

6 Sustained and integrated promotion of local, traditional food systems for nutrition security

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Introduction

The greatest biodiversity is found in developing countries where poor communities rely greatly upon agricultural biodiversity for their foods and livelihood (Hobblink, 2004). Thus maintaining the viability of developing countries' local food systems which contain immense agricultural biodiversity remains one sustainable way of ensuring food and nutrition security for resource-poor populations. Padulosi et al. (2009) furthermore highlighted that the larger the agricultural biodiversity basket available to farmers and value chain actors, the greater will be their capacity to effectively and sustainably meet the environmental challenges of climate change.

In sub-Saharan Africa (SSA), the agricultural biodiversity within traditional food systems contributes to food and livelihood security in very profound ways. Communities traditionally employ a wide range of locally available food resources in daily diets. However, across developing countries, socio-economic changes are contributing to changes in dietary patterns and food habits. These changes are believed to play significant roles in the many health problems faced by poor communities in particular. Sub-Saharan Africa continues to be overburdened by nutritional and diet related health problems, most of which can be traced to insufficient dietary intakes of micronutrients (vitamin A, iron and zinc in particular), and in the recent past, increases in the consumption of cheap, calorie-dense staple foods leading to increased incidences of obesity and other diet-related chronic diseases (Mendez et al., 2005).

Africa holds a rich and varied agricultural biodiversity that is part of local traditional food systems. Dykstra and colleagues (1996) observed that forest-based crops, root crops and cereal–root crop mixed farming constitute the main land use systems in West and Central Africa. In SSA and West Africa in particular, there are diverse agricultural ecosystems for the production of a wide range of indigenous/traditional foods which if effectively managed, mobilized, and their use in diets relentlessly promoted, can increase food availability, expand household food choices and ensure dietary diversity and better nutrition.

Using experiences from West Africa, this chapter examines the agro-ecology of the sub-region and the role played by the diversity within the local food

systems in shaping the region's well known but now disappearing rich and healthy food culture. The chapter will also review changes in this food culture and dietary habits occasioned by globalization, urbanization and changes in food production practices, the evolution of the nutrition transition, and then discuss research and intervention programmes that have been put in place in the region to address and reverse, as much as possible, the deleterious effects of the nutrition transition on the population. These programme activities are expected to generate positive changes in the food choices of the population, eventually leading to increased diversification in household diets.

West Africa's physical geography presents a striking zonal arrangement – the Guinean zone where evergreen forest formations dominate, the Savannah zone that is still forested but with trees becoming smaller and rarer as one moves north, and a Sahelian zone that is semi-arid. These distinct ecosystems provide a wide range of indigenous and traditional foods, and to a large extent determine the food systems and food habits of communities in different parts of the sub-region. The rangeland food system of the Sahel and Savannah with its dominant cereals (millet – *Pennisetum typhoideum*; sorghum – *Sorghum vulgare*; hungry rice – *Digitaria exilis*) and cowpea staples contrasts with the forest and aquatic based systems dominated by roots, tubers, starchy fruits, and several traditional bean varieties such as the cowpea, bambara ground nut and African yam bean. Thus tubers, rhizomes, roots and starchy fruits were major staples that dominated the food habits of the southern Guinean zone, while cereals and grain legumes predominated in the northern Savannah and Sahelian zones (Figure 6.1). The respective major staples are supplemented with a diversity of indigenous minor food components such as oil seeds (the oil palm and shea butter in particular), fruit and leaf vegetables, a whole array of fruits, food condiments and spices, as well as uncultivated wild gathered tubers, fruits, seeds, twigs, leaves and flowers of some plants. Some of these minor food components are also used as adjuvants

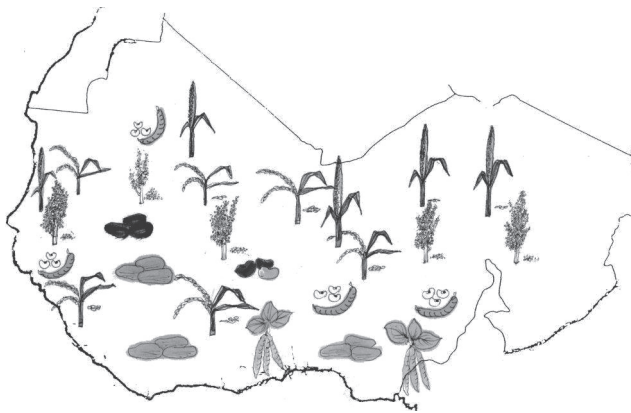


Figure 6.1 Pre-historic foods of West Africa (source: *Foods of West Africa* by F. Smith, 1998)

in traditional medicine. These indigenous foods defined the food habits of the populations in the Guinean, Savannah and Sahelian zones of West Africa.

Changes in dietary patterns

As has been reported for several developing countries (Shufa et al., 2002; Albala et al., 2002; Sodjinou et al., 2009; Delisle, 2010), West Africa has also undergone periods of changes in dietary habits and shifts in eating patterns in response to socio-economic and socio-political factors. However in West Africa the initial change was positive following the opening during the 8th century of the northern borders of the sub-region to Arab explorers, and the coastal borders to Portuguese and other colonial rulers between the 15th and 20th centuries (Smith, 1998). During these periods, the already diversified food base of communities was further expanded with the introductions of exotic food crops from North Africa, Asia and South America in particular.

These introduced foods included Asian rice, several species of beans, groundnuts, wheat, barley, taro, banana/plantain, cassava, maize, sweet potato, cocoyam, varieties of fruits, leafy greens such as Moringa, Jew's mallow, Indian spinach, quail grass, and such cash crops as sugar cane, cocoa, cotton, and rubber. Some of the foods introduced from the north of Africa became part of the food culture of the Sahelian zone while foods from South America and South Asia found more conducive environments in the Guinean zone and became part of the food habits of populations in the forest and coastal areas of the sub-region (Figure 6.2). As the introduced foods were selectively adopted by communities they became part of the traditional food systems of the region and were well established in community food habits. This influx of introduced foods, coupled with intra-regional movements of populations with their respective food cultures, created an expansion of the already diversified food base of communities all over the sub-region. During this period, and up to the mid-20th century, national and community food systems were extremely diversified (Figures 6.3 and 6.4), and this ensured some degree of food security and diversity in household diets of both rural and urban populations.

Evolution of the nutrition transition in West Africa

As the introduced food crops were adopted and cultivated, they initially complemented the indigenous food crops earlier described. More food varieties were available and the population of the region had a lot of foods to choose from. This food abundance and availability was aptly described by Schwab (1947) who reported that “the white man living in West Africa where ingredients are easily obtained, could use many of them with profit both to his health and his finances”. Murdock (1959) also observed that the population of southern Nigerians catapulted in the presence of a new and abundant food supply. However during the second half of the 20th century, because of higher and better yields and perhaps low production costs, several of the introduced food



Figure 6.2 Foods introduced to West Africa (source: *Foods of West Africa* by F. Smith, 1998)



Figure 6.3 Common staples in the Sahelian north of the region (source: *Foods of West Africa* by F. Smith, 1998)



Figure 6.4 West African foods today – Guinea Bissau to Nigeria (source: *Foods of West Africa* by F. Smith, 1998)

crops displaced the indigenous varieties in the food systems and thus radically altered the dietary patterns and food habits of the population. This signalled the onset of the nutrition transition in the sub-region. Furthermore, following the adoption of the introduced food varieties in local food systems (Figures 6.3 and 6.4), and cash (export) crops, the scene was set for the exploitation of the now conducive crop production environment in the sub-region with the establishment of cash crop plantations during the early to mid-20th century. More emphasis was now placed on cash crop production to the detriment and marginalization of food crop production. Increases in the production of cash crops such as peanuts, benniseed (sesame), coffee beans, palm nuts, cocoa, and rubber in particular, defined national agricultural production policies and set the scene for the practice of single food crop agriculture (Read, 1938). The period 1950 to date could thus be described as a period of shrinking food supplies and increasing food shortages throughout the West African sub-region. Political and socio-economic factors played contributing roles in this shrinkage of food supplies (Delgado and Rearden, 1987; Lappia, 1987) but the net effect was a significant reduction not so much on the numbers of cultivated indigenous cereals, legumes, tubers and minor food components but in their level of production and thus their availability.

Nutrition transition in full bloom

As already mentioned, the mid-20th century witnessed the emergence of cash crop economies in West Africa. Forests were cleared to make way for cash-crop farming. These clearing and cultivating activities modified the existing ecosystems and eliminated some wild indigenous food trees as well as some wild uncultivated food crops which were part of the traditional food systems (Robson, 1976). The trend towards commercial farming and the attendant destruction and erosion of ecosystem diversity negatively affected and contributed to the decline in the cultivation and availability of indigenous food resources that hitherto defined regional food habits and contributed to ensuring the food and nutrition security of local populations. This decline and displacement of indigenous food resources from national and regional food systems coincided with the emergence of food shortages and the increased dependence of populations in the sub-region on introduced and food aid cereals. The reliance on food aid grains such as wheat, rice and maize in particular, combined with declining use of food resources from traditional food systems is associated with the gradual simplification of household diets in the sub-region.

Increasing urbanization and large movements of populations to urban centres with reduced access to traditional and indigenous food resources also exacerbated the nutrition transition phenomenon (Maire et al., 1992; Voster et al., 2000; Albala et al., 2002). This reduced access to indigenous food resources has resulted in the replacement in diets of the hitherto diversified food resources by energy dense and nutrient poor convenience foods. Fouere and colleagues (2000) also observed that urbanization and new socio-economic

pressures on both rural and urban families, as well as lifestyle changes among the urban poor, force families to turn to high carbohydrate, high fat foods in order to meet their daily food needs. With increasing urbanization, the trend in dietary simplification continues as more and more women find employment outside the home, have less time for the preparation of family meals and so turn to high energy low nutritional value street foods, or easy to cook cereal foods and products like rice, wheat and maize. It is however interesting to note that in a study in Benin, West Africa, Sodjinou et al. (2009) found that many features of the “traditional diet” as defined by the study are maintained in the “transitional diet”. These researchers reported that in the study context, they observed that the transitional diet is really not a shift from traditional to western foods, but rather a more diversified dietary pattern with some imported foods added to the traditional diet although this is associated with a significantly higher intake of energy from saturated fats and sugar.

Is this trend reversible?

There has been a resurgence of interest in agricultural biodiversity within traditional food systems and the possible role these resources could play in ongoing efforts to steer populations away from carbohydrate and energy rich foods that are typical of simplified diets to more diversified diets that engender household food and nutrition security. In spite of the ongoing nutrition transition trend, it is widely acknowledged that within the sub-region, the healthy components of West Africa’s food traditions are still found in the lives and cooking pots of rural households in particular. This is confirmed by the study of dietary patterns of urban adults in Benin (Sodjinou et al., 2009). The investigators reported that many features of the traditional diet are maintained in the transitional diet patterns of the adults studied. This is indeed heartening because with the healthy components of the traditional food habits still playing a role in contemporary food habits in the sub-region, the possibility of reversing the trends in dietary simplification looks promising.

The author’s experiences during the 1967–1970 Biafran war, and the war exigencies that compelled the population of the then south Eastern Nigeria (Biafra) to resort to the traditional food systems for food and health needs also provide evidence that the trend towards dietary simplification can be slowed down if not reversed. During the three-year period of the war, most of the population of former Biafra was crammed into a land space less than half the original size of the region. Gone were the exotic cereals and products (breads and other baked products, imported Asian rice, pastas), animal products (milk, butter, cheese, imported New Zealand beef, dry and salted stockfish from Scandinavia etc.), as well as several other food imports. The population turned to traditional food resources – indigenous roots and rhizomes, cereals, grain legumes, nuts and oilseeds, leaf and fruit vegetables, mushrooms, fruits, small game, edible snails and several molluscs and aquatic species. This experience was an “eye opener” to city dwellers (the author included) who were compelled to live among the villagers and

discovered the rich agricultural biodiversity within family and community farms. The Biafran experience was enlightening and contributed to the interest of some local researchers on the nutrition, health and medicinal properties of some food resources from local traditional food systems (Smith, 1982; Achinewhu and Ryley, 1987; Achinewhu et al., 1995; Glew et al., 1997; Ighodalo et al., 1991; Nordiede et al., 1996; Jideani, 1990; Muhammad and Amusa, 2005; Achu et al., 2008; Ngondi et al., 2005; Dahiru et al., 2006; Baumer, 1995; Ladeji and Okoye, 1993; Eromosele et al., 1991; Johns et al., 1995). Data from these and other earlier studies have spurred further interest and continuing research into the nutrition and health attributes of foods from West African traditional food systems. Investigations during the past two decades on foods from these food systems have confirmed these earlier reports of their nutritional and health protecting properties. While these reports do not suggest an exclusive focus on local agricultural biodiversity as the sole way of addressing the urgent food and nutrition challenges faced by several developing countries, the body of evidence generated strongly suggests that the agricultural biodiversity within these food systems, if properly managed and mobilized, can engender dietary diversity and promote healthier diets.

Voster and colleagues (2011) also believe that the trend towards dietary simplification can be slowed down, and suggested some research and intervention approaches that are needed to move the nutrition transition in a more positive direction in Africa. Among the suggested public health promotion strategies, policies and intervention approaches are:

- Evidence-based interventions that address identified public health problems
- Holistic integrated food and nutrition interventions
- Addressing under- and overnutrition simultaneously
- Involving communities in planning interventions using a bottom-up rather than a top-down approach
- Involving relevant stakeholders at the planning stage to ensure their active participation in the implementation stage
- Focusing on diversification of diets rather than a reliance on fortified foods and supplementation where possible.

In West Africa, international organizations working in collaboration with regional research institutions as well as the West African Health Organization (WAHO) (Box 6.1) have, during the past decade, developed research and intervention programmes to address and ultimately slow down the trend towards dietary simplification and its deleterious effects on the population's nutrition and health. Key programmes developed target:

- The revitalization of traditional food systems
- Addressing important constraints to the production of traditional foods
- The development of public awareness products and tools to enable effective public awareness and education programmes on the nutrition and health benefits of consuming foods from traditional and local food systems.

Box 6.1 West African Health Organization (WAHO)

The West African Organization is a specialized Public Health Agency of the Economic Community of West African States (ECOWAS). WAHO coordinates the ECOWAS nutrition Forum and so is charged with facilitating effective food and nutrition policies and programmes, and ensuring food and nutrition security in the sub-region. Local foods from the region's traditional food systems play a fundamental role in meeting this objective. This explains WAHO's very active leadership role in initiatives aimed at enhancing the production, marketing and consumption by the population of nutrient-rich foods from the region's ecosystems in order to ensure adequate nutrition, improved health and livelihoods of populations within ECOWAS Member States.

During the past two decades several published reports (Delisle et al., 2003; Kennedy et al., 2005; McBurney et al., 2004; Barngana, 2004; Smith, 2000; VanHeerden and Schoneldt, 2004; Adegbooye et al., 2005; Frison et al., 2006) have echoed the need to mainstream the use of traditional food resources in the daily diets of resource poor communities and households in particular. However, these studies have also highlighted major bottlenecks and constraints that have over the years hampered such attempts. Important among these reported bottlenecks and constraints are:

- Very poor knowledge base on traditional food resources by the population at large including national and regional agricultural policy and decision makers who determine policies governing agricultural production
- Poorly developed seed systems for traditional food crops
- Lack of or low appreciation of local communities' indigenous knowledge of their traditional food systems and building on such knowledge when developing agricultural intervention programmes
- Lack of market access for traditional food resources
- Dearth of credible information on the nutrition and health attributes of a large number of traditional food resources, including information required for public awareness and education of the population
- Economic viability/market competitiveness of these food resources
- Ecological sustainability
- Productivity/weak agronomic knowledge
- Socio-cultural basis of decision making.

In countries and regions with rich agricultural biodiversity and food culture such as West Africa, use of locally available traditional food resources should be part of frontline strategies for nutrition interventions and so the revitalization of local traditional food systems is believed to be an imperative starting point.

Furthermore, addressing the aforementioned bottlenecks would to a significant extent pave the way for the successful development and execution of sustainable national and regional programmes aimed not only at revitalizing local traditional food systems but also at mobilizing and mainstreaming food resources from these systems in household diets of both rural and urban populations in the sub-region.

Within the sub-region, national and regional institutions as well as international organizations have been slow and perhaps ineffective in articulating appropriate programmes to address the social and human development challenges posed by these constraints. However, in recent years there have been encouraging successes in research and development programmes put in place within the sub-region specifically aimed at addressing and overcoming some of these identified constraints. Some of these programmes are presented in the following pages.

Addressing poor knowledge base on traditional foods by the population

The general ignorance of the nature and use of nutrient-rich indigenous and traditional food resources has over the years resulted in these foods being left out of most national strategies put in place to address food security and nutrition problems of the population. One of the earliest research for development programmes designed and put in place to enhance the knowledge base of local populations on traditional foods was a five-country (Botswana, Cameroon, Kenya, Senegal, Zimbabwe) multidisciplinary, community-based Bioversity International/National Agricultural Research Systems (NARS) collaborative study on the conservation through use of African traditional leafy vegetables (Chweya and Eyzaguirre, 1999).

In sub-Saharan Africa, leafy vegetables are vital dietary components and have been described as indispensable ingredients of soups or sauces that accompany carbohydrate staples (Smith and Eyzaguirre, 2007). This programme was therefore an appropriate start in the push to expand the knowledge base on traditional food resources. The five-country programme on promoting African leafy vegetables which started in 1996 significantly helped to change attitudes towards these hitherto underutilized nutrient-rich, health protecting food resources. In Kenya, which was one of the participating countries, the programme was instrumental in the development of entire leafy vegetable market chains (Gotor and Irungu, 2010). In Senegal, the introduced leafy vegetable *Moringa oleifera*, locally known as Nebeday (an adulteration of the plant's popular name Never die), is very commonly used in traditional dishes and is believed to contain healing properties. Nutritional analysis done during this programme (Ndong et al., 2007) confirmed reports (Sena et al., 1998; Oduro et al., 2008) that *Moringa* is a good source of several nutrients. The study by Ndong and colleagues (2007) however disputed the claim that *Moringa* is also a good source of dietary iron and provided evidence that points to poor bioavailability of iron from *Moringa*. These results are of particular importance in the Sahelian zone of West Africa where public awareness campaigns have encouraged the use of

Moringa in family meals, and where dried and ground Moringa leaves are very commonly consumed and also used to enrich weaning foods.

Addressing poorly developed seed systems for traditional food crops

A key issue that emerged from the leafy vegetable programme in Senegal and other participating countries is inadequate systems for germplasm management and seed production. Poorly developed seed systems have been cited by specialists as a major constraint in ongoing attempts to increase the production of several nutrient-rich traditional food crops (McGuire, 2008; Sperling et al., 2008; Adegbooye et al., 2005). To address this challenge that confronts West African small-scale farmers, researchers from Bioversity International (formerly IPGRI), in collaboration with researchers from national agricultural research systems (NARS) in Burkina Faso, Mali and Niger, and national agricultural extension specialists, worked with small-scale farmers and farming communities in these countries to improve and increase farmers' capacities to select, produce and manage improved seeds of local food crop varieties. The capacity building programme which relied on the local farmers' indigenous knowledge of the food systems involved:

- Farmer participatory seed selection that eliminated through trials on demonstration plots low yield accessions with poor agronomic characteristics
- Quality seed production, maintenance and storage during which farmers acquired the ability to identify and maintain seed varietal characteristics during handling and storage
- Popularization of selected improved varieties through field demonstrations
- Improved cultivation practices
- Community-based *in situ* maintenance of local improved seed varieties.

Project activities (Vodouhe et al., 2008) resulted in participating farmers and their communities having access to quality seeds either through individual seed exchanges or through community seed fairs. This Sahelian farmers' project established a traditional seed system network in the three participating countries and has put in place an enabling structure in the form of seed fairs on which larger regional networks can be built. It is noteworthy that in executing project activities the farmers' knowledge of their traditional food systems was acknowledged and reflected in the participatory nature of project activities. Also, the capacity strengthening activities built on the existing indigenous knowledge of the participants.

Addressing market access for traditional food resources

One of the constraints to increased production of traditional food crops is a lack of market infrastructure and support for the marketing of local foods and products. Creating access to markets for West Africa's local traditional food

resources, increasing their marketability and making them easily available in local markets has the potential to mainstream the food resources in household food choices and selection thereby increasing their use in family diets.

Realizing this vital role that markets can play in mainstreaming local foods in household diets, Bioversity is conducting a two-country (Benin and Kenya) study on the effects of market integration on the nutritional contributions of traditional food resources to the well-being of the rural poor. The ongoing project will characterize the level of integration and assess market potentials of key traditional food resources. The study also hopes to determine the potential of markets to foster a wider use of key nutrient-rich foods from the traditional food systems.

Addressing lack of information for public awareness and education on the nutrition and health attributes of local agricultural biodiversity

Information, education and communication strategies and social marketing of programmes and products have been found to be indispensable components of community mobilization for successful food and nutrition intervention programmes. Through information and culturally applicable nutrition education, community mobilization has the important effect of raising awareness on the links between local food diversity, nutrition and health of community members. In the sub-region, the lack of this vital tool – credible data and information on the compositional attributes of traditional food resources – has greatly hampered attempts to inform and educate the population on the healthful attributes of these foods. Beyond the food needs of the population, such a food composition database is also vital for the development of effective tools for advocacy and is critical for policy and programme development within the agriculture, food, nutrition and health sectors.

The West African Health Organization working in collaboration with Bioversity International, FAO, the University d'Abomey Calavi Benin, and the University of Ghana, Legon, trained local experts on the development, compilation and dissemination of food composition databases. Some of the trained experts were engaged to compile available published and unpublished data on the composition of local traditional foods from 7 of the 15 countries in the sub-region. The data compiled was used in the development of a new regional food composition database (Stadlmayr et al., 2010). This first edition of the regional food composition database (Composition of Selected Foods from West Africa) has since been expanded and updated with new published data (Stadlmayr et al., 2012).

Policy advocacy activities

In addition to the research-oriented activities which are expected to inform evidence-based interventions and programmes, advocacy was another area of thrust of the regional institutional collaboration. Also targeted in the attempts

to enhance the knowledge base on traditional foods are national and regional policy and decision makers in the agriculture, food, and health public sectors in particular. These functionaries determine and develop policies that should ensure adequate food production, availability and use by all segments of the population. It is therefore appropriate that continuous policy advocacy activities in the form of workshops, round-table discussions and stakeholders' meetings are organized to inform and educate these groups of functionaries within the health, agriculture, education and rural development sectors in particular. Bioversity International, working in collaboration with the West African Health Organization and the United Nations Food and Agriculture Organization (FAO), organized two of these advocacy workshops between 2007 and 2009, as well as a stakeholders' consultation in 2010 involving participants from international and West African regional organizations operating in the food, agriculture and health sectors.

The first of these policy advocacy workshops involved director-level participants from the ECOWAS (Economic Community of West African States) national ministries of health, agriculture, representatives from private sector groups (farmers' associations, food processors and consumer organizations), representatives from universities and research institutions, international NGOs, regional and international organizations (Bioversity/WAHO/FAO, 2007). The workshop sought to inform, educate and convince the participants by way of topical presentations and group discussions of the need to re-assess existing food and nutrition related health and agriculture policies, harmonize such policies and develop cross-sectoral implementation strategies that would positively impact on food security, nutrition and health of the West African population. An indication of the relative impact of this first workshop was the request after the

Box 6.2 Réseau des Organisations Paysannes et des Producteurs Agricole de l'Afrique de l'Ouest (ROPPA)

The pillars of the initiative to promote the production and consumption of foods from traditional food systems are the small-scale farmers represented by ROPPA – a network organization of small-scale food producers that operates in 12 of the 15 ECOWAS member states, and implements activities at both national and regional levels. Since its restructuring in 2002, ROPPA has been actively involved in consultations for the development and implementation of West Africa's regional agricultural policies and programmes. It is also very active in advocacy on behalf of small-scale food producers and working to strengthen their capacities as well as implementing public awareness programmes. At national levels, ROPPA coordinates farmers' networks and activities, empowers farmer organizations by ensuring their credibility as well as the visibility of their network activities. ROPPA also provides additional support in the form of training and capacity development to women farmer cooperative groups.

Box 6.3 List of articulated constraints and challenges of West Africa's small-scale farmers

- Increasing lack of access to arable land with the ongoing decision of governments to allocate farm lands for the production of bio-fuels
- Land tenure problems hinder female farmers from farming in the same location for sufficiently long periods to improve and increase production.
- Preference of governments for cash crops discourages food crop production; small-scale farmers get very little help and support from governments
- No institutional/government support and/or protection from the effects of droughts, floods and invasions/destruction by locusts and crickets
- Very low use of inputs by farmers due to lack of operating funds which result in low production levels
- Inadequate systems for germplasm management and seed production
- Imposition of western-type farming in the form of new seed varieties
- Poor infrastructure for transportation needed to move foods from production areas to markets
- Lack of infrastructure for processing of fresh products to limit post-harvest losses
- Lack of financial support from governments and inability to obtain bank credits due to lack of or required adequate collateral
- Marketing difficulties due to absence of protection from competition from imports
- Little or no market infrastructure and lack of support for the marketing of local foods and products

workshop by the governing body of the regional small-scale farmers' associations (ROPPA, Box 6.2) to enter into a collaborative working relationship with WAHO. This relationship between WAHO and ROPPA, whose members are the producers of the traditional foods, is considered strategic for the development and implementation of regional programmes that aim to mainstream the use of traditional food resources for improved nutrition and health.

Another indication of a scaling up effect of this workshop was the decision by the ECOWAS Commission on Agriculture to join in the initiative for the promotion of foods from local traditional food systems. The Commission co-convened and hosted a 2010 stakeholders' consultation on national and regional programmes to promote foods from traditional food systems (WAHO/ROPPA/Bioversity/FAO/ECOWAS Agriculture Commission, 2010).

The second workshop was a three-day "listening workshop" (WAHO/ROPPA/Bioversity, 2009) which brought together representatives of 12 national farmers' associations, regional and international organizations, representatives

from research institutions, private sector groups and organizations. The presentations and the group discussions that followed provided the ROPPA members with information that enabled them to better articulate the constraints and challenges they face and the types of support they require in order to improve and increase the production of traditional food crops in their farms. The list of constraints and challenges (Box 6.3) provided workshop organizers (WAHO and Bioversity) with greater insights into priority areas of intervention and support for ROPPA in order to enable this network of traditional food producers to achieve the mutual objective of increasing production, availability and easy accessibility of local traditional food resources.

Conclusion

The health consequences of the nutrition transition on developing country populations have been widely reported. While there are similarities in the determinants of the nutrition transition – shifts in eating patterns, dietary changes characterized by increased consumption of simplified high carbohydrate, high fat diets – countries differ in the strategies developed to address the resulting food security, nutrition and health challenges faced by governments. Dietary diversification is acknowledged as a vital component of any intervention strategy. Sub-Saharan Africa and West Africa in particular still have strong traditional food cultures and rich agricultural biodiversity within traditional food systems which can be mobilized and used in national strategies to encourage diversification in food systems and household diets.

Evidence presented from West Africa suggests that it is possible to reverse the trend of dietary simplification which is one of the defining characteristics of the nutrition transition, and according to Voster and colleagues (2011), steer the process into a more positive direction. The targeted programme activities that were presented in this chapter to revitalize local food systems, address key constraints to the production of traditional foods and provide public awareness of products and tools that can be adapted and applied to several developing country situations, particularly SSA countries. The policy advocacy workshops were organized to enable national policy makers make informed decisions on how best to tackle the issue of food and nutrition insecurity in the sub-region. The regional institutional cross-sectoral and multidisciplinary collaboration was developed over time but it remains vital to the successful implementation of the reported programme activities.

The active participation in the institutional collaboration of the network of small-scale food producers, who are considered the pillars of the initiative to increase production and availability of traditional foods, resulted in a synergistic partnership of food producers, government agencies, researchers and development agencies. This partnership provided the framework or “backbone” on which the reported programmes to increase food diversity within national food systems thereby engendering diversity in household diets were successfully developed and implemented.

References

- Achinewhu, S.C., Ryley, J. (1987) 'Effect of fermentation on thiamine, riboflavin and niacin content of melon seed (*Citrullis vulgaris*) and African oil bean (*Pentaclethra macrophylla*)', *Food Chem.*, vol 20, pp.243–253.
- Achinewhu, S.C., Ogbonna, C.C., Hart, A.D. (1995) 'Chemical composition of indigenous wild herbs, spices, fruits, nuts and leafy vegetables used as food', *Plant Foods Hum Nutr.*, vol 48, pp.341–348.
- Achu, M.B., Fokou, E., Tchiegang, C., Fotso, M., Tchouanguep, F.M. (2008) 'Atherogenicity of *Cucumeropsis manii* and *Cucumis sativus* oils from Cameroon', *Afr. J. Food Sci.*, vol 2, pp.21–25.
- Adegbooye, O.C., Ajayi, S.A., Baidu-Forson, J.J., Opabode, J.T. (2005) 'Seed constraint to cultivation and productivity of African indigenous leaf vegetables', *Afr J. Biotech.*, vol 4, no 13, pp.1480–1484.
- Albala, C., Vio, F., Kain, J., Oauy, R. (2002), 'Nutrition transition in Chile: determinants and consequences', *Public Health Nutr.*, vol 5, no 1A, pp.123–128.
- Barnghana, R.K. (2004) 'The need for food composition data in Uganda', *J. Food Comp. Anal.*, vol 17, pp.501–507.
- Baumer, M. (1995) *Arbes, arbustes, et arbrisseaux nourriciers en Afrique occidentale*, Enda-Editions, Dakar Senegal.
- Bioversity/WAHO/FAO (2007) 'Partnership for mobilizing the diversity in traditional food systems to ensure adequate nutrition and health within ECOWAS Member States', Workshop Report, Ouagadougou, Burkina Faso, http://www.bioversityinternational.org/fileadmin/bioversity/documents/news_and_events/Conferences%20and%20meetings/ecowas_workshop/Report_WAHO_Bioversity_workshop_Burkina_Faso_Sept_2007_web.pdf, accessed July 2012.
- Chweya, J.A. and Eyzaguirre, P.B. (eds) (1999) *The biodiversity of traditional leafy vegetables*, International Plant Genetic Resources Institute, Rome, Italy.
- Dahiru, D., Sini, J.M., John-Africa, L., (2006) 'Antidiarrhoeal activity of *Ziziphus mauritiana* root extract in rodents', *Afr J Biotech.*, vol 5, no 10, pp.941–945.
- Delgado, C.L., Rearden, T.A. (1987) 'Problemes pour les politiques alimentaire poses par la modification des habitude alimentaire dans le Sahel', Conference on the Dynamics of Cereal Consumption and Production Patterns in West Africa, Dakar, Senegal.
- Delisle, H. (2010) 'Findings on dietary patterns in different groups of African origin undergoing nutrition transition', *Appl Physiol Nutr Metab.*, vol 35, pp.224–228.
- Delisle, H., Zagre, N., Bakari, S., Codjia, P., Zendong, R. (2003) 'Des solutions alimentaires a la carence en vitamin A', *Food Nutr Agric.*, vol 32, pp.40–48.
- Dykstra, D.P., Kowero, G.S., Ofosu-Asiedu, A., Kio, P. (1996) 'Promoting stewardship of forests in humid forest zone of Anglophone West and Central Africa', Final report of a collaborative UNEP/CIFOR Research Project.
- Eromosele, I.C., Eromosele, C.O., Kuzhkuzha, D.M. (1991) 'Evaluation of mineral elements and ascorbic acid contents in fruits of some wild plants', *Plant Foods Hum Nutr.*, vol 41, pp.151–154.
- Fouere, T., Maire, B., Delpeuch, F., Martin-Prevel, Y., Tchibindat, F., Adoua-Oyila, G. (2000) 'Dietary changes in African urban households in response to currency devaluation: Foreseeable risks for health and nutrition', *Public Health Nutr.*, vol 3, pp.293–301.

- Frison, E.A., Smith, I.F., Johns, T., Cherfas, J., Eyzaguirre, P.B. (2006) 'Agricultural biodiversity, nutrition and health: making a difference to hunger and nutrition in the developing world', *Food Nutr Bull*, vol 27, no 2, pp.167–179.
- Glew, R.H., VanderJagt, D.T., Lockett, C., Grivetti, L.E., Smith, G.C., Pastuszyn, A., Millson, M. (1997) 'Amino acid, fatty acid and mineral composition of 24 indigenous plants of Burkina Faso', *Food Comp Anal*, vol 10, pp.205–217.
- Gotor, E., Irungu, C. (2010) 'The impact of Bioersivity International's African leafy vegetables programme in Kenya', *Impact Assessment and Project Appraisal*, vol 28, no 1, pp.41–55.
- Hobblink, H. (2004) 'Biodiversity. What's at Stake?' *Currents*, vol 35/36, pp.18–21.
- Ighodalo, C.E., Catherine, O.E., Daniel, M.K. (1991) 'Evaluation of mineral elements and ascorbic acid contents in fruits of some wild plants', *Plant Foods Hum Nutr*, vol 41, pp. 151–154.
- Jideani, I.A. (1990) 'Acha (*Digitaria exilis*) – The neglected cereal', *Agric Intern*, vol 42, pp.132–134.
- Johns, T., Faubert, G.M., Kokwaro, J.O., Mahunnah, R.L., Kimanani, E.K. (1995) 'Antigiardial activity of gastrointestinal remedies of the Luo of East Africa', *J Ethnopharmacol*, vol 46, pp.17–23.
- Kennedy, G., Islam, O., Eyzaguirre, P.B., Kennedy, S. (2005) 'Field testing of plant genetic diversity indicators for nutrition surveys: rice based diets of rural Bangladesh as a model', *J. Food Comp Anal*, vol 18, pp.255–268.
- Ladeji, O., Okoye, Z.S.C. (1993) 'Chemical analysis of Sorrel leaf (*Rumex acetosa*)', *Food Chem.*, vol 48, pp.205–206.
- Lappia, J.N. (1987) 'Maize as a priority in Sierra Leone: Competitiveness of production with imports and trade-offs with rice', Conference on the Dynamics of cereal consumption and Production patterns in West Africa, Dakar, Senegal.
- Maire, B., Delpeuch, F., Cornu, A., Tchibindat, F., Simondon, F., Massamba, J.P., Salem, G., Chevassus-Agnes, S. (1992) 'Urbanization and nutritional transition in sub-Saharan Africa: exemplified by Congo and Senegal', *Rev Epidemiol Sante Publique*, vol 40, no 4, pp.252–258.
- McBurney, R.P.H., Griffin, C., Paul, A.A., Greenberg, D.C. (2004) 'The nutritional composition of African wild food plants: from composition to utilization', *J Food Comp Anal*, vol 17, pp.277–289.
- McGuire, S.J. (2008) 'Securing access to seeds: social relations and sorghum exchange in Eastern Ethiopia', *Hum. Ecol.*, vol 36, pp.217–229.
- Mendez, M.A., Monteiro, C.A., Popkin, B.M. (2005) 'Overweight exceeds underweight among women in most developing countries', *Am J Clin Nutr*, vol 81, pp.714–721.
- Muhammad, S., Amusa, N.A. (2005) 'The important food crops and medicinal plants of north-western Nigeria', *J Agric Biol Sci*, vol 1, no 3, pp.254–260.
- Murdock, G.P. (1959) *Africa, Its peoples and their culture history*, McGraw-Hill, New York.
- Ndong, M., Wade, S., Dossou, N., Guiro, A.T., Gning, R.D. (2007) 'Valeur nutritionnelle du *Moringa oleifera*, etude de la biodisponibilite du fer, effet de l'enrichissement de divers plats traditionnels Senegalais avec la poudre des feuilles', *AJFAND-Online*, vol 7, no 3.
- Ngondi, J.L., Oben, J.E., Minka, S.R. (2005) 'The effect of *Irvingia gabonensis* seeds on body weight and blood lipids of obese subjects in Cameroon', *Lipids Res Disease*, vol 4, no 3, pp.1–4 .
- Nordiede, M.B., Hotloy, A., Folling, M., Lied, E., Oshaug, A. (1996) 'Nutrient composition and nutritional importance of green leaves and wild food resources

- in an agricultural district, Koutiala in southern Mali', *Intern J. Food Sci Nutr*, vol 47, pp.455–468.
- Oduro, I., Ellis, W.O., Owusu, D. (2008) 'Nutritional potential of two leafy vegetables: *Moringa oleifera* and *Ipomoea batatas* leaves', *Scientific Res & Essay*, vol 3, no 2, pp.57–60.
- Padulosi, S., Bhag Mal, S., Bala Ravi, J., Gowda, K.T.K., Gowda, G., Shanthakumar, N., Dutta, M. (2009) 'Food security and climate change: role of plant genetic resources of minor millets', *Indian J Plant Genet, Resources*, vol 22, no 1, pp.1–16.
- Read, M. (1938) 'Native standards of living and African culture change', *Africa XI*, no 3 Supplement.
- Robson, J.R.K. (1976) 'Changing food habits in developing countries', *Ecol Food Nutr*, vol 4, pp.251–256.
- Schwab, G. (1947) *Tribes of Liberian Hinterland*, The Museum, Cambridge Massachusetts USA.
- Sena, L.P., Vanderjagt, D.J., Rivera, C., Tsin, A.T.C., Muhamadu, I., Mahamadu, O., Milson, M., Pastuszyn, A., Glew, R.H. (1998) 'Analysis of nutritional components of eight famine foods of the Republic of Niger', *Plant Foods Hum Nutr*, vol 52, pp.17–30.
- Shufa, D., Bing, L., Fengying, Z., Popkin, B.M. (2002) 'A new stage of nutrition transition in China', *Public Health Nutr*, vol 5, no 1A, pp.169–174.
- Smith, I.F. (1982) 'Leafy vegetables as sources of minerals in southern Nigerian diets', *Nutr. Rep Intern*, vol 26, pp.679–688.
- Smith, I.F. (1995) *The Case for Indigenous West African Food Culture*, UNESCO BREDA Series, no 9. UNESCO Regional Office, Dakar, Senegal.
- Smith, I.F. (1998) *Foods of West Africa, Their Origin and Use*, Ottawa, Canada.
- Smith, I.F. (2000) 'Micronutrient interventions: options for Africa', *Food Nutr Bull*, vol 21, pp.532–537.
- Smith, I.F., Eyzaguirre, P. (2007) 'African leafy vegetables: their role in the World Health Organization's global fruit and vegetables initiative', *AJFAND-Online*, vol 7.
- Sodjinou, V., Aguch, V., Fayomi, B., Delisle, H. (2009) 'Dietary patterns of urban adults in Benin: relationship with overall diet quality and socio-demographic characteristics', *Eur J Clin Nutr*, vol 63, pp.222–228.
- Sperling, L., Cooper, H.D., Remington, T. (2008) 'Moving towards more effective seed aid', *J Dev Studies*, vol 44, pp.586–613.
- Stadlmayr, B., Charrondiere, R., Addy, P., Samb, B., Enujiugha, V.N., Bayili, R.G., Fagbohoun, E.G., Smith, I.F., Thiam, I., Burlingame, B. (eds) (2010) *Composition of Selected Foods from West Africa*, FAO.
- Stadlmayr, B., Charrondiere, U.R., Enujiugha, V.N., Bayili, R.G., Fagbohoun, E.G., Samb, B., Addy, P., Barikmo, I., Ouattara, F., Oshaug, A., Akinyele, I., Annor, G.A., Bomfeh, K., Ene-Obong, H., Smith, I.F., Thiam, I., Burlingame, B. (eds) (2012) *West African Food Composition Table*, FAO.
- VanHeerden, S.M., Schondeldt, T. (2004) 'The need for food composition tables for southern Africa', *J. Food Comp Anal*, vol 17, pp.531–537.
- Vodouhe, R., Avohou, T.H., Grum, M., Bellon, M., Obel-Lawson, E. (eds) (2008) *Connaissances endogènes et gestion durable de l'agrobiodiversité à la ferme: expériences des paysans sahéliens. Actes d'un atelier regional, Bamako, Mali, 18–20 Février*.
- Voster, H.H., Wissing, M.P., Venter, C.S., Kruger, H.S., Kruger, A., Malan, N.T., De Ridder, J.H., Veldman, F.J., Steyn, H.S., Margetts, B.M., MacIntyre, U. (2000) 'The impact of urbanization on physical, physiological and mental health of Africans in North West Province of South Africa', *S Afr J Sci*, vol 96, pp.505–514.

- Voster, H.H., Kruger, A., Margetts, B.M. (2011) 'The Nutrition Transition in Africa: Can it be steered into a more positive direction?' *Nutrients*, vol 3, pp.429–441.
- WAHO/ROPPA/Bioversity (2009) 'Regional initiative for the promotion of local foods from the biodiversity of West Africa's traditional food systems', Workshop Report, Ouagadougou Burkina Faso. http://www.bioversityinternational.org/fileadmin/bioversity/publications/pdfs/1423_WAHO-ROPPA-BIOVERSITY%20INTERNATIONAL%20Regional%20initiative%20for%20the%20promotion%20of%20local%20foods%20from%20the%20biodiversity%20of-En.pdf?cache=1341711554, accessed July 2012.
- WAHO/ROPPA/Bioversity/FAO/ECOWAS Agriculture Commission (2010) 'Stakeholders meeting on the regional initiative for the promotion of local foods from West Africa's traditional food systems', Workshop Report, Abuja, Nigeria. www.bioversityinternational.org/nc/publication/issue/stakeholders_meeting