



Capacity development in food and nutrition in central and Eastern Europe: A decade of achievements



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ABSTRACT

This article summarizes the activities performed by the Network for Capacity Development in Nutrition in Central and Eastern Europe and Balkan countries (NCDNCEE) in the past decade. The article gives a retrospective of the achievements and challenges in building capacity in nutrition research.

Recognizing the lack of capacity and incoherent nutritional situation in CEE/BC, the United Nations University (UNU), Food & Nutrition Programme and the UN Standing Committee on Nutrition (SCN) encouraged the formation of NCDNCEE in 2005, which became CAPNUTRA in 2012.

The network's aim was to initiate and support tailor-made activities for capacity development in food & nutrition in research and training in CEE/BC. To identify the challenges and needs of nutrition research in the region, the network performed inventories on existence of food composition databases, food systems elements, dietary surveys, micronutrient recommendations, application of dietary assessment methods and grey literature. Further on, the network focused on the development of food composition databases and concomitant data management software, the Diet Assess & Plan platform for food consumption collection, dietary intake assessment and nutrition planning. These and other elements form the Balkan Food Platform, which underpins harmonized nutrition research in CEE/BC. Among key actions promoted by the platform are EFSA-supported dietary surveys conducted in four Balkan countries, on children and adults, in which food consumption data are collected and analysed in a harmonized way. Cooperation with FAO and active participation in international research projects enhanced the exchange of information and knowledge and brought international recognition to the CAPNUTRA network.

1. Introduction

This article presents the foundation, activities and achievements of the Capacity Development Network which was particularly organized for Central and Eastern Europe and the Balkan countries (CEE/BC) region considering their needs in the field of food and nutrition in the period from 2005 to 2019. Since all the performed activities have been designed based on the identified needs and gaps of the region, the article summarizes the lessons learned to get information about further sustainability of the network and transfer the knowledge to other stakeholders and networks of similar agendas elsewhere.

Capacity Development (CD) in food and nutrition is more than formal training and includes also human resource development,

organizational, institutional and legal framework development with the aim of enhancing knowledge and skills. The CD is a long-term, continuous process, which focuses on national priorities, plans, policies and processes (Lopes and Theisohn, 2003).

CD in food and nutrition presents a continuous process for improvement of the individual, institutional and national level of knowledge and skills. It entails development of research infrastructure including standardization and harmonization of the nutritional research methodology in surveillance and monitoring. Furthermore, it requires establishment of education and training programmes which will create multidisciplinary personnel competent to take on evidence-based policy decision-making, implement action plans and policy recommendations for improvement of diet and prevention of malnutrition of the

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¹ <https://www.srbnutrition.info>.

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population.

Networks under the United Nations Standing Committee on Nutrition (SCN) already existed in Asia, Latin America, Middle East and Southern Africa. SCN, United Nations University (UNU) and the International Union on Nutritional Sciences (IUNS) established a SCN Working Group on CD in nutrition and related issues in 2001. UNU Food and Nutrition Programme for Human and Social Development (UNU-FNP) and SCN encouraged and supported the formation of the Network for Capacity Development in Nutrition in Central and Eastern Europe (NCDNCEE)³ to foster CD in the field of public nutrition research and training, based on the country-specific needs in Central and Eastern Europe (CEE).⁴

The first kick-off meeting of the UNU/SCN NCDNCEE was held on 19th May 2005 and the first inaugural meeting took place in Budapest on 13th-14th February 2006 at the Sub-regional Office of the UN Food and Agriculture Organization (FAO/SEUR), when the Network started with its CD activities. The UNU-FNP, through SCN, organized annual meetings of the regional CD networks and the SCN working group chairing from 2006 to 2008 for harmonization of the CD and support of the activities.⁵ The UNU/SCN NCDNCEE was partly financed by the UNU-FNP (from 2005 to 2011), the FAO Regional Office for Europe and Central Asia (FAOREU), several European Commission-funded FP6 and FP7 projects and the EuroFIR AISBL.

Initial activities of the network were focused on identification of the challenges and needs in the field of nutrition, the enhancement of individual, institutional and organizational capacity in food and nutrition research, including development of strategies, frameworks and planning guidelines for CD in nutrition in CEE and Balkan countries (BC) (Pavlovic et al., 2009).

To stimulate CD in food and nutrition in CEE, the NCDNCEE network identified a standpoint for building research infrastructure (RI), and specific education/ training needs of the research personnel in the region. The network established collaborations with European countries through international networks, UN and European organizations, food, nutrition, research and public health nutrition institutions, as well as international research projects. The NCDNCEE's successor - CAPN-UTRA was founded in 2012.

The CD process and activities in the CEE/BC region were shaped around nutrition challenges in the region. In this process a comprehensive approach was taken to identify the existing nutrition challenges and map the food and nutrition RI. The actual status of nutritional education was evaluated and specific education/ training needs were identified. The network fostered exchange of knowledge and experience and enhanced networking among the NCDNCEE members from other European countries and networks. The network collaborated in European Commission projects through which knowledge transfer to CEE members was performed in fields of implementation of the nutritional research methods, including development and application of innovative nutritional tools.

The article presents different aspects of development of the network and planning of its activities. Moreover, it presents concrete results in the form of developed tools, platforms and methodologies-in-place that have emerged from various collaborations throughout the years. Finally, it summarizes the lessons learned in the context of global CD processes and international authorities' recommendations.

³ https://www.unscn.org/files/Annual_Sessions/33rd_SCN_Session/33rd_session_REPORT.pdf

⁴ See the UN Standing Committee on Nutrition Report (2004), https://www.unscn.org/files/Annual_Sessions/31st_SCN_Session/31st_session_REPORT.pdf

⁵ See the 2006, 2007 and 2008 reports of the UN Standing Committee on Nutrition, available at: https://www.unscn.org/files/Annual_Sessions/33rd_SCN_Session/33rd_session_REPORT.pdf, https://www.unscn.org/files/Annual_Sessions/34th_SCN_Session/34th_session_report.pdf, https://www.unscn.org/files/Annual_Sessions/35th_SCN_Session/Report_35th_session.pdf

2. Background

Capacity development is the process by which individuals, groups and organizations improve their ability to perform their functions and achieve the desired results over time. Capacity building is an unending process by which individuals, institutions and societies increase their abilities to perform core functions, solve problems, define and achieve objectives and understand and deal with their development needs in a broad context and sustainable manner. An organization's capacities include its resources (personnel, infrastructure, technology and financial resources) and its management capacities (strategic leadership, programme and process management, networks). Capacity development must be led from within the organization, country and/ or specific region, while outer facilitators can promote or stimulate capacity development and provide information, training and other types of support. The main approaches in capacity development include following: information dissemination, training, facilitation and mentoring, networking, feedback and learning from experience. It is necessary to combine various approaches to achieve the best results. There is no universal recommendation for capacity development that is appropriate for each organization, country and region. In defining priorities for capacity development, managers/leaders and their teams need to devise suitable frameworks for assessing organizational performance and to define various capacity limitations and statuses and to tailor activities to fit the needs (Horton et al., 2003).

Capacity development in nutrition is complex due to the multi-faceted causes of malnutrition. Defining capacity development actions therefore requires understanding of the landscape of the actors involved or required to address the determinants of malnutrition, based on the country context. The UN System guidance package⁶ is intended to support countries to comprehensively assess multi-sectoral and sectoral capacity needs for effective scale-up of nutrition actions and subsequent design of the capacity development response that is integrated into a broader national capacity development agenda for nutrition. The capacity development process is made up of the following five steps: engagement, assessment, formulation, implementation and evaluation, all embedded into the programming process.

Different contexts of capacity development have been widely elaborated. Baillie et al. (2009) highlighted the importance of building capacity to support action in order to address public health nutrition (PHN) issues. CD presents the core element and the central strategy in improving PHN as practice, important in all stages of the intervention planning cycle and relevant to practice at all levels. Swanepoel et al. (2014) identified the practitioner consensus on the determinants of capacity building practice in high-income: partnerships, human resources, critical reflection in practice, leadership, workforce competencies and preparedness, problem solving, knowledge transfer, community participation, needs assessment, quality of project management and workforce size and composition. Delisle et al. (2017) highlighted the need for capacity building in PHN at individual, organizational and systemic levels for a strong PHN workforce in low-resource countries. Shrimpton et al. (2016, 2014, 2017) proposed the creation of the framework for nutrition capacity development and assessment at different levels, including system organizational, workforce and community levels. Monitoring PHN capacity development and workforce development will be required to effectively implement and scale-up actions in the countries to achieve the global targets in order to address malnutrition in all its forms.

PHN capacity building for nutrition and health workforce entails multifactorial collaboration of different stakeholders across sectors and various organizations, including universities, research organizations,

⁶ See the SUN UN Guidance Note, <https://www.unnetworkforsun.org/sites/default/files/2018-11/CA%20Guidance%20Package%20-%20Guidance%20Note-EN.pdf>

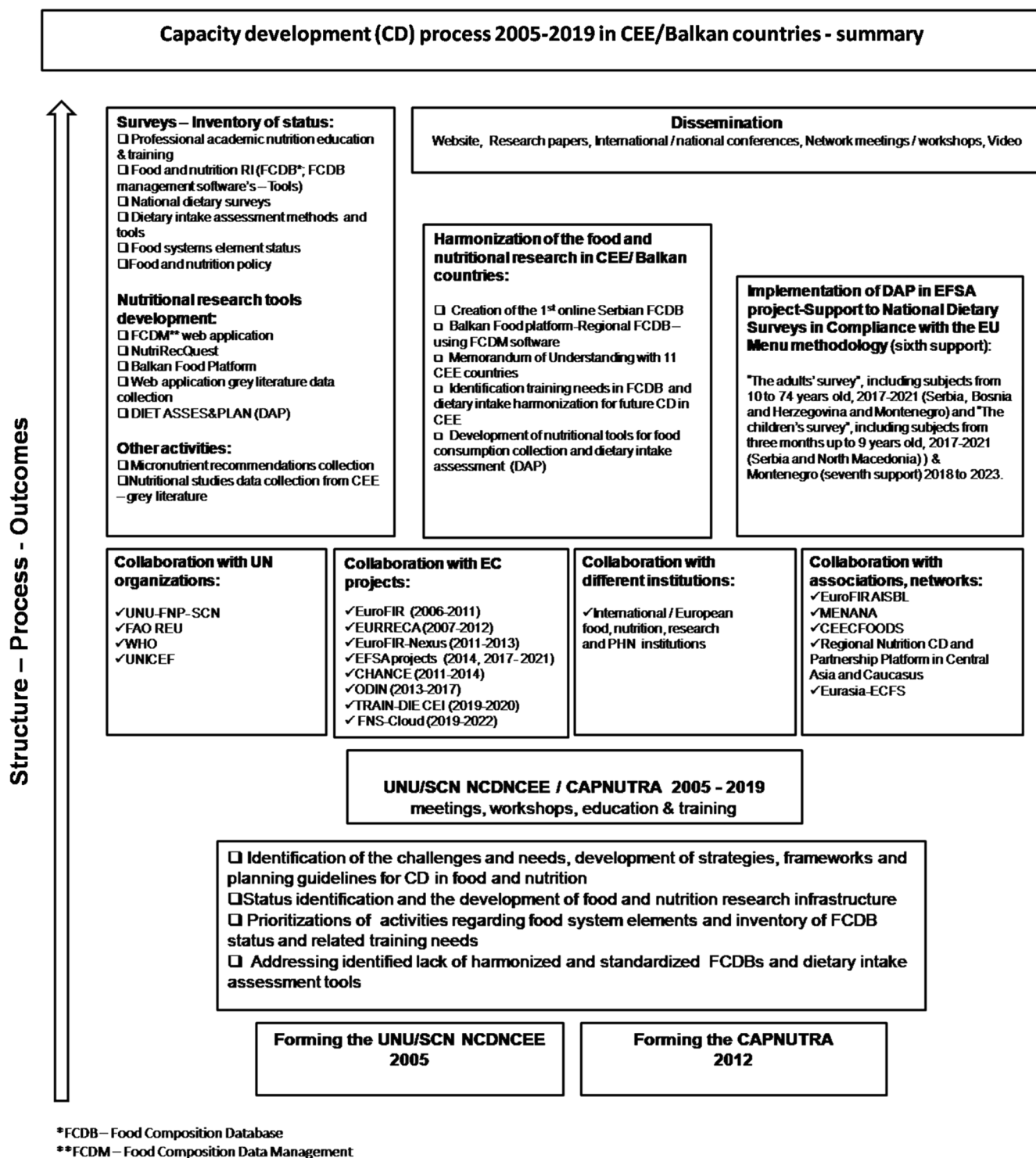


Fig. 1. Summary of the capacity development process in Central Eastern Europe/Balkan countries for the period 2005-2019.

industry and international agencies as well as involvement of policy makers from other sectors (Geissler, 2015).

3. Capacity development – activities and process

3.1. Building the collaboration with stakeholders

The essential activity in the CD process was to establish the connections with stakeholders from CEE/BC and to form the network in

2005 (Fig. 1). For more than a decade, NCDNCEE/CAPNUTRA has been establishing and maintaining collaboration with many food/ nutrition/ agriculture organizations and other prominent actors from the region. Moreover, collaboration with United Nations (UN) organizations - Food and Agriculture Organization (FAO) and World Health Organization (WHO) as well as several EC funded project consortia underpinned the activities of the network. The network consists of the members from 17 CEE countries (11 West Balkan countries signed the Memorandum of

Understanding – MoU)⁷ and closely cooperates with other European and similar international associations, sharing scientific information on food, health and related nutritional challenges. Representing a wide range of expertise in food and nutrition research, the members' panel consists of professionals who specialized in food composition research, systematic literature review, public health, nutritional surveillance, policymaking, all of which were involved in the development of nutritional tools, technology transfer and knowledge dissemination. The Network meetings were excellent opportunities to present thematic overviews, exchange experiences and discuss further activities.

3.2. Identification of challenges and needs and development of strategies for actions

Since its foundation, the network maintained its active status through the organization of annual network meetings where the network members collaborated closely with UN organizations representatives, food and nutrition associations, other networks and associated EC project. The major topics of the meetings were strategies, frameworks and planning guidelines for CD in food and nutrition. In order to provide evidence-based and sustainable development, several surveys were conducted to identify challenges and needs in the following fields:

- **Food and nutrition research infrastructure (RI):** Collaboration between NCDNCEE and EU projects was focused on the review of the Food Composition Database (FCDB) status (Gurinović et al., 2016a) and the existence of other nutritional tools. Moreover, this collaboration brought about the collection of nutrient recommendations⁸ using available sources, especially nutrition grey literature and identification of nutritional data for assessment of micronutrient inadequacy in CEE (Doets et al., 2008; Novaković et al., 2013);
- **National dietary surveys:** The network surveyed the existence of dietary surveys and evaluated the dietary methodology implemented within the regional PHN research (Gurinović et al., 2016a);
- **Dietary intake assessment methods and tools:** Based on the identified lack of nutritional dietary surveys in the region and needs in the research tools and methodologies, education and training, the nutritional assessment tools were developed in order to enable harmonization of nutritional research in CEE/BC (Gurinović et al., 2016a; Gurinović et al., 2018);
- **Existence of professional academic nutrition education & training:** An inventory on the actual situation in academic nutrition education and educational gaps among nutrition professionals in the NCDNCEE/CAPNUTRA country members was conducted during 2010 and 2011 (Gurinović et al., 2014);

All activities of the CD network were supervised by a steering committee, which was also in charge of searching for potential funding sources.

4. Results

4.1. Network growth and collaborations

Since its creation in 2005, NCDNCEE/CAPNUTRA has established fruitful partnerships and collaborations with different organizations in food and nutrition from Europe and other regions. Crucial

collaborations were established with United Nations University - Food and Nutrition Programme for Human and Social Development (UNU-FNP), through SCN, and FAO SEUR Sub-regional and later FAO Regional Office for Europe and Central Asia, Budapest, Hungary (FAOREU), WHO Europe and UNICEF Regional Office for Europe and Central Asia. From the beginning, FAOREU provided the network with financial, technical and professional support in the organization of the meetings.

Acknowledging the potential of the strategic partnership for the mobilization of expertise and resources, CAPNUTRA encouraged the cooperation among its members and the European food and nutrition research and PHN institutions as well as other regional nutrition networks.⁹ All these processes were supported by expert facilitators from various institutions in the Netherlands, Norway and the United Kingdom, whose engagements were crucial for the development of CAPNUTRA, providing it with educational, professional and fund-raising opportunities.

4.2. Capacity development activities of the network between 2005 and 2019

Since its inception in 2005, UNU/SCN NCDNCEE/CAPNUTRA promoted a variety of CD activities, which are presented in [Supplementary Material 1](#). In order to address the knowledge needs and gaps related to nutrition science, various network meetings, workshops, seminars and practical trainings were organized with financial aid and professional support provided by UNU-FNP through SCN, FAO, EC projects, WHO and other relevant stakeholders.

The capacity development process, led by the CAPNUTRA network, was focused around three major areas:

- 1) Identification of gaps and needs in RI, knowledge & training, policies and strategies, etc.;
- 2) Design and implementation of RI elements – various research instruments which are harmonized with the European RI standards;
- 3) Organization of various forms of education and trainings in food and nutrition for the network members in the region.

These processes were intertwined with the activities that encouraged involvement of local and regional partners, thus accelerating the exchange of knowledge, experiences and data, and supported implementation of innovations and technology transfer. The network attention was directed towards dissemination of scientific achievements, international cooperation and communication among scientific institutions, individual scientists and other stakeholders (see [Supplementary Material 1](#)). The comprehensive portfolio of CAPNUTRA's CD activities included the development and validation of various nutritional tools and instruments necessary for dietary intake assessment. A plethora of CD programmes and activities was organized to encourage local and regional involvement in dietary studies supported by EFSA and organized under the umbrella of EU Menu project. Furthermore, acknowledging the societal, public health, environmental and ethical value of sustainable solutions for ensuring food security, CAPNUTRA pursued numerous activities with the aim of promoting better understanding of food systems approach in the CEE region supported by FAOREU. For the establishment and further maintenance, enlargements of the network and engagement of its members, regular

⁷ To foster the connection and networking among the participants and the network members, several network meetings gathered representatives from Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Moldova, Montenegro, Poland, North Macedonia, Romania, Slovakia, Slovenia, Serbia and facilitators from the Netherlands, Norway and The United Kingdom.

⁸ <http://www.serbianfood.info/eurreca/>

⁹ Collaborations were established with EuroFIR AISBL (an international, non-profit Association in Belgium), CEECFOODS (Central and Eastern European Countries Food Data Systems), EFSA (European Food Safety Authority), MENANA (the SCN CD network in the Middle East and North Africa) in 2006 (Gurinović et al., 2010), and recently, in 2018, with the newly established Regional Nutrition Capacity Development and Partnership Platform for Central Asia and Caucasus and Eurasian Centre for Food Security (ECFS) and its Network in Food Security and Nutrition.

meetings were of essential importance for discussing specific challenges and prioritizing strategies, creating plans and guidelines for further CD activities in CEE and providing participants with training and education related to the development and application of RI.

The initial meetings helped to establish a framework and identify the key actors for capacity development. The issues, including gaps and needs, were discussed and linked to possible strategies at various levels.¹⁰ Based on the framework, the network members created a planning guideline for CD activities in the CEE countries (Pavlovic et al., 2009). The guideline defined responsibilities at different levels as well as challenges, prioritized strategies, activities for planning nutrition CD and the ways to prioritize topics and determine whether they require short/ medium/ long-term or continuous activity. This publication became an important milestone in further work of the Network. Similar principles in the capacity development processes were found in the recent United Nations Development Group (UNDG) guidance.¹¹

4.3. Collaborations with European projects

NCDNCEE/CAPNUTRA together with the Centre of Research Excellence in Nutrition and Metabolism (Institute of Medical Research, Belgrade, Serbia), collaborated on six EC projects.¹²

Collaborations and engagements provided the network with various educational, professional and funding opportunities. For instance, the collaboration with the EURECCA project resulted in a collection of current micronutrient recommendations from CEE/BC (Doets et al., 2008), aggregation of grey literature for micronutrient inadequacy assessments and nutritional data for nutrient recommendations all over Europe, as well as the assessment of dietary intake specific to the CEE region (Novaković et al., 2013). The inventory for FCDB status and the related training needs and the consequent creation of regional Balkan FCDB are a direct output of the network's partaking in several European projects (Gurinović et al., 2016a). More importantly, these collaborations have underpinned the harmonization of the dietary surveys methodology according to the European standards, the application of the developed RI in the Balkan region, and they have led to new involvement in further projects for RI improvement and capacity development.

4.4. Development of the food and nutrition research infrastructure for CEE and Balkan countries

Adequate research infrastructures (RI) in food, nutrition and public health domain are essential for nutrition epidemiology, innovative nutritional research, dietary exposure and food safety risk assessment as well as effective PHN strategies to address the diet-related diseases, malnutrition and foodborne diseases (Snoek et al., 2018). RI provides a platform for interdisciplinary/ multi-national collaboration to facilitate world-class research (Brown et al., 2017). RI, including the associated human resources, covers major equipment or sets of instruments, in addition to knowledge-containing resources such as collections, archives and data banks. In CEE/BC, the lack of RI and CD in PHN as well as in nutrition epidemiology was identified, particularly FCDB, database management systems, dietary assessment tools and standardized dietary intake data. Thus, the specific focus of the network was on the development of harmonized FCDB and dietary intake assessment tools, implementation of harmonized methodology in dietary intake

¹⁰ The key elements of the framework are shown at: http://www.agrowebcee.net/fileadmin/content/ncdn/files/stari_dokumenti/NCDNCEE_Framework.pdf

¹¹ See the UNDG UNDAF Companion Guidance on Capacity Development, <https://undg.org/wp-content/uploads/2017/06/UNDG-UNDAF-Companion-Pieces-8-Capacity-Development.pdf>

¹² For details on the projects and link to key references, see the on-line Supplemental Material 1

monitoring, evaluation & nutritional surveillance - according to the European standards and recommendations.

4.4.1. Food composition database (FCDB) development

The process of the harmonization of food composition information on the European level started with the EuroFIR project in 2006, where fundamental principles for building of this RI were grounded. Many European research institutions joined these endeavours, implementing standardized frames for the food data description and documentation in their national datasets and collaborated in the development of what is today known as EuroFIR™ Food Composition Exchange Platform hosted by EuroFIR AISBL (Finglas et al., 2014). Recognizing the importance of the FCDB for further nutrition research in the CEE region, a system for harmonized and standardized creation of the food composition database for CEE countries, which would enable a collection of data on foods and recipes from the region, was developed. This system allowed FCDB from CEE/BC to join the group of European FCDBs. The network adopted the EuroFIR standards, recommendations and received substantial support (financial, technical and educational) in creation of the RI. The RI included the development of electronic and online FCDB and the connections to the existing FCDBs on the European and international level,¹³ which ensured management and comparability among FCDBs and allowed good communication and easy data interchange among different countries.

The web-based *Food Composition Data Management (FCDM) software* (Glibetic et al., 2011), was developed in accordance with the EuroFIR standards.¹⁴ The software was provided to all NCDNCEE members to support further work in national and regional FCDBs. For example, it was employed to create the first Serbian on-line food composition database, compiled and launched in 2007¹⁵ and became a part of the EuroFIR online platform.¹⁶ Today the software is used as a benchmark for further development of regional databases (Gurinović et al., 2016b). Continuously growing and updating, the FCDB contains more than 2000 foods and over 300 recipes from Serbia and the region and presents the backbone for food composition data in the DAP platform.

4.4.2. The Diet Assess & Plan tool

The establishment of validated tools, standardized methods and adequate protocols for data collection and analyses was considered vital for strengthening effective and reliable nutrition research in the Balkans. One of the key elements of the regional RI, compliant with the contemporary European standards, is the Diet Assess & Plan (DAP) (Gurinović et al., 2018), which is a sophisticated platform for food consumption data collection (individual/ household/ population level), that performs comprehensive dietary intake assessment, nutrition planning (for public institution procurements and personalized dietary counselling), food design/ reformulation and labelling.¹⁷ The DAP web application is a highly flexible user-friendly system comprising computerized food consumption questionnaires such as 24-h dietary recalls (24HDR), Food Records, Food Frequency Questionnaire (FFQ) and Food Propensity Questionnaire (FPQ). In conjunction with the food intake data, the system enables recording of the relevant general and pre-screening information regarding the respondents, their anthropometric and biochemical parameters, blood pressure measurements,

¹³ See EuroFIR AISBL. FoorEXplorer, <http://www.eurofir.org/foodexplorer/login1.php> (retrieved June 2018)

¹⁴ The software integrates LanguaLTM and EFSA - FoodEX2 food coding systems, Recipe input - composite dishes data input and nutrient calculation, including retention factors for vitamins and micronutrients.

¹⁵ See www.serbianfood.info

¹⁶ See European Food Information Resource Association, List of EuroFIR Databases. <http://www.eurofir.org/food-information/food-composition-databases/http://www.eurofir.org/food-information/food-composition-databases/> (accessed November 2018)

¹⁷ For further technical details, see the online Supplementary Material 1

supplements intake and the assessment of physical activity.

The tool supports the standard Computer-aided personal interviewing (CAPI) protocol. In the processing of food data entries, DAP extracts the data from suitable FCDB and performs adequacy evaluation against the selected nutrient recommendation dataset. An additional feature of the DAP is validated Food Atlas – a photographic album of various portions of simple foods and dishes of the Balkan region that supports accuracy of the portion size quantification and precision of dietary intake assessment (Nikolic et al., 2018).

Nutri-RecQuest is a user-friendly web tool that allows easy access to data on current nutrient recommendations for 29 different micronutrients from 37 European countries, eight key non-European countries/regions and recommendations set by the European Commission and WHO/FAO for different population groups (Cavelaars et al., 2010). The members of NCDNCEE/CAPNUTRA contributed to the collection of the current recommendations for CEE (Doets et al., 2008). All micronutrient recommendations are freely available online.¹⁸ An easy access to this harmonized dataset represents a valuable instrument for authoritative bodies responsible for setting recommendations, scientists, policy makers, health professionals and food & dietary supplements industry.

The *Balkan Food Platform* was founded by EuroFIR and the NCDCEE in 2011, allowing the network members from CEE/BC to use and further develop the abovementioned RI elements in their research. Furthermore, the establishment of the platform was essential in laying the groundwork for promoting optimal use, exchange and pooling of nutritional data in the region.

4.5. Harmonization of the food & nutritional research in CEE and Balkan countries

CAPNUTRA efforts in the harmonization of food and nutrition research in CEE/BC were focused on the development of research infrastructures and the resources which promote greater collaboration, research reliability and data comparability. The memorandum of understanding signed by 11 CEE countries, the establishment of the Balkan regional FCDB and the development of the DAP software were essential in laying the groundwork for promoting optimal use, exchange and pooling of nutritional data in the region. Suitability of DAP in the view of EFSA's dietary exposure assessment needs was evaluated in 2014 (Gavrieli et al., 2014). The platform was further adopted for two EFSA-supported national dietary surveys in the Balkans, in compliance with the EU Menu methodology, one targeting adults (10–74 year-old) over the period 2017–2021 (in Serbia, Bosnia and Herzegovina and Montenegro) and one targeting children up 9 years of age, over the period 2017–2021 in Serbia and North Macedonia, and over the period 2018–2023 in Montenegro. To foster the application of the DAP platform, integrated practical trainings were organized in different Balkan cities.¹⁹ Furthermore, the Institute for Statistics of the Federation of Bosnia & Herzegovina (FB&H) and The Harvard T.H. Chan School of Public Health (USA) used the platform to conduct the first diet survey among adults in the FB&H (Gicevic et al., 2019).

Common research instruments (24 h dietary recall, Food Propensity Questionnaire – FPQ and International Physical Activity Questionnaire – IPAQ) and the standardized study protocol, complemented with the unique software platform for data collection and storage, created a solid framework for regional harmonization within EU Menu projects. Given the scarcity of the standardized and comparable food consumption data in the region, the identified gaps in the nutritional tools and the supporting infrastructure, the application of the DAP platform in these

projects presents a crucial act in regional harmonization of dietary assessment, synchronization of nutritional surveillance and further evidence-based policymaking. The DAP implementation presents major success on the national, regional and international level and a direct result of the Network decade-long endeavours.

4.6. Nutrition education

Investment in human capital has an essential role in capacity building. Highly educated and skilled professionals are required to perform the research, plan and deliver the interventions, implement, monitor, evaluate the nutrition policies and strategies, and to provide the leadership in these processes (Fanzo et al., 2015). The central concept of all these elements is nutritional education in academic professional curricula, but also in multidisciplinary educational and extracurricular programmes.

The lack of information regarding the PHN workforce in Europe is one of the barriers to the workforce development. Therefore, the consensus on the core PHN workforce functions promotes consistent understanding of the role and utility of public health nutritionists as a sub-speciality of the public health workforce in Europe (Jonsdottir et al., 2010, 2012). A recent comprehensive review from Wegener et al. (2018) provided the status of Sustainable Food systems related education, practical training and continuing professional development among trainees and public health practitioners and identified the gaps and the need to further SFS specialized education, training and capacity development.

From this perspective, the inventory on the actual situation in academic nutrition education and educational gaps among nutrition professionals in the NCDNCEE/CAPNUTRA country members conducted during 2010 and 2011 revealed that 5 out of 14 CEE/BC have three levels of academic nutrition education (BSc, MSc and PhD levels), while 7 countries have no academic programmes in nutrition. The knowledge and practice of the dietary data analysis and nutrition epidemiology were identified among high priority nutrition training needs that would lead to the increase of working competence of nutritionist and related professionals in CEE/BC (Gurinović et al., 2014). However, creation and implementation of a higher academic level of educational and training programmes related to PHN will need stronger involvement of Ministries of Education and Health as well as universities.

To compensate for the knowledge and training gaps in PHN, one of the major functions of the Network was to provide different forms of education and practical training as well as other forms of learning opportunities for its members. Development of the courses followed the work and the priorities of the network. Moreover, development of the RI required the design of accompanying trainings on how to implement nutritional tools and develop practical skills in nutritional research. Based on the identified training needs, CAPNUTRA continually organized different tailor-made workshops, trainings, seminars and educations, as part of the network meetings, in which the network members had an opportunity to participate and strengthen their professional capacity in the field of food and nutrition.²⁰

4.7. Dissemination activities

The role of the CAPNUTRA network is to bring nutrition science closer to its members, different stakeholders, industry, policymakers and practitioners and jointly induce real improvements to human health. Therefore, dissemination of knowledge was an explicit part of the network mission. Since the UNU/SCN NCDNCEE establishment in 2005, the network consortium was engaged in various dissemination activities, including the website,²¹ designed to provide the members

¹⁸ www.serbianfood.info/eurreca

¹⁹ See NCDNCEE/CAPNUTRA Reports and agenda from events. Retrieved November 21, 2018, from <http://www.agrowebcee.net/ncdn/events/> UNU/SCN NCDNCEE/CAPNUTRA (2019).

²⁰ See Supplementary Material 1.

²¹ <http://www.agrowebcee.net/>

with easy access to the diverse food and nutrition information and to foster capacity building in nutrition in the region. Furthermore, the website provides information about training possibilities, educational programmes and promotes food and nutrition related events and conferences.

Other NCDNCEE/CAPNUTRA dissemination activities²² over the period from 2005 to 2019 include 10 network meetings, 30 trainings/workshops involving members, participations and presentations in conferences and workshops (about 60 among national, regional and international meetings with 92 presentations), 14 research articles in scientific journals and videos on the CAPNUTRA YouTube channel.²³

5. Discussion

5.1. Obstacles and challenges

CAPNUTRA meetings hosted researchers and experts from different fields in food and nutrition who represented their (CEE/BC) countries as the network members, whose contributions significantly helped the network to perform planned activities. However, these country representatives were not all officially nominated by their governments, so the process of implementation of the recommendations for CD was not sufficiently effective on the national level in some of the country members. Perhaps, in the future, the implementation of the recommendations on the national level could be better if they had the support of stronger nutrition governance.

The substantial funding was one of the obstacles for the network capacity development activities. Since its establishment, the network has had the support of UNU-FNP, different UN organizations and different projects. However, enthusiasm and vision of the network members have been the major driving force for all the achievements throughout the years.

In the future, adequate institutional capacity should be fostered to sustain effective implementation of foreseen strategies and programmes for improvement of food security and nutrition. Improving nutritional outcomes requires intertwined actions across the sectors - food and agriculture, health, education, finance (e.g. ensuring budget allocation for the implementation of agriculture, food and nutrition policies), trade, water and sanitation. As stated in the Second International Conference on Nutrition Framework for Action (ICN2 FfA) recommendation, it is necessary to yearly allocate a part of the governance budget for the implementation of the national nutrition strategy, policy and action plan in each country. Given this complex challenge, national coordination mechanisms are essential to ensure relevant actions and coordinated stakeholders across the sectors (ICN2 FfA recommendation #3). To implement these recommendations, it is necessary to build stronger nutrition governance in all the countries including CEE/BC. Thus, multisectoral national committees should be formed to engage representatives from Ministries of Agriculture, Health, Education, Social welfare and Finance, parliamentarians and other decision-makers. If the CEE/BC achieves some of the SMART (specific, measurable, achievable, relevant and time-bound) country-specific commitments for nutrition actions using the UN SCN Guidance note on integration of nutrition into the United Nations Development assistance framework²⁴ (UNSCN, 2017), it will also contribute to CAPNUTRA further capacity development.

²² A table with all the details on the dissemination activities is provided as Supplementary Material 1

²³ <https://www.youtube.com/user/ncdncee>

²⁴ See UN SCN, Guidance note on integration of nutrition in the United Nations Development Assistance framework, <https://undg.org/wp-content/uploads/2018/02/UNDAFGuidance-EN-WEB.pdf>

5.2. Lessons learned from NCDNCEE/CAPNUTRA

Since its inception in 2005, the network leaders followed the UNDP's ten default principles of Capacity Development (Lopes & Theisohn, 2003; Pavlovic et al., 2009): 1. *Don't rush* (CD is a long-term process); 2. *Respect the value system and foster self-esteem*; 3. *Scan locally and globally, reinvent locally* (knowledge cannot be transferred, it needs to be acquired); 4. *Challenge mindsets and power differentials* (frank dialogue and the collective culture of transparency are essential); 5. *Think and act in terms of sustainable capacity outcomes* (capacity is at the core of development; any course of action needs to promote this); 6. *Establish positive motives and incentives* (motives and incentives need to be aligned with the objective of CD); 7. *Integrate external inputs into national priorities, processes and systems* (external inputs need to correspond to the real demand and be flexible enough to respond to the national needs and agendas); 8. *Build on existing capacities rather than creating new ones* (which implies using national expertise primarily, strengthening of national institutions, and protection of social and cultural capital); 9. *Stay engaged under difficult circumstances*; 10. *Remain accountable to ultimate beneficiaries* (any responsible government is answerable to its people, and should foster transparency as the foremost instrument of public accountability).

CD in nutrition had an essential role in stimulating relevant and harmonized nutritional research in CEE/BC. Guided by the plans, the frameworks, the leadership and the implementation of CD activities, the NCDCEE/CAPNUTRA country members collaborated multilaterally, exchanged knowledge and experience, and performed and attended different capacity strengthening activities - education, trainings and networking events which eventually resulted in the development of numerous RI elements and their application in harmonized nutrition research in the region. This CD process was aligned with the Rome Declaration on Nutrition and its Framework for Action,²⁵ in which it is emphasized that CD activities create a context/atmosphere in which implementation of nutrition policies and strategies can take place.

The developed and improved RI in the CEE/BC region with standardized and harmonized methodology/ tools for dietary surveys will contribute to the EFSA comprehensive European Food Consumption Database compiling process, chemical exposure assessment and to the FAO/WHO GIFT global database platform, containing individual quantitative food consumption data. The existence of the RI sheds light upon the whole region of nutrition situation and offers new possibilities for further research. Cooperation with other European networks and active participation in international research projects enhanced nutritional training, exchange of information and knowledge transfer and brought about the development of substantial capacity in food, nutrition and public health research in CEE/BC.

The harmonization of the food consumption collection and dietary surveys in the CEE/BC through implementation of the DAP platform presents a unique and the greatest achievement of the network in CD in this region, being the result of continual work for more than one decade. The network activities and achievements have been contributing and will continue to contribute to the implementation of the ICN2 Rome Declaration Nutrition and its Framework for Action, i.e. the recommendation #58, which urge countries to improve and harmonize the monitoring and the evaluation of the nutrition data.

The collection of the dietary intake data is essential for evidence-based policymaking in the areas of leveraging the potential of the nutrition-sensitive agriculture and food systems for healthy diets as recommended in the UN Decade of Action in Nutrition.²⁶ The necessity

²⁵ See the outcomes of the FAO/WHO Second International Conference on Nutrition, Framework for Action (<http://www.fao.org/3/a-mm215e.pdf>) and Rome Declaration on Nutrition (<http://fao.org/2/ml542e>)

²⁶ See the Strengthening Nutrition Action resource guide (FAO/WHO), <http://apps.who.int/iris/bitstream/handle/10665/274739/9789241550253-eng.pdf?ua=1>

for the harmonized data collection is emphasized in the objective 4 of the WHO European Food and Nutrition Action Plan,²⁷ as well as in the Key messages from the FAO/WHO Regional Symposium on Sustainable Food Systems for Healthy Diets in Europe and Central Asia in 2017: “The Governments should take action to ensure that adequate capacities of national statistical services are developed for the monitoring of SDG indicators and to strengthen the data collection and analysis for evidence-based policy, including food consumption and nutrition data, surveillance of child growth and nutritional status of the population, food composition data of commonly available local foods and the data on food contaminants”.²⁸

Moreover, The Global Panel on Agriculture²⁹ presented the findings that six of the top 11 risk factors driving the global burden of disease are related to diet. Low quality diet has been number one risk factor for non-communicable diseases (NCDs) and the main contributor to high DALY (Disability Adjusted Life Years) values in the Eastern Europe region, especially in the countries with rapid rise in income levels over the last two decades. Harmonized dietary surveys are essential to underpin the design of evidence-based nutrition policies and strategies. The DAP platform application represents an example of the successful harmonized food and nutrition data collection and analysis for evidence-based nutrition policymaking in Serbia and Western Balkans.

The CAPNUTRA network created a resource of new scientific knowledge in nutrition and became a platform for identifying needs and opportunities as well as fostering regional involvement in CD. Experiences and achievements constitute a model and a reference for other regions to establish similar networks.

As recommended in ICN2 FFA (Recommendation # 6: Promote inter-country collaboration) and the Budapest Symposium’s key messages on nutrition governance and CD in the region,³⁰ the *Regional Nutrition Capacity Development and Partnership Platform in Central Asia and Caucasus* was founded in 2017. This new network was created with the leading support from UNICEF and other UN organizations and it was inspired by CAPNUTRA as an experienced regional CD network in nutrition. The aim of the network is to address the current capacity gaps in the area of food and nutrition in sub-regions of Central Asia and Caucasus. The CAPNUTRA network will continue collaboration with this new network by sharing knowledge and foster their capacity development methodologies.

As the Regional Overview of Food Security and Nutrition in Europe and Central Asia highlighted (FAO, 2018), the triple burden of malnutrition – undernutrition, overweight and obesity, as well as micronutrient deficiencies, is present to a varying degree in all countries of the region and, therefore, improving nutrition and malnutrition prevention through capacity development is a priority in this region (WHO, 2018).

6. Conclusion

This article reports on the key NCDNCEE/CAPNUTRA capacity development action areas whose focus is on supporting PHN as a practical discipline in order to build nutrition capacity. While these actions are “work in progress”, with varying degrees of progress to date, the network is growing with a clear objective towards involving new partners and other stakeholders as well as attracting further funds to ensure sustainability.

²⁷ See WHO Europe, WHO European Food and Nutrition Action Plan: Support surveillance, monitoring, evaluation and research, <https://apps.who.int/iris/bitstream/handle/10665/329405/9789289051231-eng.pdf>

²⁸ FAO Regional Office for Europe and Central Asia, Regional Symposium: Sustainable Food Systems for Healthy Diets in Europe and Central Asia, <http://www.fao.org/europe/events/detail-events/en/c/1034293/>

²⁹ Global Panel on Agriculture and Food Systems for Nutrition, Food systems and diets: Facing the challenges of the 21st century, <http://glopan.org/sites/default/files/ForesightReport.pdf>

³⁰ <http://www.fao.org/3/mw166en/mw166en.pdf>

The results presented in this paper demonstrate that the network platform fosters regional involvement in the ever-growing source of new scientific knowledge in nutrition, identifies needs and is open for a broader communication and exchange that shifts one-way information streams to engagements from all partners in the network and creates opportunities for CD in nutrition for all members. Importantly, CD in nutrition in CEE/BC can only advance with contemporary nutritional education and trainings (e.g. distance learning) and in cooperation with other European colleagues/ networks/ projects. Further actions should be focused on the establishment of academic nutritional programmes and other forms of education. Investment in human capacity pays off in the long run with a wider impact.

Following the ICN2 Framework for Action and the United Nations Decade of Action on Nutrition (2016–2025) guidance, CAPNUTRA will continue to support the countries in the region and other stakeholders (through dissemination, training for implementation, technical support and other capacity development activities) in translating the ICN2 voluntary policy recommendations into the abovementioned SMART country-specific commitments for nutrition actions, while reflecting on principles and standardized approaches defined by the Scaling Up Nutrition Movement³¹ to effectively scale-up further nutrition actions and design of the capacity development responses. The network will continue activities following identified priority gaps in areas which need improvement, particularly in leveraging sustainable food systems to achieve healthy diets and planning activities for strengthening regional capacities for the nutrition governance. The further work of the Network will only be possible with a continual collaboration and a support from UN agencies and other international organizations.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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³¹ See the SUN UN Guidance Note, <https://www.unnetworkforsun.org/sites/default/files/2018-11/CA%20Guidance%20Package%20-%20Guidance%20Note-EN.pdf>

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Appendix A. Supplementary material

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