. Do you have any of the symptoms of anaemia now (such as fatigue, difficulty with learning or pale skin on the inside of your eyelids)?

#### Action phase

- *Part 3: What are the solutions?*
  - a. Maintaining a healthy, iron- and micronutrient-rich diet (including through school meals);
  - b. Iron and folic acid supplements; and
  - c. handwashing and hygiene.
- *Part 4: Which foods?* Find out which animal source and plant source foods are rich in iron and which foods are rich in vitamin C (as this is required with some iron-rich foods). Make two class lists / wall charts, with examples of tasty but inexpensive meals and snacks that include either or both. Prepare some of these, and share or tell your friends about them.
- *Part 5: What to do?* Decide what you would like to eat regularly (considering what is available), to make sure you always get enough iron. Discuss how it can be managed (for example, by involving your parents, or cooking for yourselves if possible).
- *Part 6: Try it out (with a friend).* Keep track of each other's progress, and report back to the class.

#### Follow-up and sharing

- *Part 7: Share what you have done.* Share your own record book (for example, by presenting to groups in school, showing family/neighbours, having a competition, getting mentioned in the local paper along with photos, and so on).
- *Part 8: What does the world need to know about iron and anaemia?* Design posters or create/choose messages to display at school and at home. Practise explaining them (choose your audience), and report back.

### Discussion, suggestions and agreement

Intervention managers, learning programme designers, evaluators and school educators meet to discuss, clarify and adapt their existing programmes and produce a joint monitoring and evaluation plan. They agree to:

- aim at success for both programmes, in the long as well as the short term;
- consult before, during and after – with students, parents and teachers;
- adapt to different contexts and to individual situations;

- keep costs (both in terms of time and effort) low and sustainable;
- minimize any extra burden on teachers and implementers; and
- evaluate differential impacts (intervention with and without education, in the first phase).

Several comments and suggestions are shared during the discussion, in particular, regarding changes to the supplementation programme to better encourage understanding, motivation and compliance:

- The supplementation programme fits well with the education programme, as one of two complementary routes to increasing iron consumption. Educationally, it can extend students' experiential learning to encompass individual experiences on the effect of the supplements, and contribute to understanding among adolescent girls on good practices and routines to keep in mind for the future, in terms of pregnancy and child-rearing. These can be reinforced in the learning programme through links with the outside world (such as clinics, community members and families) and class discussion.
- The joint programme could take the opportunity to spread the word in homes and in the community, for example through specific homework on discussions and parent participation.
- Local health centres could be briefed on both programmes, and consulted on how they might be involved, for example in advising or managing adverse tablet effects.
- The supplementation programme could also frame tablet-taking educationally, as a self-imposed discipline (i.e. basic patient training), and build up the social and motivational dimension. This would require changing the weekly dispensing activity from the existing line-up or queue approach to a more "adult" approach, with a more social format, more opportunities for self-initiated choice, self-monitoring, intrinsic interest and peer support. Some possibilities to discuss include:
  - Having the process of dispensing supplements take place in an actual, visible, and social circle on the school grounds each week, as a short group meeting enlivened with simple activities, such as recycling stories and pictures from the lessons, running quizzes created by the students on the poster or leaflet, comparing notes on the experience, explaining the importance of compliance and introducing foods or iron-rich snacks prepared at home. Such activities can eventually be led by programme "graduates", and parents can be invited to attend and participate.
  - Ensuring the process of taking the supplements is "owned" through some deliberate action, a trace of ceremony and a means of keeping track. For example the pills can be handed out by the students themselves or distributed in small groups. To keep track, students could tick off dates on personal cards, make entries in personal notebooks or sign up on a classroom or school poster.
- There should be a clear sense of reward for successfully completing the course, for example by publicizing achievements and benefits. This could be supported by conducting blood tests before and after (if not possible, other indicators such as attendance may be used).
- If the programme is repeated annually, programme graduates can promote the programme among new students and help with the facilitation of new groups.

Any of the above suggestions could be supported through classroom activities.



### Schedule C: a new, integrated learning programme

Through the process of integration, the learning programme is improved (as indicated in Table S2.2.3 by text in red) to accommodate the supplementation programme.

Table S2.2.3. Schedule C

<b>Type of intervention</b>	Relevant SFNE learning programme (revised) Competence-based programme, oriented to action outcomes.
<b>Framework of intervention</b>	School curriculum/programme and learning materials.
<b>Leading and collaborating institutions</b>	Ministry of Education, Ministry of Health and UNICEF, along with Ministry of Agriculture (where schools have direct links with food production).
<b>Aims (food practices and outlooks)</b>  (It is assumed that food and supplements complement each other.)	<ol style="list-style-type: none"> <li>1. Recognize the importance of a healthy diet, including iron-rich foods for energy, long-term health, safer pregnancies and child nutrition.</li> <li>2. Apply learning on healthy diets to the self, family and friends; perceive risks; recognize symptoms of anaemia in oneself or in others.</li> <li>3. Assess variety in own and others' diets, including sources of iron such as ASFs, other iron-rich foods and supplements.</li> <li>4. Take action to increase consumption of iron-rich foods.</li> <li>5. Keep track of iron folic acid tablet intake in school, monitor own response at intervals over two months and report on effects.</li> <li>6. Decide how to deal with intolerances / side effects (see Kheirouri and Alizadeh, 2014).</li> <li>7. Get advice and decide on a personal "iron plan" for the future – for example, to keep taking tablets, get tested regularly, and so on.</li> <li>8. Get familiar with the local health system including understanding how to get tested for anaemia, identifying iron supplements and knowing what to take, how often and for how long.</li> </ol>
<b>Target groups, related groups and roles</b>	<ul style="list-style-type: none"> <li>• Students / peers / student councils, as sources of information / experience / discussion.</li> <li>• Parents, as sources of information/experience and support for students' actions.</li> <li>• Teachers, as sources of experience and as managers of learning activities.</li> <li>• Health workers, as sources of information and case histories.</li> </ul>
<b>Influences on existing practices</b>	<p>Little belief in the need for iron in the diet among families, communities and professionals (including health workers and teachers).</p> <p>Community outlooks on iron folic acid supplements, including potential myths and misconceptions.</p>
<b>Strategy (logic, principles/ assumptions, duration)</b>	Assumptions: to be effective, learning through SFNE needs to be motivated, action-oriented, owned and shared, experiential, incremental and context-specific.
<b>Activities (who, what, where, when and how often)</b>	See Box S2.2.3.
<b>Results and assessment</b>	<p>Expected results reflect the aims.</p> <p>Assessment: self- and peer-assessment, scholastic work, self-reporting and comments or feedback from families.</p>

### Box S2.2.3. New learning programme on anaemia (now integrated with the nutrition intervention, as indicated by text in red)

The programme is part of the curriculum topic area "Healthy Eating", and addresses students directly. It takes 6–7 lessons, along with several "outside activities" (i.e. observations and enquiries as homework).

Make a little booklet to keep a record of what you do: Cut six sheets of paper in two and staple together. Put your name on the front and choose a title for your booklet. As you proceed, your teacher will give you a title for each new section or part.

#### Motivation and understanding

- *Part 1: Why does iron matter?* Learn about causes, symptoms and risks of anaemia, and the need to avoid it – ask your family and others what they do and think. Gather stories/cases, share and discuss in class.
- *Part 2: What do mothers think?* Talk to a mother or a pregnant woman that you know. Find out what they did/do about iron – gather responses, discuss in class and decide what is the best strategy.
- *Part 3: How does this affect us?* Ask the following of yourself and of others:
  - a. Do you think you are or have been anaemic? (Can you find out your status?)
  - b. Do you have any of the symptoms of anaemia now (such as fatigue, difficulty with learning or pale skin on the inside of your eyelids)?

#### Action phase

- *Part 4: What are the solutions?*
  - a. Maintaining a healthy, iron-rich diet (including through school meals);
  - b. iron supplements; and
  - c. handwashing and hygiene.
- *Part 5: Display the poster.* Students explain the poster to each other, ask questions to clarify, quiz each other on the content, and make rough copies to take home and explain to friends and family, rehearsing explanations beforehand.
- *Part 6: Which foods?* Find out which animal source and plant source foods are rich in iron and which foods are rich in vitamin C (as this is required with some iron-rich foods). Make two class lists / wall charts, with examples of tasty but inexpensive dishes and snacks that include either or both. Prepare some of these, and share or tell your friends about them.
- *Part 7: What to do?* Decide what you would like to eat regularly (considering what is available), to make sure you always get enough iron. Discuss how it can be managed (for example, by involving your parents, or cooking for yourselves if possible).
- *Part 8: Try it out (with a friend).* Keep track of each other's progress, and report back to the class.
- *Part 9: What is it like to take supplements?* Try the course of iron folic acid tablets provided in the school (over a determined period), keep track of your intake, monitor your own response at intervals (for example, by checking for periods of fatigue, or pale skin on the inside of your lower eyelid), note whether you can feel any side effects, and check with health professionals, family and friends.
- *Part 10: Plan your future.* As the final entry in your personal record booklet, discuss and write up your "iron plan" for the future.

#### Follow-up and sharing

- *Part 11: Share what you have done.* Share your own record book (for example, by presenting to groups in school, showing to family/neighbours, having a competition, getting mentioned in the local paper along with photos, and so on).
- *Part 12: What does the world need to know about iron?* Design posters or create/choose messages to display at school and at home. Practise explaining them (choose your audience), and report back.





## References

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# SUPPLEMENTS FOR THEME 3: COMPETENCES IN CONTEXT

## Supplement 3.1. Support competences: a checklist

The following table reflects a range of actions and attitudes that come into play in the process of changing practices, along with several specific examples. They are divided into *motivation for action* (e.g. enjoying nutritious foods), *action for change* (e.g. making decisions), and *specific skills* (e.g. cooking). For instance, to establish the habit or practice of consuming nutritious snacks (as opposed to sugary snacks), children might need to sample different kinds of nutritious snacks, decide which ones to incorporate into their diet or routine, and possibly learn to (or help to) prepare them. The table can serve as an aid to building learning programmes to achieve target competences.

**Table S3.1.1.** Checklist of support competences

Support competences	Related activities/examples
<b>Area of motivation for action</b>	
<p><b>Perception, understanding, knowledge, belief, experience, feeling</b></p> <p><i>General:</i></p> <ul style="list-style-type: none"> <li>• Appreciate and enjoy nutritious foods.</li> <li>• Care about healthy eating, food quality and (if relevant to the context) sustainable diets.</li> <li>• Seek, find and share information about food.</li> <li>• Be aware of social norms and influences, and help others to respond to them.</li> <li>• Seek new knowledge and experience through story, observation and enquiry, as well as tasting and trying out new foods and experiences.</li> <li>• “Own” any new knowledge through personal experience, enquiry and the re-telling and sharing of stories.</li> <li>• Build on one’s own existing knowledge/ experience.</li> <li>• Extend one’s learning about food throughout one’s daily or weekly routine (with cooking, gardening, agriculture, nutrition and waste disposal).</li> </ul>	<p><i>General:</i></p> <p>Many activities involve interaction with the home, community and school, getting and sharing information and experience, making decisions and taking action.</p>
<i>In relation to the target competence:</i>	
<p>Describe one’s own existing preferences.</p> <p>Extend one’s range of direct experience, in order to establish new preferences and widen the array of choices.</p>	<p>Say what you enjoy, compare likes and dislikes.</p> <p>Taste, try things out, collect new experiences and share.</p>

<ul style="list-style-type: none"> <li>• Recognize own and others' practices and outlooks, and identify key influences.</li> <li>• Recognize and sample alternative healthy (and sustainable) practices/choices.</li> </ul>	<p>Observe what people do in familiar settings (such as the home, school and community). Ask questions, discover reasons and rationale, interview and share.</p>
<ul style="list-style-type: none"> <li>• Recognize/assess health risks and benefits for the self and for others.</li> <li>• Understand why practices can be health-promoting or not.</li> <li>• Recognize effects on different phases of the life cycle.</li> </ul>	<p>Ask to listen to stories and pass them on, along with cases and examples. See risks in real-life actions and practices. See risks for different household members.</p>
<ul style="list-style-type: none"> <li>• Assess existing practices – both those of the self and of others.</li> <li>• Recognize, value and promote existing good practices.</li> </ul>	<p>Sort healthy from unhealthy practices (both those of the self and of others). Praise good practices in others, such as younger children and peers.</p>
<ul style="list-style-type: none"> <li>• Gain the knowledge, perceptions and concepts that are essential to the task (for example, know local foods).</li> <li>• Understand some basic concepts about diet and health, food safety, the food system, the environment, culture and traditions, and so on.</li> <li>• Increase and share personal knowledge of locally available foods.</li> </ul>	<p>Get familiar with local foods and prices. Estimate food value for money. Know the food groups, food functions and elements of a good diet. Gather and share information on locally available foods.</p>
<b>Area of action for change</b>	
<p><b>Practice, management, maintenance and sharing / passing on</b></p> <p><i>General:</i></p> <ul style="list-style-type: none"> <li>• Convert motivations into real-life action.</li> <li>• “Own” action programmes through personal decisions and acquired expertise.</li> <li>• Develop confidence in one’s own capacity to change.</li> <li>• Build on own existing practices / skills / habits.</li> <li>• Adapt actions to one’s own context, needs and circumstances.</li> <li>• Recognize general/personal challenges to change.</li> <li>• Share experience and pass on expertise.</li> </ul>	<p><i>General:</i></p> <p><i>The action programme moves through deciding what can be achieved and how, making choices, trying out and practising, and finally assessing success and passing on acquired practices.</i></p>
<b>In relation to the target competence:</b>	
<ul style="list-style-type: none"> <li>• Explore the scope for change through experience.</li> <li>• Assess obstacles to change (e.g. time, resources, taste and convenience).</li> <li>• Identify practical possibilities for change.</li> <li>• Set realistic targets.</li> </ul>	<p>Experiment with change. Ask around, find, grow, prepare and seek new sources. Discuss realistic improvements.</p>

<ul style="list-style-type: none"> <li>• Select action options.</li> <li>• Plan for small changes.</li> <li>• Get support, find out other people's opinions.</li> <li>• Manage personal actions. (For example, when actually starting a new practice, decide when and where and how much to do on a day-to-day basis.)</li> </ul>	<p>Decide what to do, for how long, when and where.</p> <p>Choose attractive and manageable action options.</p> <p>Tie changes to existing habits, routines and times.</p> <p>Make both individual and group choices.</p>
<ul style="list-style-type: none"> <li>• Practise over a period.</li> <li>• Share experience, report and discuss.</li> <li>• Get feedback and troubleshoot.</li> <li>• Take control and gain confidence.</li> <li>• Keep track of progress, compare experiences, share and report.</li> <li>• Develop and maintain habits.</li> <li>• Assess progress and celebrate.</li> <li>• Sum up and predict/plan future actions.</li> <li>• Publicize, present, promote and pass on.</li> </ul>	<p><i>Activities will depend on age. They may range from small undertakings over short periods of time, to longer processes for achieving personal goals; from monitoring progress through counts and tallies, to keeping food diaries; from acting for oneself, to taking action for the school, community and beyond.</i></p>
<b>Skills area</b>	
<p><b>Practical, scholastic, cognitive, communication and life skills</b></p> <p><b>General:</b></p> <p>"Own" acquired expertise by gaining and strengthening skills, through peer recognition and by helping others.</p>	<p>Choose a food to "adopt" and become an expert on it; share your expertise with classmates and learn likewise from the expertise they share on their chosen foods.</p> <p>Share and demonstrate your cooking expertise with classmates and peers, and offer to teach each other.</p>
<p><b>Practical:</b></p> <ul style="list-style-type: none"> <li>• Practise smart shopping, budgeting, food preparation and preservation, as well as growing food, classifying and managing food waste and so on.</li> </ul>	<p>Help with household shopping, first discussing what's to be bought and why.</p> <p>Raise trial vegetables, plan how to prepare and consume them, save seeds.</p> <p>Make and promote sun-dried fruits.</p>
<p><b>Scholastic and cognitive:</b></p> <ul style="list-style-type: none"> <li>• Build and practise skills in literacy, numeracy, comprehension (including oral and written), observation, analysis, critical thinking, assessing evidence, and so on.</li> </ul>	<p>Enquire into the costs of various cooking fuels (in terms of time, money, impacts on health and convenience).</p> <p>Use food labels to read and calculate the nutritional value of products.</p> <p>Observe actions and processes related to food safety both at home and outdoors (for example, with street food), and report accordingly.</p> <p>Collect and analyse food posters and advertisements from TV and social media.</p>



<p><b>Communicative:</b></p> <ul style="list-style-type: none"> <li>• Ask, find out, interview and exchange information.</li> <li>• Learn from one's community, family and peers.</li> <li>• Explain, describe and present.</li> <li>• Locate reliable information sources, use and share them with others.</li> <li>• Keep notes and records, capture and report on observations and learning.</li> <li>• Demonstrate, describe or show how things are done and raise awareness in others.</li> <li>• Engage in critical analysis (of advertising, advice and myths).</li> </ul>	<p>Search for and find reliable sources for food information online.</p> <p>Interview others on their daily diets and food practices.</p> <p>Find out the ingredients in school meals.</p> <p>Find out from market vendors where their goods come from, how far away it is, and how they are transported.</p> <p>Present and promote nutritious foods and dishes to classmates for open days or on other occasions.</p> <p>Train and monitor younger children in handwashing.</p>
<p><b>Life skills:</b></p> <ul style="list-style-type: none"> <li>• Build and practise skills in empathy and encouragement, collaboration, social interaction, planning, self-management, self-efficacy/ confidence and reflection.</li> </ul>	<p>Engage in teamwork for producing and marketing a food.</p> <p>Get and give support in changing a food habit.</p> <p>Ask for information/opinions politely and say thank you.</p> <p>Make new food habits attractive.</p> <p>Take change slowly.</p> <p>Make sensible decisions about what can be done.</p>

## Supplement 3.2. School-based food and nutrition education learning needs analysis and formative research

### Learning needs analysis: identifying required competences

Learning needs may be defined partly in terms of topic coverage, but when real-life capacities are the aim, a learning needs analysis should also identify the specific competences to be achieved. To do this, as outlined in Theme 3, the analysis should explore the existing practices, outlooks, skills and knowledge of priority groups, including what influences them and what will help to promote change. The process is much the same for any action-oriented learning framework, although the specific competences are different: for example, a school-based food and nutrition education (SFNE) learning needs analysis might look at the capacities needed by writers designing effective learning materials and by teachers organizing purposeful activities, as well as by children choosing nutritious snacks or helping with home cooking. These kinds of enquiry are often known as formative research because they help to design or “form” learning programmes (see Theme 8).

This supplement is concerned with the frameworks available for exploring the outlooks and practices of children, adolescents and their families, to indicate the learning needs to be tackled in school.

### What to explore in students’ and families’ practices and outlooks

Generally, a formative enquiry into learning needs considers all aspects of food practices and outlooks at the same time. It may also gather baseline data for assessing progress in an outcome evaluation. Key areas of enquiry include:

- *Practices, chains of practice and trends:* These can apply to diet or other food-related behaviour, the settings and company in which they take place, and students’ roles in the household food cycle, including positive practices that can be promoted (see for example Todela, 2017). Enquiries need to go beyond a narrow focus on knowledge and attitudes alone, on deficits alone (that is, on missing or mistaken practices), or on preconceived expectations of what will be found.
- *Influences on practices:* These can include personal, group and community beliefs, as well as preferences, knowledge and perceptions (including myths) regarding different foods (for example, how foods are regarded and valued); ideas regarding healthy diet (for example, related to content, frequency and quantity) and its value in household and individual food choices; and environmental influences at different levels (for example, levels of food security, household income and food costs; home food production and access to markets and street food; the prevalence of food advertising; school meals, school food vendors and vending machines; school facilities for water, sanitation and hygiene; and so on). The identification and understanding of influences on practices may be undermined by misconceptions, narrow survey designs and poor strategies for exploring mental landscapes. Indeed, many significant influences have been discovered purely by accident or observation – for example, perceptions of status regarding “good food” and “poor people’s food”; motivations related to habit, taste preferences, familiarity and convenience; household control of food practices;

and personal or social histories of dietary change (whether for better or for worse).

- *Possible determinants of change:* These can motivate or maintain improved practices and outlooks, but they can also block them (see for instance Food for the Hungry, 2010). Examples include available resources and facilities; levels of literacy and access to food and nutrition information (including online access); available and attractive alternative practices; family and community support; learners' and families' general or overall hopes, fears, ambitions and motivations, as well as their role models; and learners' and families' leisure activities, social groups, peer practices and spending power.

### Whom to talk to: target groups

Certain kinds of formative research focus on a single target group, but many community interventions explore a network of interacting groups (including families, producers and vendors; see for example Keith *et al.*, 1991). For SFNE in particular, information should be sought from and about several groups, partly because many different groups of people influence children and adolescents, and partly to help triangulate findings (by posing the same questions to different respondents). The immediate circle participants includes children of different ages, parents, teachers, school and foodservice staff, whereas the secondary circle may target local health and social workers, community leaders and local food vendors. Box S3.2.1 describes the protocol for a coordinated enquiry at school or school-district level.

#### Box S3.2.1. Formative research in local schools: multi-target tools

A school-/district-level formative research exercise has parallel questionnaires for children, local health professionals, school managers, parents, teachers, and non-teaching staff, with simple instructions on their use and delivery, on the processing of the data they capture (which is limited to careful counting and tallies) and on collating the responses for discussion by all groups. The enquiry thus garners several points of view on practices, perceptions, knowledge, attitudes and the school environment. Questions cover the following topics:

- nutrition issues, children's diet and ideas of how to improve it;
- children's own food preferences;
- the personal interest of teachers, school staff and parents in issues relating to health and diet, and their views on their own individual diets;
- school health and nutrition policy and actions;
- the perceptions of managers, parents, school staff and children regarding a healthy school environment and school food;
- whole-school health and nutrition activities, parental involvement and the use of community resources;
- the value given to SFNE by teachers and parents;
- SFNE curriculum content and time allocated;
- classroom approaches, preferences and improvements needed (according to teachers, parents and children);
- classroom conditions and teacher morale; and
- teachers' experience and qualifications.

(FAO, 2005)

## Formative research: a range of modalities

Relevant information may come from several sources, such as literature (including reports, research reviews and national data), professional experience, dedicated KAPP studies (focusing on knowledge, attitudes, practices and perceptions) or RRA (rapid rural appraisal) activities, target group profiles and implementation feedback. The following points reflect key considerations regarding the use of such sources:

- *Relevant literature and local professional experience:* These must contribute to findings, but need to be complemented with other sources to avoid over-generalizing across specific contexts and experience.
- *KAPP studies:* As a major instrument of formative research, KAPP is a very elastic category, with a range of possible formats (including surveys, focus group discussions, interviews and observations). KAPP studies can:
  - gather quantitative and qualitative data;
  - make use of a variety of strategies to reveal influences;
  - have international, national or local scope;
  - be carried out by external experts or practitioners (see for example FAO, 2005);
  - explore individual issues and specific groups, as well as more complex combinations involving multiple contexts and groups (see for example Kigaru, *et al.*, 2015; Ruel, Minot and Smith, 2005; Brown *et al.*, 2015); and
  - be conducted either as stand-alone processes (see for example Oogarah-Pratap and Heerah-Booluck, 2005), or as part of specific interventions (see TIPs, n.d.).
- *RRA activities: Rapid rural appraisal activities* (see for example Freudenberger, n.d.; Duraipappah, Roddy and Parry, 2005 and BoxS32.2) are very useful for revealing motivations and influences, and for engaging respondents' knowledge and experience. There are several kinds of RRA activities (including mapping, walk-throughs, diagrams, ranking, demonstrating processes and open questions), many of which are easily adapted for use with children and adolescents.
- *Target group profiles:* Target group profiles are holistic explorations of specific groups' knowledge, practices, attitudes and perceptions, particularly in relation to their cultures and contexts, life goals, motivations, interests and difficulties. They are particularly useful for informing educational approaches (see for example an international survey on adolescents in WFP and Anthrologica, 2018; and a profile of sixth-grade Zambian schoolchildren in Sherman, 2007).
- *Informal formative research as an educational strategy:* Formative research poses questions which, in their simplest form, people naturally ask themselves; for example: What do we do? Who does it? How and why? Can it be done better? If so, how? It can be used in any food and nutrition education (FNE) intervention for awareness-raising enquiries by participants into their own practices – that is, from the point of view of the people being studied rather than from outside.<sup>56</sup> In an SFNE context, such questions are useful a) for structuring learning programmes (see Theme 5); b) as a means of tailoring general findings to fit individual cases; and c) as a source of implementation feedback for improving learning programmes (for example, where information is lacking on local practices).

<sup>56</sup> In the social sciences, this is referred to as an “emic” perspective rather than an “etic” perspective (Kodish *et al.*, 2015).



### Box S3.2.2. Exploring school-based food and nutrition education practices and outlooks through RRA: examples

- *Demonstrating*: Show how you help to fetch, store and use water for the house, how you store staple foods and how you help in cooking meals. Compare methods and discuss best practices.
- *Walk-throughs*: Walk through how and where food contamination can occur. Show how to prevent such contamination.
- *Description and observation*: Describe and explain how you spend pocket money on food each week. Describe fruit trees in the vicinity – how they are used and by whom.
- *Mapping*: Draw a map of the school garden, showing what is grown, when and why. Make a large map showing all local food shops and stalls, noting which are best and why.

### Modalities: criteria for choice

The value of formative research depends on who does it, how well it is done, and for what purpose. It also depends on who uses the findings and how. When choosing formats, protocols and strategies for identifying learning needs, programme and project managers need to consider a range of questions, for example:

- *Is this protocol intended for schools? Can it be adapted?* Many nutrition-related formative research protocols are intended for community work or infant and young child feeding (IYCF), and have to be heavily adapted for schools (see for example SPRING, 2011; Food for the Hungry, 2010; Fautsch and Glasauer, 2014).
- *Does the enquiry cover a range of contexts?* Examples of possible contexts include rural, urban and semi-urban; high-income, middle-income and low-income; and so on. Regional differences should also be considered.
- *What is the technical strength of this strategy?*
  - *Is it valid?* Does it seek the information needed and does it elicit what is required (i.e. content validity)? Does it match an agreed and validated concept of SFNE (i.e. construct validity)? Do the questions and answers concur with other enquiries (i.e. concurrent validity)? Do they make sense to respondents and practitioners (i.e. face validity)?
  - *Is the methodology fail-safe?* Does it go through the necessary processes and make allowances for error (for example, in sampling, pre-testing of questions and observation schedules, training of facilitators, implementing enquiries, collecting, cleaning and processing responses and interpreting the results)? Can the conclusions be relied on? Equally, can the study be published?
- How useful is this exercise for institutions and projects?
  - *Cost*: What are the costs (in time, money and expertise)? Does it involve bringing in outside expertise?
  - *Usability*: Will it produce understandable, relevant findings which can be used by institutions?
  - *Accountability*: Is this exercise needed to explain or justify actions to donors, sponsors or governments?
  - *Scope*: How much useful research can be carried out and effectively applied within

- existing limitations? One question about one practice per year? A gold-standard study across regions, using a range of modalities and participatory approaches?
- *How valuable is this exercise for the end-users? Who learns from the exercise? Who asks and answers the questions? Who shares the findings and who applies them? From an educational perspective, the learning benefits of such studies mainly accrue to those who execute them. But from an ethical perspective, it is unacceptable that studies be carried out on people without at least informing them of the results. For SFNE in particular, and considering the importance of informed engagement from students, parents and teachers to its success, some level of end-user engagement in the process is crucial (Duraiappah, Roddy and Parry, 2005). There are several possible strategies for achieving and maintaining such engagement (especially if applied or used over an extended period), including the use of parallel enquiries at school or community level, presenting and discussing findings in schools, and embedding formative research questions in SFNE learning programmes.*

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## Supplement 3.3. Examples of specific support competences for a target competence: reducing the consumption of sugar sweetened beverages

### Enhancing motivation

#### Discuss the health effects of their food choices

Examples of specific competences:

- For 8-year-olds and younger: Students will be able to list various health benefits to be gained from making water their beverage of choice.
- For 9- to 12-year-olds: Students will be able to compare and contrast the amount of sugar in various sugar-sweetened beverages (SSBs) with the recommended daily maximum for added sugar. (See for example Lesson 3 in Koch and Contento, 2014.)
- For 13- to 18-year-olds: Students will be able to weigh the health risks of regular consumption of SSBs against the short-term pleasure derived from consuming them, and create their own recommendations for SSB consumption. (See for example Lesson 6 in Bhana *et al.*, 2015.)

#### Explain internal and external influences on their food choices

Examples of specific competences:

- For 8-year-olds and younger: Students will be able to discuss how their family, friends, and community influence what beverages are available and what they drink.
- For 9- to 12-year-olds: Students will be able to analyse print advertisements and material/online marketing campaigns for SSBs in their locality, and discuss how these influence consumption.
- For 13- to 18-year-olds: Students will be able to write a persuasive essay on how to resist social and marketing influences on SSB consumption, in order to decrease their own, their friends', and their family's consumption.

### Facilitating action for change

#### Demonstrate understanding, of practical knowledge and skills to obtain, prepare, and eat foods that are health-promoting, ecologically sustainable, and socially just

Examples of specific competences:

- For 8-year-olds and younger: Students will be confident in their knowledge of where to find safe drinking water in their community, and in understanding how adults can assist them in getting safe drinking water.
- For 9- to 12-year-olds: Students will be able to use nutrition labels to compare and contrast sugar content across various SSBs.
- For 13- to 18-year-olds: Students will be able to calculate, for various typical beverage options, how much sugar they would drink in a day, week, month or year, in order to make informed beverage choices.



**Demonstrate the ability to use decision-making and goal-setting skills to make behaviour changes toward health-promoting, ecologically sustainable, and socially just food choices**

Examples of specific competences:

- For 8-year-olds and younger: Students will be able set behaviour change goals to increase water consumption and track progress towards their goals.
- For 9- to 12-year-olds: Students will be able to set a goal involving the selection and consumption of a less sugary beverage alternative to SSBs (with specifics for time of day and days of the week), and track progress towards the goal. (See for example Unit 3 in Koch, Contento and Calabrese, 2016.)
- For 13- to 18-year-olds: Students will be able to describe their decision-making process for choosing smaller serving sizes or for avoiding SSBs in various social situations.

**Creating a supportive environment**

**Demonstrate the ability to advocate for improving the food environment for the family, community and planet**

Examples of specific competences:

- For 8-year-olds and younger: Students will be able to create a campaign focusing on the importance of making water one's beverage of choice.
- For 9- to 12-year-olds: Students will be able to advocate for having low sugar beverages available at home, school events, and community events. (See for example Lesson 5 in Koch and Contento, 2014.)
- For 13- to 18-year-olds: Students will be able to assess how many beverage cans or bottles are wasted by their family, school, and community each month, and write letters to parliament and advocate in other ways for making low sugar beverage choices that create less waste. (For examples, see Unit 5 in Koch, Calabrese and Contento, 2008, and Government of Chile, 2017.)

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# SUPPLEMENTS FOR THEME 4: THE SCHOOL-BASED FOOD AND NUTRITION EDUCATION CURRICULUM

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## Supplement 4.1. Possible curriculum outputs

### Main curriculum document: contents

- *Introduction:* This should set the scene for innovation, with a persuasive and readable rationale that can also be used for advocacy, briefings and teacher education. It should cover national nutrition issues and food practices; the importance of school-based food and nutrition education (SFNE) in aiming to improve practices and outlooks; the possible formats and settings for learning; the aims and expectations of the curriculum (with references to national food-based dietary guidelines, if any); an overview of how it has been developed and laid out; the main assumptions (for example, that children can act for themselves, that learning must be active and grounded in real-life situations and that learning starts from children's own experience) and conditions (including supporting social and physical environments, and the involvement of home and family); and the essential elements of the approach, along with the challenges it presents, for both schools and teachers.
- *Index of topic areas and main competences:* This should illustrate how they develop through the years.
- *Scope-and-sequence charts:* These should cover some or all of the following (see also Supplement 4.4):
  - a rationale for each main competence, showing what practices/outlooks need to change / develop and why, the level of urgency, and the challenges foreseen in translating competences into action;
  - the target competences / expected outcomes, based on known food and nutrition and learning needs, and worded for easy understanding and recognition by teachers, students and parents;
  - the support competences / supporting learning, i.e. the real-life pathway through motivation, action and skills;
  - the prerequisite knowledge, skills and experience, i.e. the grounding for starting each unit;
  - the essential vocabulary and concepts required;
  - specifications on what can be achieved at different ages, with indicators of progress and achievement;
  - the social, environmental and information support needed from families, communities, and schools, as well as food environment actions, and other interventions; and

- sources of further information, including local sources.
- *Curriculum map*: This can consist of a one-page graphic of the main curriculum areas for display, presentation and discussion by all users, and for reference by agencies and policy makers.

### Supplementary documents: motivation, maintenance, promotion and support

- *Curriculum poster / infographic / online resource*: Any or all of these can be displayed in schools/clinics or used as a media handout, for advocacy and for discussion by all.
- *Briefing notes*: These are intended to introduce chapters / learning units in teachers' guides, and should cover food and nutrition issues as relevant to the curriculum, along with the challenges they can present for teachers, teacher educators and advocates.
- *Checklists of environmental elements*: Aimed at schools, teachers and materials writers, these should reflect important features of students' food environments (including street food, markets, restaurants, shops, clubs and schools), and indicate how children and adolescents can interact with them (for example, what to observe, find out about, discuss, imitate, evaluate, react to, learn from, and so on).
- *Guidelines*: These provide guidance to both schools and parents on ways to support target food practices, including for example:
  - a checklist of school food environmental actions and features, and ways to link these to the curriculum (see Supplement 2.1);
  - a sample health and nutrition policy for individual schools (see for example FAO, 2005a); and
  - suggested points for discussion with parents, regarding ways for them to support the learning programme at home, through involvement with learners' homework, sharing and capitalizing on their experience and skills, and so on.
- *Guidelines for school meal services and other agencies*: These should focus on how best to link with the curriculum (see Supplement 2.2).
- *Guidelines for extracurricular activities*: For example, manuals for school gardens (see FAO, 2005b).
- *Online platform*: As a dedicated platform for SFNE, a regularly updated website can serve and support teachers, schools, parents and other contributors, for example by featuring curriculum posters and presentations, learning materials, tips for teachers, advice for parents, data, stories, experiences, achievements and challenges.

### Additional outputs: supporting other working groups in the change process

Curriculum documents and their spin-offs may have a range of end-users and uses. Some of these are listed below, along with appropriate potential outputs for each; these may be developed or produced by other groups or units, either independently or in collaboration.

- *For advocates at any level*: Ideas for using the new curriculum to support both the



content and strategy/planning of advocacy efforts and processes.

- *For teacher education departments, outside agencies and services:* Recommendations for effective pre- and in-service professional training, along with tips; for example on how to use the revised curriculum for classroom practice (these are essential if there are no learning materials), how to adapt old learning materials, how to build capacity through modelling practice, making videos of classroom activities and so on (see Theme 7).
- *For universities, nutrition institutes, or action research groups:* A prioritized list of research gaps and needs.
- *For materials writers, researchers, teacher educators and the education service as a whole:*
  - An online archive of relevant documentation gathered during the review process (including sample curricula, learning materials, studies, guidelines and videos of teaching practice).
  - A cache of illuminating stories, quotations and observations from qualitative enquires or direct experiences, which can enrich school lessons and training materials. Ideally, such a repository could continue to grow, with contributions from schools, teachers, parents and students.
  - Tips for classroom practice and for making good use of the food environment.
- *For practitioners from non-school food and nutrition education (FNE) initiatives involving children, adolescents and families:* Materials, information, ideas and activities for mutual support and reinforcement.

## References

FAO. 2005a. Nutrition education in primary schools: objectives for the school environment. Rome.

FAO. 2005b. Setting up and running a school garden: a manual for teachers, parents and communities. Rome.

## Supplement 4.2. Assessing the existing curriculum: a checklist

This assessment checklist highlights some of the desirable elements to be sought in existing or proposed national school-based food and nutrition education (SFNE) curricula. “Curriculum” here refers to the documents published by the ministry of education, including scope-and-sequence charts (with any notes on principles, criteria, assessment and cross-cutting issues), and any accompanying briefs, guidelines, annexes and checklists.

### Elements, audiences, purposes and uses

The core curriculum package

- includes a rationale for a new, more promising approach to SFNE;
- demonstrates a progressive programme that covers all school years, and recycles and extends learning through all age groups; and
- presents a scope-and-sequence chart which groups and prioritizes main topics and sub-topics, showing the main competences to be achieved in each area, along with key support competences.

The curriculum also:

- recognizes the range of audiences served by the curriculum – including the ministry of health, teacher educators, parents’ associations, teachers, schools, students, non-governmental organizations (NGOs), universities, school meal providers, health services, writers, publishers and civil society – and specify the steps to be taken to consult with them in the process of revision/development;
- recognizes in all its products the diverse levels of expertise, awareness and experience of its different audiences;
- includes, or indicates the need for implementation aids for schools and teachers, teacher educators, materials writers and outside agencies (these can include briefing notes, references to archive materials, guidelines on developing learning programmes and materials, checklists for school environmental actions, guidelines for schools on parent involvement, fliers for parents and protocols for collaboration with outside agencies); and
- produces attractive, easy-to-understand summary versions, for advocacy / display / presentation at several levels (from policy makers to parents and students), to enable all parties to recognize the learning outcomes, understand their importance, and pass on the message.

### Status, coherence and integrity

The curriculum of food and nutrition education

- has a clear and explicit goal or final outcome that drives the proposed changes;
- is included in a subject area to which it is directly relevant (such as health, food or household economics);

- has its own integral learning programme (i.e. it should not be fragmented and dispersed across other school subjects); and
- has enough timetable space, frequency and regularity to allow for progressive development and for action programmes that build up food-related practices and outlooks over time (for example, 1–2 hours a week).

## Relevance and content

The curriculum's target competences

- respond to identified learning needs, including self-reliance;
- identify and explain priorities;
- are able to adapt and respond flexibly to local situations and needs (such as urban vs rural, dietary norms, cultural context, and so on); and
- balance and integrate high-priority food and nutrition competences with a broad base of contributory knowledge and skills.

The curriculum topics and sub-topics are aligned with national policy on food systems, nutrition and health, and draw on:

- national food and nutrition priorities and food-based dietary guidelines (if any);
- relevant national studies, existing curricula and comparable curricula from other countries; and
- informed analysis, opinion and expertise regarding identified food and nutrition issues, perceptions, practices, resources and constraints (along with strengths and weaknesses).

## Learning aims and assessment

The curriculum documents

- specify what practices and outlooks children and adolescents can achieve in each age group;
- specify the support competences required (i.e. what students need to do, feel, perceive, understand and organize in order to achieve the target competences), including life skills, change management, communication and language skills, along with other learning requirements that cut across the national curriculum, and a broad base of general food and nutrition knowledge, perceptions, skills and outlooks;
- clearly indicate how these capacities develop and are augmented through the school years;
- focus on developing defensive and proactive capacities as well as positive practices;
- use language and wording that presents aims and outcomes as children's own, allowing scope for choice and selection across different strategies;
- present learning targets realistically, recognizably and attractively to the primary end-users (including teachers, materials writers, students and parents); and
- indicate how progress can be measured, assessed and demonstrated (to ministries, schools, students, teachers and parents).

## Learning model

Insofar as it maps learning pathways, the curriculum assumes that:

- children and adolescents change their practices and outlooks not only through receiving information and messages about what to do, but through the process of calling on their own experience, perceiving needs, becoming motivated and taking and managing action themselves;
- the target outcomes are developed through support competences that include and reflect a range of skills, perceptions, motivations and practice;
- supporting outcomes include relevant food and nutrition knowledge, broad experience, understanding and awareness; and
- healthy practices and outlooks are influenced by social and physical contexts.

The curriculum may therefore also:

- suggest specific steps and phases in the pathways to competence (including known starting points, contributing motivations, enquiries, perceptions, understanding, self-investment, action, practice and skills development);
- indicate how health-promoting and sustainable practices and outlooks can be established, through action and interaction in real-life settings, and by supplementing and extending classroom activities;
- indicate how interested outside services, groups, agencies and organizations can contribute to and support the learning programme, in line with curriculum aims, through consultation and guidance; and
- suggest what environmental and social supports are needed to contribute towards changes in practice and outlook, and provide guidelines as necessary on:
  - encouraging family involvement through discussion and prior approval of SFNE classwork objectives, feedback on their success, and help with homework; and
  - promoting a supportive school food environment, including with respect to school food (meals, canteens/cafeterias, food vendors, vending machines and tuckshops); school gardens, water, handwashing and sanitation; school rules and staff role-modelling.

## Supplement 4.3. Country X's new basic school-based food and nutrition education curriculum

Table S4.3.1. Country X's new basic SFNE curriculum

Curriculum threads	Practical targets (competences)	Throughout
<b>Our diet</b> <ul style="list-style-type: none"> <li>personal and social meanings of food and food practices;</li> <li>local sources of food; and</li> <li>home diet, eating practices, sources, cost and content.</li> </ul>	<b>Target: a healthy variety of foods</b> <ul style="list-style-type: none"> <li>eating different foods every day;</li> <li>having a nutritious breakfast every day; and</li> <li>choosing nutritious snacks.</li> </ul>	<b>Personal</b> Personal needs and preferences, tastes and tasting sessions, and appreciating healthy food.
<b>The functions of food (what food does for us)</b> <ul style="list-style-type: none"> <li>energy;</li> <li>growth and repair;</li> <li>health;</li> <li>pleasure;</li> <li>culture; and</li> <li>socializing.</li> </ul>	<b>Target: a balanced diet</b> <ul style="list-style-type: none"> <li>assessing one's own diet and that of others;</li> <li>eating more vegetables;</li> <li>eating adequate amounts of protein-rich foods;</li> <li>preparing and eating balanced meals; and</li> <li>resisting the temptation to eat junk food and finding alternatives.</li> </ul>	<b>Talking about food</b> Describing one's own and others' food habits, and talking about foods, meals and cooking.
<b>Specific foods and meals (what's available)</b> <ul style="list-style-type: none"> <li>knowledge of local foods.</li> </ul>	<b>Target: food knowledge and consumer awareness</b> <ul style="list-style-type: none"> <li>recognizing special nutritional value (or lack of it) in specific foods;</li> <li>knowing how to grow, store, cook and preserve a range of local foods; and</li> <li>combating food prejudices and myths.</li> </ul>	<b>Planning</b> Personal action plans, self- and peer-monitoring and reporting on progress.
<b>Special food needs</b> <ul style="list-style-type: none"> <li>needs of the family; and</li> <li>breastfeeding.</li> </ul>	<b>Target: caring for the family</b> <ul style="list-style-type: none"> <li>awareness of food needs;</li> <li>advocacy for breastfeeding; and</li> <li>cooking for children.</li> </ul>	<b>Valuing nutritious, local foods</b> Valuing, appreciating and promoting local foods.
<b>Food security</b> <ul style="list-style-type: none"> <li>providing for the lean season;</li> <li>food storage and preservation; and</li> <li>food safety.</li> </ul>	<b>Target: safe and sufficient food throughout the year</b> <ul style="list-style-type: none"> <li>identifying lean season food needs; and</li> <li>conserving and preserving.</li> </ul>	<b>Preparing and eating</b> Selecting foods, preparing and cooking and eating together
<b>Getting food</b> <ul style="list-style-type: none"> <li>purchasing;</li> <li>growing food; and</li> <li>gathering wild food.</li> </ul>	<b>Target: food value for money</b> <ul style="list-style-type: none"> <li>nutrition-sensitive shopping;</li> <li>home gardening; and</li> <li>gathering/catching wild food.</li> </ul>	<b>Family involvement</b> Involving families in targets, observations, experiments; valuing good family food practices and traditions
<b>Drinking water</b> <ul style="list-style-type: none"> <li>water pollution;</li> <li>local sources of water; and</li> <li>sterilizing water.</li> </ul>	<b>Target: clean, safe water</b> <ul style="list-style-type: none"> <li>avoiding risky water sources; and</li> <li>knowing how to draw, sterilize and store water.</li> </ul>	<b>Community</b> Talking to people about food practices in the community
		<b>Literacy, life skills and communication skills</b>

## Supplement 4.4. Scope-and-sequence chart for the competence “Get more variety and appeal in your daily food”

**Table S4.4.1.** Scope-and-sequence chart for the competence “Get more variety and appeal in your daily food”

Target competence “Get more variety and appeal in your daily food”	Support competences What students will do	Supports needed For/from students, parents and teachers (includes social, environmental and informational support)
<p><b>Rationale</b></p> <p>Many people have little variety in their diets and eat the same few foods every day. Dietary diversity (that is, the practice of eating a variety of foods every day) is very important for ensuring that children and adolescents get all the essential nutrients for growth and health. People generally like to have variety and flavour in their daily diet, and it is not always expensive, but they do not always see it as important. Increasing and maintaining food variety depends on better access, but also on changing perceptions and habits, and on finding new, appealing, economical, and easy-to-prepare meals and snacks.</p>	<p><b>Motivation, perception, understanding, experience and belief</b></p> <ul style="list-style-type: none"> <li>-Collect ideas for different foods to try (A–B).</li> <li>-Try out foods and share experiences in class (A–B).</li> <li>-Count and track the different foods consumed daily (A–C).</li> <li>-Find out and discuss what others think and do (B–C).</li> <li>-Enjoy variety, <b>and new and healthy personal food preferences</b>, tell others (A–B).</li> <li>-<b>Dis tinguish between varied and monotonous diets in real life and in cases/stories</b> (B–C).</li> <li>-See the value in variety and the risks in monotony (C).</li> </ul>	<ul style="list-style-type: none"> <li>-Families can help with lunchboxes, homework, cooking and talking with students at home. They should discuss the term’s programme with teachers at the start, so they know what to expect, and at the end to comment on the process and its outcomes.</li> <li>-Community members can help by answering questions, sharing their opinions with students, showing them how to cook/ grow food, and discussing what they buy and sell.</li> <li>-Schools and parent–teacher associations (PTAs) can help through school policies on gardens, vendors and vending machines, and by making more (and more kinds of) fruit, vegetables, legumes and other nutritious foods available in canteens and tuck shops.</li> <li>-School meal programmes can increase the variety foods they use (if possible) and provide information accordingly, thereby helping to develop this curriculum competence.</li> <li>-Outside organizations and other government entities can reinforce this curriculum competence. Examples include an initiative by the Ministry of Health in Chile, to address obesity in schoolchildren, through the promotion of fruit and vegetables;* and a children’s summer school programme in Lebanon, run by the World Food Programme (WFP) and International Orthodox Christian Charities (IOCC), to reinforce the value of dietary variety and balance.**</li> <li>-Further information can be found via national food-based dietary guidelines (for example, at the local health centre) and the national SFNE website – this can include stories, tips, downloadable materials, experiences and data.</li> </ul>
<p><b>Outcomes (in children’s words), in terms of experience, action, attitude and understanding</b></p> <p>“We will find and try out some new, tasty and nutritious foods, meals and flavours.”</p> <p>“We will eat more different foods than before.”</p> <p>“We will enjoy having a change.”</p> <p>“We will understand that eating the same foods every day is unhealthy as well as boring.”</p>	<p><b>Action, practice and maintenance</b></p> <ul style="list-style-type: none"> <li>-Explore possibilities for extending the range of options (by growing, cooking and swapping food, or by changing vendors, getting recipes, and so on), and choose accordingly, based on cost, convenience, nutritional or health value and taste (B–C).</li> <li>-<b>Choose what to change and decide what / where / how / how long, as well as adequate moments in the day</b> (B–C).</li> <li>-<b>Keep track of change, share experiences and report back</b>, both in terms of success and lack thereof (B–C).</li> <li>-Promote/publicize undervalued local nutritious foods and snacks (C).</li> </ul> <p><b>Skills (practical, communication, scholastic and life)</b></p> <ul style="list-style-type: none"> <li>-Make simple nutritious snacks, for a change (B).</li> <li>-Grow a food for variety and swap crops (A–C).</li> <li>-<b>Explain need for variety, with examples</b> (B–C).</li> <li>-Ask questions / interview / survey others for their opinions (A–C).</li> <li>-Keep track, record and count (A–C).</li> <li>-Decide to act and plan how to keep going (B–C).</li> </ul>	
<p><b>Grounding/Prerequisites</b></p> <ul style="list-style-type: none"> <li>-This competence depends on previous learning: familiarity with common local foods;</li> <li>-basic knowledge of their nutritional value; recognizing nutritious and low nutrition-value foods; and</li> <li>-basic food preparation skills.</li> </ul> <p>If these are lacking, they should be built up along with this competence.</p>		
<p><b>Vocabulary</b></p> <p>Children should be able to understand and use the following words in different contexts:</p> <ul style="list-style-type: none"> <li>-diet/dietary (B–C);</li> <li>-monotony/monotonous (C);</li> <li>-variety/ varied (B–C); and</li> <li>-diversity (C).</li> </ul>		

Notes: Age groups (in the first and second column) are indicated as follows: A = 6–7 years, B = 8–9 years, C = 10–11 years. Key indicators (in the second column) are indicated in **bold**.

\* Flores, 2018.

\*\* Johnson, 2017.

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## Supplement 4.5. Competences and learning outcomes: terminology and wording

This supplement explores a number of questions that are relevant to the understanding and use of key terms in competence-based curriculum development for school-based food and nutrition education (SFNE); in particular:

- Distinguishing between topics and competences and their usage (for example, with nouns or with verbs).
- Distinguishing activities from competences.
- Expressing competences or practice outcomes (for example, with action verbs, as single achievements and as progress).
- Adjusting or using different wording for different audiences (including students, parents, teachers and policy makers).
- Distinguishing between “we do”, “we can”, and “we can and we do”.
- Expressing mental or cognitive (and therefore, in a sense, invisible) outcomes (including attitudes, outlooks, motivations, knowledge and perceptions).
- Explaining or breaking down the meaning of key verbs that are used to describe outcomes – for example, what does “understand” mean?

### Distinguishing topics from competences

Curriculum items presented as topics and sub-topics are usually expressed as nouns (for example, “healthy diets” and “cooking methods”). Behavioural competences on the other hand, are expressed at all levels with action verbs (for example, “conserve nutrients when cooking” and “avoid deep-fried foods”). In this way, they can be seen by all as practical aims, to be exercised in real life, that initiate programmes of active learning. For presentation, they can be converted into understandable questions (“Do we ... ?”) or into can-do statements or affirmations of undertakings (“We can ...”, “We will ...”, etc.), which are also open to assessment.

### Distinguishing activities from competences

For every main target competence there is a hierarchy of support competences (see Supplement 3.1), all of which have a place in the curriculum. The processes (for example, finding out, observing, experiencing and practising) contribute to the final outcome, and some elements in a process (such as practical skills, know-how and awareness) may count as competences or support competences in themselves, along with other cross-cutting competences or skills, such as keeping records, communication and life skills.

Because people learn to do things by doing them, learning activities and behavioural competences are often similar or identical (for example, washing hands before eating). A line can be drawn where activities are specific to the process rather than the end-result – for example, “finding out” may be achieved through asking parents or community members, checking the internet and observing practices; students may make their own





learning aids or rehearse interviews with neighbours; and school monitors may organize checks on soap supplies for handwashing. Such activities are determined by context, course design and learning theory, but are not in themselves target competences.

## Expressing competences: with action verbs, as single achievements and as progress

Competences in the curriculum should be expressed:

- *With action verbs*, for example, “eat more fruits and vegetables”, “wash your hands before preparing food”, “shop for good food value” and “react critically to food advertising”. This approach also applies to control actions – for example, “choose”, “plan”, “report”, “find out”, “pass on”, “identify obstacles”, “advocate” and “manage own actions”.
- *As single objectives*, for example, “understand label information” and “argue for reducing junk food at school”, rather than as composites (for example “regularly read and understand label information”, “write an essay arguing for reducing junk food”). Composites mix skills (for instance, with the preceding example, to know the facts and argue for them and write an essay doing so), and prescribe too specifically how the competence is to be achieved. Single objectives, on the other hand, allow for various ways of achieving the target (for instance, “help to reduce the consumption of junk food” either by “writing an essay” or by “presenting arguments in a discussion” or by “running a campaign” or by “designing a poster”).
- *As progress* (whether group or individual); for example, “increase consumption of fruits and vegetables by 20 percent” with an attention to absolute criteria, like “consume 5 different fruits and vegetables per day”.

## Wording for different audiences: students, parents, teachers and policy makers

The learning aims should be accessible, attractive and usable by all. Several formulations are possible:

- *Simple, understandable action messages* (as in food-based dietary guidelines) which can be shared with parents, displayed in clinics or schools and used for advocacy; for example, to recognize / choose / ask for / use iodized salt.
- *Personalized questions*, which can head up lessons, be posted on classroom walls, taken home or used in assessments; for example, “Do you use iodized salt at home?” or “Can you recognize it in shops?”
- *Personalized competence statements* (involving words and phrases like “do”, “can do” and “know how to”) for self-assessment; for example, “We always use iodized salt at home” or “We can recognize iodized salt in shops”.

Some curricula make a point of having several differently worded versions of curriculum aims – one for professionals, one for adults, one for students, and so on.

## Distinguishing between “we do”, “we can”, and “we can and we do”

Children and adolescents need regular, repeated experiences of successful change;

it is therefore important that some target competences are realized and maintained in real life (for example, “wash hands before eating”, and “reduce own food waste”). For each age group, it should be decided which intended outcomes are to be actual, regular practices (for example, “eat a nutritious breakfast daily”) as opposed to inherent knowledge or abilities (for example, “know what a nutritious breakfast is” or “be able to boil an egg”).

### Expressing mental/cognitive outcomes: attitudes, outlooks, motivations, knowledge and perceptions

Some curriculum and course developers avoid using verbs that describe mental or cognitive (and therefore internal) processes (such as “understand”, “appreciate”, “recognize”, “believe”, “know”, “perceive”, “be aware of” and “be familiar with”), on the grounds that mental outcomes are not directly assessable. As a result, their objectives may require students to “explain”, “state”, “describe” or “list” (i.e. by using “reflector verbs”).

But verbal display is not, on its own, a true or accurate reflection of thought, feeling and capacity; it is one of many (including matching, classifying, drawing and giving examples), and all too often it is not even the best – as an objective it tends to promote rote learning and the parroting of memorized information, rather than experiential learning. Other ways of revealing, reflecting and assessing understanding should therefore be explored.

Moreover, it should be noted that the verbs in communication objectives (for example, in asking about how to store foods and recording answers, or discussing the quality of school food) are not merely reflectors, but are learning targets in themselves, and therefore essential parts of the process.

### Explaining the meaning of key verbs used to formulate outcomes: what does “understand” mean?

In interpreting the curriculum, it is useful for teachers and materials writers to know what is implied or meant by some of the verbs used to express learning outcomes. Some explanatory notation, for instance in the introduction to the curriculum or as a separate glossary, can serve to clarify what the verbs mean as steps in an active learning process. For example:

- *Know how to*: Find out, try out, practise a little or show others how.
- *Be familiar with*: Identify, experience (for instance, by handling or tasting), use / observe in use, sort or classify.
- *Be able to*: Carry out (after practice) a procedure correctly, in the required time and under the required conditions.
- *Help to*: Make a significant contribution to a complex undertaking.
- *See / understand / appreciate / be aware of*: Identify instances, give real examples from one’s own experience and explain why they matter.

# SUPPLEMENTS FOR THEME 5: LEARNING PATHWAYS AND APPROACHES

## Supplement 5.1. What makes an effective food and nutrition learning programme?

### It is feasible and practical

- It makes sense to all concerned (including stakeholders, practitioners and end-users) and satisfies them in terms of its relevance, effectiveness and intrinsic interest.
- It is low-cost and easy to manage.
- It makes good use of the existing potential of and in schools, and mitigates their limitations.
- It generates confidence, expertise and forward momentum.
- It follows educational best practices for ease, interest and motivation. It gives all participants something to aim at, something to do, and some opportunity to achieve success.

### It responds to the existing situation

- It relates to and builds upon what students, their families and communities already know and do.
- It promotes children's awareness and observation of food practices and outlooks in their own contexts.
- It sets up "outside activities" which situate students' learning in their already existing, day-to-day foodways.
- It focuses on what students and families can actually manage to do, with room for experimentation and for consultation on handling constraints and adapting or fine-tuning actions to specific situations.
- It promotes students' and families' ownership of process and product.
- It uses familiar learning processes, such as imitation, repetition, practice, stories, tasting, sharing experiences, asking around and helping at home.

### It reflects a valid and responsive school-based food and nutrition learning model

- It taps into existing beliefs, perceptions, influences and prime motivations among children and families.
- It identifies actions/steps for building and sustaining students' health-promoting and sustainable food practices and outlooks, and gives adequate attention to each phase.

- It identifies social influences, material environments and other non-educational supports in the learning process.
- It is flexible and can adapt to many contexts.
- It follows a logical framework that includes needs analysis, baselines, objectives and indicators, activities, outputs, learning outcomes, and monitoring and evaluation processes, and makes it possible to assess and improve both process and design.

### **It is grounded in a clear, structured and systematic approach**

- It provides a checklist and framework for discussing the different types of inputs and learning approaches, along with the roles of actors and interactions with food environments.
- It provides a working formula for planning lesson sequences.
- It establishes principles for choosing specific inputs, channels and activities.
- It takes steps to assess their effectiveness.

## Supplement 5.2. Theories, models and best practices

### Theories and models

Theories, operational models and best practices suggest what influences people's food behaviour, how they come to decisions, what is involved in changing practices, and how people manage and maintain change. In this way, theories and models inspire or prescribe different aspects of learning approaches, for example in terms of essential activities; the balance between knowledge, experience and practice; the roles of participants; and ownership and modes of communication required. As guides to design, these models can have a significant influence on the impact of food and nutrition education (FNE) interventions, their long-term sustainability, and their cost in time, money and expertise, all of which are critical in LMICs.

### Theories of behavioural learning

Behaviour change theories are not the only theories that are relevant to behaviour change in general, and to school-based *food and nutrition education* (SFNE) in particular. Learning theories that are relevant to SFNE (see Box S5.2.1) include those that have to do with motivation, social influence, skills learning, experiential learning (see Figure S5.2.1), knowledge and understanding, beliefs and stages of change. (For more extensive overviews, see Contento, 2016 and Ormrod, 2012.)

Theories pose questions about why and how (for example, "What is blocking change?" or "How do people learn skills?"). As such, they open up research, which in turn helps to build a foundation of validated practice.

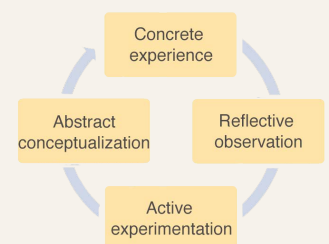
### Schools of thought and practice

Planning the framework, content and core activities of food and nutrition education interventions is often done with operational models that are based on specific schools of thought and practice (STPs), all of which are based in theory and have demonstrated impact (see Box S5.2.2). Specific STP models are often recommended by name in the briefs, frameworks and sectoral policies produced by organizations, governments, donors and institutions – for example the Second International Conference on Nutrition (ICN2) Framework for Action (FAO and WHO, 2014) recommends social marketing, social behaviour change and FNE for different contexts. Major agencies and non-governmental organizations – such as Action Aid, the Expanded Food and Nutrition Education Programme (EFNEP) of the United States Department of Agriculture (USDA), Helen Keller International (HKI) and the United States Agency for International Development (USAID) – are associated with particular schools of thought and practice. Designers and planners need to be able to distinguish between the different STPs to see which are most suitable for their schools.

### Best practices

A range of programmes have demonstrated impact with less mainstream approaches. Examples include involving participants extensively in field trials and following their advice (trials of improved practices or TIPs), identifying local dietary practices that

Figure S5.2.1. Experiential learning



### Box S5.2.1. Educational theories and models

The following theories and models are relevant to SFNE:

- cognitive theory, including constructivism;
- problem-based learning;
- motivation theories;
- ownership of learning, participation, self-efficacy and health promotion philosophy;
- skills learning;
- experiential learning theory;
- behaviour change theory (including habit formation);
- behavioural economics and nudge theory;
- social cognitive theory;
- situated learning; and
- communication theory and socio-linguistics.

The following models and areas of science are relevant to nutrition and programme planning (though they are not directly relevant to learning approaches):

- nutrition science;
- the social ecological model – a schema of interacting levels of action for health and nutrition; and
- implementation science – which explores the larger framework of support for successful interventions, including logic models and the theory of change.

are positive and building on them (CORE Group, 2002), peer counselling (Institute of Education UK, 2018), recruiting facilitators from the community who have graduated from the same intervention (USDA, 2018), and real-life practice in participants' own families and communities. Other recent examples of strategies that show promise for FNE include a reality TV show with follow-up question-and-answer messages via SMS on preparing dishes (Shamba Chef, in Kenya); short videos, produced in local languages for transfer by mobile phone or for delivery by local agents (HANDS and Manoff Group, 2016 and Digital Green, n.d.); extensive interactive use of community radio (FAO, 2018); emotional motivations for change and programming “nudges”. Several multisectoral programmes have linked FNE, with marked success, to backyard gardens (Ruel, Quisumbing and Balagamwala, 2018), and to food and cash transfers (Ahmed, Sraboni and Shaba, 2014). SFNE approaches can learn from these and many other similar initiatives.

In addition to the SFNE-specific examples listed above, programme designers, materials writers and teachers also need to be experienced in general educational best practices, in order to respond to students' needs according to age and stage of cognitive development, individual learning styles, mixed-level classes, remedial learning requirements; classroom management; segmenting, staging and the recycling of learning. Because these are not specific to SFNE, they are not explored in detail in this supplement (or in Theme 5 itself); however they are nevertheless critical to educational design and management.

### Box S5.2.2. Schools of thought and practice

The following well-known STPs are relevant to SFNE:

- Social and behaviour change communication (SBCC);
- Social marketing (SM);
- Community nutrition education (CNE);
- DESIGN procedure;
- Food and nutrition education (FNE); and
- Implementation theory – as concerned with the overall framework of interventions (see Pelletier, 2017).

### Choosing and using theories as guides

Theories, models and best practices offer explanatory insights on the ways in which food practices and outlooks are learned, and some predictive powers. But in terms of their practical value in shaping learning approaches, a number of factors should be considered:

#### Strengths and limitations

A core value of theory is that it systematizes vague assumptions, makes them explicit and testable, and guides the way to more effective approaches. Theory-driven research in FNE has for decades actively challenged and tested prevalent misconceptions about what FNE can do and how to do it – for example, the assumption that diet can be improved simply by spreading knowledge (Contento *et al.*, 1995) or by running stand-alone mass media campaigns (Graziose *et al.*, 2016); or that changes in behaviour, once achieved, will necessarily be maintained in the long term (Kwasnicka *et al.*, 2016). Conclusive research findings can save institutions significant time, energy and resources, and must be taken on board in school approaches.

But many theories are better at explaining behaviour than at predicting outcomes or designing programmes (NICE, 2007). Theories are also difficult to operationalize – they cannot specify exactly what participants or change agents should do, or determine with much certainty what matters most. (For example, what most contributes to routine handwashing? Is it know-how, understanding, peer pressure, habit, aversion or parental back-up?) And variations in context can complicate the choice of approach. For example:

- If “health belief” is lacking, can a belief in the nutritional value of leafy green vegetables be created or cultivated in children who already dislike them?
- Can theory predict how strongly families in a given community will resist varying their staple foods?
- What is the differential weight of various factors in a given intervention approach, especially those not covered by the chosen theory? (For example, the personal attention received, the organization of community groups, the gender and age of the facilitators, or the new colours of biofortified beans.)

Several reviews have concluded that some theoretical grounding is better than none in FNE design, but there is also some expert consensus (see for example Lefebvre, 2013 and NICE, 2007) that no single theory is better than others at predicting outcomes, or for that matter necessarily sufficient on its own. Likewise a theory basis, while critical, is only one element in the larger intervention framework (Pelletier, 2017), and usually does not account for human error, poor infrastructure or accidents. The claim that an intervention is “theory-based” is in itself no guarantee that it will work, or indeed that the theory has been correctly interpreted. There is some value therefore, in the composite model proposed by FAO (see Theme 5), which brings together both theory and best practice, in a simple framework for educational action.

### **The missing middle**

FNE and SFNE programmes have often not been able to propose a convincing series of core learning activities that are guaranteed to lead to the desired outcomes. This is often due to one or more issues with regard to the underlying design strategy, for example:

- failing to recognize the limitations imposed by circumstances and resources, and failing similarly to recognize the adaptations necessary to mitigate them;
- assuming that activities which increase knowledge and improve attitudes will result in changes in behaviour;
- assuming that any food-centred activity or learning product will produce the desired effect, without testing this assumption (i.e. by exploring what the activity is good for and whether its effects transfer to other contexts – see for example Dixey and Wordley, 2010);
- default or opportunistic choices which simply follow precedent, prevailing trends, personal or other preferences, or funding;
- a disproportionate focus on the motivational end of the process (Contento, 2016; Abraham and Michie, 2008), with little attention to action, practice, troubleshooting and maintenance;
- excessive prioritization of one-way communication (which imposes receptive roles on participants); and
- selecting and designing activities in advance, leaving little room for participants’ own choices and/or for adaptation.

The lack of a clear, shared rationale at the heart of the process has led implementation scientists to call this a “black box of implementation” (Pelletier, 2017). Similarly, in stressing the urgent need for empirical testing, Michie (2009) asks, “Which techniques or combinations of techniques enhance effectiveness?” Practitioners have also signalled the research gaps in this area (USAID, SPRING and GAIN, 2014). The issue is critical, as more and better answers are needed to assess the quality of programmes, explain outcomes, and design for success. There is therefore a great need for more systematic research and for practitioners to observe the outcomes of activities.

### **Differences**

A further limitation relates to the fact that many learning theories have a very selective





focus on particular parts or aspects of the learning process. They may prioritize knowledge, understanding and analysis; motivation, decision-making and influences; or action, practice, habit formation and maintenance. They may highlight cross-cutting elements such as environmental influences and settings; or ownership of learning and participation; or different modes of communication – such as information dissemination, messages, mass media, social media, face-to-face discussion, dialogue, negotiation and enquiry.

A theory or model therefore runs the risk, usually unconsciously, of neglecting some significant part/s of the learning process, for example by emphasizing motivation and the decision to act much more than practice and maintenance (or vice versa), or by neglecting significant environmental influences and constraints. This may explain the results of interventions where, for example, children are keen to make a change (and get high scores on attitude measures), but do not know how to go about it or keep it going (and get low scores on changes in practices and maintenance); or where children have developed good habits at school through access, practice and reinforcement, but do not do not continue or maintain such habits beyond the school.

### **Recommendations**

Programmes can consider a variety of steps and measures to help to ensure that good use is made of learning theory:

- Become familiar with the most popular theories, especially where they can be seen in operation.
- Keep up with FNE and SFNE research and research reviews, especially if they have local relevance.
- When designing a programme, select aspects from several theories, using care and logic to make appropriate and relevant assumptions as needed.
- Balance theory with experience, common sense and known best practices; take full account of the given context and of what students, families and education systems are likely to favour, support and manage.
- Take the time needed to design a theory of change, and adjust it as needed, to reflect results, changes in context and variations in need.
- Judge by results.

## **Choosing and using learning models**

### **Strengths and limitations**

Well-developed systems of practice have many attractions: they offer step-by-step procedures, often in tandem with manuals and training; they have a rationale and a body of expertise and experience that includes a range of working real-life examples; and in many cases they have refined their methods over time, in response to both process and impact evaluations. On the other hand, they may present issues of cost, cultural appropriacy or sustainability (for example, in terms of replicability, institutionalization and dependence on outside expertise). They may involve specific ideas about what approaches work best and specific allegiances to theory, which may incur potential

limitations (for example, on the choice of activities and participants, the balance of the learning process and the forms of communication). And they may present challenges in terms of adapting their approaches (for example, as used in community groups, public campaigns or short-term projects) to the expectations and procedures of the school system, especially where resources are limited (see below).

### **Similarities and differences**

FNE-relevant schools of thought and practice share several outlooks on intervention design (see also SNEB, 2016). They generally agree that learning processes should address motivation, application, practice and maintenance; that interventions should be supported by social, institutional and material enabling environments; and that their purpose is to change practices and outlooks – hence a strong design framework is needed (including formative research, objectives, monitoring and evaluation), based on existing practices and influences, shaped to needs and wants, with clear objectives and measurable outcomes. Some of these principles are not easily addressed by or compatible with school systems, especially where resources are limited.

Most STPs also share some gaps in design. Formal formative research and impact evaluation processes, though recommended, are not widespread. Moreover, informal needs analysis, formative enquiry and evaluation (that is, by having participants call upon and use their own experience, observation, motivation and satisfaction) are not often seen as important elements in or for the learning design. Programme designs may also neglect other strategies or areas, for example with regard to sustaining and extending intended food practices and outlooks; educational interaction with the food environment; ways of publicizing and promoting SFNE activities to communities (including practice in communication skills); and enriching the information environment so that children can find things out for themselves. All these elements are particularly important in SFNE.

The most significant differences between STPs, particularly for schools, are in learning approaches. For some STPs, the emphasis is on the motivation phase of the process (including knowledge, understanding and analysis; and motivation, influences and decision making), and in others on the action phase, with more experiential learning and practice (for example, by trying things out, experimentation and so on). Some focus narrowly on the target group, while in others, participants engage with others in the local context, who may act as consumers, producers, marketers, interlocutors, helpers, and sources of information or expertise. In this wider social frame, many learning activities can take place in natural food environments (and not only in scheduled lessons). STPs also differ in the range and types of communication they envisage: some rely mainly on advisory messages; while in others, participants' voice and share their own experience and understanding, and new knowledge is modelled and made "portable" for re-telling through stories, acting out and demonstration. In addition, there are notable differences in the levels of participation, engagement and ownership in all parts of the process. The choice of a particular working model is therefore of great significance in designing SFNE programmes.



## Recommendations

A variety of steps and measures can help to ensure that good use is made of available learning models:

- Establish the main criteria for intervention models in their own context (for example, in terms of demonstrable impact, sustainable effects, cost, ease of implementation and institutionalization, use of local expertise and on-the-job capacity development).
- Identify the models' own priority principles for effective SFNE learning approaches (for example, essential actions, a balance of elements, inclusion, hands-on learning, "action homework" and parental involvement).
- Assess examples of interventions in the literature or in practice (see the checklist in Supplement 5.1).
- Adapt the working model to local needs, criteria and principles, and to the procedures, practices, expectations and resources of the school system.
- Encourage practitioners to experiment with new activities and learning materials, assess their effects and disseminate their findings – both successful and unsuccessful.

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## Supplement 5.3. Assessing school-based food and nutrition education models and learning programmes: a checklist

### General assessment of the local situation

- The educators, school staff and school management are well-informed on:
  - local diet, food skills (including strengths and weaknesses) and local food and nutrition issues;
  - students' and families' food/nutrition knowledge, as well as their perceptions and practices, and what shapes them; and
  - the sources of information and advice on food and nutrition that are available to students and households.
- In addition, individual school staff are personally interested in food and diet.

### The potential of schools

#### School policy and school food environment

- There is a whole-school policy on health, food and nutrition, which addresses or aims at:
  - healthy school food (including meals, food available and sold in the school, food brought from home, events, and so on);
  - information, marketing and promotion;
  - good water, sanitation and hygiene (WASH) facilities and hygiene practices;
  - school gardens;
  - regular health visits and programmes (for example, for malaria, deworming and supplements); and
  - other activities and initiatives (such as open days, sports events and daily assemblies).
- The activities and areas covered by the policy (as listed above) have explicit links to the SFNE programme.

#### School and community involvement

- Parents and community regularly and willingly help with and support school activities.
- The SFNE programme involves the family and community (including parents, siblings, neighbours, groups, community leaders, farmers and health visitors), mainly through:
  - contact with school management, teachers, parent-teacher associations, and so on; and
  - contact with students (for example, as collaborators, mentors, interlocutors, aides, interviewees, demonstrators, informants, role models and visitors).
- The SFNE programme regularly consults with and/or briefs these actors.



### Activities outside the classroom

- The SFNE programme recognizes the power of food environments and social norms beyond the school as influences on students' actions and outlooks.
- The SFNE programme includes students' actions, enquiries and observations outside the classroom (as homework or in extracurricular groups), for example in terms of talking to their families / neighbours / other children, observing practices, finding out (for instance about prices, crops and water sources), asking questions, interviewing and starting discussions.
- Children and adolescents carry out specific food-related practices and skills outside the classroom as part of the SFNE programme (examples include basic cooking and food hygiene practices, teaching younger siblings to wash hands, nutrition-sensitive shopping, food budgeting, infant feeding, growing vegetables / pulses / fruit, composting, increasing iron in their diet, choosing food without plastic packaging and marketing home-grown food). In addition:
  - such activities take place mostly in school gardens, homes, markets, clubs; and
  - within the programme, students discuss, plan, monitor, share their experiences and report on such activities.

### Teacher capacity

- Teachers are familiar with handling direct experiential learning and managing homework.

## The school-based food and nutrition education programme

### Curriculum / learning programme

- Formative research has been carried out to determine practices and outlooks, influences and determinants, obstacles and resources, and previous experiences, as well as to establish baselines, learning outcomes, indicators, evaluation design and strategy for enabling the environment.
- (Ideally) the SFNE curriculum / learning programme has an hour or more per week through the school year for all age groups.
- It is treated as an integral subject.
- It is developed vertically through all the school years, building on previous learning.
- It reflects the wide educational scope and variety of effective SFNE, as well as its practical objectives and its actions beyond the classroom and school.
- It covers the following themes: sources of food; food groups and functions; values of specific local foods; diet, dietary risks, diet for different age groups and dietary change; food acquisition (including growing, gathering and shopping); food preparation, budgeting and meal planning; food safety and food hygiene; food livelihoods; and the food system (including production, processing, marketing, as well as their health-related, socio-economic and environmental impacts and how to respond to them; consumption, policies and regulation; and the effects of climate change).
- The SFNE curriculum / learning programme aims at:
  - food and nutrition competences (i.e. specific, demonstrable and lasting improvements

- in students' food-related practices and outlooks);
- broad understanding, perception and capacity for change; and
- life skills, cognitive development, literacy, numeracy, communicative competence, information handling and IT capacity (as well as other cross-cutting developmental areas).
- It clearly responds to context (including needs, local practices and skills, social norms, traditional local diet and expectations of students' behaviour); makes it possible for schools/teachers to adapt to context; and allows consultation with children, adolescents and families to ensure tailoring to specific needs/resources.
- The existing learning resources reflect the curriculum and approach (and if not, there is guidance for teachers and schools to adapt them).

### **The project framework for participants**

Participants in the programme, at whatever level (including students, families, teachers and schools) regularly:

- explore their own practices, outlooks, influences, resources and social norms in terms of specific issues;
- discuss what to achieve and how to assess it;
- practise and maintain new habits;
- assess progress and celebrate success;
- publicize achievements; and
- plan further action.

### **Core learning activities**

- *Balance*: The programme gives an appropriate amount of time and energy in each learning sequence to input and motivation; action and practice (including interaction with environments); maintenance; and spreading the word. The balance is appropriate to the situation, context, participants and intended outcomes.
- *Ownership and consultation*: Students and families are the main actors and decision makers, have confidence in the aims of the programme, are motivated to carry it forward and can adapt tasks to their own situations.
- *Activities "fit for purpose"* (see also Supplement 6.1): The activities carry the programme forward – that is, they help participants to:
  - explore own situation and that of others, and to talk about their own experience and perceptions;
  - have a clear idea of the action agenda, its purposes and its progress;
  - get interested and motivated, develop expectations and have stories to pass on;
  - turn information into action;
  - make choices, see and understand what to do, try it out, practise it and get into the habit;
  - talk about experiences, discuss, share, explain, find out and ask questions;
  - see progress and celebrate it; and





- become more confident in their own skills and in their ability to change.
- *Media/channels “fit for purpose”*: Any media or channels that are adopted or used as part of the SFNE programme also serve the activities as abovementioned.
- *Learning materials “fit for purpose”*: Learning materials are sufficient for and relevant to the aims of the programme; adequate in terms of arousing interest and inspiration and in terms of exploring existing practices and attitudes, organizing action and adapting to context; are well used in class; and can in some form be taken home to share with the family.
- *Appropriate interactions*: Through the activities, participants act, react and interact in several familiar food settings, involving families, peers, friends and neighbours, and building communication capacities.
- *Varied communications*: Class lessons prepare learners to engage in many different kinds of communication, with various people in various settings, in order to carry out their tasks.

# SUPPLEMENTS FOR THEME 6: EFFECTIVE SCHOOL-BASED FOOD AND NUTRITION EDUCATION ACTIVITIES

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## Supplement 6.1. Learning activities: a checklist

### Preparation and general needs

- The activities are based on some preliminary exploration of the learning needs (relating to the existing practices, outlooks, resources, circumstances and environment) of the groups and individuals involved.
- The activities aim at sustainable changes in own practices and/or outlooks.
- Learners, parents and school are aware of the aims of the activities.
- Where possible and appropriate, links have been made with local and national food and nutrition education (FNE) initiatives such as food-based dietary guidelines (FBDGs), early childhood development, youth groups, community projects and farmer field schools.

### Functions

The activities encourage and enable learners to:

- Build on their own existing knowledge, experience, outlooks and skills.
- Achieve new perceptions, motivation and understanding by:
  - finding out, observing and questioning;
  - describing and discussing what they and others do and think;
  - hearing, seeing, telling or acting out stories, drama and simulations which externalize new learning and make it lifelike, memorable and “portable” for passing on; and
  - enhance understanding and reinforce points with observations, reasons and examples.
- Build ownership and motivation through:
  - linking learning to one’s own needs, wants, fears and hopes;
  - making choices and decisions, and taking responsibility accordingly;
  - developing mastery and expertise; and
  - taking home and passing on messages, stories, questions and practices.
- Discuss what is feasible and easily done, tackle the barriers and share initiatives.
- Develop target practices and skills by following models and demonstrations, hands-on experience, practice, repetition, feedback, sharing and habit-formation.
- Extend and maintain practices, outlooks and new learning by recycling and repeating, ongoing reinforcement, sharing of undertakings, mentoring others, and

publicizing achievements.

- Carry out simple participant monitoring, evaluation and self-assessment (What do we know? What are we achieving? What can we do?) and look back on achievements and difficulties.
- Practise describing, interviewing, listening, keeping records, reporting and presenting.
- Practise life skills such as collaboration, management, planning and organizing, as well as making decisions and taking responsibility in classroom activities, looking after resources, group-work and teamwork.
- Practise reading for meaning as well as functional reading (i.e. for use in daily life) related to food and nutrition.
- Understand and use new concepts and vocabulary.
- Make incremental progress in their learning, by moving forward in small steps, one at a time.
- Feel encouraged, motivated and successful.

### **Pragmatics, practicality and appeal**

The activities:

- Are suitable for the age group in terms of interest, length, difficulty and reading or language level.
- Appeal to participants (including both students and families) and practitioners.
- Have variety and balance (for example, in terms of activities that are auditory, visual, tactile and/or kinetic, and activities that involve reading, writing, listening and/or talking).
- Allow educators to share their own experiences with learners, and to learn from learners.
- Require progressive changes, but not a total transformation of traditional classroom culture (which will disturb or upset teachers, learners, schools, parents and communities).

### **Environmental and social dimensions**

The activities:

- Involve schools, families and the wider community in undemanding but rewarding roles – as supports, interlocutors, demonstrators, sources of information and advice and sources of observation.
- Trigger actions, reactions and interactions in familiar food environments and settings beyond the classroom, with learners reporting back with updates in class.
- Promote social interaction, group work, dialogue and discussion, both proactively and interactively as well as reactively (i.e. not just through messages, listening and reading).
- Are easily imitated and “portable” (i.e. they can be carried home – whether figuratively or literally in some form – and repeated).

## Assessment

The activities can:

- Serve as the basis for assessing both process and outcomes in evaluations.
- Be assessed on the criteria of feasibility, effectiveness and implementation (including reach, fidelity, quality and acceptability).



## Supplement 6.2. Assessing school-based food and nutrition education materials: a checklist

The points below are based on a checklist that was developed for a workshop for materials writers in the Gambia.

### Materials assessed

Note the following (as applicable):

- titles, writers and publishers;
- approving entities and institutions (for example, ministries, non-governmental organizations, and so on);
- target population;
- illustrations (b/w, colour or none); and
- package description (for example, students' book, workbook, teachers' book, posters; supplementary readers, videos, comic books; guidelines; briefings for schools, services, parents; etc.).

### Goals for materials

#### Main goals

- Enabling learners to cope as well as possible with their own dietary and health needs, as well as those of the family, using the resources available and with respect for the environment.
- Raising awareness among learners and their families on food environments and the food system.
- Raising community awareness on the importance of food and nutrition education, as well as on good practices.
- Strengthening learners' capacities to perform their usual tasks in the home, school and community.

#### Subsidiary goals

- Developing scholastic abilities (including literacy, numeracy, communication and vocabulary) as appropriate.
- Developing life skills to support the main goals (see above), including communication skills and capacity for change.
- Customizing the learning to respond to students' needs, desires, life goals and interests.
- Increasing and promoting the discussion of issues related to food, food production and preparation, as well as the food system, nutrition, health and hygiene in the home.

#### Learning outcomes / competences

The purpose and contents of each unit and session are clear to all from the start, including

in terms of the big picture, the importance of the objectives and their relevance. They are expressed in a form suitable for learners to understand, and are discussed fully with learners.

## Background information

The materials are based on reliable and valid information regarding:

- the food and nutrition situation and any relevant issues;
- dietary practices, food and nutrition knowledge, and attitudes of the target populations (including students and families);
- the curriculum contents, target and support competences and the cross-cutting skills required;
- assessments of existing materials, needs and gaps to be filled;
- assessments of knowledge, practices, perceptions and expectations among parents and students;
- typical food and nutrition activities in school environments, for example, water, sanitation and hygiene (WASH) programmes, school gardens, school meals, and vendors on the premises; and
- teacher and school capacity, experience and interest with regard to school-based food and nutrition education (SFNE).

## Teachers' notes

- The teachers' notes for the unit as a whole:
  - align and coordinate well with the students' book (including in terms of headings, chapters and illustrations) and are clearly cross-referenced; and
  - include briefings and suggestions for collaborating with parents, school services and non-governmental organizations (NGOs).
- The teachers' notes for each lesson/session include:
  - a briefing on the food and nutrition issues and practices as relevant to the lesson topic;
  - questions for the teacher regarding the local situation and context;
  - key points regarding the conceptual or practical challenges of the objectives for students and families; and
  - detailed step-by-step notes on conducting the lesson, areas and points to highlight or stress, and what to listen for.

## Methodological elements

(See also Supplement 6.1.)

- The overall learning methodology is experiential, involving a process of exploration, decision, action and promotion that will activate the learning objectives and lead to changes in practice beyond the school.
- There is an ongoing enquiry into what learners and their families and communities currently do, feel and know about the practices and outlooks in question, which

informs both teachers and learners.

- The materials enable learners to use their own experience, explore their environments and interact with new input in order to:
  - develop new knowledge, understanding, perceptions and motivations in relation to their own contexts and behaviours, through direct observation, modelling (for example, through story and demonstration), active and purposeful engagement, and sharing and discussion with a variety of inputs;
  - decide what to do and take steps to put their decisions into practice, get and give feedback, apply their learning in real life, and evaluate, maintain and adjust changes;
  - pass on and publicize what they have done; and
  - look back and assess achievements at the close of each unit.
- Cross-cutting skills required by the curriculum (including life skills, reading skills and communication skills) are systematically developed, in particular:
  - “reading for meaning and application” of texts, diagrams, tables and pictures;
  - real communications for a range of purposes and interlocutors; and
  - planning, management, responsibility and teamwork.
- The illustrations (if any) are:
  - attractive, easily understood, and clearly referenced in the text; and
  - usable and used in the lesson activities.
- In terms of length and difficulty, lessons/sessions:
  - fit easily into the time allocated;
  - cover one main point each; and
  - cater for a range of levels within the given age group.
- The materials inspire and elicit motivation and enthusiasm by:
  - engaging families in support of the programme;
  - valuing students’ and families’ knowledge and expertise (for example with regard to cooking, shopping and growing food);
  - acknowledging and praising progress;
  - building individual learners’ expertise in particular areas; and
  - showcasing class activities.
- Homework is:
  - closely related to learning objectives / competences;
  - set to be assigned regularly, both to prepare for lessons and to follow up on them;
  - clear and explicit (for example, posting a message on a wall, asking a specific question, counting crops, and so on);
  - quick and easy to complete, and easy to incorporate into everyday life (for example, through meals, by talking to neighbours and walking to school);
- Homework consists of observations, actions and interactions in:

- the school environment (for example, with food on school premises and school gardens);
- the home (for example, with parents, siblings and the household food cycle);
- the community (including streets, neighbours, food gardens, rubbish bins, water barrels, churches, clubs);
- the market environment (including cafés, markets and vendors, and so on); and
- the information environment (including newspapers and the internet).





## School-based food and nutrition education

### A white paper on the current state, principles, challenges and recommendations for low-and middle-income countries

The SFNE white paper on the current state, principles, challenges and recommendations for low and middle-income countries' is the first document of its kind. It is based on the evidence, professional expertise and field experience, lessons learned and documented challenges of SFNE work in a variety of contexts, and presents the case for raising its profile and transforming the vision and learning model in LMICs.

This document is directed firstly to a technical audience working in governmental organizations that deal with schoolchildren and adolescents (policy advisors, ministry staff, programme planners, school level planners, curriculum developers, teacher educators and school staff). Secondly, it is of interest to researchers; technical advisors to decision makers, donors and investors; civil society and staff working in NGOs, FAO and other UN and international organizations.



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