



## Future directions







## Chapter 14

What food system **intervention strategies** and evaluation indicators are successful with Indigenous Peoples?



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## Background and rationale

It is well recognized that today's globalization of food affects economies and people at all socio-economic levels, in all countries. The forces that drive food globalization are industrialized production and trade of agricultural crops, foreign investment in food processing and retailing, and global advertising (Hawkes, 2006). Globalization leads to the erosion of the food cultures of all people and the simultaneous reduction of food biodiversity, which results from the food industry's demand for standardized and uniform products being passed on to consumers, especially in supermarkets and fast-food chains. Combined with changing lifestyles, loss of livelihoods at all stages in the food production sector, and increasing urbanization and poverty, sedentary lifestyles and new dietary patterns are driving increases in obesity and non-communicable diseases, including micronutrient deficiencies. With unresolved food and nutrition insecurity issues and high incidence of non-communicable diseases, this nutrition transition and the resulting "double burden of malnutrition" are reaching all corners of the globe (Kennedy, Nantel and Shetty, 2004; 2006).

In developed countries, disparities in obesity prevalence are related to the availability and quality of retail food environments, with more overweight and obesity occurring in socio-economically disadvantaged areas, often where there are particular ethnicities. These areas often have poor access to healthy foods and low-quality retail food environments (Ford and Dzewaltowski, 2008). In developing countries and in many areas where Indigenous Peoples live, the retail foods available and purchased have low nutrient densities and lead to poor-quality diets (Kuhnlein *et al.*, 2006a; Chapter 1 in this volume – Kuhnlein and Burlingame, 2013). Many nutrient-rich local indigenous foods still produced at the subsistence level may not be marketed or may be marketed at higher prices than processed imported foods. Direct access to these foods from local ecosystems is often hampered by the environmental damage caused by industrial interests and urbanization (Chapter 3 – Turner, Plotkin and Kuhnlein, 2013).

Broadly speaking, to improve the quality of food available in poor communities, including those of Indigenous Peoples and in both developed and developing countries, it makes sense to: i) improve access to traditional local foods; ii) reduce the prices of healthy foods, with government enforcement; iii) increase education in and demand for "good" food, and understanding of the impact of poor diet on health; and iv) increase the prices of "junk food" (nutrient-poor, high-energy, sweet or fatty foods and drinks), perhaps through increased taxes. Points i), ii) and iv) are usually difficult to implement and require government involvement, whereas point iii) can be supported through community nutrition networks. All four measures will speed up success in food systems predominated by industrialized food markets. Indigenous communities' attention to their food systems may be increased if interventions are based on communities' own knowledge bases, especially if there is limited use of market food and ensured access to traditional food.

## Nutrition transition

The contemporary global food security crisis – which includes simultaneous and paradoxical obesity and undernutrition from poor-quality diets – is a public health crisis driven by inequitable access to food through international systems of governance (Traill, 2006; Yngve *et al.*, 2009). This calls for consideration of Indigenous Peoples' food systems, attention to the poor quality of Westernized<sup>1</sup> diets, and action to promote sustainable food systems within the unique local cultures and ecosystems in which Indigenous Peoples live.

Recent moves to disaggregate national health data by ethnicity are uncovering aspects of the nutrition transition that are specific to Indigenous Peoples. For example, research on a large cohort of Inuit children in Nuuk, Greenland, demonstrates that more children are reaching overweight status and at younger ages than in earlier cohorts (1970s versus 1990s) (Schnohr, Petersen and Niclasen, 2008). In a very different part of the world, the socio-economic

<sup>1</sup> Derived from or relating to the countries of Europe and North America.



status and obesity levels (measured as percentage of the population obese and as mean body mass index [BMI]) of Surui Indians in Brazil were found to have increased between the 1980s and 2008 – this rapid nutrition transition occurred in the midst of poverty (despite increased income), food insecurity, indicators of poor growth (stunting) and precarious living conditions (Lourenço *et al.*, 2008).

## Disparities

Indigenous Peoples face widespread disparities with the larger societies in which they live, in all countries where threats to land, culture and linguistic heritage destabilize identity and self-determination. These circumstances generate health challenges that are specific to Indigenous Peoples (King, Smith and Gracey, 2009; Gracey and King, 2009). In Canada, Indigenous Peoples experience higher rates than the overall national averages for diabetes, heart disease, HIV/AIDS, tuberculosis and many other diseases. Infant mortality rates are higher and life expectancy is lower than in the general population. Suicide rates are two to three times higher overall, and five to six times higher among youth (Reading, 2009; Egeland and Harrison, 2013). Similar and worse circumstances driven by poor access to traditional resources and culture exist in other countries (UNPFII, 2009).

Social practice is recognized as a driving force in dietary strategies (Delormier, Frohlich and Potvin, 2009), so there is need for new, innovative and transformative intervention strategies and policies that use traditional food systems to make long-term improvements in the health of Indigenous Peoples. This is especially so for Indigenous Peoples who recognize that health encompasses physical, mental, social and spiritual dimensions and regard food as affecting all of these dimensions. To address these multiple dimensions, health promotion strategies must therefore be carefully incorporated into the five stages of behaviour change – pre-contemplation, contemplation, preparation, action, and maintenance (Medical College of Georgia, 2005).

Nutrition interventions that stress obesity control and healthy body weight cannot be separated from

interventions that support increased physical activity. A study of the physical activity patterns of a large cohort of American Indian and Alaskan Native Peoples concluded that many activities are undertaken within communities, including traditional food harvesting. However half of the respondents (49 percent) reported no vigorous activity at all, and only 23 percent reported up to 30 minutes of moderate to vigorous activity a day. Women had lower activity levels than men; those with vigorous activity had better clinical health characteristics (BMI, blood lipids, etc.) (Redwood *et al.*, 2009). Successful physical activity interventions with American Indians and Alaskan Natives in the United States of America showed significant changes in health knowledge or behaviour, with sustainability being related to capacity building involving locally trained personnel, culturally acceptable programmes, local leadership and stable funding (Teufel-Shone *et al.*, 2009).

There is considerable literature on how to use schools to deliver nutrition education information and improve physical activity. Strategies can be sought from focus groups of teachers, parents and students (Schetzina *et al.*, 2009) examining how to improve school lunch and physical activities. The Pathways Program for American Indian schoolchildren was well constructed for addressing obesity prevention, dietary improvement and the sharing of health messages with families (Caballero *et al.*, 2003; Teufel *et al.*, 1999), and the Native Diabetes Wellness Program of the United States Centers for Disease Control and Prevention (CDC) published the Eagle books for diabetes prevention (CDC, 2009). Obesity prevention in Canadian schoolchildren was researched through an intervention implementation and evaluation programme in Kahnawake, Quebec (Cargo *et al.*, 2003; Jimenez *et al.*, 2003).

## Food and nutrition interventions

For decades, national and international health agencies have been promoting food and diet-based approaches to solving nutrition problems, along with nutrient supplementation and food fortification. The food-based approach to alleviating micronutrient deficiencies has received special attention as a relatively easy-to-deliver

and cost-effective strategy. However, in the absence of adequate food (energy), supplying micronutrients to improve nutrition status is obviously futile. It has also long been known that nutrition education cannot compensate for poor access to food, and activities for improving access must be integrated into other elements of programmes (Kennedy and Pinstrup-Andersen, 1983). Local food-based strategies are therefore important in contributing food with all the needed nutrients, and they can also provide livelihoods and income (FAO and International Life Sciences Institute, 1997). Community-level production of small animals, poultry and fish can provide necessary animal foods with absorbable micronutrients, as complementary foods for infants and young children. Sustainable food programmes use a combination of approaches directed at increasing the production of animal and plant micronutrient-rich foods, promoting nutrition education and guiding food selection, to increase diet quality through reduced consumption of less nutritious carbohydrates and fats. This helps to prevent both undernutrition, and overweight and obesity (Allen and Gillespie, 2001; Allen, 2008).

Community-based food and nutrition programmes that promote healthy diets have been analysed and summarized in detail to identify the factors that drive success (Gillespie, Mason and Martorell, 1996; FAO, 2003a; 2003b). It is recognized that there is no single way for programmes to succeed, because of cultural diversity and complexity and multiple perceptions of “the good life” and of what constitutes desirable cultural change (Messer, 1999). Review of the contextual factors that are important for programme success suggests that the most important factor is the existence of a nutrition-friendly policy environment at all levels of society in the country (Gillespie, Mason and Martorell, 1996). Infrastructure that supports community nutrition interventions includes charismatic leadership with decision-making skills, particularly among women, and the existence of poverty reduction programmes. The presence of community organizations, non-governmental organizations (NGOs) and infrastructure for basic services is also important, as is a culture that recognizes the need to support child development. Given

the many complexities and local and global contextual factors that affect the food systems of Indigenous Peoples – such as lack of political commitment at the national level, pollution of lands and waters, climate change, and discrimination against women – it is not surprising that there is no single template for improving food security for Indigenous Peoples by ensuring that food resources are available, accessible, acceptable and sustainable. In the context of these pillars of food security, successful programmes for improving health also depend on the application of key components of individual and/or community behaviour change: changing of knowledge, action, attitudes/values and behaviour (Boyle and Holben, 2006).

Climate change, with impacts on many traditional food systems of Indigenous Peoples, is an interfering external contextual factor (Nilsson, 2008). Within the United Nations, considerable attention is paid to global actions for reducing the pollution emissions that drive climate change, with consideration of Indigenous Peoples’ issues playing a key role (Damman, 2010). Recently, reports of climate change affecting traditional food have been made for Arctic Peoples (Nuttal, 2008), African pastoralists (Simel, 2008) and small island states in the Pacific (Smallacombe, 2008). The need for resiliency to changes in ecosystems resulting from climate instability or other ecosystem threats focuses Indigenous Peoples’ attention squarely on their own management of biodiverse resources to maintain community health.

When nutrition interventions have positive results, their scaling up to other communities and regions is an additional mark of success. Methods for understanding and measuring scale-up can be: i) quantitative, through increasing numbers of participating people/places; ii) functional, through increasing numbers/types of activities within a community; iii) political, with activities moving beyond service delivery to include empowerment and increasing relations with others in the state or region; or iv) organizational, through enhancing an organization’s strength to increase the intervention’s effectiveness, efficiency and sustainability, such as by improving its finances and income, or introducing appropriate legislation (Uvin, 1999). Scaling up can



also be measured with qualitative data that demonstrate improving programme effectiveness in empowering communities to collect data and decide what to do themselves – showing that the programme is “scaling down the top-down management” and using resources generated locally (Messer, 1999).

While the whole world needs improved nutrition with appropriate interventions, Indigenous Peoples are routinely at the bottom of the poverty ladder and especially vulnerable to malnutrition. In many regions there is an overriding assault on “indigeneity” and demands from multinational industries to profit from Indigenous Peoples’ land and water resources (oil, gas, minerals, lumber, etc.), ignoring the unique relationships and interlinkages Indigenous Peoples have with their ecosystems, cultures and health, as well as their priorities for the protection and sustainable use of resources. The United Nations actively promotes the human rights to food security and food sovereignty for Indigenous Peoples (FAO, 2009a; 2009b; 2009c). However, successful interventions that provide the necessary resources, promote Indigenous Peoples’ priorities, create the social conditions for self-determination and well-being, and develop capacity to build better nutrition and health within communities have still to be identified. The CINE programme is a contribution to this effort.

This chapter revisits the food, nutrition and health interventions described in other chapters. These were conducted by communities of Indigenous Peoples in nine case studies included in the CINE programme. The authors of each chapter share stories, lessons and commonalities that may help identify successful strategies and policies for initiation in other regions.

### **Basic concepts for creating interventions with communities of Indigenous Peoples**

It has long been known that nutrition interventions can be efficacious, but the crucial issue is whether or not they are effective and sustainable in the long run (Gillespie, Mason and Martorell, 1996). Interventions involving education and medical health tend to have

the lowest costs, while those that involve feeding or providing food resources to populations can be very expensive (ACC/SCN, 1991). Over the years much has been written about recommended procedures for producing and sustaining food and nutrition programmes (e.g., Caribbean Food and Nutrition Institute and Ministry of Health, 1985; FAO, 1997; 2003a). In the context of Indigenous Peoples, the CINE research team found that it makes a great deal of sense to build community infrastructure so as to make the best use of local food resources, and to protect ecosystems so they can provide sustainably for communities within the local cultural context.

Even in the most favourable conditions, community-based health promotion interventions are not easy to implement and complete successfully. Garnering resources, developing local community members’ capacity to conduct intervention activities for behaviour change, evaluating these activities and sustaining them pose immense challenges. Creating food-based community interventions to improve nutrition and health adds another layer of complexity at each of these steps, because getting the desired nutritious food into the community, and creating the formative events that ensure people have access to it and can enjoy and use it effectively and sustainably to improve health with measurable outcomes stretches the research agenda to almost impossible levels. The health promotion effort becomes even more challenging when it depends on creating a successful food-based intervention for Indigenous Peoples living in areas with difficult access, in circumstances of poverty and disadvantage and with multiple nutrition and health issues.

#### **Begin at the beginning – know the resources**

The CINE programme research partners recognized that the rural areas where the case study communities are located have the potential for making better use of local food resources to improve food and nutrition security. The partners began by realizing that many people did not know about their local resources, or at least not all of the resources known to the most knowledgeable community residents – the elders. For case study

projects that are grounded in knowledge and use of local food it was therefore necessary to ensure community-based knowledge sharing and documentation of local food systems in their full diversity. It was important to understand what people could harvest and purchase locally, what made foods acceptable to different age and gender groups in the community, and what health-giving potential there was for each of these foods. The first step in the overall CINE programme was to document scientific terminology and laboratory-based food compositions, under expert guidance. The methodology used to create this knowledge base is presented by Kuhnlein *et al.* (2006a).

Earlier work with partners demonstrated that a wide variety of intervention approaches are feasible in indigenous communities, and that many indicators can be used to measure the effectiveness of each (Kuhnlein *et al.*, 2006b). However, each community and culture has its own knowledge of benefits for physical, mental, emotional and spiritual health. Each has its own symbolic values for food, its own ways of using these to create identity and culture, and its own holistic approach to well-being (including physical activity, sharing, and community spirit in joint harvesting activities and celebrations). Tapping this knowledge for a health promotion effort requires building a knowledge-sharing consortium in the community. The research team had the benefit of strong community leadership to guide this component in each of the case studies. Applying and disseminating this knowledge in the community, and developing and evaluating health promotion activities depended on building trust and commitment among the community residents, their leaders and the research partners. This required substantial time, and was implemented in unique ways in each of the cultures, with their vastly different ecosystems, local social settings and priorities.

For example, in the Karen case study (Chapter 10 – Sirisai *et al.*, 2013)<sup>2</sup> involving a community of 600 people in western Thai land, the programme

explored and documented knowledge of more than 380 different food species/varieties in the rain forest jungle area. The priority was to develop better community experience of how children's health can be fostered using the Karen's own gardening and forestry techniques. Through school and community programmes, children were taught how to grow and cook healthy foods. One outstanding result was that within three years, the community had increased its production of local vegetables and fruits from 81 to 137 different food species, thereby increasing the diversity and variety of family meals, resulting in improved nutrition status (stature) for children.

### Common themes for interventions

Programmes must reflect communities' own world views, allowing them to accomplish goals that are within their own priorities and to recognize the values within their own environments. The CINE researchers found that interventions based on local cultural knowledge and focusing on children's health, and food for women and children have universal appeal. Communities welcome scientific knowledge about the physical benefits of good nutrition and health when it is presented sensitively and with meaningful examples, while communities' own understanding and knowledge of food environments offer unique perspectives and indicators for recognizing progress and change in health.

In all of the case studies, it became clear that Indigenous Peoples were keen to document their food systems for the benefit of future generations. However, there was an overarching sense that assessing these food systems was not enough; more had to be done with the information before it could help lead to better lives. The project had to provide not only a research environment and research subjects, but also opportunities for participants and leaders in the community to make decisions and use the information wisely for the community's benefit. Creating research agreements and/or mutual understandings with all those involved helped build the trust that this work required. Capacity building developed the concept of being empowered to express indigenous ways of knowing and indigenous community

<sup>2</sup> For the case studies with Indigenous Peoples described in this volume, chapter numbers and authors' names are given only on the first mention. The section on pp. 249 to 255 presents the case studies in alphabetical order of the Indigenous Peoples concerned, and repeats the chapter number and author name(s) for reference.



in the community during the period) from net changes (only those changes resulting from education or other community intervention activities). In any community, net effects can be influenced or masked by extraneous confounding effects and secular trends, such as increasing income from new employment opportunities in the community. There can be interfering events (climate change, food prices, natural disasters, etc.), design effects and stochastic effects (chance fluctuations). Attention needs to be given to the reliability of measurements, the bias or lack of internal validity that may result from selection bias, information bias, or even the placebo effect of simply having a new activity in the community (Oshaug, 1997).

In evaluations of health programmes in communities of Indigenous Peoples, it is not always possible to survey and analyse populations that are large enough to provide valid findings from statistical methods using quantifiable indicators of health, welfare or environmental improvements. This often limits the researcher to using only descriptive statistics (LaFrance, 2004) and creates the need to use qualitative methodologies that offer alternative ways of determining success, which may be more efficacious. Qualitative methodologies are appropriate for efforts to capture indicators of participatory methodologies, empowerment, community solidarity, and use of culture and traditional foods (Tauli-Corpuz and Tapang, 2006).

Despite the daunting challenges in evaluating interventions, research partners were convinced that their projects in reasonably small community settings were successful, and that evaluations provided meaningful demonstrations of impact measured in many different ways.

## Successful strategies and particular challenges

### Inter-project communications

Communication among the different case study research partners, community leaders and academic leaders was very important to the successes experienced. It provided rich discussion and cross-fertilization of ideas among interventions, and strategies for implementing

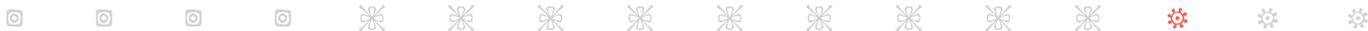
and evaluating activities. Annual meetings of research partners created new friendships and helped maintain the interventions' vitality. The CINE research team constantly learned the need for patience and careful listening. By keeping intervention leaders abreast of developments, ensuring opportunities for them to discuss their successes and challenges with colleagues, and providing incentives for revising and bolstering interventions where needed, these meetings were an important part of empowering communities and their leaders to see interventions through. The communities involved were proud that their leaders had been invited to these international meetings.

### Understand the basics

It was very important for the food system projects to begin with basic knowledge about the food resources: the species/varieties, their scientific properties and identification, and their use patterns within communities. Interdisciplinary experts such as nutritionists, food scientists, anthropologists, ethnobiologists and public health professionals contributed as needed. This grassroots knowledge made it easy to discuss food resources and ways of maximizing their availability. For example, the Pohnpei State Department of Agriculture of the Office of Economic Affairs, Department of Land and Natural Resources and the College of Micronesia-FSM/ Cooperative Extension Service collaborated to provide seeds and seedlings of important traditional species and cultivars, for planting in home areas (Chapter 12 – Englberger *et al.*, 2013; 2010). Karen case study leaders worked with community elders and knowledgeable leaders to teach schoolchildren how to grow many of the species in their food system.

### Building pride in the cultural food system and the project

Pride in the local food and culture created enthusiasm and momentum for community leaders and assistants to continue activities. Sharing success stories and showcasing special events and foods within the community and at meetings also provided impetus. Stories were routinely shared with local media, through newsletters, e-mail networks, radio and television, promotional



films, and school class and parent discussions, as available. The Ainu case study issued a weekly newsletter for sharing recipes and stories based on traditional foods (Chapter 13 – Iwasaki-Goodman, 2013); the project succeeded in giving Ainu people pride in and recognition of the particular flavours in their unique traditional preparations. The Nuxalk case study describes the development of user-friendly community food system handbooks presenting photos, names in the local language, identifications, harvest areas and strategies, and recipes (Chapter 11 – Turner *et al.*, 2013). Locally produced books can be expanded and revised periodically, reprinted and shared as a resource for adults and children. The book created for the Awajún case study was deposited in the national library of Peru (Chapter 5 – Creed-Kanashiro *et al.*, 2013). Several case study teams made posters of their foods for display in local community halls and schools.

### Focus on children and youth

All the case studies included interventions for children and youth, who represent the future of food system knowledge as it is passed to following generations. The case studies include many examples of food use in child care, and of teaching children to be self-sufficient in food, often using knowledge from elders. For example, elders in the Gwich'in area demonstrated the preparation of dried caribou meat to groups of youth in school. The youth then prepared several boxes of meat for distribution to home-bound elders (Chapter 7 – Kuhnlein *et al.*, 2013). In the Pangnirtung example, elders' stories were recorded on video for sharing with youth in school classes, to stimulate discussions about food, health and the impact of climate change on the availability of local foods (Chapter 9 – Egeland *et al.*, 2013).

### Commitment, capacity building and empowerment

Project leaders' commitment and capacity are essential for the success of interventions in communities of Indigenous Peoples. How and by whom activities are organized and carried out are of crucial importance, and there must be genuine community ownership,

for example, involving women's organizations and leaders. People are not just the beneficiaries of programmes; they make programmes happen. Community ownership is developed through the involvement of community partners in programme planning, initiation, organization and implementation. Community leaders recognize what seems reasonable and is operationally realistic for the community. Community nutrition programmes in developing areas are more likely to succeed when intervention activities result from the persistence and persuasiveness of project advocates rather than precisely documented needs (Berg and Muscat, 1971; Gillespie, Mason and Martorell, 1996). Each of the chapters in this book gives evidence of local leadership mobilization and commitment and community empowerment, especially the case studies with the Nuxalk, Awajún and Dalit (Chapter 6 – Salomeyesudas *et al.*, 2013).

### Multidisciplinary stakeholders

In all of the case studies, once the basic documentation had been completed and shared with the community, the project team took time to gather and discuss new ideas and strategies from the community. Successful projects have long lists of stakeholders, including intersectoral and multidisciplinary partners, NGOs and government sectors (for capacity building), local research assistants and community volunteer networks. For example, the Inga case study team worked with local schools and health promoters, had immeasurable support from the NGO, Amazon Conservation Team, and built government support for the protection of lands for indigenous food and medicines in Colombia (Chapter 8 – Caicedo and Chaparro, 2013). The Pohnpei project drew on strong support from state, national and other agencies, including those for education, land and natural resources, health and agriculture – particularly the extension service provided through the College of Micronesia-FSM and the United States Department of Agriculture (USDA) Natural Resources Conservation Services Program. All the case studies worked with local professionals to enhance small-scale homestead and community farming of crops and livestock, emphasizing methods that were culturally appropriate and suitable for the local ecosystem.

Rather than basing intervention design on evaluation results, all the case studies adopted multifaceted approaches, which some call the “bottomless pit” of using anything that comes to mind to create awareness and behavioural change to improve food system use. This often brings unexpected rewards, with new ideas and resources coming from unanticipated sources. For example, the extensive communication networks built by the Island Food Community of Pohnpei led to requests for similar initiatives in the rest of the Federated States of Micronesia and on other Pacific islands. The Island Food Community of Pohnpei also worked with the Federated States of Micronesia Philatelic Bureau to develop two series of postage stamps depicting local foods.

### Intra-project communications and dialogue to build confidence and trust

Effective project management within communities must meet time-bound goals. In the CINE programme, community leaders played major roles in management, as academic leaders were often distant from the community region (Awajún, Gwich’in, Inuit, Inga). Frequent meetings between academic and community leaders stimulated mutual trust and effective management (Dalit, Nuxalk, Karen, Pohnpei, Ainu). Community steering committees played supportive roles, boosting the confidence of community leaders and assistants, and providing advice and direction for new activities. Community members themselves are the most effective in delivering new information and integrating it to reinforce community knowledge.

### Scaling up beyond the initial project communities

Requests for the scaling up of intervention activities can be considered the gold standard of success. The initial Nuxalk programme led to similar programmes in British Columbia and, eventually, the creation of CINE and its Global Health Food Systems Program. The Awajún health promoters are now working in many other communities in the Cenepa River region of Peru. The Ainu education programmes on traditional foods are spreading through universities in Hokkaido. There have been several requests for the Karen programme to be

replicated in other Southeast Asian tribal communities. The Deccan Development Society, an Indian NGO in Andhra Pradesh, has an impressive record of engaging Dalit communities in celebrating their traditional food knowledge through extensive media and community awareness campaigns.

### Contextual strengths and weaknesses

Contextual factors have a very strong influence on interventions, as they result in both enabling strengths and disabling weaknesses. For example, the Awajún in Peru faced a serious setback when government policies supported the use of their lands for mining and resource development (*Asociación Interétnica de Desarrollo de la Selva Peruana* Web site).<sup>3</sup> A national socio-economic plan promoting a sufficiency economy and active participation in community development enabled the Karen in Thailand, by procuring support and attention from various development partners at the national and community levels. The Pohnpei case study (Englberger *et al.*, 2010) benefited greatly from a supportive government that ensured attention through the attendance of the President and Governor at programme activities and the creation of national postage stamps, noted earlier. Climate change is a massive contextual factor, with impacts on the availability of traditional food species in all global regions, which are especially noted by Gwich’in and Inuit of Baffin Island. Escalating food prices during project periods, and various local environmental and economic changes were other important contextual features in case studies. All the case studies recognized that evaluations would likely have recorded better intervention results if they had not been carried out so soon after activities were implemented. Despite these caveats, all the case studies were enthusiastic about their projects and the results documented.

### Funding constraints

Funding constraints are always a problem when programmes have multifaceted and multisectoral activities. Each of the interventions mentioned in this book was conducted with minimal external budget while

<sup>3</sup> [www.aidesep.org.pe/](http://www.aidesep.org.pe/)



stimulating local empowerment and local sustainability. Stimulus funding through CINE was provided by Canada and FAO for all phase 1 activities (developing methods for documenting each of the 12 food systems) and some phase 2 (intervention and evaluation) ones. All of the case studies faced challenges with finding their own resources for phase 2 activities. This sometimes made it difficult to continue an intervention, such as with the Maasai (Oiye *et al.*, 2009), Bhil (Bhattacharjee *et al.*, 2009) and Igbo (Okeke *et al.*, 2009). However, all the other interventions obtained funding through NGOs and a wide variety of local volunteers. Finding this support depends on having committed, energetic and charismatic leaders, networks and a positive attitude to project success. All of the interventions have continued since the evaluations that were carried out in preparation for the chapters in this book.

### Evaluation constraints

The constraints to evaluation design considered in these case studies result from activities taking place in small community populations, activities being multifaceted, and appropriate control groups not being available. Another constraint is the use of pre- and post-assessments, which may result in data collection bias and lack of internal validity. As anticipated from the literature, these two- to three-year intervention programmes did not result in anthropometrical changes, reflected as improvements in stunting or obesity control. The exception was growth improvement among Karen children. The CINE programme team used community assistants in the field to collect evaluation data, which increased the burden on communities by requiring them to provide skilled assistants or people who were easily trained. However, communities appreciated this opportunity for capacity building in collecting their own data. Qualitative assessments of communities' knowledge of the changes taking place recorded successes, with notable examples being the Ainu, Pohnpei (Englberger *et al.*, 2010) and Karen case studies.

Resistance to the collection of biological samples (blood, faeces, urine), due to fear of discomfort or superstition, was offset by acceptance of food use and dietary indicators as ways of tracking change

resulting from food-based strategies. Dietary indicators were challenged by missing values in the nutrient composition data set for all the species used, and wide data variations within small populations.

### Working with government

In some cases, it was possible to work successfully with government agencies as partners, which contributed to intervention success. Although all the case studies had networks within some form of government service or policy setting, governments were not always supportive of efforts to increase Indigenous Peoples' access to local traditional foods. In Pohnpei (Englberger *et al.*, 2010) and for the Karen, both the community and the government felt ownership of the projects and their successes. However, different political priorities led governments or government sectors to avoid direct involvement with the food access strategies of the Awajún, Dalit, Gwich'in or Ainu.

### The case studies<sup>4</sup>

Table 14.1 provides a summary of the intervention strategies used by the case studies described in this volume, and Table 14.2 summarizes the evaluation indicators used. The reader is encouraged to read the specific chapters. The following subsections present brief descriptions of the case studies (in alphabetical order), intervention activities, evaluation methods and important contextual features.

#### Ainu

(Chapter 13 – Iwasaki-Goodman, 2013)

The Ainu are considered Japan's indigenous population, but serious discrimination and assimilation practices have contributed to poor cultural morale among Ainu people. The intervention is being conducted on Hokkaido Island through various projects to promote enjoyment of Ainu traditional food. A monthly newsletter describing harvesting, processing and cooking techniques for Ainu foods is distributed

<sup>4</sup> The present tense is used in this section because the interventions described are ongoing.

**Table 14.1 Summary of intervention strategies used**

<i>Intervention activity</i>	<i>Case studies conducting the activity</i>
Community partner consultation and/or research agreement	Ainu, Awajún, Dalit, Gwich'in, Inga, Inuit, Karen, Nuxalk, Pohnpei
Community steering committee	Gwich'in, Inuit, Nuxalk, Pohnpei
Empowerment in training	Ainu, Awajún, Dalit, Gwich'in, Inga, Inuit, Karen, Nuxalk, Pohnpei
Local resources and traditions	Ainu, Awajún, Dalit, Gwich'in, Inga, Inuit, Karen, Nuxalk, Pohnpei
Employment of community assistants	Ainu, Awajún, Dalit, Gwich'in, Inga, Inuit, Karen, Nuxalk, Pohnpei
Activities in and for schools	Ainu, Awajún, Dalit, Gwich'in, Inga, Inuit, Karen, Nuxalk, Pohnpei
Activities engaging elders	Ainu, Gwich'in, Inga, Inuit, Karen, Nuxalk
Activities for children/youth	Awajún, Gwich'in, Inga, Inuit, Karen, Nuxalk, Pohnpei
Activities for women	Ainu, Awajún, Dalit, Gwich'in, Inga, Karen, Nuxalk, Pohnpei
Presentations of local/traditional food in community settings	Ainu, Awajún, Dalit, Gwich'in, Inga, Karen, Nuxalk, Pohnpei
Reaching diverse segments of communities	Ainu, Awajún, Dalit, Gwich'in, Inga, Inuit, Karen, Nuxalk, Pohnpei
Internal and external communications	Ainu, Awajún, Dalit, Gwich'in, Inga, Inuit, Karen, Nuxalk, Pohnpei
Media activities	Ainu, Dalit, Gwich'in, Inuit, Karen, Nuxalk, Pohnpei
Involvement of the business sector	Karen, Nuxalk, Pohnpei
Engaging partners from government	Dalit, Inga, Inuit, Karen, Pohnpei

to every household in the main community, Biratori, which has a population of 2 500. Two books for local residents have been prepared from interviews with elders, describing different Ainu traditional foods and medicinal plants. Community gatherings now serve Ainu dishes, and traditional prayers and offerings to the gods have been revived. More Ainu rituals have been conducted recently, with elders' participation, and traditional foods are indispensable parts of these occasions. Both Ainu and non-Ainu people living outside Biratori are interested in learning about Ainu foods and dishes, and cooking classes for students are held at Sapporo universities, including Rakuno Gakuen and Hokkai Gakuen. In partnership with elders in Biratori, students have developed a project highlighting new kinds of *shito* (a dumpling made from millet and rice powder). An Ainu graduate student helped to open a *shito* stall for university festivals. Restaurants in the Sapporo Grand Hotel have organized special dinners featuring an Ainu theme, and the Shiraoi Museum has adopted Ainu dishes for its cultural days.

The community and academic leaders view intervention activities as having improved socio-cultural health among Ainu people in Saru River region. The

reintroduction of cultural elements associated with food, such as knowledge regarding the harvesting, preservation and cooking of certain foods, and rituals featuring food, has led to cultural revitalization. Ainu people are now proud of their ethnic background and their food culture's integration into local food culture. This is helping to resolve the serious social prejudices faced by Ainu people.

### Awajún (Chapter 5 – Creed-Kanashiro *et al.*, 2013)

The local diet of the Awajún on the River Cenepa in the Amazon region of Peru is almost entirely made up of more than 200 traditional food species, but intakes of micronutrients are low, particularly among children. The intervention aims to increase the accessibility and use of high-quality traditional foods. Through participatory workshops, health promoters have been trained to emphasize traditional food topics and hygiene in food preparation. Use of traditional foods prepared with traditional utensils is promoted through print media, drama, songs and the sharing of recipes for young children's food. Small animal production,



**Table 14.2 Summary of evaluation indicators used**

<i>Evaluation indicator</i>	<i>Case studies using the indicator</i>
Interdisciplinary partners	Ainu, Awajún, Inga, Karen, Pohnpei
Qualitative methods	Ainu, Awajún, Dalit, Gwich'in, Inga, Inuit, Karen, Nuxalk, Pohnpei
Quantitative methods	Awajún, Dalit, Gwich'in, Inga, Inuit, Karen, Nuxalk, Pohnpei
Dietary indicators	Awajún, Dalit, Gwich'in, Inga, Inuit, Karen, Nuxalk, Pohnpei
Biological indicators	Nuxalk, Pohnpei
Clinical indicators	Awajún, Dalit, Gwich'in, Inga, Karen, Nuxalk
Anthropometry	Awajún, Dalit, Gwich'in, Inga, Inuit, Karen, Nuxalk, Pohnpei
Process indicators	Awajún, Gwich'in, Inga, Karen, Nuxalk, Pohnpei
Employment of community assistants	Awajún, Dalit, Gwich'in, Inga, Karen, Nuxalk, Pohnpei
Training and empowerment for local residents	Ainu, Awajún, Dalit, Gwich'in, Inga, Karen, Nuxalk, Pohnpei
Feedback from community	Ainu, Awajún, Gwich'in, Karen, Pohnpei
Locating local resources for sustainability	Ainu, Awajún, Dalit, Gwich'in, Inga, Inuit, Karen, Nuxalk, Pohnpei
Participation of volunteers	Awajún, Gwich'in, Inga, Karen, Nuxalk, Pohnpei
National awareness of project	Ainu, Awajún, Dalit, Gwich'in, Karen, Nuxalk, Pohnpei
International awareness of project	Ainu, Awajún, Dalit, Gwich'in, Inga, Inuit, Karen, Nuxalk, Pohnpei
Serious contextual constraints	Ainu, Awajún, Gwich'in, Inga, Inuit, Karen, Nuxalk
Policy impact	Ainu, Awajún, Dalit, Pohnpei
Scaling up	Ainu, Awajún, Dalit, Inga, Karen, Nuxalk, Pohnpei

fish farms, fruit tree production, food plant nurseries and medicinal plants have increased. Primary school children are trained in plant nurseries, and school lunches have been improved. Several cultural festivals are held annually. A traditional food reference book with photos, descriptions and nutrient data has been prepared, distributed in the communities and deposited in the national library.

Local health promoters keep records of food and health promotion activities. Surveys have recorded food intakes, mothers' physical activity levels, family food security, infant feeding practices and anthropometry of children. After two years of the intervention, traditional food diversity in the diets of women and children under five years had increased, and young children were consuming more animal-source foods (meat and fish).

External constraints experienced include changes in the local political structure, and a violent land rights conflict with the federal government, which interfered with activities of the local Awajún promoters. In

addition, imported food from donation programmes and cash from coca production is beginning to decrease the quality of the local diet.

### **Dalit** (Chapter 6 – Salomeyesudas *et al.*, 2013)

Although the Dalit are not considered a tribal people,<sup>5</sup> Dalit women are recognized as the most disadvantaged of Indian adults. The local Dalit food system in the Zaheerabad region of Andhra Pradesh contains more than 300 species and has evolved over the thousands of years that these people have lived in the region, working in agriculture. Case study partners have been using participatory methods to promote these foods since the mid-1980s, focusing on locally grown sorghum, millet, legumes, vegetables, fruit and uncultivated green leafy vegetables. A broad spectrum of activities benefit the health of women and children: reclaiming land and using revitalized agricultural methods for food

<sup>5</sup> The Indigenous Peoples officially noted by the Indian Government.

production by Dalit women farmers; capacity building for women as farmers, advocates, and film and media producers; food preparation for day-care centres; food festivals in communities and educational and industrial settings; film; school curricula; advocacy through radio and television; and work with a policy action group to influence national and state policies. Major impacts noted by the community and partners include enhanced soil fertility and conservation, increased food availability, greater self-reliance, reduced seasonal migration, more animal fodder and livestock, and more children attending school.

The CINE programme has contributed a dietary and nutrition assessment and a socio-cultural evaluation based on interviews. Intervention activities have been conducted through participating women's *sanghams*, and data from participating villages have been compared with data from villages that did not participate in the programme. Women in participating communities have better intakes of sorghum, legumes, vegetables and animal-source foods, and better dietary status; however children's nutrition levels are similar in both intervention and non-intervention villages. The traditional foods protect against chronic energy deficiency and night blindness (Schmid *et al.*, 2006). The evaluation was probably affected by the extensive media exposure of intervention activities in all villages.

### Gwich'in (Chapter 7 – Kuhnlein *et al.*, 2013)

The Gwich'in community of Tetlit Zheh in the Northwest Territories of Arctic Canada have expressed concern that their traditional wildlife foods, particularly caribou, birds and fish, are becoming scarcer and that children are affected by poor-quality diets composed mainly of market food. Local personnel have implemented intervention activities for two years, to improve the use of traditional food and better-quality market food. Activities have included regular radio announcements, school activities with youth, food teaching events involving elders, physical activity events, the creation of a DVD about local food, and production of a Gwich'in food and health book. The

baseline assessment of young women and youth found extensive overweight and obesity and poor diets, with high consumption of sweet, salty and fatty market foods and beverages. Those consuming wildlife foods have better nutrition status, although intakes of some nutrients are still below recommended levels. More than half of households are categorized as food-insecure, and households with less access to traditional foods have lower food security.

Serious external contextual events include climate change impacts on wildlife, and escalating fuel and food prices (market food) driven by external global markets. The local project personnel declined CINE's follow-up assessment with interviews and dietary and health assessment. However, the food and health book has been found to be highly appreciated by the community.

### Inga (Chapter 8 – Caicedo and Chaparro, 2013)

The Inga community members involved in this project are located on several reserves in the Caqueta region of Colombia. Community leaders and leaders of the Tandachiridu Inganokuna Association provide participatory development approaches and planning, in cooperation with the Amazon Conservation Team, an NGO. More than 5 000 Inga from 800 farm areas (covering 94 ha) have participated in the programme to ensure community health, which focuses on traditional food and medicine availability, cultural promotion and primary health care. An Inga traditional food handbook and an agro-ecology calendar have been developed. All the programme materials developed use words and imagery that are common to the Inga and consistent with their official *Plan de Vida*. Traditional foods and medicines have been promoted through family visits, workshops and courses, traditional food seed exchanges, the establishment of community and school gardens for food and medicinal plants, culinary festivals and recipe exchanges, radio programmes and health brigades, which include shamans and women healers.

Quantitative evaluation was based on dietary, anthropometric and clinical nutrition assessments, and qualitative evaluations on individual and family



interviews. The proportions of dietary energy, protein, iron and vitamin A in the diet increased over the two-year evaluation period, but there have been no changes in anthropometric indicators. Fewer participating families express insecurity regarding the availability of locally grown food and medicines. Species diversity in farms has increased by 54 percent.

Specific challenges relate to advancing colonization on traditional Inga territory, for logging and seismic exploration for petroleum extraction, and the presence of armed militias and paramilitary groups. These create economic, environmental and social instability, leading to violence against citizens. Coca production and peripheral relations with the narcotics industry have contributed to ecosystem instability.

## Inuit

(Chapter 9 – Egeland *et al.*, 2013)

The community of Pangnirtung in the Baffin region of Nunavut in Arctic Canada participate in this project, with community leadership through Inuit Tapiriit Kanatami. Primary traditional food species are caribou, blueberries, seal, Arctic char, clams and local shrimp, and intervention activities focus on elders' traditional food stories, delivered on DVD and through youth radio drama programmes that provide modern-day nutrition and health advice. These build beneficial associations with health and well-being. Inuit traditional knowledge on plants, medicines and foods, and observations on climate change are discussed in these media.

Health surveys of adults and youth for the baseline evaluation found that dietary quality improves with increased intakes of traditional food. More sugared beverages and chips are eaten when traditional food is not, and this contributes greatly to high energy, sugar and saturated fat intakes and resulting overweight. Those consuming even only one serving of traditional food per day have significantly more dietary energy from protein, less carbohydrate and more total fat. Girls, but not boys, who consume traditional food were found to have higher dietary intakes of iron, vitamins A, B and D. Clearly, increasing the proportion of traditional food in food energy would improve nutrition.

As a result of climate change, disturbances in the Arctic ecosystem are happening rapidly, and are likely to continue. Changes in ice formation threaten Inuit traditional food species and food security, and undercut the promotion of greater use of traditional food.

## Karen

(Chapter 10 – Sirisai *et al.*, 2013)

The Sanephong Karen community is in a remote village in western Thailand, close to the Myanmar border. The community and academic partners recognize that traditional food availability is deteriorating rapidly, partly because traditional lands have been designated as a national park, thus restricting the Karen's access to wildlife. The intervention has the objective of using traditional food knowledge about more than 300 food species/varieties as a platform for working with the community to improve nutrition and health. Focusing on empowerment and building trust and commitment, partners have worked together to increase awareness of food and water sources; promote production and consumption of these resources in village areas, especially by children; and increase local capacity, knowledge and skills for taking action in children's food and nutrition security. Using a culture-based approach with metaphor and social dialogue, project personnel are growing more food at home, encouraging better food education for schoolchildren, empowering community women, and strengthening community leaders, with input from elders and many stakeholders, including local Buddhist monks and store owners. Interdisciplinary academic participants from Mahidol University include personnel from the Institute of Nutrition, the Faculty of Environment and Resource Studies, the Institute of Language and Culture for Rural Development and the Faculty of Medicine. Staff from the Ministries of Agriculture and Cooperatives and of Health are also involved. A unique aspect of the intervention is its strong empowerment of both the Karen community and local government officials. Local people are encouraged to report on the progress of their community development at all levels, including to Her Royal Highness Crown Princess Mahachakri

Sirindhorn who has visited the community. Many different materials have been created and distributed in the community, including posters and a book highlighting local foods and stressing that “food is part of happiness” and local pride.

Evaluation demonstrated substantial change in the number of household-grown vegetables and fruit species in the community (with more than 50 additional species compared with pre-project numbers); change in opinion, with more household members recognizing the benefits of using traditional vegetables; and schoolchildren’s increased capacity for growing, harvesting, cooking and enjoying local traditional plants. The anthropometric status of children under 12 years of age has also improved.

## **Nuxalk** (Chapter 11 – Turner *et al.*, 2013)

More than 20 years ago, the Nuxalk Nation, an indigenous community on the west coast of British Columbia, Canada, conducted a highly successful intervention stressing traditional food use and well-being. The intervention was based on participatory cooperation with the Nuxalk Nation Council and the local nursing station, with researchers from the University of British Columbia, and stressed the use of traditional food knowledge as a platform for health promotion. Intervention strategies included research and the sharing of results to define the food system, the nutrient composition of key foods and how food use knowledge had changed over three generations of Nuxalk women. Personnel living on the reserve and working in its health centre promoted the use of traditional food and quality market foods. Food teaching events led by elders included the creation of a traditional food and medicine garden, regular information flyers distributed to family mailboxes, fitness events, and school classes on nutrition, dental health and food preparation. A traditional food handbook and a recipe book were distributed to all homes on the reserve and have been reprinted several times (Kuhnlein and Moody, 1989).

Before-and-after evaluation demonstrated increased quantities of traditional food being harvested and used,

and more families participating in these activities after the intervention. Biological evaluations from blood samples showed increased red blood cell folate, serum retinol and carotene in adults and youth, with youth also experiencing better iron status. Process measures documented community participation and tracked successful activities (Kuhnlein and Burgess, 1997).

Key to programme success was regular participation of the Nuxalk Nation Council and community health personnel in traditional food promotion events. A fitness “guru” from Vancouver spent several days in the community, encouraging youth to participate in fitness activities. When the project was revisited 20 years later, the original participants and their families still indicated substantial awareness of the importance of traditional food and an interest in growing garden produce and processing fish and other local foods for their families; they attributed at least part of this interest to the original programme.

## **Pohnpei** (Chapter 12 – Englberger *et al.*, 2013)

The Mand community of Pohnpei State, one of four states in the Federated States of Micronesia, is the focus of traditional food documentation and food and health promotion activities, which were evaluated two years after they commenced. Activity design and implementation were led by the Island Food Community of Pohnpei and its many collaborators. Documentation of the traditional food system uncovered knowledge and use of 381 species and their varieties/cultivars, and many valuable nutritional properties of these foods. Intervention activities that were community-based are now continuing with interdisciplinary and multisectoral inter-agency support at the state and national government levels and through other NGOs: departments of education, economic affairs, health, lands and natural resources; the College of Micronesia-FSM Cooperative Extension Services; and USDA’s Natural Resources Conservation Services. Activities include youth drama clubs, recipe presentations, training in container gardening, cooking classes, newspaper articles, radio, film and television presentations, school and curriculum development,



slogans and songs, games, weight loss competitions, and many promotional incentives.

Baseline and two-year evaluations have been successfully conducted with randomly selected households. Significant data differences between the two show that the consumption of refined imported white rice has decreased – this is a major improvement, as white rice has been replacing healthy local foods that are abundant in this rural area. In addition, the consumption of locally grown giant swamp taro and vegetables has increased, as has that of different banana varieties. Dietary diversity and attitudes to local food have improved (Kaufer *et al.*, 2010).

The success of this programme results from several factors, including outstanding and extremely supportive leadership at the local, state, national and NGO levels; the small island situation, creating close proximity among these different levels; extensive communications across sectors and disciplines, including the participation of graduate students from several universities; and the development of imaginative activities that appeal to community leadership. Community and academic leaders are satisfied that the package of project activities has had substantial impact, based on social marketing, education and agricultural provisioning to the community.

## What have we learned? Where do we go from here?

Participants and researchers in all case studies have learned immeasurably about their unique settings, and continue to promote the increasing availability of local food, ensuring that it is accessible and acceptable for all members of the community, and developing programmes with good promise of internal sustainability. These local success stories demonstrate opportunities for scaling up to adjacent communities and wider regions.

Intervention strategies that work intensively at the grassroots level with small communities of Indigenous Peoples and have limited budgets present overwhelming challenges. It is notoriously difficult to use food-based strategies to effect rapid change that can be reflected

in quantitative evaluation using statistical methods. There are many justifications for poor returns on public health promotion efforts, such as formidable contextual factors affecting access to land, water and local cultural food resources; the extensive debilities and disparities resulting from neglect and repressive discrimination of indigenous communities, especially women; and the need for time and commitment for capacity building within cultures and communities.

Nevertheless, the research partners described in this book have achieved successes in their work with indigenous communities, and have learned how to create and evaluate effective intervention programmes grounded in the rich diversity and nutrition provisioning available in the local food systems of Indigenous Peoples. Capacity building, participatory decision-making, learning by doing, the use of local cultural and ecosystem knowledge and resources, and networking are key factors for success. These findings contribute to understanding of how governments and advocates can help to create programmes for improving well-being throughout the indigenous world. Building confidence in local food systems and links to cultural and ecosystem integrity develops the commitment to using and protecting these vital resources with community-specific knowledge and methods. Giving credence to these methods in local, national and international communications helps to reduce the disparities in health and well-being experienced by Indigenous Peoples.

The CINE researchers have learned to listen to what people have to say about what is important to them. Definitions of wealth, well-being and happiness are connected to important principles of culture and the food that people enjoy within their local environment. Many indigenous people do not consider themselves poor, even though they are living at the bottom levels of the definitions of poverty accepted by most development agencies. Information exchange has been at the heart of CINE's work, and all partners recognize that development, including food and nutrition security, is more sustainable when they listen and understand each other and work together to build the best strategies for change that is meaningful to the people directly involved.

Despite obvious obstacles, the imperative for United Nations agencies and forward-thinking governments is to recognize the scientific benefits of and the human right to Indigenous Peoples' local food systems, using activities such as those created and described in this book. Programmes that find success with any disadvantaged population do not necessarily work for Indigenous Peoples; additional efforts are needed to address the issues of discrimination, rural inaccessibility, and respect and protection of the culture and ecosystems from which Indigenous Peoples draw their well-being. On the other hand, successful health promotion using local food systems with communities of Indigenous Peoples are very likely to provide important lessons for public health practitioners working with any other community, regardless of whether it is disadvantaged, indigenous or not. ❁

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