Middle East Journal of Agriculture Research
Volume: 10 | Issue: 02| April - June| 2021

EISSN: 2706-7955 ISSN: 2077-4605
DOI: 10.36632/mejar/2021.10.2.31
Journal homepage: www.curresweb.com
Pages: 453-471

The Green Food Value Chain Development Approach: Key Lessons Learnt

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Received: 24 February 2021 **Accepted:** 10 April 2021 **Published:** 20 April 2021

ABSTRACT

The green food value chain development (GFVCD) approach has its foundations in the green, circular and low-carbon economies as well as within green growth. It was developed, mainly, with a 'bottom-up' approach focused on realism. The thrust of the process was and is to partner with bottom of the pyramid (BOP)/subsistence marketplaces (SM) stakeholders, for example agri-food value chain actors, and critically learn from stakeholders and their contexts to attempt to identify and better understand how, within agri-food value chains and markets, environmental challenges and impacts were tendered with, via, frugal, green and grass root innovations. Over the period 2012 to 2020, in developing the GFVCD approach and also in implementing such an approach, data and information, knowledge, know-how and experiences were gained from 23 countries. Within this background, the aim of this research was to ascertain, identify, analyze and diagnose key lessons learnt in developing and implementing the GFVCD approach over the past nine years. The research was based on a review of sources of data and information, both secondary and primary related directly and indirectly to the GFVCD approach. The research was further enhanced by an online meeting with subject matter specialists held with the main aim of reviewing, discussing and attempting to agree upon the key lessons learnt over the past nine years in terms of developing and implementing the GFVCD approach. The results of the research and the online meeting found 14 key lessons learnt in terms of developing and implementing the GFVCD approach. All the 14 key lessons were found to carry all the same 'weight' in terms of relevance to the GFVCD approach as well as being all interconnected. From the stocktaking, the 14 key lessons learnt can be considered as a set of 'best practices' for the GFVCD approach. These 14 reference points on 'best practice' can be important and can be instrumental in not only developing the GFVCD approach further, but also and importantly in further implementing the approach at field level. The findings from this research indicate that effectively the GFVCD approach, both in terms of developing further and implementing such an approach, is dynamic and consequently needs to be considered as a flexible, adaptable and morphing approach that can be assimilated within the high diversity of BOP/SM contexts.

Keywords: Green economy, Circular economy, Low-carbon economy, Green growth, Green food value chain development, Food value chain development, Bottom of the pyramid

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1. Introduction

The green economy[1], circular economy[2] , low carbon economy[3], green growth[4] and the inherent low emissions development strategies (LEDS)[5] are now taking more and more the center stage of the global economy as there is unequivocal evidence that biodiversity is disappearing at an unprecedented rate, soils are being irreversibly damaged, freshwater is increasingly in short supply and climate is changing at an increasing rate (UNEP, 2107). The agricultural and food sector plays a large role in the depletion of the natural environment, its resources and in the contribution to climate change. For example, commercial activities and processes along agricultural and food value chains have considerable negative environmental impacts at pre-production, production and post-production stages, and environmental impacts result from differing practices carried out at each stage (Reynolds *et al.,* 2015). However, the reduction of environmental impacts of food value chain activities has been widely studied in industrialized countries, but relatively less so in developing and emerging economies: the subject matter is relatively new (Stucki & Blignaut, 2018). Most of these economies rely on fossil fuels, on energy intensive irrigation and refrigerated storage and have considerable issues in terms of food governance (Stucki & Blignaut, 2018). Hence developing environmentally-sensitive (green) food value chains in development and transitional countries is a priority area for reducing and attempting to eliminate the impact of commercial and non-commercial activities on the natural environment, its resources and climate.

Over the past nine years, an approach, which focuses on greening and climate smarting[6], has been developed and implemented to attempt to cater for environmental and climate impacts commonly generated by agricultural and food value chain commercial and non-commercial activities. Green food value chain development (GFVCD) is defined as an approach that provides value at each stage of a food value chain by proactively reducing the usage of the natural environment (natural resources, ecosystem services, and biodiversity), to diminish or mitigate adverse impacts, or even have positive impacts, while at the same time considering disposal and recycling patterns of generated waste, to recapture value at every stage of the food value chain and thus further reduce environmental impact (Hilmi, 2018). The focus of this approach is twofold: 1) it is based on learning from the bottom of the pyramid (BoP)[7]/subsistence marketplaces (SM)[8] contexts in terms of grass root, frugal and green innovations; and 2) implementing such innovations for the greening and climate smarting of agricultural and food value chains within BOP/SM contexts. However the focus is not just on green and climate smarting 'technology' innovations derived from BOP/SM contexts, but also and importantly learning from green and climate smarting activities, processes, systems, knowledge, know-how and behaviours in

[1] The green economy can be defined as fostering improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities (UNEP, 2011)

[2] A circular economy can be defined as providing for a gradual decoupling of economic activity from the consumption of finite resources and the designing waste out of the system. It is based on the transition to renewable energy sources and the inherent circular model builds economic, natural, and social capital. It is based on three principles: design out waste and pollution, keep products and materials in use and regenerate natural systems (Ellen McArthur Foundation, 2020)

[3] A low carbon economy is one that causes low levels of greenhouse gas (GHG) emissions (Suttie et al, 2017)

[4] Green growth can be defined as economic growth and development that ensures that natural assets continue to provide the resources and environmental services on which society's well-being relies (OECD, 2011)

[5] A Low-Emission Development Strategy (LEDS) is a national, high-level, comprehensive, long-term strategy, developed by domestic stakeholders, which aims at decoupling economic growth and social development from greenhouse gas (GHG) emissions growth. In other words, the goal of a LEDS is to make development climate-compatible (GIZ, 2013)

[6] Climate smarting means attempting to actively mitigate climate change impacts, adapt to climate change as well as provide resilience to food value chains in the face of climate change

[7] The BOP refers to the poorest in the economic human pyramid, composed of a group of more than four billion people living in abject poverty (Prahalad, 2010)

[8] SM consist of consumer and entrepreneur communities living at a range of low-income levels (Viswanathan & Rosa, 2007)

agricultural and food value chains in both rural and urban BOP/SM contexts. The approach overall considers BOP/SM contexts as 'research and development hubs'.

The aim of this research was to ascertain, identify, analyze and diagnose the key lessons learnt on developing and implementing the GFVCD approach over the past nine years. The research in nature was historical, descriptive and exploratory, and took an abductive approach. It was based on a review of sources of data and information, both secondary and primary, that had been provided over the past nine years, related directly and indirectly to the GFVCD approach. The research was further enhanced by an online meeting held with the main aim of reviewing, discussing and attempting to agree upon the key lessons learnt over the past nine years in terms of developing green food value chains.

2. Background to the green food value chain development approach

Moving away from food production and distribution models that are based on unsustainable extractions from the natural environment and unsustainable consumption of such resources is, in itself, a priority objective for increasing food security, improved nutrition and overall social welfare. In this regard and with an appropriately used, and consequently, well-functioning natural environment, the required increases in food production and food distribution can be provided for. A well-functioning natural environment can cater for food availability, accessibility, affordability and adequacy (food security) in the ever growing landscape of food production and distribution and moreover a well-functioning natural environment tends to have social mitigation effects as conflicts over basic access to such a resource, food, are prevented.

The main driver for preventing, reducing, and attempting to eliminate the environmental impacts of agricultural and food value chain activities is primarily focused on the planet (natural environment) aspect of the sustainability 'triple bottom line' of people, profits and planet. The logic is fairly simple: without planet there can be no people, let alone profits (Hilmi, 2019). But important considerations need to be given to the fact that the vast majority of people on the planet live in poverty and obtain their livelihoods from living in dire contexts, commonly referred to as the bottom of the pyramid (BOP) and working in subsistence marketplaces (SM). In fact, the number of poor worldwide remains unacceptably high, and it is increasingly clear that the benefits of economic growth have been shared unevenly across regions and countries' (World Bank, 2018). There are circa four billion people who live and work in BOP/SM contexts and currently, 736 million people, or 10.9 percent of the world population, live in extreme poverty, with an income of less than US$1.9 per day, while 3 billion live on US$2.5 per day and represent about 40 percent of the world population (World Bank, 2018, World Bank 2016). Thus about 50.9 percent of the world population live and work in BOP/SM contexts.

It is estimated that circa a 'billion entrepreneurs worldwide live in subsistence contexts and run micro-enterprises to meet life's basic consumption needs' (Venugopal et al, 2015,). Such environments, although resource-poor with respect to income and literacy, are typically 'network-rich, with social ties among people that facilitate information sharing and the consequent development of consumer and entrepreneurial skills' (Viswanthan *et al.,* 2010). Further many people are 'proactive, entrepreneurial innovators who are constantly co-creating solutions to survive the struggles of their daily lives and are a rich source of technological and business model innovations' (Fisk *et al.,* 2016).

People living and working in BOP/SM contexts are more dependent on environmental capital and climate for their economic activities, not least as most of the poor still live in rural areas, dependent on agriculture (Dercon, 2012). The poor are also more vulnerable to extreme events affecting economic productivity, health and security of livelihood, and may also find it harder to adapt their livelihoods to changing environmental conditions, as they lack the resources to invest in more appropriate profitable economic activities (Dercon, 2012). Hence the BOP/SM, as commonly thought, is more vulnerable to environmental concerns such as climate change and pollution, for example, and individuals and communities have less capacity to adapt (Vermeulen *et al.,* 2012).

However, this common thinking, in terms of BOP/SM contexts as being both 'victim' of negative climate and environmental impacts as well as contributing to negative climate and environmental impacts is not necessarily the case. Local communities have an innovative capacity to find effective solutions to solve the problems they face on a daily basis, and to seek processes that are socially inclusive. Many communities have proven track records of being resilient to environmental challenges, as local knowledge has been co-evolving with nature for centuries (Hilmi, 2018), and such knowledge and ingenuity is inevitably going to be rooted in the traditions and specific localities of such

communities (Cozzens & Sutz, 2014). Local knowledge relies on raw materials and capabilities that are affordable and socially acceptable, such as, for example, organic farming and related sustainable land and water management practices (Pansera & Owen, 2014). In fact, those who work in the informal food sector (and not only), be they grass root innovators, menial workers, etc., attempt to provide for solutions that take advantage of the many challenges they face daily and transform them into opportunities. Innovations in such contexts, are commonly referred to as grassroot or frugal or green innovations[9], where such innovations, based on local available raw materials and capabilities, contribute to the development and wellbeing of human needs with affordable, socially acceptable and culturally adaptable, accessible products, services, processes and technologies, while (attempting) to respect the world's natural resources and regenerative capacity (Le Bas, 2016; Pansera & Own, 2016; Hilmi 2016a, 2016b, 2018, 2019, 2020). Such innovations, find opportunities in a context of adversity, do more with less, think and act with agility and aim for simplicity (Le Bas, 2016). Frugal innovation is a first step towards a greener and circular economy and greener growth, with sensible connotations towards a far more low-carbon economy and provides for a valuable and costless mechanism of adaptation to climate change as well as mitigation of climate change impacts (Pansera & Sarkar, 2016, Hilmi, 2016b, 2020).

Food value chains that operate in BOP/SM settings seemingly do not have a good natural environmental track record according to the common adage of the interface between poverty and the misuse of natural environmental assets. However, this is not always the case as demonstrated in some studies (see Benson, 2014; Brown *et al.,* 2014, Hilmi 2016a, 2016b, 2019, 2020). For example, small-scale farmers and micro-scale traders are far more embedded within the natural environment (and its degradation) in many BOP/SM contexts, especially within peri-urban and urban areas, and consequently seem to be far more sensitive to environmental concerns. This seemingly creates a greater awareness for the natural environment and thus more motivation (and concern) to use natural environmental assets in a way that attempts to avert further degradation and harm to their work and livelihoods. Many practices that are carried out in such BOP/SM contexts are undoubtedly carried out and motivated as a matter of need (poverty) and to earn whatever meagre living can be made. However, such practices can also potentially reduce the environmental impact of food value chain operations. For example, the reintroduction of recycled materials into food value chain activities, which many food value chain actors are involved in, (see Hilmi, 2019) causes a reduction in the emissions of pollutants generated during the production and marketing of food. These recycling activities reduce the quantity of waste that is destined for landfills and consequently reduces GHG emissions because a lower content of organic material goes into landfills (GIZ, 2011).

3. The process to develop the green food value chain approach

The GFVCD approach finds its foundations in the green economy, the circular economy, the low carbon economy and green growth. It was developed, mainly, with a 'bottom-up' approach focused on realism: embedded (immersion) research, observational (pictographic) and case study methodologies in countries, with a main focus on BOP/SM contexts. The thrust of the process was to partner with BOP/SM stakeholders, for example agri-food value chain actors, and critically learn[10] from stakeholders and their contexts to attempt to identify and better understand how, within agri-food value chains and markets, environmental challenges and impacts were tendered with, via, frugal, green and grass root innovations. Such innovations were not only seen as being 'technologies' but on a much wider-scale to include activities, processes, systems, knowledge, know-how and behaviour. Critically such aspects were attempted to be seen, and importantly understood, from the perspective of those who lived and worked in BOP/SM contexts. This would enable a far more permeable approach to greening food value chains and would provide a more solid basis on which to attempt to institutionalize such greening practices as it would be far more prone to the social, cultural and economic environments found within BOP/SM contexts. The overall intent was to develop an approach that was flexible, adaptable and could

[9] Grass root innovations are innovative skills, activities, processes, systems and products found in the BOP commonly deriving from challenges, hardship and necessities (Hilmi, 2012)

[10] This was done so as to enable learning of the realities of how people work and earn their livelihoods in such harsh and frugal contexts. The focus was on listening and learning from people and their contexts and their living environments, in other words ground-truthing: the participatory rigor of realism (Chambers, 2017).

morph into the highly diverse range of BOP/SM contexts[11] found in many developing countries. This would enable the approach to be more widely understood and hopefully adopted by the wide range of stakeholders that are commonly involved in BOP/SM contexts.

Over the period 2012 to 2020, in developing the green food value chain approach and also in implementing such an approach at the field level, data and information, knowledge, know-how and experiences were gained from 23 countries: Algeria, Belize, Cameroon, Chad, Egypt, Fiji, Ghana, Grenada, Haiti, Iran, Iraq, Jamaica, Kenya, Liberia, Peru, Solomon Islands, Tanzania, the Gambia, Trinidad and Tobago, Tunisia, Uganda, Vanuatu and Zambia.

The actual approach to GFVCD was first published in 2018 (see Hilmi, 2018[12]). This resulted from a longitudinal research stance and a long 'gestation period':

- In 2012 an initial in-country appraisal was conducted in Tanzania and the results of such research provided guidelines, in the period 2012 and 2013, to carry out an extensive and in-depth literature research and review;
- Concurrently to this, still in 2012, country-based case study researches were conducted in Africa (Cameroon, Ghana, Kenya, Liberia, Uganda), the Caribbean (Belize, Grenada, Haiti, Jamaica) and the Pacific (Fiji, Solomon Islands, Vanuatu,) (see Westlake, 2014a, Westlake 2014b);
- This was then followed by other in-country researches conducted in Africa (Tanzania, Kenya, the Gambia) and the Middle East (Egypt, Iran, Tunisia);
- The findings from such initial research provided a concept note and conceptual framework (see Hilmi, 2014) that provided the basis to organize a knowledge exchange forum in 2014 to review, contribute too and validate the concept and conceptual framework (see FAO, 2015);
- In 2015 further in-country case study researches were conducted in Latin America (Peru), Caribbean (Trinidad and Tobago), North Africa (Tunisia) and the Middle East (Iran);
- This was followed, still in 2015, by a series of unstructured one-to-one in-depth e-interviews with a panel of global subject matter specialists to present findings and receive feedback as well as participate in a number of conferences and e-conferences to present findings and importantly receive feedback;
- This was then followed in 2016 and 2017 by another extensive literature research and review and further field work conducted in Algeria, Chad and Zambia.
- The process is still on-going as for example in the period 2018-2019, further research work was conducted in Iraq (see Hilmi, 2020) to implement the GFVCD approach within local rural to urban food systems and to ascertain lessons learnt in greening and climate smarting locally-based food systems.

The approach over the past nine years provided for a first journal article to appear in 2016 (see Hilmi, 2016a) followed by a second journal article, still in 2016 (see Hilmi, 2016b). This was followed by a book chapter (see FAO & CIHEAM, 2016) and a third journal article, (see Hilmi, 2018), that delineated in full the GFVCD approach. This was followed in 2019 by another journal article which outlined one of the three main strategies of the GFVCD approach, recapturing value from waste (see Hilmi, 2019) and this was followed by another journal article, as provided previously, on climate smarting local food systems (see Hilmi, 2020). However, the entire research period was far from being a 'solitary path' as other academics, researchers, field practitioners, organizations and so forth, in the same time period and previously, had been researching and working directly and indirectly on greening food value chains . Some, for example, were as follows: Bass *et al.,* (2016), Benson (2014), Brown *et al.,* (2014), Dercon, (2012) Ellen McArthur Foundation (2012, 2014a, 2014b, 2015, 2017), Islam *et al.,* (2016), IIED (2009, 2016), OECD, (2011a, 2011b, 2013), Stucki & Blignaut (2018), UNEP (2006, 2011, 2014, 2016) , UNDP (2017), UNESCAWA (2014), UNESCAP, UNIDO (2013, 2014), World Bank (2012).

4. The GFVCD approach

A green food value chain can be defined as one that needs to provide value at each stage by proactively reducing the usage of the natural environment (natural resources, ecosystem services, and biodiversity), to diminish or mitigate adverse impacts, or even have positive impacts, while at the same

[11] The BOP/SM represents multiple cultures, ethnicity, literacy, capabilities, and needs (Prahalad, 2011).
[12] A summary of the GFVCD approach is provided in the next section of this article

time considering disposal and recycling patterns of generated waste, to recapture value at every stage of the food value chain and thus further reduce environmental impact (Hilmi, 2018). This definition provides a basis on which to define a conceptual framework for developing green food value chains. The framework, shown in Figure 1, provides for a circular (and open-ended) nonlinear flow of forward and reverse food values that progress from the natural environment to final markets. The forward flows increase not only food economic value, but importantly food environmental, social, and cultural values; the food value that is wasted is recaptured with reverse flows that reset such food value from an economic, environmental, social, and cultural point of view. The intent is to provide for a holistic, circular, systemic and open-ended framework that inherently mitigates effects on the natural environment, attempts to adapt to changes, and at the same time attempts to replenish what has been used/consumed from the natural environment (Hilmi, 2018).

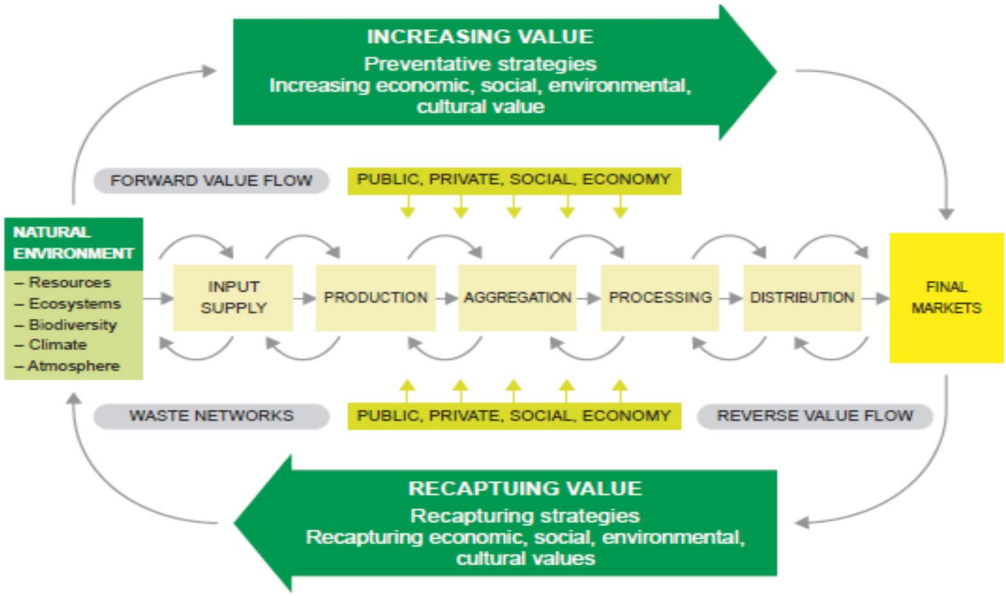

Fig. 1: The green food value chain framework

Source: Hilmi, (2014)

The process for developing green food value chains is one that is intended to suit the necessities, time lines, and especially budgets of those working at field level. The approach can have considerable impact on the appropriate use of the natural environment, for example reducing emissions and consequently contributing to low carbon development. Moving towards greener food value chains will require re-thinking of how organizations and individuals act, behave and operate in terms of greening, while at the same time providing for the same return on capital investments. This implies that every part of a food value chain must become more efficient by using less land, water, energy and other inputs, while still producing and delivering food sustainably and to become more resilient to changes and shocks (UNESCWA, 2014). Greening food value chains is composed basically of three main strategies: prevent, reduce and recapture that can be applied to all stages of the food value chain in terms of the stage's functions and activities, consequently fostering greening and low-carbon development (see Box 1).

Preventive strategies

This considers understanding how preventive strategies for averting inappropriate use of the natural environment can be defined and importantly implemented all along the food value chain or in defined sections (stages) of it. This will not only pertain to purely functional aspects, but also look at how institutional and behavioural aspects can be geared to the prevention of the inappropriate use of the natural environment. Importantly, such strategies will need to build on and learn from existing greening competencies found within such food value chains and not introduce practices that are not part of the cultural context, are not economically and socially viable, and are convenient to implement.

Reduction strategies

Such strategies seek to reduce the inappropriate use of the natural environment where preventive measures are not feasible and/or applicable. In very much the same way as preventive strategies, reduction strategies require local adaptation and acceptance by food network stakeholders and blend in well with cultural, social, and economic contexts, and importantly need to be convenient to implement.

Recapturing strategies

This looks at strategies that can recapture any value to be found in waste derived from food value chain operations. In food value chains, more often than not food losses and waste may be inevitable because of the biological nature of food, for example, and thus such strategies for recapturing value from losses and waste need to be in tune not only with environmental priorities, but also and importantly social and economic priorities of stakeholders.
(Source: Hilmi, 2018)

Box 1: The main strategies for green food value chain development

The GFVCD approach is a step-by-step process that attempts to learn from the field and from frugal innovations, and adapts this learning to the process. The step-by-step process can be seen in Box 2 in summary form. For the detail of the process and the tools used in each step can be found in Hilmi (2018).

Step 1: Form a multi-stakeholder working group
Step 2: Identify one or more food value chains that need green upgrading
Step 3: Select one or more specific food value chains for green upgrading
Step 4: Map one or more food value chains, provide for an environmental hotspot analysis and a stakeholder analysis
Step 5: Set specific objectives and strategies
Step 6: Plan and action plan
Step 7: Set up a monitoring and evaluation system
Step 8: Hold regular multi-stakeholder working group meetings
Step 9: Attempt to contribute to and foster the development of a policy action plan
Source: (Hilmi, 2018)

Box 2: The steps in the green food value chain development approach

The guideline was purposely designed in this manner so as to allow for adaptability, flexibility and morphing in the most diverse of local circumstances and contexts that can be found in local BOP/SM contexts. Some Steps are provided with 'tools' that have been field tested time and time again, for example in Step 2 *Identify one or more food value chains that need green upgrading*, suggested tools to be used are rapid market appraisal (see CRS, 2009), market research, (see Miehlbradt & Jones, 2007), and end-market analysis (see USAID, 2008). In Step 4: *Map one or more food value chains, provide for an environmental hotspot analysis and a stakeholder analysis*, one of the tools provided is hotspot analysis (see GIZ, 2015). Step 5 of the GFVCD approach provides for three generic strategies that are adaptable to the most diverse circumstances (see Box 1). In other Steps, for example, suggestions are provided in text boxes on how to go about managing and importantly implementing such Steps.

5. Aim of the research

The main aim of the research was to ascertain, identify, analyze and diagnose the key lessons learnt on GFVCD over the past nine years, both in terms of developing as well as in implementing the approach.

6. Method

The research in nature was historical, descriptive and exploratory and took an abductive approach. It was based on a review of sources of data and information, both secondary and primary, that had been provided over the past nine years, related directly and indirectly to the GFVCD approach. Further an

online meeting was held[13] with the main aim of reviewing, discussing and attempting to agree upon the key lessons learnt over the past nine years in terms of developing green food value chains as well as implementing the GFVCD approach. The meeting was composed of 11 subject matter specialists who derived from the private, public, IGO, NGO, academic, research and donor foundation sectors from various countries in developing , transition and developed countries. The meeting was held in English and French and was recorded and transcribed. Both the recording and the transcription of the meeting were analyzed via thematic analysis. This analysis provided for a draft set of key lessons learnt. The draft set of key lessons learnt were sent to the 11 meeting participants for review and feedback[14]. The outcome provided for an agreed upon set of 14 key lessons learnt.

7. Findings: Key lessons learnt in the development and implementation of the GFVCD approach

The key lessons provided below are in a numerical rank order. However this does not mean that Key Lesson 1, for example, is more important than Key Lesson 2. All the 14 Key Lessons were found to carry the same 'weight', as well as being all interconnected. These lessons were in fact determined to be 'Key' as they were found to be more prominent in both the development of the GFVCD approach, but also in the implementation of the GFVCD approach. There were also other and numerous lessons which were learnt over the time period, but even though these were deemed as important, they were not deemed to be Key.

Key Lesson 1: Providing for reflection and reflexivity

During the development process of the GFVCD approach as well as its implementation, both providing for and implementing, reflection and reflexivity[15] were deemed as an important lesson learnt. Reflection was provided for in terms of reflection on the learning from BOP/SM context, i.e. after learning had occurred, reflection on action while learning was occurring, i.e. reflection in action, (Schön, 1991), and reflection for action (Cowan , 2006), i.e. planning for the future. What was found also to be viable was critical reflection: 'a process of inquiry involving practitioners in trying to discover, and research, the assumptions that frame how they work' (Brookfield (2017). However such reflection, even though important, tended not to be dialogical and relational and hence what was seen further as an important part of the Key Lesson 1, was reflexivity. Reflexivity involves ' questioning what we, and others, might be taking for granted, what is being said and not said, and examining the impact this has or might have' (Cunliffe , 2016). In practical terms, this meant 'examining critically the assumptions underlying our actions and the impact of those actions' (Cunliffe, 2004). In this regard, reflexivity can be considered on two levels: one being ' self-reflexive about our own beliefs, values, and so on, and the nature of our relationships with others, what we say, and how we treat them and the second being critically reflexive about organizational practices, policies, social structures, and knowledge bases'(Cunliffe , 2016). Importantly the relational and dialogical nature of reflexivity was key in, for example, sharing and discussing findings with food value chain actors. This provided for a 'constant feedback' on what was seen as relevant, but importantly fitted into the perspectives and interests of such stakeholders and thus was part of the institutional context from a social, cultural and economic perspective and hence was deemed as viable, feasible and implementable from the stakeholders' perspective. For example, many of the green practices found in terms of technologies, activities, processes, systems, knowledge, know-how and behaviour (see Hilmi, 2016b) were based on this relational and dialogical process. In fact such greening 'practices' that were documented, were not only useful in contributing to the development process of the GFVCD approach, but were also implementable by food value chain stakeholders as they fitted well into their perspectives and practices as well as their social, cultural and economic context.

[13] The meeting was held on 23rd May 2020
[14] The review and feedback process was carried out between July and September 2020.
[15] Reflection and reflexivity, even though being closely tied are not the same 'as reflexivity requires a self-consciousness that is not inherent in reflection' (Anderson & Gold, 2015)

Key Lesson 2: Stepping outside of oneself to attempt to understand and learn from the BOP/SM context

Another Key Lesson learnt was that of 'how to' attempt to better understand and learn from BOP/SM contexts. This not only to develop the GFVCD process, but also to implement the GFVCD approach. The BOP/SM contexts are plagued by inadequacies in physical and informational infrastructure, operate in formal-institutional voids[16], are characterized by low levels of literacy and the distinctiveness of each setting calls for methods that help overcome such barriers (Viswanathan *et al.,* 2016). All this in reality means 'stepping outside of oneself to obtain and be informed by the interpretations of others' (Van de Ven, 2007). This means in practical terms, examining critically one's backgrounds, social and cultural heritage, knowledge, know-how, assumptions and actions so to attempt to better understand and learn from BOP/SM contexts. For example just to reach the poorest, means considering multiple layers of exclusion and deprivation as well as trade-offs between competing groups (Lawson *et al.,* 2017), and it also means overcoming a high level of unfamiliarity with these contexts (Viswanathan *et al.,* 2016) as well as dealing with the complexity and uncertainty involved in such contexts and how these can all enhance the difficulty of gaining insights.

It is within such contexts of 'survival' that the GFVCD approach attempts to learn from and attempts to understand and asses 'innovations' that have environmentally sensitive connotations in terms of technologies, activities, processes, systems, knowledge, know-how and behaviours. This also requires being aware and prepared for active experiential learning (Kolb, 1983), spiral learning (Bruner, 2003) as well as for 'double-loop learning that involves to think more deeply about personal assumptions and beliefs as it considers changing methods and improving efficiency to obtain established objectives (i.e., doing things right) to concerns changing the objectives themselves (i.e., doing the right things)' (Argyris, 1977 in Cartwright, 2002). Hence the main orientation to this type of learning is 'deep learning ' (Marton & Säljö, 1976).

One good example of this Key Lesson in terms of 'stepping out of oneself' and deep learning is to listen. As provided by Anderson *et al.,* (2012): just listening is far from an easy task: It takes time, energy, demands attention, receptiveness, and requires choices. Listening is a discipline that involves setting aside expectations of what someone will say and opening up, instead, to the multiple levels at which humans communicate with each other. At the interpersonal level, one needs first to be quiet long enough to let the other person talk. Then one needs to ask questions and probe the ideas offered rather than interject one's own opinions and analyses or jump to quick conclusions about what the other person means. A listening conversation is distinct from an interview. It opens space for dialogue on issues of importance to both parties. The act of listening is a way of showing respect (Anderson *et al.,* 2012).
Another good example of this Key Lesson in terms of stepping outside of oneself so as to deep learn from BOP/SM contexts is provided by Chikweche & Fletcher (2012) and (Venugopal & Viswanathan, (2017) : living in the BOP/SM respondents' community for a continuous period of time and using such qualitative data collection methods as in-depth one to one consumer interviews, focus groups, ethnographic observations and case studies. It is good to (a) acknowledging one's own ignorance and (b) actively seek the voices of the marginalized: this approach is, thus, starting at the micro-level. In other words, 'lived experience' is the starting point for knowledge: (a) anchored in premises that accurately describe the realities in poverty, (b) parsimoniously explain the empirical regularities observed in contexts of poverty and (c) predict interventions or programs that enhance well-being in contexts of poverty.

All in all BOP/SM contexts can be seen as 'research and development hubs' for green innovations from which technologies, activities, processes, systems, knowledge, know-how and behaviour can be captured and fed into making food value chains greener.

[16] In terms of the BOP/SM context, commonly, but not always, food production and marketing, occurs in the informal food sector, which is not under the direct purview of national governments (FAO, 2003). The main characteristics of the informal food sector are that it targets households with very small budgets, and usually, but not always, provides food with low safety, hygiene, and quality standards. It also provides for strong relationships between production and consumption, with consequent local sourcing of food. It is vulnerable to seasonal changes and seemingly has a poor environmental track record (FAO, 2003).

Key Lesson 3: Stepping outside of oneself to attempt to understand and learn BOP/SM food value chains, markets and consumers

Angot & Ple' (2015) provide for a perspective that regards poor people not as victims but rather as economic actors, potential entrepreneurs and value-demanding consumers (Angot & Ple', 2015). This is especially true about food, food markets and food distribution systems. For example, at retail level, in particular street foods, the diversities of such foods, how the foods are prepared, sold and consumed as well as the types of distribution networks used, all fit in to the high diversity of BOP/SM markets and settings (FAO, 2012).

In BOP/SM markets, consumers have very specific, but not necessarily basic needs to fulfil, seeking out for very low prices, precise and useful features in products or services. These goods and services are commonly provided within their communities, for the communities, are commonly customized, either in product features or related services, and can be highly innovative. Consumers are brand conscious, are well connected not only among themselves in terms of relational networks, but also thanks to the access of, for example, mobile communication. Such environments, although resource-poor with respect to income and literacy, are typically network-rich, with social ties among people that facilitate information sharing and the consequent development of consumer and entrepreneurial skills (Viswanthan *et al.,* 2010). For example in South India, (see Viswanathan *et al.,* 2012), there is a strong mutual interdependence, not just between buyers and sellers, but between friends, neighbours and others involved in their social networks, a reliance on oral tradition, empathy among buyer and sellers beyond the simple economic transaction (interactional empathy), a focus on long term and enduring relationships, high seller responsiveness to customer demands and high demanded customization. In a case from Brazil (see Barki & Parente, 2010) for consumers there is a different configuration of the perception of value not solely determined by lower prices; a stronger need to compensate for a dignity deficit and low self-esteem; a stronger preference for personalized relationships; a high level of aspiration to feel socially included in society; and a preference for abundance.

Key Lesson 4: Partnerships for sharing information, knowledge, know-how and experiences

There is an underlying lesson that crosses all Key Lesson learnt which is critical: that of partnering. Relational and dialogical approaches to attempting to understand and learn from BOP/SM contexts are important, but these need to be provided in partnerships. Partnerships need to be provided not just between local food value chains actors, for example, but at multiple levels. For example, partnerships between private operators in the food value chain, be they rural, peri-urban, urban, regional, national, and international, public stakeholders (local, regional and national), non-governmental and intergovernmental and support services (public, private and non-profit) and so forth. These types of partnerships are termed multi-stakeholder platforms (see Hilmi, 2018).

The first step in developing partnerships is to provide for a stakeholder mapping and analysis[17] as well as setting up a system for cooperation among stakeholders. Such partnerships are far from easy to develop, as each stakeholder will have differing perspectives and interests for example, which will inevitably collide with those of others. However, such partnerships are critical as even though providing for differing perspectives and interests, such partnerships can enable a more overall and comprehensive picture to be formed of what stakeholders can provide for in terms of information, for example, about a particular food value chain, but also and importantly how such stakeholders may 'take on-board' the implementation of greening activities for a food value chain. Having such knowledge of the full range of perspectives and interests provided by stakeholders can enable, for example, much better and more critical verification of information collected from food value chain actors and hence make such information far more valid and reliable. Further having such a full range of knowledge of stakeholders' perspectives and interests can enable to identify, for example, leverage points within stakeholders' perspectives and interests to implement greening activities.

Such partnerships do not signify one person or organization liaising with each stakeholder, but bringing the stakeholders together and facilitating and enabling relations and dialogue to develop. For example, this can be provided by:

- Undertaking an in-depth stakeholder analysis: What are their attitudes? How are they organized?

[17] GTZ (2007) provides for a method of stakeholder mapping and analysis that has proven to be very effective.

- Include primary stakeholders (for example farmers, processors, traders and collectors, processors, wholesalers, distributors, retailers, consumers, importers, exporters) and secondary stakeholders (for example extension services, banks, transport services, R&D agencies, regulatory agencies, electricity suppliers, NGOs, public health inspectors);
- Apply principles of collaboration, openness, and mutual respect;
- Emphasize the need for inclusiveness so that all are represented and all have an equal voice;
- Highlight ownership of consultations by all and that all are accountable;
- Information concerning 'how; what and why' is distributed to all to create understanding and legitimacy;
- Identify existing mechanisms and procedures for consultation and how they can be utilized;
- Assess other mechanisms and procedures that may be required to successfully facilitate stakeholder consultations (Hilmi, 2018).
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Key Lesson 5: A holistic and synergistic approach is taken

Another Key Lesson learnt is that of taking a holistic and synergistic approach. On the one side a good understanding of the 'bigger picture' is required and on the other side that the many factors that compose such a bigger picture work in synergy. For example, focusing on the SM/BOP context to ascertain green innovations from food value chain actors as well as to implement green innovations with food value chain actors needs to be coupled with: 1) understanding the 'bigger picture': considering all stakeholders involved, for example, the public sector, community groups, etc., and further the agricultural and food sector in country, agricultural policies, etc., and 2) the understanding that such factors work in synergy.

Key Lesson 6: Simplicity and practicality

The GFVCD approach needs to be considered from the perspectives and interests of stakeholder practitioners and how BOP/SM contexts require easy to use and practical approaches, which provide for adaptability, flexibility and morphing. The GFVCD approach needs to be seen to provide guidelines for greening and climate smarting food value chains and not specific and detailed actions of what needs to be done, with all the advantages as well as limitations that such an approach can have.

The simplicity and practicality of the approach is evidenced clearly in the step by step approach adopted and the three main strategies for GFVCD. The GFVCD approach has been found easy to understand and does not have excessive complexities in terms of its practical implementation. For example the tools provided and used within the approach: market research (see CRS [2009]; Miehlbradt & Jones [2007]; USAID [2009]); value chain selection (see GiZ [2015]); mapping value chains (see DFID [2008]); stakeholder mapping (see (GiZ [2007]); and hotspots analysis (see Giz [2015]) have been used extensively and have been field tested, hence they work at field level, the tools are not complicated in nature, are easily understood, do not require excessive time and budget to implement and overall work. Clearly where more time and larger budgets are available, for example, instead of implementing a hotspots analysis (see Giz [2015]) a far more in-depth product life cycle analysis and carbon foot print analysis can be carried out. However, and as from field experience, keeping implementation of the GFVCD simple and practical is critical.

Key Lesson 7: Understanding and learning from rural and urban linkages and urban and rural linkages

Commonly small and large towns and cities have traditionally relied on rural areas for food, potable water, environmental services and raw materials. At the same time though, rural areas have commonly relied on urban areas for such matters as access to markets, employment and services such as health care, for example. Linkages and partnerships between rural and urban areas and between urban and rural areas are very diverse in nature, scale and are site specific. Such linkages, commonly involve, for example flows of produce, finance, waste and information, the 'channels' in which they occur and the physical and non-physical (digital) facilities in which they occur, including the spatial aspect, in other words where do they occur in topographical, distance and time concerns. Such linkages and partnerships also include social relationships, for example among intermediaries (farmers, traders, processors, retailers), how they are linked together via relational aspects (contract farming, vertical

integration, etc.,), and transport and communication technologies. Linkages and partnerships also involve environmental services and can also be cross-sectorial, for example between the agricultural and the service sectors.

A lot of information has be sourced from both rural as well as urban BOP/SM contexts in terms of developing the GFVCD approach as well as in the implementation of the GFVCD approach. A better understanding and learning of these distinct geographical areas, their linkages, the coordination, regulation, governance and partnerships in rural to urban food value chains and urban to rural food value chains have been found to be critical. For example what was found in Iraq, (see Hilmi , 2020) in terms of implementing the GFVCD approach, was not only encouraging but also motivating, as with a better understanding and learning of rural and urban linkages and urban and rural linkages enabled and facilitated the implementation of the GFVCD approach in such a context.

Key Lesson 8: Greening is a dynamic, continuous and an iterative process

The GFVCD approach is not a one off activity. This derives from the fact that greening is a continuous moving target and can provide for differing shades of green. Usually and from experience, see for example Hilmi (2020), what is easiest to green first is greened. This creates what may be termed 'easy wins', which can be motivating and can create more 'buy-in' from stakeholders. These easy wins can be championed and hence encourage and motivate for other greening activities to occur that may be more challenging and arduous to achieve. However the greening of activities is iterative, in the sense that, for example, once 'easy wins' have been greened, they will inevitably over time need to be greened again in a continuous and iterative process. Importantly in every iteration there will be learning that derives from such a process and can support and help the iteration process itself as well as iteration processes in the future.

Key Lesson 9: Climate smarting and greening go hand in hand

Another lesson learnt is that greening and climate smarting go hand in hand. This, for example was found, see Hilmi (2020), where stakeholders in both rural and urban settings valued natural resources more and hence made such resources more prone to be resilient in the face of evident climate changes. Hence greening food value chains, not only considers enhancing food value in terms of environmental, social, cultural and economic factors as it moves through the food value chain, but as a result of this, also considers mitigation and adaptation, and enabling and facilitating resilience of the food value chain in the face of climate change.

Key Lesson 10 : Realism: Trade-offs will need to made

As per the previous Key Lessons and in particular the various shades of green that can be achieved with the GFVCD approach, there is a need for realism: trade-offs will need to be made. For example, Hilmi (2019) documents a number of trade-offs that need to be made in terms of waste valorisation. This derives from a number of reasons. For example, it may be found that recapturing value from waste may have only economic (income) and social (employment) benefits, with little environmental benefits. In other instances, it may be that there are far more environmental and social benefits than economic. There will be trade-offs to take into account in considering the costs and benefits of recapturing value from waste, and hence trade-offs will need to be considered realistically and a 'mediation' for greening found.

Key Lesson 11: Assessing, monitoring and evaluation

Another Key Lesson learnt is the need for assessing, monitoring and evaluation. This not only in terms of implementing the GFVCD approach in BOP/SM contexts, but also in learning from BOP/SM contexts. Important data and information, knowledge, know-how and experiences can be generated from, for example assessing, monitoring and evaluating learning that occurs from BOP/SM contexts. This enabled, for example, to discern what lessons learnt from BOP/SM were more relevant and those that were less relevant. Importantly such information, knowledge, know-how and experiences were shared with stakeholders for their participative assessments and evaluations, for example. This not only helped and supported more 'buy-in' of lessons learnt from BOP/SM contexts, but also and importantly provided for more relevance and thus more chances of up-take and implementation by stakeholders.

Of course assessing, monitoring and evaluation are also important in implementing the GFVCD approach as it can provide also for lesson learnt which can be shared with stakeholders, but can also enable modifications to take place, if, for example, some greening activities may not be working as planned. Further it can also provide for an 'early warning system' as matters may become apparent before they occur and hence can provide for prevention.

Key Lesson 12: Documentation of data, information, knowledge, know-how and experiences and communications with stakeholders

This Key Lesson underlies and integrates with other Key Lessons. As is evident, documenting data, information, knowledge, know-how and experiences is a critical part of the GFVCD approach in terms of learning from BOP/SM contexts, but also in implementing the GFVCD approach in BOP/SM contexts. It is a challenging task to document green and climate smarting technologies, activities, processes, systems, knowledge, know-how and behaviours in agricultural and food value chains in both rural and urban BOP/SM contexts. For example in Hilmi (2016b) such documentation took place, but in such documentation of learning from BOP/SM contexts there were several challenging issues to contend with. For example, one of the major challenges found was if the meaning of what was found at the field level reflected the reality on the ground, in other words, was the interpretation of what was found representing the reality of the field or were there biases that intervened, based on for example the role of the researcher. Further another challenge found, was for example, how to document: in writing, recording, photography, filming, etc. Very much the same challenges were found with implementing the GFVCD approach.

Further once findings have been documented how could they be communicated with stakeholders for example for review and discussions. For example, within some defined BOP/SM contexts there is a strong cultural and social tradition of verbal and visual communication. In such contexts pictographics may been seen as viable, but will such documentation just allow the conveying of meaning, but not facilitate the assimilation of such meaning. Hence and as found, commonly more than one method of communication has been provided to be viable and feasible, for example using pictographics along with verbal communication.

Key Lesson 13: The need for mentoring and coaching and training 'with' stakeholders not 'for' stakeholders

Mentoring, coaching and training should be conducted 'with' stakeholders, not 'for' stakeholders. In other words, stakeholders should not be considered as 'recipients' of mentoring, coaching and training, but should be seen as an integral part of mentoring, coaching and training. Mentoring and coaching have been found to be critical in implementing the GFVCD approach, especially with stakeholders who are directly involved in the greening process, for example food value chain actors. This mentoring and coaching is not a one off process or a 'hold them by the hand' type of approach. It needs to done over time and is iterative. Such a process, though, needs to be seen as a two way form of learning as the GFVCD approach is flexible, adaptable and morphs and hence implementing it in diverse BOP/SM contexts may well require not just implementing assumed mentoring and coaching practices, but those that fit in best within the local contexts. Hence within this, and as found, a lot can be ascertained in terms of learning from the BOP/SM context and hence mentoring and coaching practices will need to be implemented accordingly. For example, enabling and facilitating, more than guiding, within mentoring and coaching, seemingly works. Clearly this all depends on the type of stakeholders, but prevalently such an approach has been found to be fruitful with many of the stakeholders involved within the implementation of the GFVCD approach. Consequently mentoring and coaching have been found to be more effective than, for example, actually training the GFVCD approach.

However, in certain circumstances and with defined stakeholders, for example the public sector, training on the GFVCD approach has seemingly been provided to be effective. The training focused on active and experiential learning, but built on trainees' backgrounds, knowledge, know-how and experiences as well as their context. Also here the aim was to train with stakeholders, not train for stakeholders. However, even within such training contexts, it was found that mentoring and coaching needed to be implemented, during the training as well as after the training.

Key Lesson 14: The public sector and the private sector in green food value chain development

In terms of the GFVCD approach and the inherent greening activities within, there are clear signs deriving from evidence (for example see Banerjee and Duflo, 2012; Viswanathan *et al.,* 2012;Hilmi, 2016a, 2019, 2020; FAO and CIHEAM, 2016) that market mechanisms, can provide for greening food value chains at the local level. For example many of the practices within a GFVCD approach that is being implemented in a defined BOP/SM context will have derived from such a context and these practices will have been developed, in the majority of cases, by actors in food value chains i.e. private sector actors. However, and as also found, the private sector cannot 'jump-start' major efforts in greening food value chains in all cases, and thus 'seed money' from the public economy and/or for example from donor organizations will be needed. For example replacing traditional cooking stoves of street food vendors, with ones that are more energy efficiency, will inevitably require external funding.

Conclusions and the way forward

From the stocktaking, the 14 key lessons learnt can be considered as a set of 'best practices' for the GFVCD approach. These 14 reference points on 'best practice' can be important and can be instrumental in not only developing the GFVCD approach further, but also and importantly in further implementing the approach at field level. This indicates that effectively the GFVCD approach, both in terms of developing further and implementing such an approach, is dynamic and consequently needs to be considered as a flexible, adaptable and morphing approach that can be assimilated within the high diversity of BOP/SM contexts.

The key lessons learnt also provided a basis on which to consider what could be the next steps for the GFVCD approach. As per the online meeting held, a number of matters were highlighted and agreed upon as possible ways forward for the GFVCD approach. These were provided as follows:

- A new concept note is required that provides for and takes account of the key lessons learnt, but also of the other lessons learnt along the path of developing as well as implementing the GFVCD approach;
- More research should be conducted on the GFVCD approach in terms of further ascertaining of green, frugal and grass root innovations in terms of technologies, activities, processes, systems, knowledge, know-how and behaviours from BOP/SM contexts. Further, the same should be done in terms of implementing the GFVCD approach, so as to ascertain for example, lesson learnt;
- Data and information, knowledge, know-how and experiences on innovations and implementation within BOP/SM contexts should be made far more easily accessible and available as an information resource, for example, with an online data base. This 'centralization' of information would, for example, not only enable a 'reference source', but could also provide for an opportunity for all stakeholders to make their contributions to such a centralized online information resource;
- With the increased diffusion and penetration of mobile communication technology in BOP/SM contexts, its ease of accessibility, affordability and usability, such technology could be used to the advantage of the GFVCD approach. This both in terms of learning from the BOP/SM contexts, but also in implementation of the GFVCD approach within BOP/SM contexts ;
- The increase in, and wider availability, accessibility, usability and importantly interactivity of digital information, on varying digital platforms, could also be used to the advantage of the GFVCD approach. This critical role of mobile communications and the ease of transferring, sharing and accessing digital information as well as partnering online, for example, should be taken full advantage of. For example as per the increase in diffusion and availability of mobile communications and digital information, mobile online interactive communities could be set up with involved stakeholders;
- There is also a need for the furthering of multi-stakeholder platforms and importantly such platforms be more institutionalized;
- Further augmentation of institutionalization of GFVCD practices within the BOP/SM contexts was also seen as a next viable step forward;
- More involvement of the public sector, especially at the local level, was seen also as a next step forward;
- More efforts were also seen to be needed in supporting the public sector in policies and legislation development in terms of GFVCD, especially at the local public sector level;
- A communications strategy of the GFVCD approach was also seen as most necessary as a next step forward. This not only in terms of fostering awareness creation, but importantly as enabling a more

coherent and comprehensive communication strategy on the GFVCD approach that effectively provides a clear and concise message, transfer of meaning, to the multiple stakeholder target audiences.

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