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for Sustainable Food Security
in the 21st Century

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FOREWORD

The issue of food security has become increasingly pressing in recent years. According to current estimates, eleven percent of the world population suffer from chronic undernourishment. Hunger crises and food insecurity can be traced back to many causes: poorly governed public health systems, the large-scale cultivation of biofuels, the growing demand for meat products, global food losses and waste, as well as the effects of climate change, to only name a few. At the same time, since the 1990s, the rate of global food production has increased faster than the rate of global population growth. The overall amount would be enough to feed 10 billion people. Both the UN as well as the EU have recognised food security as a priority: The UN has dedicated a stand-alone goal within its post-2015 sustainability agenda to the issue and agreed to realize the right to food for everyone until 2030. The EU has identified food security as one of the greatest social challenges within its Framework Programme for Research and Innovation ‘Horizon 2020’. However, notwithstanding these and other promising developments, the international community is still far away from solving the complex and multidimensional problems connected with the issue of food security.

This volume compiles selected papers written by international scholars on occasion of a summer school, which took place in Halle, Germany, in September 2016. The summer school aimed to address the topic “Legal and Economic Challenges for Sustainable Food Security in the 21st Century” from various angles and perspectives, with a special focus on case studies and best practice models. It was hosted by the Faculty of Law and Economics of the Martin-Luther-University of Halle-Wittenberg in cooperation with the Leibniz Institute of Agricultural Development in Transition Economies (IAMO) and fully funded by DAAD (German Academic Exchange Service). The interdisciplinary event brought together international Germany Alumni from a multitude of scientific fields, including economics, law, agriculture, philosophy, and biology. The selected papers mirror the manifold aspects which informed and enriched the discussions during these intensive days of the summer school. Thus, the volume gives an impression of the enormous challenge presented by the issue of food security, but also of the rich variety of research questions.

Special thanks go to Romy Klimke, Hannah Schneider, Dustin Heße and Simon Honermeyer for the thorough editing of this volume.

PART I: LEGAL CHALLENGES FOR SUSTAINABLE FOOD SECURITY

FOOD SECURITY AND SUSTAINABLE DEVELOPMENT – ADDRESSING FOOD SECURITY IN THE EXTRACTIVE INDUSTRY WITH THE SUSTAINABLE DEVELOPMENT GOALS

Lina Lorenzoni Escobar

A. Introduction

Agriculture is about more than just supplying food.¹ Agriculture not only provides non-food goods and services that shape and affect social, cultural and economic systems,² but it also has an impact on biodiversity and the environment in the areas where it occurs.³ The multifaceted role of agriculture in society and the diversity of outcomes across agricultural practices should be reflected in our understanding of food security. Food security is indeed a ‘multi-dimensional phenomenon’,⁴ which requires multidisciplinary approaches to solve. In fact, the evolution of the definition of food-security highlights growing awareness of its multilayered nature and of the complex national and international policy approaches it requires (Section A).⁵

The evolution of food security shows that it has multiple narratives. Different institutional actors have tackled the issue in the past years, usually focusing on improvements within their specialized fields. This is reflected in the co-existence and complementarity of approaches that tackle issues of availability and access to food. International human rights law has focused on what has become the right to food;⁶ international trade law has invested efforts, albeit not enough, in creating open and stable markets for food stuffs.⁷

Sustainable development attempts to tackle the issue of food security by viewing it

¹ *Daugstad/Ronningen/Skar*, *Journal of Rural Studies* 22 (2006), 67-81.

² See <http://www.fao.org/mfcal/d_ip_ch1.htm> (visited on 20 March 2018). The EU’s Common Agricultural Policy (CAP) develops this extensively. Farming practices are associated with landscape diversity and in particular with the cultural and ecological values associated to European scenic landscapes. See <http://ec.europa.eu/agriculture/envir/landscape/index_en.htm> (visited on 20 March 2018).

³ On this regard see for example the concept High Nature Value Farming, which was developed to recognize that the conservation of biodiversity in Europe depends on the continuation of low-intensity farming systems. See <<http://www.high-nature-value-farming.eu/>> (visited on 20 March 2018). The concept has been adopted by the European Union as well, it is part of its policy to develop and share information in support of farming in areas of ‘exceptional natural value’ across Europe. See <<https://ec.europa.eu/eip/agriculture/en/news/agricultural-areas-outstanding-natural-and-cultural-values>> (visited on 20 March 2018).

⁴ FAO, *Trade Reforms and Food Security, Conceptualizing the linkages*, 33. Available at: <<ftp://ftp.fao.org/docrep/fao/005/y4671e/y4671e00.pdf>> (visited on 20 March 2018).

⁵ *Ibid.*, 25.

⁶ For an overview, see *Mechlem*, *Right to Food*, in: Wolfram (ed.) *Max Planck Encyclopedia of Public International Law*.

⁷ International trade regulation in the context of trade in agriculture includes in particular the WTO Agreement on Agriculture. Available at: <https://www.wto.org/english/docs_e/legal_e/14-ag_01_e.htm> (visited on 20 March 2018).

holistically. (Section B). This approach allows for assessing policies addressing food security with due consideration of tradeoffs. The Sustainable Development Goals (SDGs) adopted in 2015 are the most comprehensive and coordinated interdisciplinary framework for achieving its stated goals, including food security, in an integrated, sustainable manner (Section C). However, an important question is whether the SDGs allow the inclusion of issues and objectives that are not already included in them. The case of mineral extraction and its potential impact on food security is used here as an example of a thematic area of development that is exogenous to the SDGs. They are exogenous in the sense that the SDGs are laconic – to say the least – on the sustainable management of the resource base for development and do not address the possible contributions of extractive industries to development. However, it is an area that can be incorporated, thus overcoming the intuitive framing that considers ‘food’ and ‘minerals’ as exclusive themes of development. Food security, as conceptualized in the SDGs, is a tool to address questions of sustainability within the mining industry and to develop best policies and practices (Section D). While, on an abstract level, this exercise could be carried out by looking at several other issues, a focus on mineral extraction and food security shows how the SDGs can provide the framework to relate issues that were otherwise treated separately.

B. Evolution of the definition of food security

I. The Hot Springs Conference: Freedom from want

Historically, the underlying tenants of food security go back to the United Nations Conference on Food and Agriculture, held in Hot Springs, Virginia, in 1943.⁸ Convened by US President Roosevelt, the conference was concerned with foodstuffs production and transportation in the light of the expected transition to peace after the war. The purpose of the conference was to find ways of ‘relieving the hunger’ of those peoples whose liberation was approaching.⁹ Indeed the final act adopted by the conference attendees during the conference (Final Act) states the belief that “*the goal of freedom from want of food, suitable and adequate for the health and strength of all peoples, can be achieved*”.¹⁰ The Final Act focuses on the immediate post war period, where economization of consumption and increase of supplies are underscored,¹¹ and also on the sus-

⁸ See Committee on World Food Security, ‘Coming to terms with terminology: Food Security, Nutrition Security, Food Security and Nutrition, Food and Nutrition Security’, Thirty-Ninth Session, CFS 2012/39/4, September 2012, paragraph 6, available at: <<http://www.fao.org/docrep/meeting/026/MD776E.pdf>> (visited on 20 March 2018).

⁹ *Evang*, The United Nations Conference on Food and Agriculture, Hot Springs, Virginia, 18th May–3rd June, 1943, Fifteenth Scientific Meeting – Seventh Scottish Meeting, Royal Infirmary, Edinburgh, October 2nd, 1943, The Hot Springs Conference, available at: <<https://www.cambridge.org/core/services/aop-cambridge-core/content/view/S0029665144000277>> (visited on 20 March).

¹⁰ United Nations Conference on Food and Agriculture: Text of the Final Act, *The American Journal of International Law*, Vol. 37 No. 4, Supplement: Official Documents (1943), 163.

¹¹ *Ibid.*, Paragraph 1.

tainability of freedom from want. Three important issues are emphasized. First, freedom from want must be secure in the sense that it can only be achieved when freedom from fear is also maintained.¹² Second, people are to be free of want of food that is adequate and suitable. This implies an increase in production¹³ but also an expansion of markets, framed as a reduction of poverty, so that there can be market demand for food.¹⁴ Third, freeing people from want of food requires international cooperation.¹⁵ The term “food security” does not appear in the Final Act, but the connections between availability, access and poverty are made clear. The conference at Hot Springs created ‘a sort of world conscience in re

gard to the food supply of the world’,¹⁶ leading to the establishment of the United Nations Food and Agriculture Organization (FAO) in 1945 as a specialized agency of the United Nations.¹⁷

II. The nineteen-seventies: Food security as food availability

The FAO would become prominent in mainstreaming the concept of food security in the international agenda. Indeed, food security as a concept first appeared under FAO auspices during the World Food Conference held in Rome in November of 1974. The conference was convened to address the crisis brought by a series of poor harvests that caused prices of grains to soar in the early seventies. Not surprisingly, the focus of food security at the time was on the volume and stability of food supplies,¹⁸ with food security being defined as the “*availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production prices*”.¹⁹ The World Food Conference of 1974 established the Committee on World Food Security (CFS) as an intergovernmental body to review and follow up policies concerning world food security.²⁰ In line with the focus of the World Food Conference of 1974, in the following years the work of the CFS focused on increasing global grain production and on stabilizing world grain markets.²¹

¹² *Ibid.*, Paragraph 2.

¹³ *Ibid.*, Paragraph 3: “*There has never been enough food for the health of all people... Production of food must be greatly expanded...*”.

¹⁴ *Ibid.*, Paragraph 4: “*The first cause of hunger and malnutrition is poverty. It is useless to produce more food unless men and nations provide the markets to absorb it. There must be an expansion of the whole world economy to provide the purchasing power sufficient to maintain an adequate diet for all*”.

¹⁵ *Ibid.*, Paragraph 5: “*But each nation can fully achieve its goal only if all work together*”.

¹⁶ *Evang*, note 9, 165.

¹⁷ While the origins of the FAO go back to 1945, the year the organization was founded, the preamble of its constitution included the phrase “...and ensuring humanity’s freedom from hunger”, among the commitments of states only in 1965. See FAO: Its origins, formation and evolution 1945-1981, <<http://www.fao.org/docrep/009/p4228e/P4228E03.htm>> (visited on 20 March 2018).

¹⁸ FAO, Trade Reforms, note 4, 26.

¹⁹ Definition of the Report on the World Food Conference, quoted in FAO, Trade Reforms, note 4, 27. Available at: <ftp://ftp.fao.org/docrep/fao/005/y4671e/y4671e00.pdf> (last accessed on 3 July 2017).

²⁰ CFS, Information Note, <http://www.fao.org/fileadmin/templates/cfs/Docs0910/InfoNote/CFS_General_Info_Note_EN.pdf> (visited on 20 March 2018).

²¹ See CFS: Coming to terms with terminology: Food Security, Nutrition Security, Food Security and

III. The nineteen-eighties: Food security as availability and access

The focus on increasing supply during the nineteen-seventies did not remain static throughout the nineteen-eighties, especially as the definition of food security expanded. In 1983, the FAO acknowledged, in addition to availability of food, the issue of access to food by vulnerable peoples, implying that attention should be given to the demand and supply side of the food security equation.²² This renewed emphasis on consumption is closely linked to Amartya Sen's seminal study, focused on entitlements of individuals and households.²³ Sen's study led to recognition that sufficiency of supply did not automatically translate into access to food. The study, together with the poor grain harvests of the early 1980s, led to further broadening of the definition of food security as concerned with the goals of adequacy of supply, stability of supplies and markets, and security of access to supplies.²⁴ Furthermore, the 1986 World Bank Report "Poverty and Hunger" focused on the temporal dynamics of food insecurity, and introduced the ideas of chronic and transitory food insecurity.²⁵

IV. The nineteen-nineties: Food security as availability and access to nutritious food

During the nineteen-nineties there was another important expansion of the definition of food security. During the decade, the issue of nutrition came under scrutiny of the international community,²⁶ and the debate on food security started to focus on access to *sufficient* food. Concerns of malnutrition became part of the food security discourse.²⁷ This is reflected in the outcome documents of the World Food Summit of 1996. The World Food Summit Plan of Action states that there is food security "...when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life".²⁸ Here, the elements of availability, access and sufficiency of food are included in the definition, but the World Food Summit goes one step further by including food preferences as well.

Nutrition, Food and Nutrition Security', Thirty-Ninth Session, CFS 2012/39/4, September 2012, paragraph 11, <<http://www.fao.org/docrep/meeting/026/MD776E.pdf>> (visited on 20 March 2018).

²² FAO, Trade Reforms, note 4.

²³ The study is *Poverty and Famines, An Essay on Entitlement and Deprivation*, published by Clarendon Press, Oxford, in 1981.

²⁴ See CFS, Coming to terms with terminology, note 21, paragraph 12.

²⁵ It is in the foreword of this document that food security is defined as "access by all people at all times to enough food for an active and healthy life". World Bank, *Poverty and Hunger, V*, available at: <<http://documents.worldbank.org/curated/en/166331467990005748/pdf/multi-page.pdf>> (visited on 20 March 2018).

²⁶ In 1992, the International Conference on Nutrition was held, which adopted the World Declaration and Plan of Action on Nutrition. Available at: <<http://apps.who.int/iris/bitstream/10665/61051/1/a34303.pdf>> (visited on 20 March 2018).

²⁷ FAO, Trade Reforms, Note 4, 27.

²⁸ FAO, World Food Summit Plan of Action, available at: <<http://www.fao.org/docrep/003/w3613e/w3613e00.HTM>> (visited on 20 March 2018).

V. The two-thousands: Food security as availability and (economic and social) access to nutritious food

The definition of food security in the World Food Summit Plan of Action, stated above, was adopted again during the World Summit on Food Security held in Rome in 2009. However, the word “social” was added to the characterization of access to food.²⁹ Following the inclusion of the word social in the definition of food security, the definition of food security today includes physical availability of food and stability of markets, economic, social and physical access to food, and finally, food utilization (nutrition and preferences).³⁰ The meaning of food insecurity is, likewise, more nuanced and holistic than ever before, and includes chronic, seasonal or transitory circumstances.³¹ This nuanced approach to food insecurity can help us understand the concept of vulnerability of affected populations, which may arise from the risk of being affected by certain events, and the inability to manage such events. Accordingly, vulnerability analysis suggests two main intervention options: to reduce the degree of exposure to the hazard, on the one hand, and to increase the ability to cope with it, on the other.³²

VI. Critique of the current definition of food security

The current international consensus on the meaning of food security is not without criticism. One criticism, for instance, is that the food system is not neutral as it is often assumed to be. Indeed, the global food system is accompanied by many deficits and asymmetries, with very diverse agricultural actors that compete with each other.³³ The regional and global food system is to many extents a controlled system: agricultural supply chains have become increasingly integrated and oligopolized, with weak competition.³⁴ With this leading to market exclusion for small business holders, not to speak of small farmers, it appears that shaping food policy implies contrasting privileges,³⁵ mostly of transnational and developed country based corporations. This politically ‘uncharged’ definition would thus be irrelevant in actual shaping food consumption and production priorities.³⁶

The doctrine of food security continues to be the subject of debate in some circles, however, the international community has generally accepted broad statements, such as

²⁹ See footnote 1 of the Draft Declaration of the World Summit on Food Security of 2009, available at: <http://www.fao.org/fileadmin/templates/wsfs/Summit/Docs/Declaration/WSFS09_Draft_Declaration.pdf> (visited on 20 March 2018).

³⁰ FAO, Food Security Information for Action, Practical Guides, available at: <<http://www.fao.org/docrep/013/al936e/al936e00.pdf>> (visited on 20 March 2018).

³¹ Unlike chronic food insecurity, which is long-term and part of wider development issues, transitory food insecurity is characterized by unpredictability and sudden emergence. Seasonal food insecurity on the other hand is usually predictable but patterns of availability and access to food are cyclical and uneven. See FAO, Practical guides, *ibid.*

³² *Ibid.*

³³ *Bürger Bonanomi*, Sustainable Development in International Law Making and Trade, 198.

³⁴ *Ibid.*, 199.

³⁵ *Bedi*, Geoforum, 253.

³⁶ *Ibid.* 253.

of the World Bank, to be its shared goals. The practical response to a sweeping definition of food security, however, has been to focus on narrower, simpler objectives around which to organize international and national public action.³⁷ Such narrow focuses are problematic though, not only because they can overlook substantial tradeoffs that need to be balanced under a sustainable development perspective, but also because they often build on assumptions. For example, liberalization, at least during transition phases, appears to increase the risk of food insecurity in vulnerable populations.³⁸ However, it is frequently reiterated that there is enough food globally to feed everyone, and so economic liberalization policy choices give less prominence to transitory food insecurity. Shaping these policy choices from a sustainable development perspective helps bringing vulnerabilities to the fore and taking them in due account.

C. The sustainable development narrative: Food security as a thematic area

The evolution of the definition of food security accepted by the FAO did not occur in isolation. Since the creation of the FAO, food security had become a matter of concern and debate in other institutional frameworks, both inside and outside the United Nations. Approaches taken to food security give particular importance to certain issues depending on the institutions adopting the approach. For the purposes of the present contribution, the narrative of food security as a theme of sustainable development will be analyzed. Sustainable development as reflected in international law is essentially UN-driven and food security has gradually become an important theme of sustainable development narrative. It appears that, in contrast to other narratives, sustainable development offers an understanding of food security that is holistic.

Sustainable development is notoriously defined in the Brundtland Report³⁹ as “*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*”,⁴⁰ a definition that underscores the element of inter and intra generational equity. The principle of integration of the so-called three pillars, initially the two pillars of environmental protection and economic development,⁴¹ with social protection subsequently added,⁴² complements the principle of equity. Defining

³⁷ FAO, Trade Reforms, note 4, 28.

³⁸ *Ibid.*, 32.

³⁹ The Brundtland Report was published in 1987 by the World Commission on Environment and Development (WCED), an independent body mandated by the United Nations to examine environmental and developmental issues putting forward realistic ways to address them. The report of the WCED was named “Our Common Future”, but it is commonly referred to as the Brundtland Report because the chair of the WCED, the Norwegian Prime Minister, was Gro Harlem Brundtland.

⁴⁰ Report of the World Commission on Environment and Development: Our Common Future, available at: <<http://www.un-documents.net/wced-ocf.htm>> (visited on 20 March 2018).

⁴¹ See Declaration of the United Nations Conference on the Human Environment, available at: <<http://www.un-documents.net/unchedec.htm>> (visited on 20 March 2018).

⁴² The social pillar was added in occasion of the UN General Assembly held in New York in 1997 to appraise the implementation of Agenda 21. See Resolution S/19-2, Programme for the Further Implementation of Agenda 21. Available at: <<http://www.un.org/documents/ga/res/spec/aress19-2.htm>> (visited on 20 March 2018).

sustainable development by reference to integration and equity gives an incomplete picture of sustainable development, but for the present purposes it is sufficient.⁴³ It is particularly relevant to discuss the development of the narrative of sustainable development with emphasis on the gradual inclusion of food security.

I. The Seventies and early Eighties: food security and the environment

The preamble of the Stockholm Declaration of 1972 characterizes the environment of man as one that gives him physical sustenance.⁴⁴ This idea of physical sustenance was reworded to ‘supply of energy and nutrients’⁴⁵ in the 1982 World Charter for Nature,⁴⁶ arguably anticipating the broadening of the definition of food security within the FAO in the decade that followed. While the instrumental function of the Earth as a source of sustenance is reaffirmed in the World Charter for Nature, it also underlines environmental sustainability of food production: land must be managed to “*achieve and maintain optimum sustainable productivity, but not in a way as to endanger the integrity of those other ecosystems or species with which they coexist*”.⁴⁷ Therefore, productivity should not affect the surrounding ecosystem but it should also not affect the fertility of soils⁴⁸ and it should be adapted to the characteristics of the area.⁴⁹ Hence, the issue of environmental compatibility of agriculture emerged in the UN sustainability discourse early on, but it was and is not a feature of food security as conceptualized by the FAO.

II. The Brundtland Report: Food Security and structural deficiencies of the world trade system

In 1987, the Brundtland Report devoted its fifth chapter entirely to food security. The Brundtland Report, in assessing the state of the world, found, as the FAO had, that

⁴³ For an overview of sustainable development some references are: *Barral*, Le développement durable en droit international; *Beyerlin*, Sustainable Development, in: Wolfrum (ed.) Max Planck Encyclopaedia of Public International Law; *Bürgi Bonanomi*, Sustainable Development in International Law Making and Trade; *Schrijver*, The Evolution of Sustainable Development in International Law.

⁴⁴ The Preamble of the Stockholm Declaration, at point 1, establishes: “*Man is both a creature and a moulder of his environment, which gives him physical sustenance and affords him the opportunity for intellectual, moral, social and spiritual growth*”. See Declaration of the United Nations Conference on the Human Environment, available at: <<http://www.un-documents.net/unchedec.htm>> (visited on 20 March 2018).

⁴⁵ Preamble, (a) “*Mankind is a part of nature and life depends on the uninterrupted functioning of natural systems which ensure the supply of energy and nutrients*”.

⁴⁶ The World Charter for Nature was adopted by the UN General Assembly in 1982 but it was not a UN-led document. It stems from the International Union for Conservation of Nature and Natural Resources.

⁴⁷ Part I, General Principles, point 4 of the Charter for Nature.

⁴⁸ Point 10 (b) of the Charter for Nature: “*The productivity of soils shall be maintained or enhanced through measures which safeguard their long-term fertility and the process of organic decomposition, and prevent erosion and all other forms of degradation*”.

⁴⁹ Point 12 (d) of the Charter for Nature: “*Agriculture, grazing, forestry and fisheries practices shall be adapted to the natural characteristics and constraints of given areas*”.

increased production does not necessarily result in increased availability. The Brundtland Report also notes the increase in consumption of animal protein, with related environmental impacts. This is a specific example of an unsustainable pattern of consumption, unsustainable patterns of production and of consumption being an issue the Brundtland Report introduces. Subsidies given to farmers in developed countries are identified as problematic because, among other reasons, they help create surpluses that, sent as aid, undermine producing capacity of developing countries and depress international market prices of commodities.⁵⁰ The problem of poor support given to farmers in developing countries is also highlighted, along with the related issue of lagging technology. Unlike the criticized ‘neutral’ approach to food security within the FAO, the Brundtland Report acknowledges the realpolitik behind the problem of food security. It accordingly concludes that global food security goes beyond ‘just’ raising global production: it implies reducing distortions in the structure of the world food market⁵¹ and reappraising global food distribution.⁵² Responsibilities of national governments are not overlooked, and governments are seen as having an important role in steering agricultural research and development in partnership with commercial enterprises.⁵³ Reflective of the evolution of the definition of food security, the Brundtland Report also addresses stability of access to food. It is underscored that food security is not just about raising food production, but also about ensuring that the poor do not go hungry. Addressing this challenge, says the report, requires the systematic promotion of equity in food production and distribution.⁵⁴

Highlighting the shortcomings of the then current state of affairs,⁵⁵ the Brundtland Report takes issue with ‘short-sighted policies’ which lead to the degradation of the resource base.⁵⁶ It thus underlies how food security policies need to integrate environmental concerns.

III. The Nineties: Food security and poverty

The Rio Declaration on Environment and Development of 1992 (Rio Declaration) is universally acclaimed as the starting point of sustainable development as ‘mainstream’ in international law and policy (although debates on the normative nature of the concept and its standing in international law are ongoing).⁵⁷ The Rio Declaration does not

⁵⁰ Paragraph 48, Chapter V of the Brundtland Report.

⁵¹ Paragraph 38, Chapter V of the Brundtland Report.

⁵² Paragraph 39, Chapter V of the Brundtland Report. Although here the responsibility of national governments is key: “*Inequitable distribution of production assets, unemployment and underemployment are at the heart of the problem of hunger in many countries*”.

⁵³ *Ibid.*, Paragraph 82, Chapter V mentions how commercial enterprises can help develop and diffuse technology, but “*public institutions must provide the essential framework for agricultural research and extension*”.

⁵⁴ *Ibid.*, Paragraph 90, Chapter V.

⁵⁵ Although the structural problems with trade and distribution of food are relevant still today.

⁵⁶ Paragraph 20, Chapter V of the Brundtland Report. This paragraph focuses extensively on the expansion of arable land in developing countries, where agricultural resources are untapped.

⁵⁷ Rio Declaration on Environment and Development, available at: <<http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm>> (visited on 20 March 2018).

mention food security explicitly, although some of its principles are linked to the equitable dimension of the right to development,⁵⁸ the integration of environmental protection within the development process,⁵⁹ the eradication of poverty⁶⁰ and the elimination of unsustainable patterns of production and consumption.⁶¹ All these elements were underscored in the Brundtland Report as explicitly related to food security. Having said this, as a declaration of principles, it is not in the nature of the Rio Declaration to elaborate on any theme.

The Copenhagen Declaration on Social Development of 1995 (Copenhagen Declaration) addresses food security in explicit terms and within the framework of its goal to eradicate poverty.⁶² Chronic hunger and malnutrition are reckoned as conditions that affect global well-being, and its point b of commitment number 2 on the eradication of poverty mentions that achieving its goals will require the “Provision of food security”. Access to land is pointed out at point c. Improving food security is also a measure contemplated at point c of commitment 7 as a way to accelerate the economic, social and human resources available for the development of Africa and the least developed countries.

What is novel in the Copenhagen Declaration is the introduction of a gender perspective. It is not mentioned explicitly in connection with food security, but the limited access of women to resources and income is acknowledged immediately following mention of the fact that most people living in abject poverty go hungry each day.⁶³

The Copenhagen Declaration introduces food security explicitly within the sustainable development discourse. From the Copenhagen Declaration onwards, the issue of food security has become recurrent in the sustainable development narrative, slowly building up to become an area of focus within sustainable development.⁶⁴

The UN General Assembly held a special session in New York in 1997 in order to appraise the implementation of Agenda 21. In that occasion, the UN General Assembly

⁵⁸ *Ibid.*, Principle 3: “*The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations*”.

⁵⁹ *Ibid.*, Principle 4: “*In order to achieve sustainable development, environmental protection shall constitute and integral part of the development process and cannot be considered in isolation from it*”.

⁶⁰ *Ibid.*, Principle 5: “*All States and all people shall cooperate in the essential task of eradicating poverty as an indispensable requirement for sustainable development, in order to decrease the disparities in standards of living and better meet the needs of the majority of people of the world*”.

⁶¹ *Ibid.*, Principle 8: “*To achieve sustainable development and a higher quality of life for all people, States should reduce and eliminate unsustainable patterns of production and consumption and promote appropriate demographic policies*”.

⁶² United Nations, Report on the World Summit for Social Development, Copenhagen, 6-12 March 1996, available at <http://www.un.org/documents/ga/conf166/aconf166-9.htm> (last accessed on 13 July 2017).

⁶³ *Ibid.*, Point 16 (b).

⁶⁴ The Declaration of Santa Cruz also mentions food security as part of the social dimension of the plan for the sustainable development of the Americas.

adopted a resolution⁶⁵ that addresses food security linking it to the eradication of poverty.⁶⁶ A specific issue that the document identifies is land and sustainable agriculture,⁶⁷ echoing considerations made in the World Charter for Nature: “*Land degradation and soil loss threaten the livelihood of millions of people and future food security...*”. The resolution goes on to say that “*The greatest challenge for humanity is to protect and sustainably manage the natural resource base on which food and fibre production depend, while feeding and housing a population that is still growing.*” Paragraph 63 brings adequate nutrition into the picture. The sustainable development discourse is careful to balance food security with environmental protection, even when discussing food security within the framework of eradicating poverty. Food security and environmental protection are also balanced in the Millennium Development Goals.⁶⁸ While the link between poverty and food insecurity is undeniable,⁶⁹ framing food security as an issue of poverty gives only a partial representation of the issue. Food security is multidimensional in nature and poverty is just but one of its dimensions.

IV. Johannesburg onwards: Food security is multidimensional and holistic

At the Summit for Sustainable Development that took place in Johannesburg in 2002 (Johannesburg Summit), food availability and affordability were considered part of a more general concern about poverty eradication, consistent with the discourse during the nineteen-nineties. Agriculture, however, emerged as a standalone concern also considered to play a role in the eradication of poverty.

At the Johannesburg Summit, the multidimensional nature of food security began to be acknowledged. The Johannesburg Plan of Implementation⁷⁰ identifies several important links involving food security. Predominantly underscored is the link between food security and health. It is, in fact, under the broader caption of health and sustainable development that the definition of food security set forth by the FAO is restated.⁷¹ Furthermore, food security is mentioned as a means of attaining imperatives such as gender equality.⁷² Of course, echoing the past discourse on food security within the

⁶⁵ See Resolution S/19-2, Programme for the Further Implementation of Agenda 21, available at: <<http://www.un.org/documents/ga/res/spec/ares19-2.htm>> (visited on 20 March 2018).

⁶⁶ *Ibid.*, Paragraph 27 is captioned “Eradicating poverty”. It states, among other things, that “*The provision of basic social services and food security in an equitable way is a necessary condition for such integration and empowerment*”.

⁶⁷ *Ibid.*, Section 62 and following.

⁶⁸ The MDGs mention the eradication of hunger within the broader context of the eradication of poverty. The MDG was specifically to halve by 2015 the proportion of people that suffer from hunger.

⁶⁹ And it had been noted since the genesis of this process at the Hot Springs Conference.

⁷⁰ Plan of Implementation of the World Summit on Sustainable Development, available at: <http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/WSSD_PlanImpl.pdf> (visited on 20 March 2018).

⁷¹ *Ibid.*, Point (n) of section 54 sets forth: “*Improve availability and access for all to sufficient, safe, culturally acceptable and nutritionally adequate food, increase consumer health protection, address issues of micronutrient deficiency and implement existing internationally agreed commitments and relevant standards and guidelines*”.

⁷² *Ibid.*, Paragraph 40: “*Enhancing the role of women at all levels and in all aspects of rural development,*

sustainable development narrative, food security is viewed as needing to be balanced with environmental interests. It is added that the increase in food production and the enhancement of food security must be carried out in an environmentally sustainable way,⁷³ that there is a relationship between food security and biodiversity and thus the conservation of forests,⁷⁴ oceans, seas, islands and coastal areas are critical for food security, and that climate change has an impact on access to water and food and on food production. Finally, food security is mentioned in the section devoted to sustainable development and Africa.⁷⁵

The Johannesburg Plan of Implementation has a specific chapter dedicated to implementation measures. Under this specific chapter, the shortcomings within the WTO Doha Round and lack of implementation of the Agreement on Agriculture are addressed. The Johannesburg Plan of Implementation, in accordance with the concerns expressed in the Brundtland Report and the Copenhagen Declaration, is realistic about structural constraints within the international trade system that hinder the achievement of food security.⁷⁶

In 2005, the UN convened a world summit to celebrate its sixtieth anniversary. The resolution adopted on that occasion, the 2005 World Summit Outcome,⁷⁷ addresses food issues at paragraph 34, where it proposes quick-impact initiatives, among which expansion of local school meal programmes is mentioned. The inclusion of meal programmes underscores the link between food security and health within a vulnerable group, children. Paragraph 46, under the caption ‘rural and agricultural development’, focuses on the role of domestic policies in achieving food security.⁷⁸ One policy to help achieve food security is to increase productive investment in rural and agricultural development.

In occasion of the UN Conference on Sustainable Development, held in 2012 in Rio, the UN General Assembly adopted the conference’s outcome document, ‘The future we want’.⁷⁹ The Future we want is particularly noteworthy because food security is a theme in its own right, under the caption “*Food security and nutrition and sustainable agriculture*”. This is a very important shift. While understanding food security as a self-

agriculture, nutrition and food security is imperative”.

⁷³ *Ibid.*, Paragraph 40.

⁷⁴ *Ibid.*, Paragraph 45.

⁷⁵ *Ibid.*, paragraph 67: “Achieve significantly improved sustainable agricultural productivity and food security...”, “...implement food security strategies...”.

⁷⁶ *Ibid.* Specifically, letter (c) of point 92 establishes the States’ commitment to fulfil the “*commitment for comprehensive negotiations initiated under article 20 of the Agreement on Agriculture, aiming at substantial improvements in market access...with a view to phasing out all forms of export subsidies, and substantial reductions in trade-distorting domestic support, while agreeing that the provisions for special and differential treatment for developing countries shall be an integral part of all elements of the negotiations...so as to be operationally effective and to enable developing countries to effectively take account of their development needs, including food security and rural development.*”

⁷⁷ 2005 World Summit Outcome, available at: <<http://www.un.org/womenwatch/ods/A-RES-60-1-E.pdf>> (visited on 20 March 2018).

⁷⁸ *Ibid.*: “*We reaffirm that food security and rural and agricultural development must be adequately and urgently addressed in the context of national development and response strategies*”.

⁷⁹ The Future we want, available at: <http://www.un.org/disabilities/documents/rio20_outcome_document_complete.pdf> (visited on 20 March 2018).

standing theme it still acknowledges the link between food security and poverty eradication and also emphasizes that food security is a multilayered concept and not be limited to discussions about eradicating poverty. This approach allows a more balanced blueprint for sustainable development policies addressing the challenge of food security and other issues that touch upon it.

Accordingly, there are several dimensions to food security that emerged in occasion of the 2012 UN Conference on Sustainable Development. One is equity: the commitment to ensure access to food on the part of vulnerable categories such as women and children is reaffirmed.⁸⁰ Goals may be achieved only where food is sufficient, safe and nutritious. The environmental dimension of food security is stressed in several paragraphs. It is acknowledged that food production systems rely on natural ecological processes which must be maintained.⁸¹ The importance of healthy marine ecosystems, sustainable fisheries and sustainable aquaculture is stressed as important for food security and nutrition.⁸² Another issue raised is the management of food production systems: States commit to reduce post-harvest and other food losses and waste throughout the food supply chain. Linkages are acknowledged, as usual, between food security, the world trade regime,⁸³ climate change, desertification, biodiversity, and mountain ecosystems.

Finally, the 2012 UN Conference on Sustainable Development considers institutional coordination among international actors engaged with the issue of food security. The work of the CFS is reaffirmed and the implementation of the CFS Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security is encouraged.⁸⁴

In 2015, the Sustainable Development Goals (SDGs) were adopted by the UN General Assembly.⁸⁵ Here again, food security is a standalone theme, indeed, food security is a goal in itself at SDG No. 2: 'End hunger, achieve food security and improved nutrition and promote sustainable agriculture'.⁸⁶ What the SDGs bring to the narrative

⁸⁰ *Ibid.*, paragraph 108: "We reaffirm our commitments regarding the right of everyone to have access to safe, sufficient and nutritious food, consistent with the right to adequate food and the fundamental right of everyone to be free from hunger. We acknowledge that food security and nutrition has become a pressing global challenge and, in this regard, we further reaffirm our commitment to enhancing food security and access to adequate, safe and nutritious food for present and future generations in line with the Rome Principles adopted in 2009, including children under two, and through, as appropriate, national, regional and global food security and nutrition strategies." Paragraph 109 reiterates the importance of empowering rural women as critical agents for enhancing agricultural and rural development and food security and nutrition.

⁸¹ *Ibid.*, Paragraph 111.

⁸² *Ibid.*, paragraph 113. This is cross-referenced at paragraph 158 when addressing oceans and seas as a topic in themselves.

⁸³ *Ibid.*, paragraph 116: "We stress the need to address the root causes of excessive food Price volatility, including its structural causes, at all levels, and the need to manage the risks linked to high and excessively volatile prices in agriculture commodities and their consequences for global food security and nutrition, as well as for smallholder farmers and poor urban dwellers."

⁸⁴ *Ibid.*, See paragraph 115.

⁸⁵ United Nations General Assembly, Seventieth Session, resolution A/RES/70/1 of 25 of September 2015. Available at: <http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E> (visited on 20 March 2018).

⁸⁶ *Ibid.* The issue of food is also part of the 'world vision' depicted by leaders at point 9, which is a world where "food is sufficient, safe, affordable and nutritious". The 'New Agenda' at point 24,

is a holistic and integrated view of food security (and other goals as well). Food security appears in the SDGs not only as a multidimensional goal, but also as part of an inter-related network of goals and targets.

D. Mapping food security within the SDGs

The SDGs have a peculiar structure, in that the 17 SDGs are accompanied by a varied number of targets. These targets detail the goal under which they are captioned, but they also reference other goals or targets in the SDGs, or are, practically, connected. In this sense, the structure of the SDGs has the potential to encourage cross-sector dialogue. Each SDG has a broader scope than the issue it primarily seeks to address, and as such could conduce greater consideration of trade-offs and enable more synergetic outcomes.⁸⁷

I. Le Blanc's network of targets

The mapping of SDGs herein referred to is based on David *Le Blanc's* approach to presenting the SDGs as a matrix, where each target under a given goal is linked to all the goals and targets to which its wording refers.⁸⁸ *Le Blanc* thus maps the SDGs building graphic networks between goals and targets that reference each other. The mapping of SDGs done by *Le Blanc* reflects the connections that the SDGs expressly make, which, like the SDGs themselves, are the result of a political process. This acknowledgment is relevant since it allows the structural limitations of the SDG to be recognized, as the results of the mapping exercise based purely on natural or social insights would differ.⁸⁹ This means that there are links that are obvious from socio-economic or physical considerations, but are not made in the SDGs themselves.⁹⁰

With this in mind, it is proposed herein to apply *Le Blanc's* methodology of mapping SDG 2, which states “End hunger, achieve food security and improved nutrition and promote sustainable agriculture”, with some modifications. *Le Blanc* already mapped SDG 2 in his work, where he links SDG 2 as follows: Target 2.1 is linked to SDG 1 on poverty eradication, target 2.2 is linked to SDGs 3 and 5 on health and gender, respectively, target 2.4 is linked to SDGs 8, 12 and 15 on growth and employment, sustainable consumption and production patterns and terrestrial ecosystems, and target 3.5 is linked to SDG 15 on sustainable use of ecosystems. This is illustrated by him graphically as:

reaffirms the commitment to end poverty and within this paragraph is the determination to end hunger and to achieve food security as a matter of priority, as well as to end all forms of malnutrition.

⁸⁷ *Le Blanc*, DESA Working Paper No. 141, 11, available at: http://www.un.org/esa/desa/papers/2015/wp141_2015.pdf (visited on 12 July 2017).

⁸⁸ *Ibid.*, 2.

⁸⁹ *Ibid.*, 1.

⁹⁰ *Ibid.*, 3.

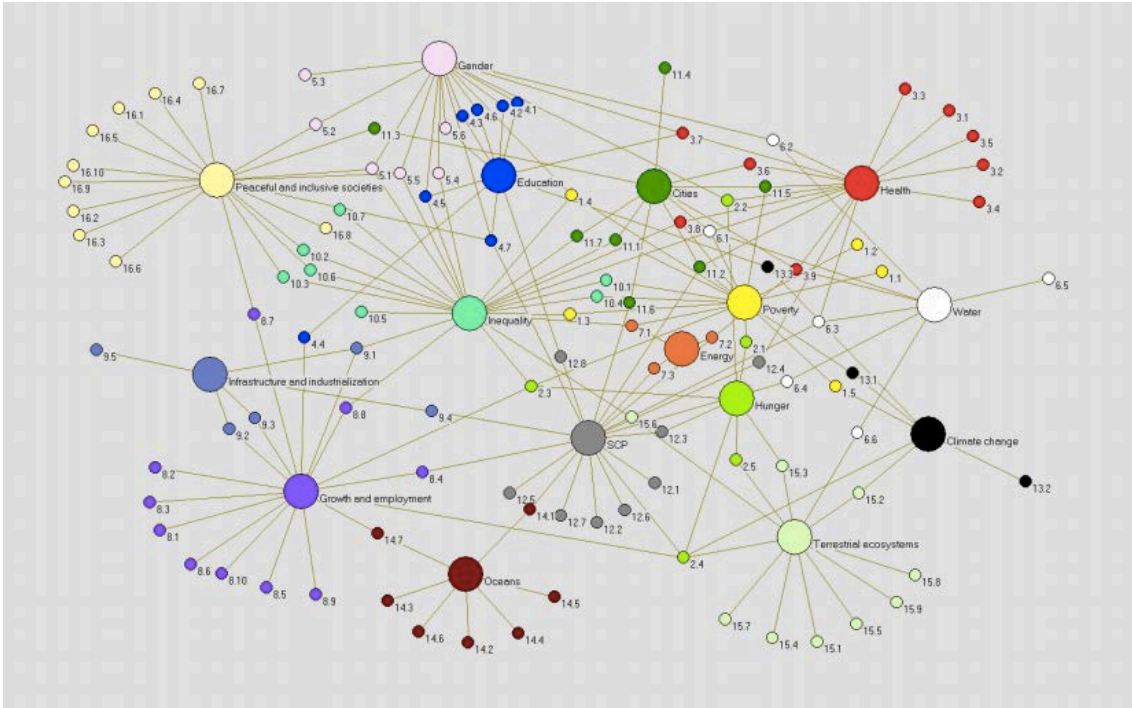


Figure 1: “The SDGs as a network of targets”, *Le Blanc*.⁹¹

II. Mapping SDG 2

This part II includes a mapping exercise which connects SDG 2 and its targets with other targets or goals within the SDGs. The outcome of this mapping largely overlaps *Le Blanc*'s work with the addition of SDGs 4, 5 and 9.

SDG 2 contains five ‘substantive’ targets and 3 targets that relate to ‘means of implementation’. The means of implementation targets, at 2.a, 2.b and 2.c of SDG 2, include enhancing cooperation, correcting trade restrictions and distortions (among which subsidies are explicitly mentioned) as well as adopting measures to ensure the proper functioning of food commodity markets and to facilitate “*timely access to market information, including on food reserves, in order to help limit extreme food price volatility*”.

Means of implementation targets contained in the SDGs are similar across SDGs. SDG 17 on means of implementation applies to all remaining sixteen SDGs. In this regard, all the means of implementation targets help little to understand the substance and scope of the goals the implementation provisions are meant to help achieve. The ‘substantive targets’ are of more interest, since they give insight into the understanding of SDG 2 by the international community and allow thematic relationships among the SDGs to be developed. Accordingly, *Le Blanc*'s analysis discarded means of implementation targets altogether.⁹² While here the same approach is adopted because means of implementation targets are not descriptive, there are two means of implementation targets, outside of SDG 17, which are included in the analysis because they bear sufficient

⁹¹ *Ibid.*, Figure 1.

⁹² *Ibid.*, 4.

specificity to be significant to the substantive issue of food security.⁹³ These are marked with an asterisk in table 1 below to distinguish them from the other targets.

Again, it is worth putting forward that this mapping is based on the wording of the targets and on the connections that are made evident within the SDGs themselves. SDGs have different links when mapping is done from perspectives outside of the SDG network. For example, a scientific perspective on the issue of food security underscores the linkage of SDG 2 with SDG 7, as access to modern and renewable energy is important for sustainable agriculture. A scientific perspective overall highlights rationales for linkages with other SDGs that are not made explicit within the SDG network.⁹⁴ In this sense, the mapping under Table 1 is limited. When doing it within institutions or organizations best results are expected when insights from scientific and cultural perspectives are brought into the picture.

Table 1: SDG 2 and linkages with other SDGs and targets.

SDG 2	Linkages
Target 2.1.	<i>SDG 1 'End poverty in all its forms everywhere'</i> Target 1.1. – Eradication of extreme poverty by 2030. Target 1.2. – Reduction at least by half of people living in poverty.
Target 2.2.	<i>SDG 3 'Ensure healthy lives and promote well-being for all at all ages'</i> Target 3.1. Reduce the global maternal mortality ratio to less than 70 per 100,000 births by 2030. Target 3.2. By 2030, end preventable deaths of newborns and children under five, reduce neonatal and under-5 mortality.
Target 2.3.	<i>SDG 1 'End poverty in all its forms everywhere'</i> Target 1.4. By 2030 ensure all have equal rights to economic resources including ownership and control over land. <i>SDG 4 'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all'</i> Targets 4.3., 4.4., 4.5. By 2030 ensure equal access for boys and girls, men and women, to education. Eliminate gender disparities in education. Target 4.7. By 2030 ensure all learners acquire knowledge to promote sustainable development. <i>SDG 5 'Achieve gender equality and empower all women and girls'</i> *Target 5.a. Undertake reforms to give women equal rights to economic resources as well as access to ownership and control over land. <i>SDG 8 'Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all'</i> Target 8.2. Achieve higher levels of economic productivity through

⁹³ Although they are not specific to food security alone. In fact, target 5.a below is significantly relevant to gender issues as well.

⁹⁴ ICSU-ISSC, Review of targets for the Sustainable Development Goals, 20, available at: <<https://www.icsu.org/cms/2017/05/SDG-Report.pdf>> (visited on 20 March 2018). Le Blanc maps the connections identified by the ICSU-ISSC review in his work, at Figure 6. See *Le Blanc*, note 87, 4.

	<p>diversification, technological upgrading and innovation.</p> <p>Target 8.5. By 2030 achieve full and productive employment and decent work for all.</p> <p><i>SDG 9 'Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation' is lacking'</i></p> <p>*Target 9.b. "Value addition to commodities" – indirect link to non-farm employment.</p> <p><i>SDG 10 'Reduce inequality within and among countries'</i></p> <p>Target 10.2. Promote the social, economic and political inclusion of all.</p> <p>Target 10.3. Ensure equal opportunity and reduce inequalities of outcome.</p>
Target 2.4.	<p><i>SDG 1 'End poverty in all its forms everywhere'</i></p> <p>Target 1.5. Build resilience of the poor and vulnerable to climate-related events.</p> <p><i>SDG 6 'Ensure availability and sustainable management of water and sanitation for all'</i></p> <p>Target 6.3. Improvement of water quality through minimization of release of hazardous chemicals and materials.</p> <p>Target 6.4. Increase water-use efficiency</p> <p>Target 6.6. By 2020, protect and restore water-related ecosystems.</p> <p><i>SDG 8 'Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all'</i></p> <p>Target 8.4. Improve progressively global resource efficiency in production and decouple economic growth from environmental degradation.</p> <p><i>SDG 12 'Ensure sustainable consumption and production patterns'</i></p> <p>Target 12.1. Implement the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns.</p> <p>Target 12.2. By 2030, achieve sustainable management and efficient use of natural resources.</p> <p>Target 12.3. By 2030, reduce food losses along production and supply chains.</p> <p>Target 12.4. By 2030, achieve environmentally sound management of chemicals and reduce their release into the soil.</p> <p><i>SDG 13 'Take urgent action to combat climate change and its impacts'</i></p> <p>Targets 13.1., 13.2., 13.3. on building resilience, integrating climate change measures into strategies and planning, improving education.</p> <p><i>SDG 15 'Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss'</i></p> <p>Target 15.4. By 2030 ensure conservation of mountain ecosystems.</p>
Target 2.5.	<p><i>SDG 15 'Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss'</i></p>

Target 15.1. By 2020, ensure conservation, restoration and sustainable use of terrestrial and inland fresh water ecosystems.
 Target 15.5. Take urgent action to halt loss of biodiversity.
 Target 15.6. Promote fair and equitable sharing of benefits arising from the utilization of genetic resources.
 Target 15.9. By 2020, integrate ecosystem and biodiversity values into national and local planning.

This analysis largely overlaps with *Le Blanc's* mapping of SDG 2, while adding some additional elements. The inclusion of two 'means of implementation' targets, for the reasons mentioned above, translates into two connected goals, SDG 5 and SDG 9 on gender and infrastructure, respectively, which are not included in *Le Blanc's* mapping. SDG 4 on education is also connected here while absent from *Le Blanc's* analysis. Education indeed 'suffers' the same methodological shortcoming of the means of implementation measures, in that it is generally related to most or all of the SDGs, which is why its link with food security is less descriptive. However, SDG 4 is a goal in its own right and is not conceived within the SDG system as being purely related to implementation. In addition, it has a specific relevance when building resilience, enhancing productivity, diversifying and enabling small farmers to contribute towards sustainable development.

A graphic depiction of this approach, presented using a similar method as *Le Blanc*, shows the following network:

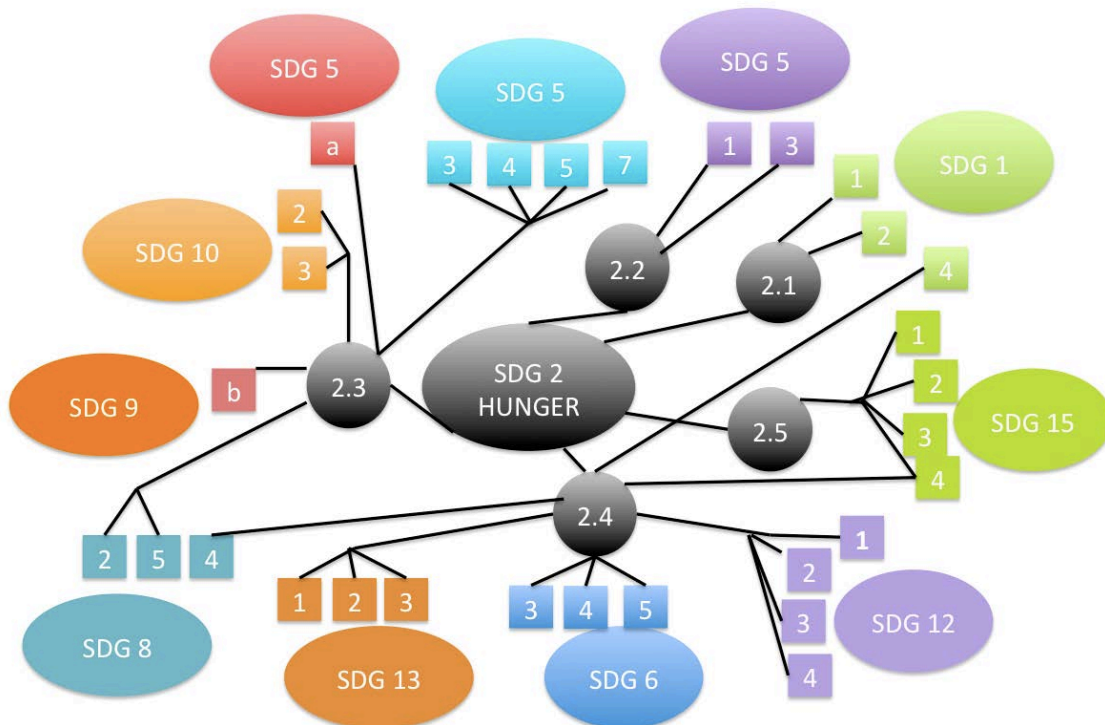


Figure 2: Graphic representation of SDG2

This graphic depiction of connections between SDG 2 and other SDGs highlights

the deep level of integration among the SDGs and offers an easy-to-understand blue print of what issues relate with any particular theme of the SDGs. This approach highlights that the principle of integration as a cornerstone of sustainable development cannot easily be overlooked. A diligent approach towards any thematic area within the SDGs necessarily implies an analysis of tradeoffs and relationships, which are more easily identifiable using a matrix of SDGs, as proposed by *Le Blanc*.

The impacts on food security of a well-intentioned policy can be better understood from the outset if the SDGs are used as an analytical tool. Policies that are pursued in an uncoordinated fashion may jeopardize food security and also undermine sustainable development by being contrary to the holistic approach sustainable development requires. At the same time, private initiatives that claim the “sustainability” label can be assessed using this analytical tool. Even better, corporations that are creating their own sustainability policies can use the SDGs for coherent outcomes.

Considering themes as related is relatively easy if the subject matter that is of concern is included explicitly within the SDGs. However, the 2030 Agenda is a document that stems from political negotiation and that, as a result, has excluded some thematic areas which impact the SDGs. The sustainable management and efficient use of natural resources is mentioned once in the SDGs: it is target 12.2 of SDG 12, which at turn is to ensure sustainable consumption and production patterns. The SDGs, however, do not refer to the management and use of the ‘resource base of development’, a wording the sustainable development narrative has otherwise used and which arguably underscores a more nuanced understanding of possible tradeoffs. In particular, this is a wording that in other moments of the sustainable development narrative has introduced the difficult relationship of non-renewable resources with development.⁹⁵ The exclusion of these considerations within the SDGs is, to a certain extent, notable, given extractive activities have been addressed, albeit not coherently, within the sustainable development discourse. Extraction of minerals is also directly relevant for the economic development of many countries.

That a theme or issue is excluded from of the 2030 Agenda does not imply that the SDGs cannot be used to frame policy issues affecting that theme or issue. This can be achieved by identifying the concerns underlying the substantive theme or issue and subsuming the “exogenous” theme or issue into the network of SDGs. Though this exercise can be done for any given exogenous subject matter, this section demonstrates how it may be done using SDG 2 and mining of non-renewable resources as models. Table 3 shows the underlying concerns of each target under SDG 2.

Table 2: SDG2 Targets and underlying concerns

Target	Underlying concerns
2.1. By 2030, end hunger and ensure access by all people, in particular the poor	<ul style="list-style-type: none"> - Access to food - Availability of food - Protection of the most vulnerable

⁹⁵ See for example Paragraph 46, Chapter IV, of the Johannesburg Plan of Implementation. Indeed, Chapter IV is titled “Protecting and managing the natural resource base of economic and social development”. Changing unsustainable patterns of consumption and production is the title of Chapter III.

and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round.	
2.2. By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons.	<ul style="list-style-type: none"> - Health - Gender - Protection of the most vulnerable
2.3. By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment.	<ul style="list-style-type: none"> - Growth - Gender - Indigenous peoples - Protection of the most vulnerable - Fair markets - Technology transfer - Diversification
2.4. By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.	<ul style="list-style-type: none"> - Climate change - Sustainable intensification⁹⁶ - Protection of the environment
2.5. By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed.	<ul style="list-style-type: none"> - Protection of the environment - Biodiversity - Intellectual Property - Indigenous peoples

⁹⁶ With past ways to increase food supplies being not a viable alternative (such as expansion of arable lands), sustainable intensification addresses the growth in food production, increase in yields and productivity being hand in hand with the reduction of pressure on natural resources. See *Vos*, CDP Background Paper No. 29, 7, available at: <http://www.un.org/en/development/desa/policy/cdp/cdp_background_papers/bp2015_29.pdf> (visited on 20 March 2018).

E. Narrowing the focus: Food versus mining?

Both mining and agriculture relate to the use of natural resources. In this sense, there are areas of convergence and of conflict.⁹⁷ Few issues spur as much tension as mining activities. Mining is indeed a unique industry, which affects not only economic development, but also the environment and sociocultural profiles. Mining also has no given outcome: it has the potential to contribute significantly to poverty reduction⁹⁸ as well as to increase the risks of economic and physical harm to the very poorest.⁹⁹ This latter consideration is particularly relevant to mining in that it often takes place among vulnerable communities with little mobility or means of alleviating negative impacts.¹⁰⁰ A mining project thus almost always creates tension among and within communities affected by a mine and tension between competing interests. One of said interests is, almost inevitably, the means of livelihood.

Gary Lye, executive director of GCM Resources, has been reported to have said, with regard to the very controversial Phubari Mine in Bangladesh, that “*Coal under the ground is worth more than growing rice on the surface*”.¹⁰¹ While markets could resolve dilemmas of tradeoffs in land use based on the most profitable land use allocation, the reasoning of sustainable development requires looking beyond profit as a benchmark for tradeoffs.

I. Mining: Impacts and benefits

Food security inevitably becomes a matter of concern during any mining project with direct or indirect impacts on vulnerable communities. On the one hand, mining can generate important developments that lead to better food security. These results go beyond the obvious fact that mining may generate jobs. For instance, mining can contribute to the agricultural industry by extracting and making available minerals such as phosphate and micronutrients such as zinc, which are used as fertilizers.¹⁰² Furthermore,

⁹⁷ The similarities with the impacts of big agricultural investments are significant and are a venue to explore more. In fact, the Columbia Center for Sustainable Investment does just that in its recent publication, *Employment from Mining and Agricultural Investments, How Much Myth, How Much Reality?*, available at: <<http://ccsi.columbia.edu/files/2016/07/Jobs-Paper-Aug-2.pdf>> (visited on 20 March 2018).

⁹⁸ Benefits of mining include the generation of jobs. However, there is no universal standard on how employment numbers should be counted in the mining industry since employment can be direct and indirect. This complicates assessing the impact of mining on employment. Additionally, employment may have a small impact on the community where mining actually takes place, which may be unfit to be employed in the mine because of their lack of skills. On this see *Cordes/Östenson/Toledano, Employment from Mining and Agricultural Investments*, 6, available at: <<http://ccsi.columbia.edu/files/2016/07/Jobs-Paper-Aug-2.pdf>> (visited on 20 March 2018). Among other positive impacts, are the generation of downstream businesses and the catalysing of investments in infrastructure. See *Weber-Fahr, Strongman, Kunanavagam, McMahan, Sheldon*, in: Klugman (Ed.), *A Sourcebook for Poverty Reduction Strategies*, 442.

⁹⁹ *Ibid.*, *Weber-Fahr, Strongman, Kunanavagam, McMahan, Sheldon*, in: Klugman (Ed.), *A Sourcebook for Poverty Reduction Strategies*, 440.

¹⁰⁰ *Ibid.*, 443.

¹⁰¹ Quoted in *Bedi*, *Geoforum*, 248.

¹⁰² See *Mapping Mining to the Sustainable Development Goals*, 12, available at: <<https://www>.

the very structuring of a mining project can generate knowledge that can benefit food security: mapping data collected during exploration can improve land-use planning, regardless of whether the mining project goes ahead. Communities, more often than not, do not have extensive knowledge of resources on their lands. A shared use of geophysical data can help address issues related to competing land uses.¹⁰³ On the other hand, mining operations can have an adverse effect on the ability of the local non-mining population (and in the long run, especially considering dependencies, local mining populations too) to achieve and sustain economic self-sufficiency. Mining may drive regional price levels up to a point that the poor are unable to afford basic goods and services,¹⁰⁴ while at the same time not providing employment opportunities to very poor populations that lack certain skills. In addition, environmental damage, whether incurred during mining operations or after closure, can limit future income possibilities that depend on the environment (e.g. agriculture, fishery, forestry, or hunting).¹⁰⁵

Balancing and managing competing interests is a challenge which stakeholders repeatedly face, and a challenge that is context-specific. However, the SDGs can provide normative guidance, in particular through subsuming mining concerns into concerns pursued by SDG2.

II. Mining or sustainable development?

A controversy surrounding mining is whether it can be sustainable at all, given its purpose of extracting finite resources.¹⁰⁶ The debate brings competing ideas of sustainability to the fore and differing views of mining as merely the depletion of resources, or alternatively, an aspect of development. The debate is ontological and goes beyond the scope of this brief contribution, which modestly acknowledges the existence of conflict in mining sites and explores one venue, given by the SDGs, to manage it.

Having said that, the UN sustainability narrative is not consistent with regard to non-renewables and in this sense reflects the complexity of the debate on the sustainability of extraction. Non-renewables are mentioned in the Stockholm Declaration,¹⁰⁷ in the World Charter for Nature,¹⁰⁸ in the Johannesburg Plan of Implementation, where mining is presented as a means to eradicate poverty¹⁰⁹ and a means of protecting

commdev.org/wp-content/uploads/2015/05/P_Mapping_Mining_SDGs_An_Atlas.pdf (visited on 20 March 2018).

¹⁰³ *Weber-Fabr, Strongman, Kunanavagam, McMahon, Sheldon*, note 98, 443.

¹⁰⁴ *Ibid.*, 444.

¹⁰⁵ *Ibid.*, 449.

¹⁰⁶ *Dalupan*, in: Bastida/Wälde/Waren-Fernandez (Eds.), *International and Comparative Mineral Law and Policy*, 149 (164).

¹⁰⁷ Principle 5: “*The non-renewable resources of the earth must be employed in such a way as to guard against the danger of their future exhaustion and to ensure that benefits from such employment are shared by all mankind.*”

¹⁰⁸ Principle 10 (d): “*Non-renewable resources which are consumed as they are used shall be exploited with restraint, taking into account their abundance, the rational possibilities of converting them for consumption, and the compatibility of their exploitation with the functioning of natural systems.*”

¹⁰⁹ “*Provide financial and technological support, as appropriate, to rural communities of developing countries*

and managing the natural resource base while developing economically and socially.¹¹⁰ Finally and more recently, mining is mentioned in *The Future we want*, where mining's contribution to economic growth is acknowledged together with the need to balance it with non-economic concerns, such as environmental and social concerns.¹¹¹

However, as highlighted above, the SDGs are laconic on the management of the resource base for development and they are silent on mining. This absence highlights how controversial the topic is: while nobody challenges the fact that mining can contribute to economic development, there is little agreement, if any, on how this can be balanced with its social and environmental impacts. This absence in the SDGs is regrettable. Mineral extraction accounts for much of the GDP of many developing countries. The SDGs could have represented the opportunity to set forth a blue print for a sustainable management of extractive activities, at least under the UN sustainable development framework.

However, the narrative on non-renewables that exists in the UN discourse, together with the SDGs, allows identification of themes that have a bearing on sustainable development and that are impacted by mining. For instance, the sustainable development narrative generally acknowledges that mining can contribute to the eradication of poverty, but that its benefits must be shared equitably.¹¹² There is also concern with negative environmental and social impacts of mining, which should be avoided or mitigated.¹¹³

Projecting these underlying concerns related to mining onto the SDGs, it appears that some SDGs are more relevant to mining than others.¹¹⁴ In particular, SDG 1 on poverty eradication, SDG 2 on food security, SDG 8 on sustainable growth, and SDG 10 on reducing inequality between countries are relevant to the concern of equitable growth. SDG 6, on sustainable management of water, SDG 12 on sustainable consumption and production patterns, SDG 13 on climate change and SDGs 14 and 15 on sustainable use of marine and terrestrial ecosystems respectively, address the social and environmental concerns.

to enable them to benefit from safe and sustainable livelihood opportunities in small-scale mining ventures”.

¹¹⁰ At paragraph 46 of Chapter IV.

¹¹¹ Paragraph 227 acknowledges that “...*minerals and metals make a major contribution to the world economy and modern societies*”, that mining industries are important and that the sector can catalyse “*broad-based economic growth*”. On the other hand, that same paragraph recognizes that “...*mining activities should maximize social and economic benefits, as well as effectively address negative environmental and social impacts*”. Paragraph 228 acknowledges the importance of solid frameworks so that mining can deliver economic and social benefits while reducing social and environmental impacts, as well as conserving biodiversity and ecosystems.

¹¹² This can be deduced from Principle 5 of the Stockholm Declaration but also from paragraphs 227 and 228 of the outcome of Rio+20, *The Future we want*.

¹¹³ See the World Charter for Nature, as well as the Johannesburg Plan of Implementation and Rio+20.

¹¹⁴ Mining on the other hand has the potential of contributing to all SDGs, as can be appreciated in the Atlas at note 103.

III. Mapping mining for food security

Subsuming mining and its underlying concerns into the framework of the SDGs by using *Le Blanc's* method of mapping produces a useful starting point for constructing a narrative for the sustainable development of mining, despite its exclusion from the SDGs. When using this approach for mining activities, the issue of food security cannot be overlooked: food security is potentially affected at almost every phase of a mining project. During construction of a mining site, food security could be affected if resettlement activities or construction bar access to previous arable lands and markets.¹¹⁵ During the exploitation phase of mining, food security can be affected because local economics result in high prices and, or alternatively, because environmental damage makes food unsafe to consume.¹¹⁶ This scenario can be aggravated by the 'mobile' nature of this kind of pollution, which ultimately can affect downstream populations as well.¹¹⁷ Finally, the legacy of environmental contamination after closure can affect food security for the same reasons.¹¹⁸ This overview does not even begin to analyze the more complex problems related to food security, such as economic dependency on a mine as a source of income, which may affect food security when the mine closes there are no economic alternatives.

As highlighted above, we can create a sustainable management map of non renewable resources using the SDGs. Knowing that the issue of food security is relevant to mining, SDG 2 and its underlying concerns offer guidance. With the exception of exploration phase of mining, food security could be affected at each other stage, being the construction, exploitation and closure phases. At the same time, the concerns that underlie the targets of SDG 2 are relevant to all mining phases, for different reasons. The table below is an attempt to identify the underlying concerns during the three major phases of the mining process:

Table 3: Underlying concerns of mining phases

Relevant mining phase	Underlying concerns
Construction	<ul style="list-style-type: none"> - Access to and availability of food (access to previous arable land, noise that scares livestock) – 2.1. - Protection of the most vulnerable – 2.1. - Health (noise and dust created by construction) – 2.2. - Protection of the environment, biodiversity – 2.4., 2.5. (consideration of sensible environmental areas within the construction site) - Indigenous people (participation, consultation) – 2.3.
Exploitation	<ul style="list-style-type: none"> - Access to and availability of food (increase of prices, change

¹¹⁵ Max Planck Foundation for International Peace and Rule of Law, Human Rights Risks in Mining, A Baseline Study, available at: <https://www.bmz.de/rue/includes/downloads/BGR_MPFPR_2016_Human_Rights_Risks_in_Mining.pdf> (visited on 20 March 2018), 39.

¹¹⁶ Mining induced pollution can have detrimental effects on local food sources.

¹¹⁷ Max Planck Foundation for International Peace and Rule of Law, note 116, 55.

¹¹⁸ *Ibid.*, 76.

	<p>in income generation, i.e., less self-production) – 2.1. Alternatively, sustainable intensification of already existing agriculture – 2.4</p> <ul style="list-style-type: none"> - Health (noise and dust) – 2.2. - Gender (involvement of women in labour force, sexual exploitation markets around the mine) – 2.2., 2.3. - Protection of the most vulnerable (child labour) – 2.2., 2.3. - Indigenous peoples, intellectual property (when exploring diversification venues) – 2.5. - Growth, technology transfer, diversification (avoid dependency on the mine, infrastructure sharing) – 2.3. - Protection of the environment, biodiversity, climate change (impact of mining activity on surrounding environment) – 2.5., 2.5.
Closure	<ul style="list-style-type: none"> - Access to and availability of food (loss of habits of food production, environmental damage that encroaches on safety of fisheries or picking) – 2.1. - Growth (economic possibilities post closure) – 2.3. - Protection of the environment, biodiversity – 2.4., 2.5.

The underlying concerns of each mining phase help link this exogenous subject matter to SDG 2. *Le Blanc's* network of targets then allows branching mining concerns out into the whole SDG universe.

Table 4: Broader connections of food security and mining in the SDG network.

Mining phase	SDG 2 – Underlying concerns	SDG Linkages – Indirect linkages of mining phase contingencies with the SDG network
Construction/ Exploitation/ Closure	SDG 2.1. Access and availability – Protection of the vulnerable (infants, women, elderly)	SDG 1
		Target 1.1. – Extreme poverty Target 1.2. – Poverty
Construction/ Exploitation/ Closure	SDG 2.2. Health - Protection of the vulnerable (infants, women, elderly)	SDG 3
		Target 3.1. – Maternal mortality Target 3.2. – Infant/Child mortality
Construction/ Exploitation/ Closure	SDG 2.3. Growth (Fair markets, technology transfer, diversification – Protection of the vulnerable (indigenous peoples, women))	SDG 1
		Target 1.4. – Access to land
		SDG 4
		Targets 4.3, 4.4., 4.5. – Equal access to education Target 4.7. – Promotion of sustainable development
		SDG 5

		Target 5.a. – Equal access to economic resources and land.		
		SDG 8		
		Target 8.2. – Higher economic productivity Target 8.5.- Decent work		
		SDG 9		
		Target 9.b. – Value Addition to commodities		
		SDG 10		
		Target 10.2. – Inclusion Target 10.3. – Equal opportunity and income		
Construction/ Exploitation/ Closure	SDG 2.4. Growth (sustainable intensification) – Climate change – Maintenance of ecosystems.	SDG 1		
		Target 1.5. – Resilience to climate change		
		SDG 6		
		Target 6.3. – Water quality Target 6.4. – Water use efficiency Target 6.6. – Water-related ecosystems		
		SDG 8		
		Target 8.4. – Resource efficiency		
		SDG 12		
		Target 12.1. – Framework on Sustainable Consumption and Production Patterns Target 12.2. – Sustainable management of natural resources Target 12.3. – Reduction food losses Target 12.4. – Management of chemicals.		
		SDG 13		
		Targets 13.1. 13.2., 13.3. – Resilience to climate change		
		SDG 15		
		Target 15.4. – Conservation of mountain ecosystems		
		Construction/ Exploitation/ Closure	SDG 2.5. Biodiversity – Intellectual property of indigenous peoples	SDG 15
				Target 15.1 – Conservation of terrestrial and inland water ecosystems.
Target 15.5. – Biodiversity				
Target 15.6. – Benefits from genetic resources				
Target 15.9. – Biodiversity in national and local planning				

This exercise, when replicated with other relevant SDGs, provides the framework to create a comprehensive sustainable design and management of a mining project.

IV. SDG 2 compliance

Context determines the specificity of the measures available to address sustainability considerations, but mapping an approach using the SDGs will help identify relevant goals and policies that need consideration. There could, accordingly, be a notion of “SDG compliance” that enables the embedding of sustainable development concepts within legislation or a project and assessment of existing approaches.

Creating links as done in Table 5 above can help design policies or mining legislation that effectively address those issues that have to be addressed under a sustainable development perspective. For example, policies to stimulate economic growth and diversification in mining areas that want to be in line with sustainable development, must at least tackle issues of equal access to land and resources, value addition to commodities and overall, gender. This in line with the linkages evidenced under SDG 2.3.

On the other hand, the same approach can be used to help to create sustainable policies with regard to specific projects. It can also be especially useful in assessing existing commitments to sustainable development in projects that are already being carried out. This is particularly important for CSR narratives that may be used, or abused, by private actors.¹¹⁹ These narratives, under SDG 2, have to address the concerns identified in tables 4 and 5 to be consistent with sustainable development narratives. This essentially means that when addressing issues such as resettlement, agriculture and livelihoods, speaking in vague terms of “alignment with international standards” or “compliance” with the Equator Principles, for example, or any other initiative of that nature, is not sufficient to label a project as being compliant with sustainable development. A level of specificity can be achieved by identifying the connections between underlying concerns of each mining phase and the substantive targets of SDG2.

F. Conclusion

Food security emerges in the sustainable development narrative as a multifaceted concept that requires holistic approaches. Sustainable development underscores the links of food security with environmental protection and with social development and human rights. In particular, the SDGs identify food security as a theme that deserves attention. The SDGs embed food security within their network of goals and targets, thus making the interdependence of food security with other issues evident.

This contribution has shown that the SDGs can be used as a tool that not only allows mapping the connections of food security within the SDG network, following *Le Blanc’s* matrix, but also connecting food security to specific questions of sustainability within mining. This is relevant given the scenarios of conflict surrounding mining activities that often question their ability to be sustainable to begin with. Using this tool allows overcoming the view that there can be food security or mining. Between the extremes there lies a space that is dynamic and where, under given circumstances, a

¹¹⁹ On the ‘cloaking’ of CSR narratives with human rights language and thus their legitimation through recognized legal categories, see *Bedi*, note 35.

balance can be found.¹²⁰ Referring to the normative framework of sustainable development and of SDGs specifically grants more predictability and allows also identifying and creating committed sustainability narratives.

¹²⁰ *Ibid.*, 256.

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INTERNATIONAL ECONOMIC LAW AND FOOD SECURITY: THE PROMOTION OF FOOD SECURITY WITHIN THE EU-CARIFORUM EPA

Jasmin Hansohm

A. Introduction

This paper will consider food security in the context of the EU-CARIFORUM Economic Partnership Agreement (EPA),¹ an agreement between the European Union (EU) and the Caribbean Forum trading bloc². This topic is particularly relevant as it exemplifies an agreement that is set to become the new norm for relations between the EU and African, Caribbean and Pacific (ACP) relations. Furthermore, it may also become the norm for trade relations between other developing and developed countries or regions.³ As such it is relevant to assess whether the agreement is suitable for the task, especially given the substantial criticism levelled at the drafters since its inception.⁴

This discussion will focus on food security provisions in the EPA as one aspect of the wider development focus of the agreement. As such, it is necessary to consider whether the legal framework of the EPA is conducive to its elevated objectives, including sustainable development and poverty eradication,⁵ more generally, before assessing to what extent food security in particular meets the development goals of the agreement. Ultimately, this analysis will establish that while the agreement emphasises food security as a development goal, in practice, strict rules on export restrictions seem to counteract this goal.

EPAs are the latest phase in EU-ACP relations, but it is important to recognise that trade relations between the regions have undergone substantial shifts over the past decades, and this remains relevant to the current state of affairs. Outside factors in particular influenced changes, with concerns about WTO compatibility and unequal treatment of different developing countries. Trade relations between the EU and the ACP countries began as 'association arrangements' governed by the Treaty of Rome 1957 – the treaty founding the European Economic Community (EEC), which was the precursor to the EU.⁶ One of the key features of this initial period of EU-ACP relations was the principle of reciprocity, meaning that trade relations were largely governed by

¹ Economic Partnership Agreement between the CARIFORUM States, of the one part, and the European Community and its Member States, of the other part (adopted 30 October 2008, provisionally entered into force 12 January 2009) L 289/I/4 OJEU (EU-CARIFORUM).

² Consisting of 15 countries in the Caribbean.

³ *Claude SK Chase*, MFN in the CARIFORUM-EC Economic Partnership Agreement: Policy Blunder or Legal Inconsistency?, *Legal Issues of Economic Integration* 38 (2011), 190.

⁴ See especially: *Vaughan Lewis*, Renegotiate the EPA, <<https://www.ictsd.org/bridges-news/trade-negotiations-insights/news/renegotiate-the-cariforum-epa>> (visited 20 March 2018).

⁵ These objectives appear in art 1 EU-CARIFORUM EPA.

⁶ EEC Treaty (Treaty of Rome, as amended) Part IV.

mutual obligations between the parties.⁷ This shifted to non-reciprocal obligations with the introduction of the Lomé Conventions in 1973. The perception, internationally, was that developing countries were not in a position to offer reciprocity to developed countries given their status.⁸ Following this period, the Cotonou Agreement was negotiated between the parties and established that new, reciprocal trade agreements would be negotiated between the EU and regional bodies within the ACP.

B. EU-CARIFORUM EPA Background

It is relevant to first establish the overarching goals of the agreement and determine how these are reflected in individual provisions. This will establish that development, and in particular special and differential treatment (S&DT) for developing countries are key aspects of the agreement and reflected at multiple points in the agreement. The following chapter will then examine food security in particular to determine to what extent this sector reflects the overall development approach.

I. Regional background

It is relevant to first provide a brief background of the region, since the EPAs are meant to be “tailor made” to apply to the particular regional circumstances of each ACP region.⁹ The CARIFORUM region consists of twelve small island countries and a further three small and medium sized coastal countries.¹⁰ These states “are poorly diversified and their geographical location makes them particularly vulnerable to natural disasters”.¹¹ They vary significantly in terms of population size, GDP, and development indicators such as indebtedness.¹² Nevertheless, as a region, CARIFORUM is much further in terms of development than other EPA regions. Haiti is the only state within the region that falls within the category of Least Developed Country (LDC). As such, it is the only country that could potentially seek treatment under the Everything But Arms (EBA) scheme as an alternative to negotiating an EPA.¹³ Ghahremani argues that this certainly impacted the negotiation process and meant that the Caribbean region was “under more pressure to conclude an agreement by time than other ACP regions”.¹⁴ The Caribbean region is also the only region to have entered a “full EPA” with the EU,

⁷ *Lorand Bartels*, The Trade and Development Policy of the European Union, EJIL 18 (2007), 724.

⁸ Consider for example the creation of UNCTAD during this period; see discussion in *Mitsuo Matsu-shita et al*, The World Trade Organization – Law, Practice, and Policy, Oxford 2015, 66.

⁹ European Commission, Economic Partnerships, <http://ec.europa.eu/trade/policy/countries-and-regions/development/economic-partnerships/index_en.htm> (visited on 20 March 2018).

¹⁰ *Ibid.*

¹¹ *Nuschin Ghahremani*, The EU-CARIFORUM EPA: Pursuit of Neo-Mercantilist Goals under the Cloak of Development Cooperation, 60, available at: <http://othes.univie.ac.at/2544/1/2008-11-11_0007770.pdf> (visited on 20 March 2018).

¹² *Ibid.*, 61.

¹³ *Gabriel Siles-Brügge*, EU Trade and Development Policy Beyond the ACP: Subordinating Developmental to Commercial Imperatives in the Reform of GSP, *Contemporary Politics* 20 (2014), 60.

¹⁴ *Ghahremani*, note 11, 62.

meaning that it regulates not just trade in goods between the parties, but also services and investment. This is beyond the scope necessary to meet the World Trade Organisation (WTO) legal requirements, but was a path chosen in order to diversify its exports and gain access to other sectors of the EU market.¹⁵

II. Development

Free Trade Agreements (FTAs) typically pursue the commercial goal of trade liberalisation between the parties, a goal that is central to the WTO, and multilateral trade relations more generally. The rules of the General Agreement on Tariffs and Trade (GATT) 1994 – the main trade agreement within the WTO –, can be generally summarised as rules regarding market access,¹⁶ non-discrimination rules¹⁷ and reciprocity of commitments,¹⁸ reflecting this trade liberalisation focus. The development approach of the EPA, however, necessitates an asymmetric liberalisation approach to take into account the differing levels of development in each region.

It should be recognised that the WTO has changed since its inception to acknowledge the limits to trade liberalisation, in particular recognising the objectives of sustainable development and environmental protection as relevant, in addition to the original goal of maximising use of the world's resources.¹⁹ This is mainly reflected in the numerous special and differential treatment (S&DT) provisions that have been introduced to the agreements since the Enabling Clause in 1979.²⁰

The approach to development and poverty reduction in the EPA arguably corresponds to the “international community’s redefined, holistic approach to development”, which is perhaps most clearly reflected in the latest round of WTO negotiations, entitled the “Doha Development Round”, taking on the issue of trade and development²¹.

The development approach of the EPA reflects this shift in perspective and necessitates an asymmetric liberalisation approach to take into account the differing levels of development in each region. The EPA agreement attempts to balance the two seemingly contrasting objectives of trade liberalisation and development. The first goal of the EPA

¹⁵ *Vanessa Constant LaForce*, The EU-Caribbean Trade Relationship Post-Lisbon: The Case of Bananas, *Journal of Contemporary European Research* 10 (2014), 270.

¹⁶ For example art II on tariffs, as well as arts VIII and X on non-tariff barriers in the General Agreement on Tariffs and Trade 1994 (adopted 15 April 1994, entered into force 1 January 1995) 1867 UNTS 187 (GATT 1994).

¹⁷ For example arts I and III GATT 1994.

¹⁸ For example art XXVIII and the preamble of GATT 1994.

¹⁹ The preamble of GATT 1994 mentions the goal of sustainable development, which does not appear in the preamble of its predecessor: General Agreement on Tariffs and Trade (adopted 30 October 1947, in force provisionally since 1 January 1948) 55 UNTS 194 (GATT 1947).

²⁰ GATT Contracting Parties, Decision of November 28, 1979 on Differential and More Favourable Treatment, Reciprocity and Fuller Participation on Developing Countries (28 November 1978) GATT BISD (26th Supp.) at 203 (Enabling Clause).

²¹ *Gerhard Thallinger*, From Apology to Utopia: EU-ACP Economic Partnership Agreements Oscillating between WTO Conformity and Sustainability, *European Foreign Affairs Review* 12 (2007), 502.

reads:

“contributing to the reduction and eventual eradication of poverty through the establishment of a trade partnership consistent with the objective of sustainable development, the Millennium Development Goals and Cotonou Agreement”.²²

The strategic placement of this goal as the first one, establishes immediately that this is not a typical FTA, but rather that the primary goal of the trade agreement is to pursue poverty eradication and more generally development. Mandelson (the former EU Commissioner for Trade) in fact proclaimed that “EPAs . . . should no longer be conceived as trade agreements in the conventional sense where both sides are seeking mutual advantage. The purpose of EPAs is to promote regional integration and economic development”.²³ This indicates the different context of EU-ACP trade relations from other trade agreements. The focus is thus on integrating trade and development under this new regime, rather than treating them as separate goals. Hadfield suggests that EU development policy has changed considerably over the years, and that it “now operates more robustly as official EU foreign policy”²⁴.

There are numerous examples throughout the agreement of S&DT provisions that reflect S&DT present in WTO agreements. These provisions suggest that the admirable development goals listed in the first chapter of the agreement are reflected in practice. Examples include the rules on technical barriers to trade and sanitary and phytosanitary measures, trade defence measures and rules on customs valuation, which all recognise, and provide for the asymmetric development status amongst the contract parties.

III. WTO Conformity

It is important to recognise at this stage that the EPAs came into being as a new generation of agreements in order to combat the perceived WTO incompatibility of previous regimes. In particular, there were concerns with respect to the discrimination between developing countries, with former European colonies in the ACP region receiving better treatment than other developing country regions, such as Latin America and Asia.

A series of GATT decisions on the EUs banana import policy determined that the non-reciprocal trade relations under the Lomé Convention could not be justified under Article XXIV GATT 1994.²⁵ Essentially, the Panel decisions determined that discrimi-

²² Art 1(a) EU-CARIFORUM EPA.

²³ Statement made at the London School of Economics, Feb 2005, and stated again in November 2005, available at: <http://trade.ec.europa.eu/doclib/docs/2005/november/tradoc_125868.pdf> (visited 20 March 2018).

²⁴ *Amelia Hadfield*, *Janus Advances? An Analysis of EC Development Policy and the 2005 Amended Cotonou Partnership Agreement*, *European Foreign Affairs Review* 12 (2007), 39.

²⁵ Several decisions followed in succession beginning with *Bananas I* (1992), *Bananas II* (1993), and *Bananas III* (1995) - *European Communities – Regime for the Importation, Sale and Distribution of Bananas*, WT/DS27/R and WT/DS27/AB/R.

nation between different regions could not be justified in terms of either tariffs or quotas.²⁶ The EC prevented the first panel reports from being adopted, and applied for a waiver of the MFN clause set out in Article 1 of the GATT to address the issue.²⁷ This waiver allowed for the maintenance of provisions of the agreement that gave preferential treatment to ACP products, and an equivalent waiver has been signed under the Cotonou Agreement, the current agreement governing EU-ACP relations, and the agreement that imposes the framework for EPAs.²⁸

Given this background, the underlying structure of the new EPAs is WTO-conformity, particularly with respect to Article XXIV GATT.²⁹ This is an issue that has been raised consistently as an obstacle to EU-ACP trade relations, and as such it is worth carrying out a comprehensive dissection of the requirements of the article at this stage. Article XXIV.8 GATT provides that regional trade agreements can be entered into only if they eliminate barriers to “substantially all the trade” between the relevant parties, although the article does not provide a definition. There is also no single accepted definition beyond the scope of the agreement, and the Appellate Body of the WTO has been vague about the concept, providing only that it is “not the same as all the trade, and also that [it] is something considerably more than merely some of the trade”. It has however stated that it seems to “provide for both quantitative and qualitative component”.³⁰ In general, it is considered to constitute 80-90 percent of all trade between the partner states, although some WTO Members have advocated for stricter guidelines.³¹ This uncertainty in definition has raised issues in the negotiating process, as will become clear below.

In addition to the quantitative sum, the time period of liberalisation is relevant to the question of Article XXIV GATT compatibility.³² The Art XXIV Understanding suggests that an appropriate transitional period would be less than ten-years,³³ nevertheless, Thallinger suggests that the long transitional period could be justified on the basis of ‘exceptional cases’, which are alluded to in para 2.³⁴ There is no clear criteria on what qualifies as ‘exceptional’ in the Understanding, but it may be that “the transformation from the EU-ACP scheme of Generalised System of Preferences (GSP) to six regional FTAs would satisfy an exceptionally long transitional period” and thus meet the requirements of Article XXIV.³⁵

²⁶ *Eckart Guth*, The End of the Bananas Saga, *Journal of World Trade* 46 (2012), 5.

²⁷ Marrakesh Accord (n 24) art IX(3).

²⁸ WTO, ACP-EC Partnership Agreement (Decision of 14 November 2001) WTO Doc WT/MIN (01)/15.

²⁹ *Melaku G Desta*, EC-ACP Economic Partnership Agreements and WTO Compatibility: An Experiment in North-South International Agreements?, *CMLR* 43 (2006), 1346.

³⁰ Turkey – Restriction on Imports of Textile and Clothing Products, WT/DS34/R, 31 May 1999 paras 48-49.

³¹ Australia for example advocates 95% of trade coverage in Australia, Submission on Regional Trade Agreements (3 March 2005) WTO Doc TN/RL/W/173/Rev. 1 and (13 May 2005) WTO Doc TN/RL/W/180.

³² *Lorand Bartels*, The Trade and Development Policy of the European Union, *EJIL* 18 (2007), 754.

³³ WTO, Understanding on the Interpretation of Article XXIV of the General Agreement on Tariffs and Trade 1994 (Article XXIV GATT Understanding) para 2.

³⁴ *Thallinger*, note 21, 510.

³⁵ *Ibid.*

The EPA attempts to meet the requirements of Article XXIV GATT by immediately opening up European markets to trade, offering duty free and quota free (DFQF) access to 98.5% of trade in goods, and 94% of trade in services.³⁶ The Caribbean markets are subject to a more gradual opening of 87% of trade relations over a period of 25 years.³⁷ This is considerably longer than the ten-year period indicated within the Article XXIV Understanding, yet, as Thallinger suggests, it is possible that this situation qualifies as an ‘exceptional case’.³⁸

The question then is whether the provision implies a degree of asymmetry, or perhaps whether it should be expressly stated.³⁹ The Cotonou Agreement certainly suggests a degree of asymmetry is permitted:

“Negotiations will [...] be as flexible as possible in establishing the duration of a sufficient transitional period, the final product coverage, taking into account sensitive sectors, and the degree of asymmetry in terms of timetable for tariff dismantlement, while remaining in conformity with WTO rules then prevailing”⁴⁰

This also indicates that the EPAs must carefully straddle the line between WTO conformity and ‘flexibility’ for the benefit of developing countries.

IV. Relationship between Article XXIV GATT and S&DT

Given this analysis of Article XXIV GATT, it is worth examining the relationship between the article and S&DT. Article XXIV GATT has existed within the multilateral trade framework for thirty years longer than S&DT.⁴¹ The Enabling Clause (1979) is perhaps the first formal recognition of S&DT for developing countries, but notably, did not result in a change to the content of Article XXIV GATT, which raises the question of the legal relationship between the articles.⁴² As noted above, Art XXIV GATT essentially requires reciprocity between the parties, while S&DT “encourages non-reciprocity and modulated compliance with other trade rules for LDCs and developing countries”.⁴³ This is especially interesting to consider in light of Article V of the General

³⁶ World Bank, *Accelerating Trade and Integration in the Caribbean: Policy Options for Sustained Growth, Job Creation, and Poverty Reduction*, 45, available at: <http://documents.worldbank.org/curated/en/585831468012036954/Accelerating-trade-and-integration-in-the-Caribbean-policy-options-for-sustained-growth-job-creation-and-poverty-reduction>, (last accessed on 8 September 2016).

³⁷ *Ibid.*

³⁸ *Thallinger*, note 21, 510.

³⁹ This question is considered in *Bonapas Onguglo and Taisuke*, *In Defence of the ACP Submission on Special and Differential Treatment in GATT Article XXIV*, available at: <http://ecdpm.org/wp-content/uploads/2013/11/DP-67-Defence-ACP-Submission-Special-Differential-Treatment-GATT-2005.pdf> (visited on 20 March 2018).

⁴⁰ Art 37(7) Cotonou Agreement.

⁴¹ *Matsushita et al.*, note 41, 765.

⁴² *Ibid.*

⁴³ *Alisa DiCaprio and Silke Trommer*, *Tracing the Special and Differential Treatment Principle Through the CARIFORUM EPA*, 1, available at: <http://www.ictsd.org/bridges-news/trade-negotiations-insights/news/tracing-the-special-and-differential-treatment> (visited 20 March 2018).

Agreement on Trade in Services (GATS),⁴⁴ which is the equivalent provision to Article XXIV GATT, and regulates preferential agreements relating to services in the WTO legal framework. This provision makes mention specifically of developing countries, providing that flexibility be given to developing countries party to a preferential agreement within the meaning of Article V GATS.⁴⁵ The omission of an equivalent provision in the GATT raises questions about the permissibility of a flexible, differential approach for developing countries under this article.⁴⁶

There is a great deal of ambiguity in the scope of Article XXIV GATT, as was demonstrated above. Seifu suggests that “there lacks sufficient room” for S&DT under Article XXIV GATT,⁴⁷ but others have suggested that the ambiguity of the provision “opens the door to interpretation, [but] it does not indicate incompatibility”.⁴⁸ The above analysis suggests that the parties have taken a fairly liberal approach in terms of time scale, but a fairly strict approach in terms of percentage of liberalization. The following chapter will examine whether this is the case in greater detail by examining food security provisions in terms of their development impact. An assessment of this agreement is especially valuable since the ambiguity of the Article XXIV GATT provisions has created a wide “negotiating space to define this relationship”.⁴⁹ Given that EPAs are the first agreements of their kind, involving developed, developing, and least developed countries, an arrangement that “has no precedent in GATT Article XXIV history”, “the practice established by the EPA will set the precedent for future negotiations of this type”.⁵⁰ This is particularly true of the CARIFORUM-EC EPA as it is the first full EPA in place, and will set the tone for future EU-ACP EPAs.

C. Food Security as an S&DT principle? To what extent does it fall within scope of development?

I. Food security as a goal

It is firstly relevant to provide a definition of food security; the FAO defines this as the state when “all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life”.⁵¹ The EU-CARIFORUM EPA makes specific reference to food security, which seems particularly fitting given the poverty eradication and development

⁴⁴ General Agreement on Trade in Services (adopted 15 April 1994, entered into force 1 January 1995) 1869 UNTS 183 (GATS 1994).

⁴⁵ Ibid art V.3.

⁴⁶ *Getahun G Seifu*, The Interplay of the ACP-EU Economic Partnership Agreements and the Rules of the World Trade Organisation: Double Jeopardy for Africa, *Irish Yearbook 1* (2007), p. 192.

⁴⁷ Ibid, p. 293.

⁴⁸ DiCaprio and Trommer, note 43, p. 1.

⁴⁹ Ibid.

⁵⁰ Ibid.

⁵¹ World Food Summit, World Food Summit Plan of Action, <<http://www.fao.org/docrep/003/w3613e/w3613e00.HTM>> (visited on 20 March 2018).

approach espoused and examined above.⁵² Food insecurity is a particularly challenging issue for countries in the Caribbean region due to their development status and vulnerability to natural disasters, as discussed previously.⁵³ Additionally, the small size and economic structure of these countries means that they have little impact on international food prices. The spike in food prices in 2007 as well as the export limitations of major exporters led as a result to major issues in the region with respect to both food security and poverty levels.⁵⁴ Despite the acknowledgement of the importance of food security as a development goal, in practice, an examination of export restrictions will reveal that the agreement does not cater to this goal.

II. Export restrictions

It is worth delving into the link between export restrictions and food security. Export restrictions are used as a mechanism for different policy objectives, but commonly, to combat short-term food shortages in the domestic market.⁵⁵ Limiting exports abroad has the effect of both increasing domestic supply and lowering prices on the goods themselves.⁵⁶ It is important to differentiate between the effect of export restrictions on the part of small countries, which has little impact on global food prices and the impact of large economies, which can result in major price hikes and as a result food insecurity.⁵⁷ The global food crisis was largely the result of export restrictions on some key food products by large producers, including Russia, China, Pakistan, Ukraine and Argentina, according to a Food and Agriculture Organisation (FAO) study.⁵⁸ This indicates that export restrictions are essentially both necessary and damaging, and can both contribute to food insecurity, and be used as a mechanism to relieve it. Developing countries are most at risk from the consequences of food price spikes, and thus it seems that an appropriate mechanism to deal with this is necessary in the context of a trade agreement involving developing countries.

While the previous chapter indicated that the agreement contains examples of S&DT available in WTO agreements, this is not consistently the case. Certain EPA clauses are 'silent' on the issue of S&DT, and by effectively ignoring the issue developing countries are subject to the same standards as the EU.⁵⁹ This seems to contradict the goal of 'asymmetrical liberalisation' that is professed at the start of the agreement.

⁵² The agreement ties food security to poverty eradication explicitly at Art 37(1).

⁵³ *Giovanni Gruni*, Going From One Extreme to the Other: Food Security and Export Restrictions in the EU-CARIFORUM Economic Partnership Agreement, *European Law Journal* 19 (2013), 873.

⁵⁴ *Ibid.*

⁵⁵ ICTSD, Agricultural Export Restrictions, Food Security and the WTO, available at: <<http://www.ictsd.org/sites/default/files/research/Agricultural%20Export%20Restrictions,%20Food%20Security%20and%20the%20WTO.pdf>> (visited on 20 March 2018).

⁵⁶ *Ramesh Sharma*, Food Export Restrictions: Review of the 2007-2010 Experience and Considerations for Disciplining Restrictive Measures, available at: <http://www.fao.org/fileadmin/templates/est/PUBLICATIONS/Comm_Working_Papers/EST-WP32.pdf> (visited on 20 March 2018).

⁵⁷ *Sharma*, note 56, 14.

⁵⁸ *Ibid.*, 15.

⁵⁹ DiCaprio and Trommer, note 43, 3.

This is particularly true of export restrictions, which Gruni argues are “unprecedented in international trade treaties concluded by the EU”.⁶⁰ Indeed, the two relevant clauses on this issue lay down strict rules. Article 26 bans new quantitative restrictions from being adopted while also obliging the parties to remove any quantitative restrictions currently in place.⁶¹ This is vastly different from WTO law on the issue. Article XI GATT contains a number of exceptions to the general restriction on quantitative restrictions, including significantly, “to prevent and relieve critical shortages of food-stuffs or other products essential to the exporting contracting party”.⁶² This is in contrast with Article 26, which provides essentially a blanket ban with no exceptions. The second difference, which can be identified is that export taxes are wholly eliminated within the EU-CARIFORUM EPA, while this is not the case under WTO law.⁶³ Article 14 of the agreement provides for the elimination of customs duties on Caribbean goods destined for the EU as well as EU goods destined for the Caribbean. This is essentially “unprecedented in EU trade practice, and there is nothing similar in WTO law”.⁶⁴

Additionally, certain general exceptions exist in WTO law, which provide further opportunity for WTO members to restrict trade liberalisation, and in particular limit exports.⁶⁵ Article XX(i) explicitly provides for “restrictions on exports” where this is necessary “to ensure essential quantities of such materials to a domestic processing industry”. Article XX(j) states more generally that measures may be taken that are “essential to the acquisition or distribution of products in general or local short supply”. Article XX(g) provides for measures with respect to “the conservation of exhaustible natural resources”. These three clauses within the scope of Article XX GATT are especially relevant to food security and in fact arguably provide WTO members with a substantial degree of flexibility with regard to individual food export agendas.⁶⁶ The EPA does not replicate these exceptions, and this creates a considerably stricter agreement than the WTO.⁶⁷ It should be noted however, that objectives involving the environment and natural resources as well as social aspects are present in the agreement,⁶⁸ even referred to as “thematic and cross-cutting issues”,⁶⁹ however they do not form justifications for export restrictions as they do in WTO law.

In effect, the impact of the omission is that bilateral safeguards are the only short-term mechanism to address issues such as food insecurity.⁷⁰ The rules on export restrictions essentially create WTO+ provisions that go further than what is required to

⁶⁰ Gruni, note 53, 874.

⁶¹ *Ibid.*

⁶² Art XI(2)(a) GATT 1994 (n 7).

⁶³ Gruni, note 53, 874.

⁶⁴ *Ibid.*, 875.

⁶⁵ Art XX GATT 1994 (n 7).

⁶⁶ Siddhartha Mitra and Tim Josling, *Agricultural Export Restrictions: Welfare Implications and Trade Disciplines*, available at: <http://www.ictsd.org/downloads/2009/02/exportrestrictions_final.pdf> (visited on 20 March 2018), 13.

⁶⁷ Gruni, note 53, 875.

⁶⁸ Title IV Chapter 4 contains provisions on the environment while Chapter V contains provisions on ‘social aspects’.

⁶⁹ Title IV Chapter 4, Article 183(2) EU-CARIFORUM EPA.

⁷⁰ DiCaprio and Trommer, note 43, 3.

meet the compatibility criteria of WTO law. WTO compatibility has been addressed in the previous chapter as one of the primary consistent obstacles/arguments against EU-ACP relations, and thus this is an interesting point to observe.

While the EPA law on the issue is much more restrictive than the WTO rules, it is not immediately clear that it is worse than WTO law in terms of its practical impact on food security, and in a wider sense, development. Article XI GATT, which provides for an exception to the ban on quantitative restrictions where there are “critical shortages of foodstuffs or other products” has proved insufficient in preventing the food crisis.⁷¹ In particular, it has been argued that the article is not defined enough to closely regulate whether the actions of major exporters are justified and meet the criteria within the exception.⁷² Furthermore, the article does not sufficiently protect small and vulnerable countries from the effects of such action by large exporters.⁷³

The EPA, however, provides a blanket ban on the use of quantitative restrictions on the part of both parties, in effect removing the possibility for Caribbean countries to take action where necessary to combat critical food shortages.

Given this assessment, it seems clear that a change is necessary with respect to both agreements. The Agriculture Agreement of the WTO attempts to combat the shortcomings of GATT by obligating developed countries to consider the effects of quantitative restrictions on developing countries when taking action under Article XI(2)(a) GATT to relieve food shortages.⁷⁴ While this seems like an ideal solution, given that the impact of export restrictions is worse in developing countries, in practice it has not proven to be a successful provision.⁷⁵ The article creates only a notification obligation on the part of developing countries rather than requiring them to restrict their use of export restrictions. Even so, few countries notified the WTO of the intention to implement a restriction leading up to the food crisis.⁷⁶ This suggests that stronger rules are also necessary from a WTO perspective.

The EUs strict policy towards export restrictions is especially remarkable when compared with its approach to the issue in other FTAs. The EU-South Korea FTA, which was concluded in the same time period as the EPA makes reference to Article XI GATT to determine the rules on export quotas.⁷⁷ Similarly, the EU-Chile Association Agreement provides makes direct reference to Article XI(2)(a), stating that food shortages will be dealt with on this basis.⁷⁸ This seems especially remarkable given that these

⁷¹ Article XI(2)(a) GATT 1994; *Gruni*, note 53, 868.

⁷² *Baris Karapinar*, *Defining the Legal Boundaries of Export Restrictions: A Case Law Analysis* JIEL 130 (2012), 477.

⁷³ *Ibid.*

⁷⁴ Agreement on Agriculture (adopted 15 April 1994, entered into force 1 January 1995) LT/UR/A-1A/2 art 12.

⁷⁵ *Gruni*, note 53, 869.

⁷⁶ *Baris Karapinar*, *Export Restrictions and the WTO Law: How to Reform the “Regulatory Deficiency”* *Journal of World Trade* 45 (2011).

⁷⁷ Free Trade Agreement between the European Union and its Member States, of the one part, and the Republic of Korea, of the other part (adopted 6 October 2010, entered into force July 2011) L127/6 art 2(9).

⁷⁸ Agreement establishing an association between the European Community and its Member States, of the one part, and the Republic of Chile, of the other part (adopted 18 November 2002, entered into force February 2003) art 97.

countries are “more influential than the Caribbean on global food supplies”,⁷⁹ and are in general much higher on the development scale. Indeed, this seems very much to run counter to the development approach strongly advocated in the goals of the agreement.

D. Conclusion

This paper set out to determine whether the legal structure of the EPA is conducive to the goal of development – and more specifically food security – given the unique development focus of this new generation of North-South agreements. The overarching themes of the EPA were analysed, and concluded that development of the CARIFORUM region is the main goal guiding trade relations throughout the agreement. WTO compatibility however remains an issue given the vague criteria in Article XXIV GATT, and as such this left substantial negotiating space for the parties to determine the balance between development and WTO compatibility. This balance does not always come out in favour of the CARIFORUM countries in terms of providing them with asymmetric development opportunities. A comparison with WTO law in particular has established that the EPA provides less S&DT in terms of rules on export restrictions, which are intimately connected with food security issues in vulnerable countries. The EPA's provisions in this respect not only ignore S&DT available, and recognised as necessary under the WTO, but are also stricter than commitments in other FTAs. This seems especially irreconcilable with the overarching goal of development and poverty eradication.

⁷⁹ *Gruni* note 53, 879.

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INTELLECTUAL PROPERTY LAWS AND INTERNATIONAL FOOD SECURITY

Yixian Chen

A. Introduction: Food Security and Genetically Modified Food

Food security is a flexible concept and was reflected in many attempts at definition in research and policy usage. During the World Food Summit held in Rome in 1996, food security was deemed to exist

“when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”.

This definition was later refined, according to the 2005 Food and Agriculture Organization of the United Nations (FAO) State of Food and Agriculture report, into

“food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”.

Evidently, instead of quantitative aspects, the emphasis of food security is nowadays put on food safety and nutritional aspects.

The concept of “Green Revolution”, introduced by American scientist Norman Borlaug, refers to the renovation of agricultural practice that dramatically increased agricultural production between 1930s and late 1960s. Initially launched by research establishments in Mexico, the Green Revolution resulted in a notable increase in cereal-grain production in Mexico, India, China, Pakistan, the Philippines and other developing countries and was generally considered to reduce famine in countries such as India and Pakistan.

However, notwithstanding its humanitarian goals, the Green Revolution spurred much criticism due to its reliance on water resources, chemical fertilizers and pesticides. During the course of the Green Revolution, new chemical fertilizers and synthetic herbicides and pesticides were created and resulted in problems such as inter crop imbalances, reliance on fertilizers, etc. as was later deemed as demerits brought by the Green Revolution. Environmentalists expressed concerns in pollution and agriculturists raised criticism over the decrease in soil fertility due to the excess use of fertilizer. From the viewpoint of those who are pro Green Revolution, and as it turned out, the Green Revolution was meant to be a temporary response to famine, designed to give nations about 20 to 30 years to bring about reforms.

Genetically modified food (GM food) are foods derived from organisms whose genetic material, i.e. DNA, has been modified in a way that does not occur naturally. As a result, organisms can be grown to have desirable traits such as higher yields, greater pest resistance, better drought tolerance, etc.

The first genetically modified plant, produced in 1983, was antibiotic-resistant tobacco. In 1994, GM food started to be commercialized. The first genetically engineered food after commercialization is the Flavr Savr tomato produced by Calgene, a Californian-based company. Flavr Savr has the mechanism of delaying the ripening of tomato

after it is removed from the vine. The sales of Flavr Savr were ceased in 1997 and Monsanto Company later on acquired Calgene.

Due to the unprecedented pressure for the affordability and availability of food in recent years, some people have regarded GM food as a solution for the international food security crisis, while others oppose the use of GM Food. One of the reasons given by the opposing voice is that genetic modification technologies and innovations are mainly profit-driven by patenting. Underpinning this criticism on GM Food is the fact that most GM Food is the product of private-sector research and development instead of public funding. As provided by Ian Sconnes, the debate on food security can be broken down into two parts, namely food supply and food access. Programs such as breeding GM crops as well as the Green Revolution are tools helping with the supply of food and both of them are mostly based on patent research by private sectors.

B. The International Treaty on Intellectual Property Rights (Patent Rights and Plant Variety Rights)

I. Patent Rights and Plant Variety Rights

In the patent world, a patent or patent protection represents a bargain, or *quid pro quo* between the patent holder and the public, often described as an exchange of knowledge for a monopoly on the patented products. From a societal perspective, patent bargain exchanges short term inefficiencies (the potential for “monopoly” rents for the patent rights) for long-term gains (the encouragement of efficiencies gained through innovation) and how to balance the private monopoly and public benefits has being a long-standing debate.

Similar to patents, plant variety rights, also known as plant breeder’s rights, were acknowledged by the International Union for the Protection of New Varieties of Plants (UPOV) as an exclusive property right by which plant breeders can protect their new varieties in the same way an inventor protects a new invention with a patent.

With respect to the relationship between patent rights and plant variety rights, UPOV has provided that patent rights and plant variety rights are separate intellectual property rights with different conditions of protection, scope and exceptions. Breeders can use plant breeders’ rights, patents or other forms of intellectual property rights, or a combination to the extent that such systems are available in the territory concerned. UPOV further indicates that with recent technological developments, such as the rising number of gene-related patents and rapid progress in the field of genetic engineering, patent rights and plant breeders’ rights are more interlinked.

Food security and crop improvement are widely dependent on the exchange of seeds. However, modern techniques of plant breeding require increased sources of funding, and intellectual property rights are designed to allow private operators to recoup their investments in research on the development of new products such as plant varieties and other agricultural inputs.

II. International treaties on Patent and Plant variety protection

1. *The International Convention for the Protection of New Varieties of Plants*

The International Union for the Protection of New Varieties of Plants (UPOV) is an intergovernmental organization with headquarters in Geneva, Switzerland. UPOV was established by the International Convention for the Protection of New Varieties of Plants adopted in 1961, and was revised in 1972, 1978 and 1991. The objective of UPOV Convention is to provide protection of new varieties of plants by granting intellectual property rights and to encourage innovations of new plant varieties for the benefit of the public.

a) *Propagating materials – Article 1 (vi) of the UPOV Convention 1991*

It should be noted that under UPOV Convention 1991, the object of exclusive rights in plant varieties is the propagating materials. Therefore, unlike patents, plant variety rights do not cover within their subject matter technical processes for the production of protected varieties.

b) *Protection of Plant Breeder's Right and the limitation of farmer's privilege– Article 14 and 15 of the UPOV Convention 1991*

UPOV Convention sets rules for plant breeders' rights to be granted. According to Article 14 of the UPOV Convention 1991, breeders' rights have expanded and now consist not only of the production, the sale or offering for sale of the propagating material of the variety, but also the conditioning for the purpose of propagation of said material, its importing or exporting.

These new elements in UPOV Convention 1991 provide stronger protection for plant breeders than any previous convention. For example, the 1991 amendments extended the scope of protection beyond the propagating material of protected varieties to include also "essentially derived varieties". This was introduced to protect breeders against forms of "cosmetic modifications" and plagiarism.

Furthermore, UPOV Convention 1991 limits the farmers' privilege to save seeds for replanting, and requires farmers to limit the amount of seeds saved or to pay an equitable remuneration to the right-holder. It is worth noting that the informal sale and offer for sale of protected varieties is also outside the scope of farmers' privilege as plant breeders' right may only be limited to "permit farmers to use for propagating purposes, on their own holdings, the product of the harvest which they have obtained by planting, on their own holdings" pursuant to Article 15(2) of the UPOV Convention 1991.

2. *Agreement on Trade-Related Aspects of Intellectual Property Rights*

The Agreement on Trade-Related Aspects of Intellectual Property Rights (“TRIPs”) is an international agreement administered by the World Trade Organization (WTO), which came into effect on January 1, 1995. TRIPs introduces intellectual property rules into multilateral trading system by requiring all WTO members to provide minimum standards of protection for a wide range of intellectual property rights (IPRs). There are a few sections in TRIPs that should be highlighted in association with plant varieties protection.

a) *Plant variety – Article 27(3)*

With respect to plant variety protection, WTO members agreed that plant production may be excluded from patentability. However, if they do so, member states shall comply with TRIPs’ requirements where they must provide protection for plant varieties either by patents or by a sui generis (stand-alone) system, or a combination of the two. It should be noted that as TRIPs also permits members to adopt measures necessary to protect public health and nutrition, and promote public interests in sectors important to their socio-economic and technological development (Article 8.1), these measures cannot easily derogate from the patentability requirement of Article 27. The same idea was provided when a WTO member excludes plants from patenting, it should provide an effective sui generis system for the protection of plant variety and this cannot be waived on the basis of the Article 9.1.

b) *Compulsory license – Article 31*

One development of TRIPs in comparison to the UPOV Convention is its compulsory license provisions. Article 5 A. (2) of the Paris Convention was referred to in Article 2(1) of TRIPs, and provides that each member country shall have legislative measure for the grant of compulsory licenses “to prevent the abuses which might result from the exercise of the exclusive rights conferred by the patent”. WTO members together with TRIPs Agreement itself suggests that WTO members are in principle free to grant government use orders or compulsory license technologies of public interest, subject to certain procedural requirements and restrictions, and safeguards for the interests of the patent holder.

Article 31 of TRIPs sets out detailed requirements for compulsory license to apply. However, Article 31(b) provides that the compulsory licenses would only be permitted if the proposed licensee has “made efforts to obtain authorization from the right holder on reasonable commercial terms and conditions and that such efforts have not been successful within a reasonable period of time”. This may create a barrier for the rules to be applied without further guidance provided on how to defined the “efforts”, and unsuccessful attempts made by licensees.

Article 31(c) of TRIPs provides that the scope and duration of a compulsory license must be limited to the purpose for which it was authorized. This means that when in order for a compulsory license to be granted on a patented invention for the purpose of

meeting a particular need, the scope and duration of the license must be limited to what is necessary to achieve this purpose and nothing more. Article 31(h) suggests that the right holder shall be paid “adequate remuneration” for the patent license, but again, the term was not defined and very little guidance was provided.

Dependent patents are patents that are developed based on the technologies of previously protected patents, often called original patent after obtaining consent or license from the owner of the original patent. In other words, a dependent patent could be an improvement on an existing product or process or a new use for an existing product. Dependent patents are prevalent in plant breeding, where the creation of new varieties often occurs incrementally in the form of adaptations and improvements of existing varieties, as opposed to radically new innovations. It is still not clear as to how compulsory licenses can affect plant breeders due to their use of dependent patents. Proposals have been made that governments may seek to impose compulsory licenses in favor of third party breeders who are unable to negotiate voluntary access to patented plant varieties. However, the compatibility of such licenses with TRIPs is untested and governments seeking to impose them should ensure that they comply scrupulously with each of the many requirements set forth in Article 31.

3. The International Treaty on Plant Genetic Resources for Food and Agriculture

Owing to the interdependency of countries with respect to food supplies, to the raising awareness of environmental and health concerns constraining food production and to the growing role played by intellectual property rights in the field of agriculture, the International Treaty on Plant Genetic Resources for Food and Agriculture (“IT-PGRFA”), also known as International Seed Treaty, was brought up by the FAO and came into force in 2004.

In its preamble, ITPGRFA aims to meet “the goals of the Rome Declaration on World Food Security and the World Food Summit Plan of Action and for sustainable agricultural development for this and future generations, and that the capacity of developing countries and countries with economies in transition to undertake such tasks needs urgently to be reinforced”.

As one of the main topics of ITPGRFA, farmer’s rights are officially recognized. ITPGRFA provides that the responsibility for realizing farmers’ rights lies with national government. This means that contracting countries have the option to implement (or not) measures on “matters related to the conservation and sustainable use of plant genetic resources for food and agriculture”. Furthermore, ITPGRFA provides that subject to national law, farmer’s right to save, use, exchange and sell farm-saved seed/propagating material should not be limited. However, the rights, equivalent to the “farmer’s privilege” recognized in UPOV Convention with the exception of seed exchanges, is again, optional for each country. It has been argued that this optional provision leads to problems that in many countries, seeds marketing regulations and implementation of the World Trade Organization rules on intellectual property make it illegal, if not highly difficult, for farmers to use, exchange and market farm-saved seed.

III. Interface between Patent Law and Plant Variety Law

The interface problem is about how patent claims that extend to plants should affect the exercise of agricultural exemptions afforded by plant breeder's rights legislation and how countries react to the cumulative protection provided by patent law and plant variety law.

1. *The North American Approach*

Until 1930, living organisms could not be patented in agricultural industry. After World War I, concerns about food security motivated the passage of the 1930 U.S. Plant Patent Act, which created intellectual property rights for plants that propagate (asexually) through roots rather than seeds. In support of the Act, plant breeders had argued that they needed intellectual property rights to protect their investments in research and development of new plant variety because competitors could easily reproduce an improved plant, which had taken years to develop by plant breeders by simply taking a cutting. Stark Brothers Nursery, for instance, had built a cage with a burglar alarm to prevent competitors from taking cuttings of their improved Golden Delicious apple.

Responding to these arguments, U.S. Congress hoped to encourage the development of a domestic US plant breeding industry by creating plant patent rights. According to the approach that characterized U.S. legislation, the traditional principle of independence between different intellectual property rights systems is deemed sufficient to strike an appropriate balance between intellectual property rights. However, for the case of plant varieties, the problem is that activities that are not prohibited under plant variety rights legislation may infringe upon patent rights as the rights conferred by patent law are granted under a different protection scheme. The cumulative protection between patent law and plant breeder's law are demonstrated in two cases: In *Monsanto Canada Inc. v. Schmeiser*, Percy Schmeiser, a Canadian canola farmer was held liable for using patented cells and genes owned by Monsanto Canada and therefore constituted patent infringement. The Supreme Court upheld the trial court's decision that the case under question should be decided as a matter of patent law:

“While the rights available under the Plant Breeders Rights Act fall well short of those conferred by patent, both in comprehensiveness and in duration ... they may be all that Monsanto is entitled to. ... that patents should not necessarily be available when other, more tailored intellectual property protection exists. Monsanto has since had the opportunity to come within its protection even though the Act was not in force when Monsanto was granted its patent”.

In the United States, a typical case is *Monsanto Co. v. Scruggs* from 2006. In the case, Scruggs purchased Roundup Ready soybean and cotton from seed companies without signing a license agreement required by Monsanto. The Federal Circuit held that “[w]ithout the actual sale of the second-generation seed to Scruggs, there can be no patent exhaustion”, and that

“the fact that a patented technology can replicate itself does not give a purchaser the right to use replicated copies of the technology. Applying the first sale doctrine to subsequent generations of self-replicating technology would eviscerate the rights of the patent holder”.

Later on, *Bowman v. Monsanto Co.* followed the decision in *Monsanto Co. v. Scruggs* and the Supreme Court of the United States affirmed the decision of the Federal Circuit that the patent exhaustion doctrine does not permit a farmer to plant, grow, and save patented seeds without the patent owner’s permission.

The case represents that currently in the United States and Canada, when plant germplasm falls within the scope of patent protections, farmers should be aware that the legitimate experimental use of genetic material is restricted and a license from the patent owner is always required.

2. *The European approach*

European plant-related IP laws codify specific interface rules to avoid restrictive rights on proprietary genetic materials. In particular, a compulsory cross-licensing mechanism has been devised to enable the commercial exploitation of new plant varieties containing third parties’ patented invention. In general, there are two mechanisms in European law that sets out conditions when agricultural exemptions may allow the commercial exploitation of new plant varieties override the protection provided by patents:

a) When the use of plant-related intellectual property rights does not restrict access to the genetic pool to the extent that incremental innovation is discouraged, for example, the 1998 Biotechnology Directive provides a cross-compulsory licensing scheme:

“1. Where a breeder cannot acquire or exploit a plant variety right without infringing a prior patent, he may apply for a compulsory licence for non-exclusive use of the invention protected by the patent inasmuch as the licence is necessary for the exploitation of the plant variety to be protected, subject to payment of an appropriate royalty. Member States shall provide that, where such a licence is granted, the holder of the patent will be entitled to a cross-licence on reasonable terms to use the protected variety.

2. Where the holder of a patent concerning a biotechnological invention cannot exploit it without infringing a prior plant variety right, he may apply for a compulsory licence for non-exclusive use of the plant variety protected by that right, subject to payment of an appropriate royalty. Member States shall provide that, where such a licence is granted, the holder of the variety right will be entitled to a cross-licence on reasonable terms to use the protected invention.”

However, according to Article 31 of TRIPs, the applicant must demonstrate that he/she has unsuccessfully applied for a contractual license from the intellectual property right holder and that the plant variety constitutes a “significant technical progress of considerable economic interest” in comparison with the invention.

b) To recognize the existence of a general right of farmers to replant saved seeds, the

1998 Biotechnology Directive extends the scope of “farm saved seed exemption” under Article 14 of EC Regulation 2100/94 by providing that the sale or commercialization of plant-propagating materials for agriculture use “implies authorization for the farmer to use the product of his harvest for propagation or multiplication by him on his own farm, the extent and conditions of this derogation corresponding to those under Article 14 of Regulation (EC) No 2100/94”. However, it should be noted that according to Article 14 (2) of Regulation (EC) No 2100/94, farmers can only replant limited agricultural species.

3. The approach in developing countries

Unlike industrialized countries, such as the United States and European Union, developing countries have relatively narrow room to adjust plant-related intellectual property legislation and to promote domestic needs. One of the reasons is that plant-related intellectual property policies adopted by industrialized countries limited the options for developing countries to design sui generis plant variety rights systems that do not violate free trade and investment treaties with industrialized countries.

C. Intellectual Property Rights and Food Security – a country study: China

I. Patent Law and Plant Variety Legislation in China

China has first adopted the Patent Law of the People’s Republic of China (“Patent Law”) in 1984. The law was amended in 1992, 2000, and 2008. Article 25 of the Patent Law provides that animal or plant varieties cannot be granted as patent, however, the process of animal or plant varieties can be granted as patent. With the initiative to join the WTO and to implement UPOV 1978, China has enacted the Regulation of the People’s Republic of China on Protection of New Varieties of Plants (“Plant Variety Regulation”) in 1997. This Plant Variety Regulation is further specified by two sets of Implementing Rules, respectively titled “Agricultural Part” and “Forestry Part”. However, the Plant Variety Regulation and its Implementing Rules still need to be improved upon and conflicts between the three legislations need to be resolved.

To the date of this paper, China has not yet joined UPOV 1991.

II. Food Security in China

As a country with 1.38 billion people, China ranks number 1 on the list of countries by population. With one-fifteenth (around 7 percent) of the world’s arable land, China needs to feed almost one-fifth of the world’s population. However, the population of China is still growing and demographers are predicting another population boost after the relaxing of the one-child policy at the end of 2015.

China’s food security problem has been the subject of a continuing debate and global speculation. Shrinking arable land, environment degradation and water crisis are creating restraint to China’s agriculture and therefore leading concerns to whether China is able to grow enough food to satisfy the country’s expanding requirements. In

1995, FAO has initiated a flagship program called Special Program on Food Security (SPFS) for Low Income Food Deficit Countries (LIFDCs) with China as one of the LIFDCs. Under the SPFS program in China, a project on food security in Sichuan province was launched and as a result, the program has generated economic returns of 14 to 20 percent and dramatically increased the incomes of the farmers in the tested villages. It was reported that the positive environmental impact of the project included improvements in irrigation and drainage facilities, controlling water logging, improving soil structure, reducing soil erosion, better terracing, afforestation, and a balanced use of fertilizers and pesticides through integrated pest management. The Chinese model of Sichuan is being successfully replicated in over 105 member-countries of FAO.

The success of this SPFS project in China demonstrated the ability of technology and inventions to help solve problems in agricultural activities, benefit agricultural reforms in Low Income Food Deficit Countries, and therefore provide a solution for food security challenges.

D. Intellectual Property Rights and Food Security

As previously mentioned, the concept of intellectual property law allows private-sectors to recoup their investment in research and development of new technology and potentially puts the monetary benefits earned by intellectual property rights owner to be in conflict with the general public. Concerns were raised as to whether intellectual property rights provide an unreasonable ambit of protection to the rights owner in the field of food and agriculture and therefore is detrimental to international food security crisis.

Most of the criticism lies in line with the debates on human rights concern. As one aspect of food security, the right to food is recognized as a human right in the Universal Declaration of Human Rights and the International Covenant on Economic, Social and Cultural Rights. In August 2000, the United Nation Sub-Commission on the Promotion and Protection of Human Rights has published a resolution (the “2000 Resolution”) that adopted an antagonistic approach to TRIPs by providing that the primacy of human rights obligations is to be put over economic policies and agreements. The Resolution also noted that there are “actual or potential conflicts existing between the implementation of the TRIPS Agreement and the realization of economic, social and cultural rights”. These conflicts include impediments to the transfer of technology to developing countries, the consequences for the right to food of plant variety rights and the patenting of genetically modified organisms, etc. After the 2000 Resolution, the U.N. human rights system has responded enthusiastically to intellectual property issues. For example, in 2001, in a report by special Rapporteurs on Globalization, it was argued that intellectual property protection has undermined human rights objectives.

However, in recent year, the shared goals and other points of commonality between Intellectual property laws and International human rights laws have been identified by the public. In fact, the above mentioned successful case study of China reflects that by recognizing individual entitlement to some (intellectual property rights holders), namely by granting the protection of intellectual property rights, the results of the technology and innovations that are applied in real life are in turn granting protection of the public by way of securing food resources and therefore promoting human rights.

E. Conclusion

The debate between intellectual property laws and international food security is unlikely to reach an agreement soon. By examining and correctly dealing with the possible problems brought up by patent rights and plant variety rights and acknowledging that advanced technologies in food and agriculture industry help with global food security challenges, countries should embrace the fact that intellectual property rights, especially patent rights and plant variety rights, led by private-sectors can be utilized as a tool to mitigate current global food security challenges.

PART II: ECONOMIC CHALLENGES FOR SUSTAINABLE FOOD SECURITY

RISK GOVERNANCE IN AGRI-FOOD SUPPLY AND DISTRIBUTION CHAINS – CHALLENGES AND OPPORTUNITIES FOR SUSTAINABLE FOOD SECURITY

Hrabrin Bachev

A. Introduction

Around the globe the issues of management of diverse (natural, technical, market, financial, criminal, policy, etc.) risks in agri-food supply and agrarian distribution chains are among the most relevant for farm and business managers, consumers, economists, lawyers, interest groups, politicians, international organisations, academicians, and public at large (Babcock; Bachev 2011d, 2012a, 2013, 2016; Bonanomi; CIPS; Deep and Dani; EU; Hanschel; OECD; Olsson and Skjöldebrand; Kaufmann; Ramaswami; RPDRM; Schaffnit-Chatterjee; Shepherd et al.; Trench et al.; Tietje; Weaver and Kim). In the last decades, newly evolving uncertainties, risks and crisis associated with the progression of natural environment, products and technology safety, social demands, policies, economy, and globalization have all put additional challenges on existing system of risk management on the agri-food sector. For instance, according to a global study one in five seafood is synthetic and it is likely that the average consumer has eaten mislabelled fish (International New York Times, September 10-11, 2016).

Most risks management studies in agri-food sector predominately focus on technical methods and capability to perceive, prevent, mitigate, and recover from diverse threats and risks (Barker; DTRA & IIBR; Hefnawy; Jaffee et al.; Luning et al.). In majority of economic publications, a neoclassical approach is applied, the risks are studied as other commodities regulated by market supply and demand, and farmers and agri-business agents' willingness to pay for an insurance contract in relations to agents risk aversion, risk probability and magnitude of damages modelled (Gerasymenko and Zhe-moyda; OECD). Nevertheless, market and private failures are acknowledged, and the needs for public intervention in risk management increasingly recognized. At the same time, risk management analyses largely ignore significant human-nature-based risks (bounded rationality, opportunism), and large risks related to food distribution and access, the critical factors for the managerial choice such as the institutional environment and the transaction costs, and the diversity of alternative (market, private, collective, public, hybrid) modes of risk management. As a result, the efficiency and complementarities of diverse agri-food risk management modes cannot be properly assessed and improved (Bachev, 2012a).

Despite the significant advancement in the risk management technologies and the menu of risk reduction, mitigation and coping strategies, a great number of failures and challenges (production, supply chain, food and human safety, environmental etc.) continue to persist in the agri-food sector (Dani and Deep; EU; Humphrey and Mededovic; OECD; Luning et al.). Consequently, greater attention is directed to the system of governance, which eventually determines the exploration of technological opportunities and the state of agri-food security (Bachev, 2010a, 2011c).

This paper incorporates the interdisciplinary New Institutional Economics (Coase, 1939, 1960; Furuboth and Richter; North; Williamson, 1981, 1996) and presents a comprehensive framework for analysing risk management in agri-food supply and distribution chains. First, it specifies the type of agri-food risks and the modes of their management. Second, it defines the efficiency of risk management and identifies factors for the governance choice. Third, it presents stages in the analysis of risk management and for the improvement of public intervention in the risk governance. Finally, it specifies the contemporary opportunities and challenges for the risk governance in the agri-food supply and distribution chains.

B. Framework for analysing and improvement of agri-food risk management

I. Agri-food risks and modes of their governance

Risk related to the agri-food sector is any current or future hazard (event) with one or more significant negative impacts. It is either an idiosyncratic, accidental, low probability, unpredictable event/threat, or it is systematic – a high probability respectively a predictable event/threat. The risk and threat could be of a natural origin – e.g. adverse weather, insect attract, catastrophic event etc. They may be of a technological origin – e.g. technical failures like tractor's flat tire, engine disorder etc. They are often of human origin – individual or collective actions/inactions. Frequently, risks are a combination of previous three.

A great portion of risks in agri-food sector are caused or are consequences of a human actions or inactions. The individual behaviour and actions causing risks may range from: agent's ignorance (normal human errors, lack of sufficient knowledge, information, and training); risk-taking (retention) strategy of individuals (accepting "higher than normal" risk); mismanagement (bad planning, prevention, recovery); deliberate opportunistic behaviour (pre-contractual cheating and adverse selection, post-contractual moral hazards); criminal acts (stealing property or yields, arson, invasion on individual safety); terrorist attacks (contamination of inputs and outputs aiming mass terror), etc.

The collective actions, which are source of risks are commonly related to: economic dynamics and uncertainty (changing industry and consumers demands, market price volatility, international competition, market failures and disbalances such as a lack of labour, credit, certain inputs etc.); collective orders ("free riding" in big organizations, codes of behaviours, industry standards, strikes and trade restrictions, community rules and restrictions); public order (political instability and uncertainty, evolution in informal and formal social norms and standards, public failures such as bad, delayed, under/over intervention, law and contracts enforcements, mismanagement, inefficiency by design), etc.

The agri-food sector risk could be faced by an agri-food sector component – e.g. risk on a dairy farm, on a food processor, on a trader. The risk could also be caused by the agri-food sector – risk from farming, from food processing, from food-distribution etc. The risk could be internal for the agri-food chain such as hazards caused by one element to another, and staying in or mitigating within the sector. It could also be external associated with hazard coming from outside factors (such as natural environment,

government policy, international trade), and/or affecting external components (consumers, residents, industries, nature).

Finally, the risks could be private, when it is taken by individuals, collectives, economic entities (households, firms, cooperatives), industries. The risk is often public affecting large groups, communities, consumers, society, future generations.

The risk is big when there is a great likelihood of a risky event to occur and that is combined with substantial possible negative consequences. The later may take a great variety of forms – e.g. damaged human and livestock health and property, inferior yields and income, lost market positions, food and environmental contamination etc. When risk is considerable it would likely be associated with significant costs which sometimes are hardly expressed in monetary terms – e.g. human health hazards, degraded soils, lost biodiversity and eco-system services etc. Thus the rational agents maximizing their own welfare will be interested in investing in risk prevention and reduction.

In a narrow, technical sense, the risk management comprises the individual, collective and public actions for reducing or eliminating risk and its negative consequences. In a broader sense, the risk management is the specific system of social order (governance) responsible for a particular behaviour(s) of agents and determining the way(s) of assignment, protection, exchange, coordination, stimulation and disputing diverse risks, rights, resources, and activities (Bachev, 2011c). In the particular socio-economic, technological and natural environment, the specific system of risk governance “put in place” is intimately responsible for the efficiency of detection, prevention, mitigation, and reduction of diverse threats and risks and their negative consequences (Bachev, 2012a).

The generic forms and mechanisms of risk governance are (Figure1):

- private modes (“private and collective order”) – diverse private initiatives, and specially designed contractual and organizational arrangements tailored to particular features of risks and agents – e.g. private or collective codes of behaviour, diverse (rational, security, future etc.) private contracts, cooperatives, associations, business ventures etc.
- market modes (“invisible hand of market”) – various decentralized initiatives governed by the free market price movements and the market competition such as risk trading (selling and buying insurance), future contracts and options, production and trade of special (organic, fair-trade, origins) products etc.
- public modes (“public order”) – various forms of a third-party public (Government, international) intervention in market and private sectors such as public information, public regulation, public ban, public assistance, public funding, public assurance, public taxation, public contract, public provision etc.

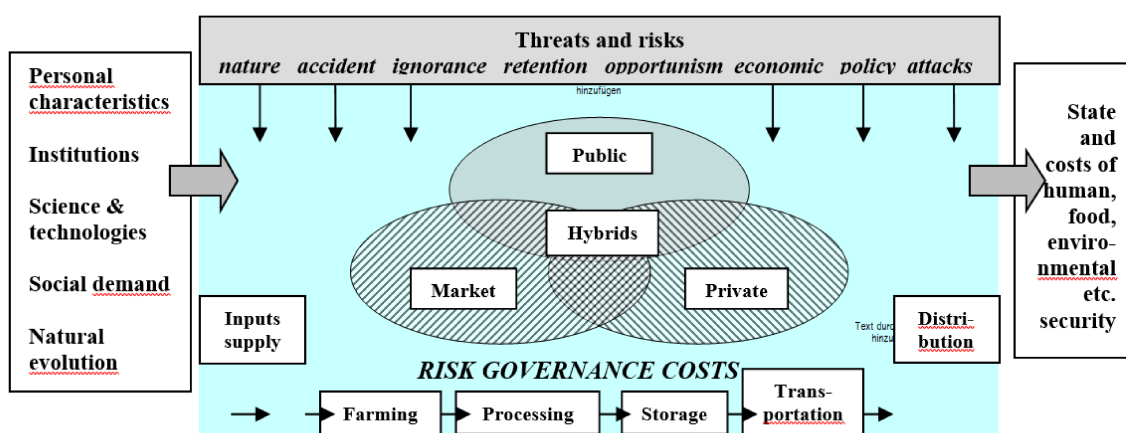


Figure 1: Generic risks, factors, stages and modes of risk governance in agri-food sector, *Bachev*

Sometimes, the risk management in agri-food sector could be effectively done through self-management – e.g. production management, adaptation to industry and formal standards, self-insurance through keeping stocks, financial reserves etc. For instance, primitive forms of on farm risk management through improving production management are widespread such as control and security enhancement, application of appropriate (pest, disease, weather resist) varieties, technology and production structure, product diversification, dislocation etc. Similarly, off-farm enterprise (and income) diversification is a major strategy for risk management in most of the European farms (Bachev and Tanic). However, very often, the risk management requires an effective governance of relations with other agents – exchange and regulations of rights, alignment of conflicts, coalition of resources, collective or public actions at regional, national and transnational scales etc. Accordingly, a risk could be managed through a market mode (e.g. purchase of insurance, hedging with future price contingency contracts), a private mode (contractual or literal integration, cooperation), a public form (state regulation, guarantee, compensation), or a hybrid combination of other forms.

II. Efficiency of risk management

The individual modes of risk governance are with unequal efficiency since they have dissimilar potential to reduce the likelihood and the (negative) impact of risk, and command different costs (Bachev, 2010a). Principally, the market or the collective governance has bigger advantages over the internal mode (own protection) since they allow the exploration of economies of scale and scope in risk prevention and bearing (sharing) negative consequences. However, the risk of trading and/or sharing is often associated with significant transaction costs – for finding best partners, prices, formulating and disputing terms of exchange, coalition, safeguarding against new risk from opportunistic behaviour of counterparts or partners etc. Consequently, market and private sector fail to govern effectively the existing and likely risks in agri-food sector, and there is a need for a state intervention in risk management – assisting farmers cooperation, public

costs-sharing or provision, mandatory insurance regulation etc. Thus, governance matters and applying a proper structure of risk management is an important part of the overall process of the optimization (effective allocation) of resources.

Following Coase's logic (Coase, 1960), if property rights were well defined and transaction costs were zero, then all risks would be managed in the most efficient (socially optimal) way independent of the specific mode of governance. Then, individual agents would either sell out their risk to a specialized market agent, or safeguard against the risk through terms of a private contract, or join a risk-sharing organization of interested parties. The risk-taking would be distributed between (exchanged, shared by) agents according to their will while the total costs for risk prevention, assurance, reduction, and recovery minimized. The rational choice for an individual agent would be to get rid of a significant risk altogether – to sell the risk out to a specialized market agent (a risk-taker). Such totally decentralized (market) governance would optimize the risk-taking and minimize the technological costs for risk assurance and recovery exploring the entire potential for economies of size and scope at national and/or transnational scales. However, when property rights are not well defined or enforced and transaction costs are high then the type of governance is essential for the extent and costs of risk protection (Bachev, 2012a). For instance, an internal (ownership) mode is often preferred because of the comparative protective and costs advantages for standard natural or behavioural risk management over the outside (market or contract) modes. What is more, frequently the enormous transaction costs could even block the development of insurance market or the emergence of mutually beneficial (collective) risk-sharing organization. It is well known that despite common interests and the huge potential for risk minimization the collective organization for risk sharing is not or hardly developed by stallholders.

Furthermore, the formal and informal institutional restrictions could make some modes of risk governance impossible – e.g. risk assuring monopolies and/or cartel arrangements are illegal in many countries while most entrepreneurial risk-taking is endorsed (the “low risk - low profit” principle). Thus, not all modes of risk governance are constantly feasible in any socio-economic settings. What is more, individual agents differ significantly in their capacity to recognize, take, pay for prevention, and manage a risk. For instance, a risk-taking farmer prefers risky but more productive forms (e.g. bank credit for a new profitable venture); the bigger enterprise can better perceive (hire expertise, collect information) and invest in protection of risks and/or take (absorb negative consequences) of a larger risk, etc. Besides, the individual agents have quite different interests for an effective management of a particular risk(s) since they get unlike benefits and costs from the risk management – e.g. effective environmental management often create costs for farmers while benefit the residents and other industries.

Last but not less important, there is no single universal form for the management of diverse type of risks and according to the specific feature of each risk (origin, probability, likely damages) there will be different most effective form of governance. For instance, while a low probable “standard” (natural, criminal) risk could be effectively governed by a classical market contract (e.g. purchase of insurance), most behavioural risks require special private modes (branding, long-term or interlink contracts, vertical integration), a high damaging risk from a terrorist attract necessities specialized public forms (intelligence, security enforcement) etc. Hence, depending on the kind and severity of risk,

and the interests and personal characteristics of individuals, and the specific natural, economic and institutional environment, there will be different (most) efficient forms of governing a particular kind of risk. Consequently, some governance mix will always exist to deal with divers risks associated with the agri-food sector (Bachev and Nanseki).

In many cases, an effective risk management leads to a considerable reduction or removal of a particular type of risk. However, often complete risk elimination is either very costly (unaffordable for individuals, communities, society) or practically impossible (when uncertainty associated with the future events is enormous, the transaction costs are very high etc.). For instance, certain natural risk will always exist despite the available system of risk management. Besides, it is practically impossible to write a complete contract (e.g. for insurance supply and trading risk) including all probable future contingencies, and the subsequent rights and obligations of each party. Consequently, some transacting risk will always remain. Therefore, an effective risk management is usually connected with the needs for some trade-off between the benefits from reducing a particular risk (saved costs, minimized negative impacts) and the related costs for the risk governance.

Furthermore, an individual mode of governance could offer an effective protection from different (multiple) risks. Besides, an effective management of one type of risk might be associated with exposure to a new type of risk/costs – e.g. the vertical integration eliminates the market risk but creates a risk from opportunisms of partners. Moreover, the level of the (overall) risk exposure is typically determined by the critical (most important) risk and the integral risk is rarely a sum of the individual risks. For instance, if there is a very high risk/threat for stealing the harvest, otherwise important risk for crop pest protection would not be added to the overall risk of the farm.

Frequently, there are a number of possible (alternative) forms of governance of a particular type of risk – e.g. “risk to the environment” could be managed as voluntary actions of individual farmers, environmental cooperation, private contracts with interested parties, assisted by a third-party organization, public eco-contact, public regulation, hybrid forms etc. (Bachev, 2010a).

In certain cases, some forms of the risk management are practically impossible or socially unacceptable – e.g. insurance markets do not develop for many kind of agro-food risks and the private management is the only option; the management of many environmental risks and challenges require collective actions at local, eco-system, regional or transnational levels etc. In modern societies many type of risks management are publicly imposed – e.g. food safety risk is under public management and harmonized in the EU, there are strict regulations on GMC, “precaution principle” is mandatory for the environmental related projects and carried out by the state authority, safety nets are organized as public projects etc.

Therefore, a comparative analysis is to be employed to select among (technically, economically, socially) feasible alternatives the most efficient one – that which would reduce the overall risk to an acceptable level, and which would require minimum total (risk assurance and risk governance) costs (Bachev, 2012a). The later must include all current and future costs associated with the risk management – the current technological and management costs (for adaptation, compliance, information, certification), risk insurance premium, contracting and coalition costs as well as the (current and future) long-term costs for adaptation and recovering damages including associated transaction

costs (disputes, expertise, low suits etc.) for claiming experienced losses. In any case an individual, group, community, sectoral, chain, national and international efficiency of the risk management has to be distinguished. It is often when elimination of a risk for one agent induce a (new) risk for another agent – e.g. the agri-food price fluctuation causes an income risk to the producers but benefits the speculators; the application of chemicals reduces risk for the farmers but produces significant negative effects (e.g. water, soil and air contamination) on the residents, consumers, affected industries etc. Furthermore, the risk management is only a part of the overall governance of divers (production, consumption, and transaction) activities of agents. That is why the total efficiency (benefits, disadvantages, costs saving and risk minimization potential) of the various modes for the individual agents and the public at large are to be taken into account.

According to the specific natural and socio-economic environment, the personal characteristics of individuals, and the social preferences, various structures of risk governance could evolve in different sub-sectors, industries, supply chains, and societies. In one extreme, the system of risk management would work well and only the normal (e.g. entrepreneurial) risk would be left ungoverned. In some cases, market (free-market prices, competition) would fail to provide adequate risk governance but a variety of effective private modes would emerge to fill the gap – special contractual and organizational arrangements, vertical integration, cooperation. Often, both market and private governance may fail but an effective public involvement (regulation, assistance, support, partnerships) could cure the problem. Nevertheless, there are situations when the specific institutional and risk management costs structure would lead to failures of market and private modes as well as of the needed public (government, local authority etc.) intervention in risk governance. Consequently, a whole range of risks would be left unmanaged which would have an adverse effect on the size and the sustainability of agri-food enterprises, the markets development, the evolution of production and consumption, the state of environment, and the social welfare (Bachev, 2010a). Depending on the costs and the efficiency of the specific system of governance put in a particular (sub)sector, region, country, supply chain etc. there will be unlike outcome in terms of residual risks, and dissimilar state and costs of human, food, environmental etc. security in different regions and period of time (Figure 1). For instance, when there is inefficient public enforcement of food, labour, environmental etc. safety standards (lack of political willingness or administrative capability), then enormous “grey” agrarian and food sectors develop with inferior, hazardous and counterfeit components.

III. Factors of governance choice

The forms of risk management in agri-food sector would depend on the risk type and features, the personal characteristics of agents, the institutional environment, the progress in science and technologies, culture, the social education and preferences, the evolution of natural environment etc. (Figure 1). The risk features like origin, probability of occurrence, likely damages, scale etc. are important factor for the governance choice. For instance, local technical or behavioural risk could be effectively managed though a private mode while most of market and environmental risks require collective actions at regional, national or transnational level. For a high probability and harmful

risks, the agents will prefer more secure (and more expensive) mode – e.g. security investment, purchase of insurance, keeping reserves, taking hostages, interlinked organization. Nevertheless, due to the lack of economic means many small size farmers cannot afford related costs and practice no or primitive forms of risk management – cash and carry deals, product diversification etc. Here, there is a need for a third party (Government, international assistance) intervention through insurance, support, safety net etc. schemes to decrease farmer's vulnerability.

The personal and behavioural characteristics of agents (such as specific interests, preferences, knowledge, capability, risk-aversion, reputation, trust, contractual power, opportunisms) are important factor for the choice of management form. For instance, some risks are not perceived (unknown) by private and public agents and therefore no risk management is put at all; in some cultures, the cooperative is the preferred mode of agrarian organization; experienced and trained farmer could design and manage a bigger organization (based on hired labour) and more outside (credit, insurance, inputs supply etc.) contracts adapted to his specific needs; a risk-taking entrepreneur prefers riskier but more productive (specialized, high margin) ventures etc. The behavioural factors such as individuals' bounded rationality and opportunisms have been identified as responsible for the transaction costs, and thus for the choice of organizational mode (Williamson, 1996). They are widely studied in the insurance theory as a source for cheating by both sides of contract (Derrig). The agents do not possess full information about the economic system (risks, price ranges and dynamics, trade opportunities, policy development) since collection and processing of such information is very expensive or impossible (multiple markets, future events, partners intention for cheating etc.). In order to optimize decision-making, they have to spent on "increasing their imperfect rationality" (on data collection, analysis, forecasting, training, consultation) and selecting forms minimizing related risks/costs (internal organization, "selling out" risk etc.).

The agents are also given to opportunism and if there is an opportunity for some of the transacting sides to get non-punishably extra benefit/rent from the exchange he will likely to take an advantage of that. A pre-contractual opportunism ("adverse selection") occurs when some of the partners use the information asymmetry to negotiate better contract terms. A post-contractual opportunism ("moral hazard") occurs when some counterpart takes advantage of impossibility for full observation on his activities (by another partner, a third-party) or when he takes legal advantages of unpredicted changes in exchange conditions (costs, prices, formal regulations etc.). The third form of opportunism ("free ride") occurs in development of large organizations where individual benefits are not-proportional to the individual efforts (costs) and everyone tend to expect others to invest in organizational development and benefit from the new organization in case of a success (Olson).

It is often costly or impossible to distinguish the opportunistic from the non-opportunistic behaviour because of the bounded rationality – e.g. a farmer finds out that purchased seeds are not of high quality only during the harvesting time. Therefore, the agents have to protect their rights, investments, and transactions from the hazard (risk) of opportunism through: ex-ante efforts to find reliable counterpart and design efficient mode for partners credible commitments; and ex-post investments for overcoming (through monitoring, controlling, stimulating cooperation) of possible opportunism during the contract execution stage (Williamson, 1996). In the agri-food sector, the

opportunism is widespread before signing an insurance contract (not disclosing the real information for possible risks) or during the contract execution period (not taking actions for reducing damages when risky event occurs; consciously provoking damages in order to get insurance premium etc.). That augments considerably the insurance prices and restricts the utilization of insurance contracts by small enterprises. On the other hand, insurees often discover the pre-contractual opportunism of the insurers only after the occurrence of harmful event finding out that not all assurance terms (protected risks, extend of coverage of damages, ways of assessing damages, extra hidden costs) had been well explained and/or adapted to farmers needs [Bachev, 2010b]. For many kinds of farm-related risks, the markets evolve very slowly and/or the insurance services are practically inaccessible by the majority of small operators. What is more, for many important risks an insurance is not available “for purchase at all” – e.g. the risk of lack of market demands for farm products, the fluctuation of prices, possible opportunism of the counterparts etc. That is why farmers have to develop other (private, collective) modes to safeguard their investments and rights or lobby for a public intervention in the assurance supply.

The institutional environment (“rules of the game”) is an important factor for management choice. For instance, in many countries some forms of risk governance are fundamental rights (on food, labour, environmental security and safety) and guaranteed by the state; a public income support to farmers is institutionalized; environment and food safety standards could differ even between different regions in the same state etc. Furthermore, the (external) institutional environment considerably affects the level of transaction costs – e.g. in recent years tens of thousands of European farms and processors have been closed due to the impossibility to adapt to (invest for) newly introduced EU standards for quality, safety, environmental preservation, animal welfare, certification etc. Principally, in the conditions of stable and well-working public regulation (regulations, quality standards, price guarantees, quotas) and the effective mechanisms for laws and contract enforcement, a preference is given to the standard (spotlight and classical) market contracts. When rights and rules are not well defined or changing, and the absolute/contracted right effectively enforced, that lead to the domination of primitive form of risk management (subsistence farming, personalized and over-integrated forms) and the high vulnerability to diverse (natural, private, market, contractual, policy etc.) risks. The later was the case during the post-communist transition in East Europe characterized by the fundamental restructuring, the “rules change” and ineffective public enforcement, a high exposure to “new” (natural, market, entrepreneurial, private, contractual, institutional, international etc.) risks by the newly evolving private structures, unsustainable organizations, large grey economies, undeveloped or missing (agrarian credit, insurance, extension supply etc.) markets, individuals (e.g. thefts) and organized (e.g. providers of “security services”) risk introduction devastating the private businesses and the household welfare (Bachev, 2010a).

The multidimensional characteristics of the activity and transactions (the combination of uncertainty, frequency, assets specificity, and appropriability) are critical for the management choice. When recurrence of the transactions between the same partners is high, then both sides are interested in sustaining and minimizing costs of their relations (avoiding opportunism, sharing risk, building reputation, setting up incentive, adjustment, and conflict resolution mechanisms). Here, continuation of the relations with a

particular partner/s and designing a special mode for transacting has a high economic value and the costs for its development could be effectively recovered by frequent exchange. When a transaction is occasional (incidental) then the possibility for opportunism is great since the cheating side cannot be easily punished by turning to a competitor (losing future business).

When uncertainty surrounding transactions increases, then costs for carrying out and secure transactions go up (for overcoming information deficiency, safeguarding against risk etc.). Since bounded rationality is crucial and opportunism can emerge the agents will use a special private form diminishing transaction uncertainty – e.g. trade with origins; providing guarantee; using share-rent or output-based compensation; an obligatory collateral for providing a credit; participating in inputs-supply or marketing cooperative; complete integration.

The transaction costs get very high when specific assets for the relations with a particular partner are to be deployed. Here a costless alternative use of the specific assets is not possible (loss of value) if the transactions fail to occur, are prematurely terminated, or less favourable terms are renegotiated (in contract renewal time before the end of the life-span of the specific capital). Therefore, the dependant investment/assets have to be safeguarded by a special form such as a long-term or tied-up contract, interlinks, hostage taking, joint investment, quasi or complete integration. Often, the latter is quite expensive, investment in the specific capital not made, and the activity/transactions cannot take place or occurs without (or loss of) comparative advantages in respect to the productivity (Bachev, 2011b).

If a high symmetrical (risk, capacity, product, timing, location etc.) dependency of the assets of the counterparts exists (a regime of “bilateral trade”) there are strong incentives in the both parties to elaborate a special private mode of governance (e.g. interlinking the credit, inputs and insurance supply against the marketing of output). A special relational contract is applied when detailed terms of transacting are not known at outset (a high uncertainty), and a framework (the mutual expectations) rather than the specification of the obligations of counterparts is practiced. Here partners’ (self)restrict from opportunism and are motivated to settle emerging difficulties and continue relations (a situation of frequent reciprocal trade). When unilateral dependency exists (risk of unwanted “exchange”, quasi or full monopoly), then the dependent side has to protect the investments against possible opportunism (behavioural uncertainty/certainty) through integrating transactions (unified organization, joint ownership, cooperative); or safeguarding them with an interlinked contract, exchange of economic hostages, development of collective organization to outstand asymmetrical dependency (for price negotiation, lobbying for Government regulations) etc.

Activity and transacting are particularly difficult when appropriability of rights on behaviour, products, services or resources is low. Because of the bounded rationality, the costs for the protection, detection, verification, and a third-party (court) punishment of unwanted exchange extremely high. The agents would either over-produce (e.g. negative externalities) or under-organize such activity (positive externalities) unless they are governed by an efficient private or hybrid mode – cooperation, strategic alliances, a long-term contract, trade secrets, or a public order.

The progress in science and technologies significantly improves the risk management and facilitate the diversification of its form. For instance, the introduction of new

(resistant) plant and livestock varieties; the mechanization and standardization of operations and products; the application of information, forecasting, monitoring, storage, and transportation technologies, all they improve significantly the risk management in agri-food chain (COST; Hefnawy). The modern application of the science and technologies is also associated with the production and/exposure to the new type of risks – e.g. greenhouse gas emissions, genetic contamination, natural resource depletion, technical over-dependency etc.

Finally, the natural environment and its evolution are critical factors for the management choice. For instance, certain geographical regions (mountainous, river beds, tropics, etc.) are more prone than others for natural menace and risks like soil erosion, soil and water contamination, frosts, droughts, floods, pest attacks, diseases, wild animal invasions etc. What is more, evolution of the natural environment associated with a global warming, extreme weather, plant and animal diseases, drought, flooding and other natural disasters, is posing series of new challenges for the risk management in the agrarian and food sector (Hefnawy; OECD, 2011).

The identification of the critical factors of risk management choice, the range of practically possible forms, and their efficiency (costs and benefits) for the individual agents, stages, subsectors, countries, food chains and public at large, is to be a subject for a special micro-economic study.

The comparative analysis is to be employed to select among the feasible forms the most efficient one reducing the overall risk to an acceptable level and minimizing the total (risk assurance and governance) costs. Most of the elements of the efficiency of the risk governance are hardly to quantify – e.g. the individuals' personal characteristics, the amount of the risk, the level of benefits and costs associated with each mode etc. That is why a qualitative (Discrete structural) analysis could be used. The later matches the features of a risk to be managed (the probability, significance, acceptance level, needs for collective action etc.) and its critical (institutional, technological, behavioural etc.) factors with the comparative advantages (the effective potential) of the alternative modes to inform, stimulate an appropriate behaviour, and align the interests of associated agents, and to overcome, reduce, control, share, dispute, and minimize the overall costs of that risk.

In a specific market, institutional, technological and natural environment the effective risk governance choice will depend on the combination of the risk features (probability of occurrence, likely magnitude of damages) and the critical dimensions of the activity/transactions (appropriability, assets specificity and frequency). Figure 2 presents a matrix with the principle forms for the effective risk governance in agri-food sector.

Critical dimensions of activity		<u>Appropriability</u>						
		High					Low	
		Assets Specificity						
		Low		High				
		Frequency						
Risk features		Low	High	Low	High			
Severity of damages	High	Probability /uncertainty	High	M/CC	M/CC	SC	VI	PO
			Low	M/CC	SC	CO	CO	
	Low		Low	<u>na</u>	Na	SC	VI	<u>na</u>
			High	M/CC	M/CC	TPI	VI	CO & TPI

M – free market; CC – classical (standard) contract); SC – special contract; VI – vertical (internal) integration; CO – collective organisation, TPI – needs for a third-party involvement; PO – needs for a public organisation

Figure 2: Principle modes for risk governance in agri-food sector *Bachev* 2012a.⁸⁰

For instance, likely probable and low damaging risks combined with a small assets specificity and appropriability usually do not necessitate (motivate, economically justify) any risk management.

A high standard risk could be effectively managed through a free market mode such as a standard (classical) insurance, inputs supply, marketing etc. contracts. Highly probable and damaging risks with a good appropriability and frequency of transactions between the same partners require a special (e.g. relational) contract. The later form is also appropriate for the risks surrounding with low uncertainty, high assets specificity and appropriability, and occasional character of the relations between the counterparts.

Principally, risks combined with high specificity, appropriability and frequency could be effectively managed though a vertical integration (internal risk management, contract forward or backward integration for risk sharing or mitigation). Highly likely and menacing risks combined with a high assets specificity and a good appropriability call for a collective organization (cooperation, collective action). Moreover, such risk/costs sharing organization could be easily initiated and maintained since the condition of a high risk and assets dependency is in place. A serious transacting risk exists when the situation of assets specificity is combined with a high uncertainty, low frequency, and good appropriability. The elaboration of a special governing structure for private transacting is not justified, the specific (risk reducing) investments not made, and the activity/restriction of activity fails to occur at an effective scale (“market and contract failure”). Here, a third-part (private, NGO, public) involvement in the transactions is necessary (assistance, arbitration, regulation) in order to make them more

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efficient or possible at all. The unprecedented development of the special origins, organic farming, systems of fair-trade are good examples in this respect. There is increasing consumer's demand (a price premium) for the organic, original, and fair-trade products associated with some forms of (natural, poor household, labour, quality etc.) risk management. Nevertheless, the supply of the later products could not be met unless effective trilateral governance including an independent certification and control is put in place. Similarly, for risks with a low appropriability a third party (public) intervention is necessary to secure the effective risk management. Moreover, while a high probability low danger risks need a collective organization assisted by a third-party (quasi-public organization for risk sharing and mitigation), the high damaging risks necessitate a public organization.

IV. Stages in the analysis and improvement of risk management

The analysis and the improvement of the risk governance in the agri-food chain are to include following steps (Figure 3): First, identification of existing and emerging threats and risks in agri-food chain. The persistence of certain risks is a good indicator for ineffective management (Bachev and Nanseki). The modern science offers quite reliable and sophisticated methods for assessing various risks to or caused by the agri-food chain (DTRA & IIBR; Trench et al.).

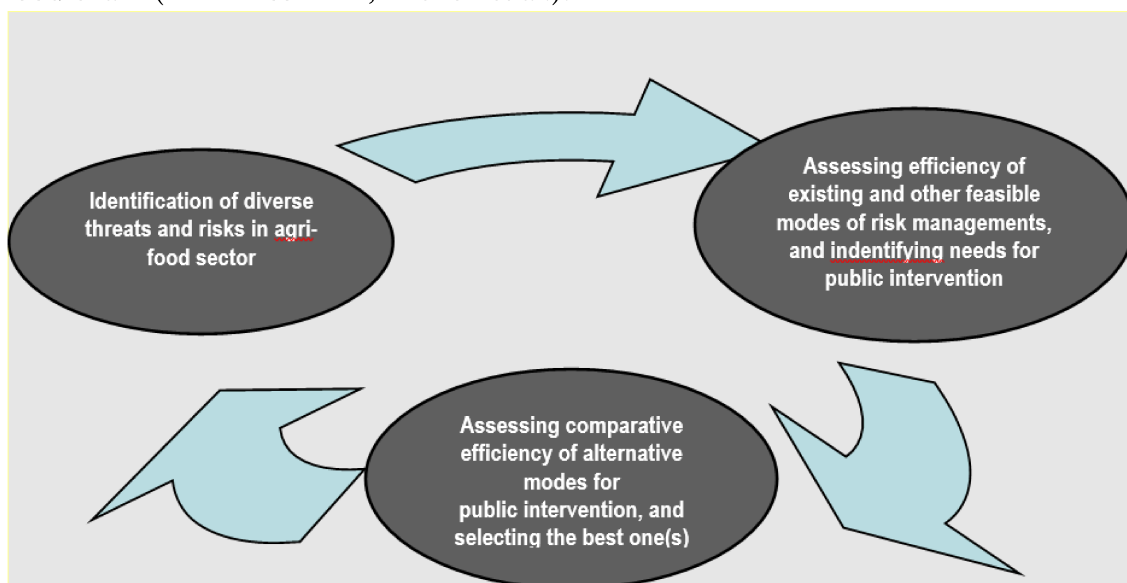


Figure 3: Analysis and improvement of risk management in agri-food sector, *Bachev*.

Second, specification of existing and other feasible modes of risks governance, and assessing their efficiency, sustainability and prospects of development. The efficiency of individual modes shows the capability for risks detection, prevention, mitigation and recovery at lowest costs while the sustainability reveals the internal potential to adapt to socio-economic, technological and environmental changes and associated threats and risks. A holistic framework for assessing the efficiency and the evolution of governing modes is suggested by OECD (OECD, 2011) and Bachev (Bachev, 2010a). That stage is to identify the deficiencies of dominating (market, private, and public) modes to solve

the existing and emerging risks, and to determine the needs for a (new) public intervention. For instance, when appropriability associated with the transaction/activity is low, there is no pure market or private mode to protect from associated risks. Emerging of a special large-members organization for dealing with low appropriability to cover the entire social risk would be very slow and expensive, and they unlikely are sustainable in a long run (free riding). Therefore, there is a strong need for a third-party public intervention in order to make protection of such risk possible or more effective – either pure public organization (e.g. public assurance for high damage natural or economic disasters) or quasi-public mode (collective organization assisted/ordered by a third party) for high probable lower damaging risks (Figure 2).

Third, identification of the alternative modes for public intervention to correct (the market, private, public) failures, assessing their comparative efficiency, and selection the best one(s). The comparative assessment is to be made on (technically, economically, politically) feasible forms as mode(s) minimizing the total risk management (implementing and transaction) costs selected. The analysis is to take into account the overall private and social costs – the direct and indirect (individual, third-party, tax payer, assistance agency etc.) expenses, and the private and public transacting costs. The later often comprise a significant portion of the overall risk management costs and are usually ignored by analysts – e.g. costs for the coordination, stimulation, mismanagement of the bureaucracy; for the individuals' participation and usage of the public modes (expenses for information, paper works, payments of fees, bribes); the costs for community control over and for the reorganization of the bureaucracy (modernization and liquidation of public modes), and the (opportunity) costs of public inaction, etc.

Initially, the existing and emerging problems (difficulties, costs, risks, failures) in the organization of market and private governance have to be specified. The appropriate public involvement would be to create institutional environment for: making private investments less dependent, decreasing uncertainty surrounding market and private transactions, increasing intensity of exchange, protecting private rights and investments etc. For instance, the State establishes and enforces quality, safety and eco-standards, certifies producers, regulates employment relations, transfers management rights on natural resources etc., and all that increases the efficiency of market and private risk management.

Next, practically possible modes for increasing appropriability have to be considered. The low appropriability is often caused by unspecified or badly specified private rights and obligations. In some cases, the most effective government intervention would be to introduce and enforce new private and groups (property) rights – on diverse type of risks and its trading; on natural and biological resources; on food safety and clean environment; tradable quotas for products, inputs, emissions; on intellectual property, origins etc. That intervention transfers the organization of activity/transactions into market and private governance, liberalizes market competition and induces private incentives (and investments) in certain agrarian risk management. In other instances, it is more efficient to put in place public regulations for risk minimization: for utilization of resources, products and services (e.g. standards for labour, product, and environmental safety); introduction of foreign species and GM crops, and for (water, soil, air, comfort) contamination; ban on certain inputs, products or technologies; regulations for trading

ecosystem service protection; trade regimes; mandatory risk and eco-training and licensing of operators, etc. In other instances, using the incentives and restrictions of the tax system is the most effective form for intervention. Different sorts of tax preferences are widely used to create favourable conditions for the development of certain (sub)sectors and regions, forms of organization, segment of population, or types of activities. For instance, the environmental taxation on emissions or products (inputs, outputs of production) is applied to reduce the use or the emissions of harmful substances; tax reductions are used to assist in overcoming the negative consequences of natural disasters by private agents etc. In some cases, public support to private organizations is the best mode for intervention. Programs for modernization, enterprise adaptation, income support, environmental conservation, public risk-sharing etc. are common in most countries around the world. Often providing public information, recommendations, and training to farmers, entrepreneurs, residence, and consumers in risk management is the most efficient form. In some cases, pure public organization (in-house production, public provision) is the most effective as in the case of critical infrastructure; food safety inspections; research, education and extension; agro-meteorological forecasts; border sanitary and veterinary control; recovery from the natural catastrophe etc.

Usually, the specific modes are effective if they are applied alone with other modes of public intervention. The necessity of combined intervention (governance mix) is caused by: the complementarities (joint effect) of the individual forms; the restricted potential of some less expensive forms to achieve a certain (but not the entire) level of the socially preferred risk prevention and mitigation; the possibility to get extra benefits (e.g. “cross-compliance” requirement for participation in the public programs); the specific critical dimensions of governed activity; the risk and uncertainty (little knowledge, experience) associated with likely impact of the new forms; the administrative and financial capability of the Government to fund, control, and implement different modes; and the dominating policy doctrine.

The level of effective public intervention (governance) also depends on the kind of risk and the scale of intervention. There are public involvements, which are to be executed at local (ecosystem, community, regional) level, while others require nationwide governance. And finally, there are risk management activities, which are to be initiated and coordinated at international (regional, European, worldwide) level due to the strong necessity for trans-border actions or the consistent (national, local) government failures. Very frequently the effective governance of many problems and risks requires multilevel governance with a system of combined actions at various levels involving diverse range of actors and geographical scales.

The public (regulatory, provision, inspecting) modes must have built mechanisms for increasing the competency (decrease the bounded rationality, powerlessness) of the bureaucrats, beneficiaries, interest-groups and public at large as well as restricting the possible opportunism (cheating, interlinking, abuse of power) of the public officers and stakeholders. That could be made by training, introducing new assessment and communication technologies, increasing transparency, and involving experts, beneficiaries, and interest-groups in the management of public modes at all levels.

Generally, hybrid modes (public-private partnership) are much more efficient than the pure public forms given coordination, incentives, control and cost-sharing advantages. The involvement of the farmers, beneficiaries and interest groups increases the

efficiency, decreases asymmetry of information, restricts opportunisms, increases incentives for private co-investment, and reduces management costs. For instance, the enforcement of most labour, quality, animal welfare, and environmental standards is often very difficult or impossible at all. Stimulating and supporting (assisting, training, funding) the private voluntary actions are much more effective than the mandatory public modes in terms of incentive, coordination, enforcement, and disputing costs (Bachev, 2010a).

If there is strong need for a third-party public involvement but the effective (government, local authority, international assistance) intervention in risk management is not introduced in a due time, then significant risks to individuals and public at large would persist while the agrarian development substantially deformed.

Dealing with many problems and risks in the agri-food sector/chain would require multiform, hybrid, multilevel, and transnational intervention, and therefore the appropriate governance mix is to be specified as a result of the comparative analysis. The later let improve the design of the (new) public intervention according to the specific conditions of the food-chain components in the particular country or region in terms of increasing security and decreasing costs.

Suggested new approach also let predict likely cases of the (new) public failures due to the impossibility to mobilize a political support and resources or ineffective implementation of otherwise good policies in the particular conditions. Since public failure is feasible, its timely detection permits foreseeing the persistence/rising of certain risks, and informing the local and international communities about the consequences.

The risk management analysis is to be made at different levels – the individual component (inputs supply, farm, processing, transportation, distribution etc.), regional, sub-sectors, food-chain, national, and international according to the type of risks and the scales of collective actions necessary to mitigate the risks. It is not a one-time exercise completing in the last stage with a perfect system of risk-management. It is rather a permanent process, which is to improve the risk-management along with the evolution of socio-economic and natural environment, the individual and communities' awareness, and the modernization of technologies. Besides, the public (local, national, international) failure often prevails which brings us into the next cycle in the improvement of risk-management in the agri-food sector.

For the application of the suggested new approach, besides traditional statistical, industry etc. data, a new type of data is necessary for the diverse type of risks and the forms of governance, their critical factors for each agent, the level of related benefits and costs etc. Such data are to be collected through interviews with the agri-food chain managers, stakeholders, and experts in the area.

C. Contemporary opportunities and challenges for agri-food risk management

The modern agri-food chains involve millions of actors with different interests, multiple stages, and divers risks requiring a complex, multilateral and multilevel governance at a large scale. For instance, in the EU the number of employed persons in the agri-food chain reaches 48 million working in almost 17 million different holdings and enterprises (Table 1) while final consumers comprise 500 million.

Table 1: Number of enterprises and persons employed in EU agri-food chain (1000).

Number		Agricul- ture	Food and beverages activities			
			Manufacturing	Wholesaling	Retailing	Services
		2010	2011			
Holdings and enterprises	EU - 28	13 700.4	267.9	275.1	1 060.2	1 448.4
	Bulgaria	493.1	5.1	5.4	31.5	19.2
Regular farm	EU - 28	26 669.4	4 725.0	2 001.5	7 369.7	7 316.5
Labour force and persons employed	Bulgaria	950.0	106.5	44.9	102.0	92.0

Source: *Eurostat*.

Various existing and emerging (natural, technological, health, behavioural etc.) threats and risks along with the modern agri-food chains are well identified (DTRA & IIBR; Eurostat, 2011a; Humphrey and Memedovic; OECD). Diverse market and private modes have emerged to deal with the specific risks driven by the ethics, competition, consumer demand, business initiatives, and trade opportunities – e.g. direct marketing, voluntary codes (professional and corporate social, labour, environmental etc. responsibility), industry standards, insurance schemes, guarantees, fair-trade, trade with brands, origins, organic and quality products etc. (Table 1). A good example for a successful initiative of multinational BSSF using market channels (“food fortification”) to overcome particular type of risk of under nutrition is presented by Bluther (Bluther).

Table 2: Major risks and modes of governance along with modern agri-food chain.

Risks	Modes of governance		
	market	private	Public
Natural disasters and extreme weather; Pests and diseases; Improper using pesticides and chemicals; Using contaminated water and soils; Improper animal health practices; Poor waste disposal; Using prohibited antibiotics;	Clientelisation; Direct marketing; Informal branding; Insurance purchase; Organic production; Specific origins; Brands; Eco-system services; Special (quality, eco-) labelling; Outsourcing;	Improved inputs, technology, variety and structure of production; Product and income diversification; Self-insurance forms; Patronage and community insurance; Voluntary initiatives; Professional codes; Building (good) reputation; Guarantees; Private producers labels and brands; Private traders labels and brands; Private and collective	Mandatory (products, process, labour, animal-welfare, environmental) quality and safety standards; Regulations/bans for using resources, inputs, technologies; Regulations organic farming; Quotas for emissions and using products/resources; Regulations for introduction foreign species/GMC; Regulations for plant and animal nutrition and healthcare; Licensing for using agro-systems and natural resources; Mandatory farming, safety, eco-training; Mandatory certifications and licensing; Compulsory food labelling and information; Public accreditation and certification; Mandatory records keeping and traceability

<p>Using contaminated feeds; Animal-borne diseases; Improper handling and storage; Poor cooling system; Poor sanitation and hygiene; Using unhygienic containers, processing units, and transport facilities; Improper grading and packaging; Using prohibited food-additives; Inputs, resources and output contamination; Changing social demands; Market price fluctuation; Market failures; Political and institutional instability; Ignorance of agents; Opportunistic behaviour of counterpart, collation partner, a third party or public officer; Criminal intrusion; Terrorist attacks</p>	<p>Security services; Fair trade system; Standards insurance contract; Hedging with future price contacts</p>	<p>origins and specialties; Private products recalls; Long-term contracts; Interlink contracts (inputs and service supply against marketing); Inputs and service cooperatives; Production cooperation; Joint-ventures; Internal audits; NGOs; Professional and consumer associations; Good Agricultural Practice; Good Hygienic Practice; Good Manufacturing Practice; Good Transport Practice; Good Trade Practice; GLOBALGAP; Private and collective food quality and safety management systems; Certification; Licensing; Third-party verification; Inputs supply integration; Integration into processing and marketing; Franchises; Risk pooling and marketing cooperatives; Vertical integration;</p>	<p>coding; Public products recalls; Public food, veterinary, sanitary, border control; Public price and income support; Public preferential crediting; Public funding farms and processors adaptation; Public safety nets and disaster reliefs; Financial support to organic production, traditional and special products, private and collective actions; National GAPs, cross-compliance requirements; Public education, information, advise; Designating vulnerable/dangerous zones; Tax rebates, exception, breaks; Eco-taxation (emissions, products, wastes); Public eco-contracts; Public food and security research/extension; Assistance in farmers, stakeholders, security cooperation; Public promotion/partnerships of private initiatives; Public food security monitoring, assessments, foresights; Public food reserves and buffer stocks; Public prevention and recovery measures; Public compensation of (private) damages; Disposal of (old) chemicals, degraded lands and water purification; Protected Designation of Origin, Protected Geographical Indication, Traditional Specialty Guaranteed; European Rapid Alert System for Food and Feed; EU policies, support and enforcement agencies (EFSA, ECDC, ECHA, CFCA, OSHA, EEA); International Standardization Organization (ISO 22000); UN (FAO, WHO) agencies interventions (Codex Alimentarius; Early Warning Systems; Crisis Management Centres); Bilateral and multilateral trading agreements/rules (WTO);</p>
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		Consumers cooperatives	National and international anticrime/antiterrorists bodies
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Source: *Bachev*.

Furthermore, different bilateral and multilateral private forms are widely used to safeguard against the risks, explore the benefits, and facilitate the exchange – e.g. clientalisation, contractual arrangements, cooperation, complete backward or forward integration etc. Special trilateral forms have evolved to enhance security and partners and consumers’ confidence including an independent (a third-party) certification and inspection. Trade internationalization is increasingly associated with the collective private actions (standards, control mechanisms etc.) at a transnational and global scale (e.g. GLOBALGAP).

The property (security and safety) rights modernization, and the market and private “failures” brought about needs and modes for public interventions (assistance, regulations, provision) in the agri-food sector. Moreover, the scope and stringency of publicly imposed rules expand constantly embracing new products, methods, dimensions (human, animal, plant, eco-health), hazards (GMC, nanotechnology, terrorism), and information requirements. Furthermore, the globalization of exchange, and threats and risks increasingly require setting up a transnational public order (e.g. ISO, WHO, FAO, WTO etc.). For instance, there are common (traceability, precaution, communication) principles, (food, veterinary, phytosanitary, feed, environmental etc.) legislation, and implementing and enforcing agencies (such as EFSA, ECDC, ECHA) for the agri-food chains in the EU (including for imported products). The process and challenges of modernization of human rights on adequate food and related legislations and implementing bodies at global, regional and national level have been well presented by Bonanomi, Hanschel, Kaufmann, Tietje (Bonanomi, Hanschel; Kaufmann; Tietje).

Consumers concerns about the food-safety risks significantly have increased after the major food-safety events/crisis in recent years (e.g. Avian flu; Mad-cow and Foot-and-mouth diseases; poultry salmonella; contaminations of dairy, berries, olive-oil; natural and industrial disaster impacts etc.). For instance, since 2005 there has been an augmentation of the respondents worrying about food-safety problems in the EU and it comprise a significant share now (Figure 4); as much as 48% of the European consumers indicate that the consumed food can very or fairly likely damage their health etc. (Eurobarometer). In a new member state like Bulgaria this figure is 75%. The number of cases and incidence rates of various foodborne and waterborne diseases is significant even in developed countries. For example, in the USA yearly 1 in 6 of 48 million people gets sick, 128,000 are hospitalized, and 3,000 die of foodborne diseases (CDC). In the EU there are also a number of confirmed cases of foodborne diseases having a high incidence rate, most notably Giardiasis (167,025), Campylobacteriosis (190,579) and Salmonellosis (134,606) (ECDC).

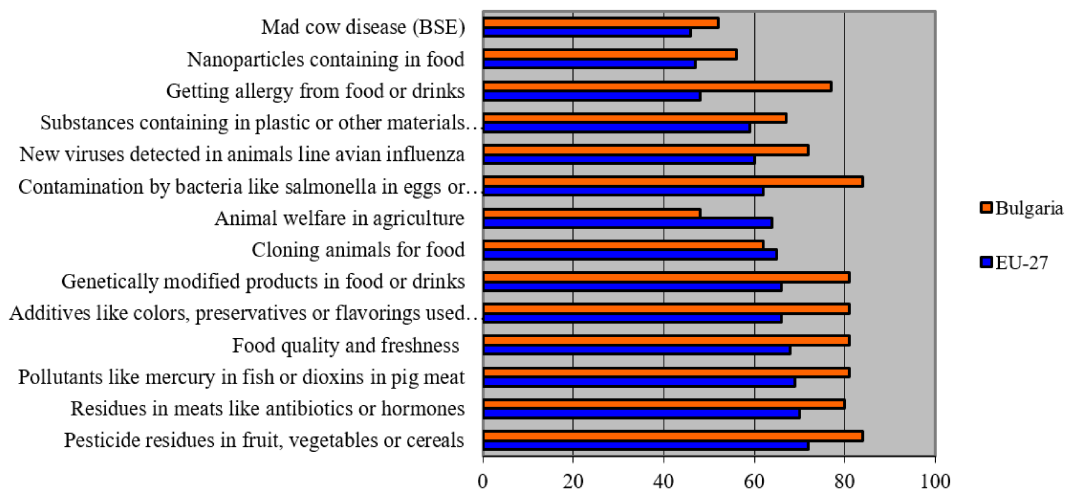


Figure 4: Indicate if you are worried in relation with following food-safety problems (% of respondents), *Eurobarometer*.

Consumers’ definition of safety reaches beyond industry’s narrow focus and changes all the time - in USA almost two-third expect their food to be free from harmful elements while other (not traditional) food safety concerns also gaining ground such as: clear and accurate labelling; clear information on ingredients and sourcing; fewer overall ingredients, no artificial ingredients and less processing; and nutritional content of foods (Figure 5). Safety is no longer strictly defined based on near-term risks and consumers’ traditional short-term food safety concerns about germs, aka pathogens, are now augmented with consideration for long-term health and wellness benefits, such as whether a food is free of carcinogens (Food Safety News). Consequently, agri-food companies operating under the old definition of safety feel ongoing pressure to address consumer concerns in a way that meets this evolving, long-term need.

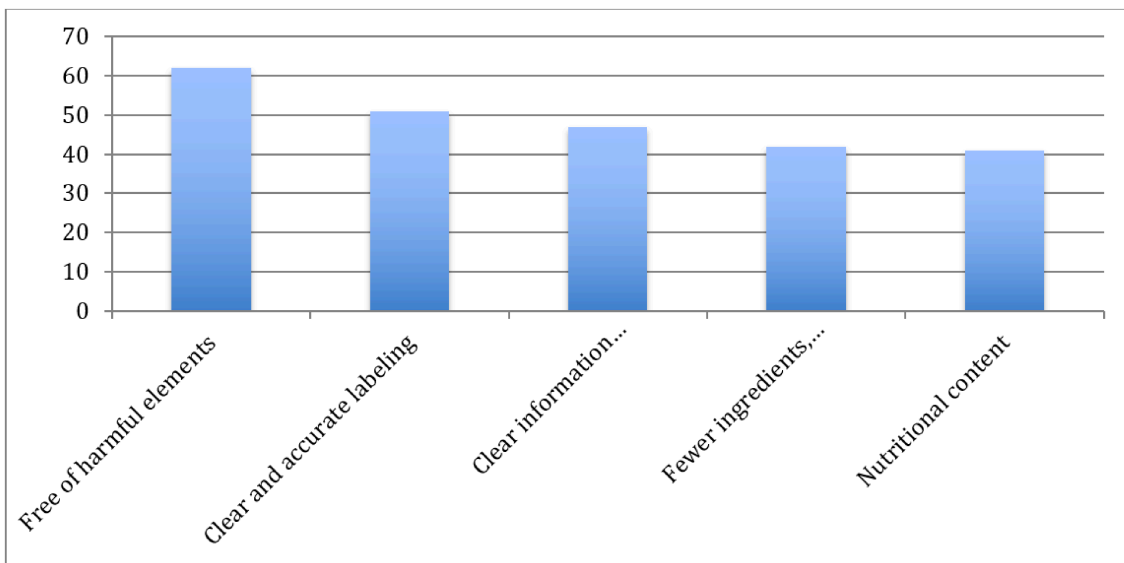


Figure 5. Consumers’ criteria for food safety definition in USA (percent), *Food Safety News*.

It is well recognised that certain types of global risks (e.g. reduction of green gas emissions, waste management) would not be effectively dealt with unless large scale collective actions are taken such as changes in consumer behaviour, dietary patterns, reduction of overall livestock and energy production, etc. (Pirscher; Melesse). Furthermore, there have been huge risks associated with persistent failure to secure access of necessary quantity and quality of food for a considerable portion of world population because of lack not of sufficient food supply (availability of food) but unfair food distribution (access to food) (Hanschel).

There are a number of (new) opportunities for the risk governance in the agri-food chain (Figure 6): First, the advances and the dissemination of the technical food-chain, training and risk-management methods (such as microbiological, genetic, electrical, laser, robotic, immunological, chemical and biosensors, nanotechnology, ICT etc.), the integral and food-chain approaches, and the research, monitoring, testing, decision, and foresighting capability for the risk-detection, assessment, prevention, and mitigation (COST; Trench at al.). For instance, the advancements in detection, assessment and mitigation methods and technologies associated with the biological and the chemical risks have been presented at a recent international conference (DTRA & IIBR).

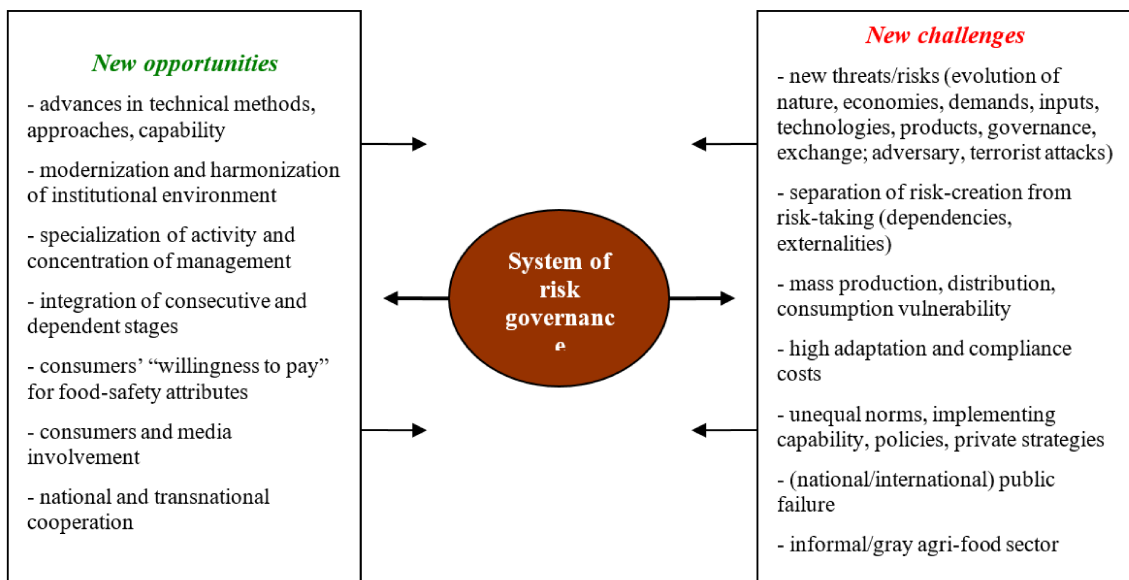


Figure 6: Opportunities and challenges for risks governance in agri-food chain, *Bachev*.

Second, the modernization and the international harmonization of the institutional environment (private, corporate, collective, NGOs, public food-safety and related standards, rules, enforcements etc.). For instance, the EU membership improves considerably the rules of the game in new member states like Bulgaria; the market access rules, and/or the corporate responsibilities induce the agri-food sector transformation of exporting countries in Africa, Latin America and Asia etc.

Third, the considerable development of the specialization of activities (including in the risk-taking, monitoring, management) and the concentration of (integral) management in the food-production, processing, servicing, and distribution – centralized innovation and enforcement; time, scale, and scope economies; easy third-party control etc. For instance, the market share of the three largest food-retailers comprises between

27-91% in the EU states (Eurostat, 2011a); the food-safety training, certification, inspection, and information are big international business (Humphrey and Memedovic), etc.

Forth, the quasi or complete integration of the food chain's consecutive or dependent stages creating mutual interests, and the effective and long-term means for the risk-perception, communication, and management. For example, in Bulgaria the (raw) milk supply is closely integrated by the (dairy) processors through on-farm (collecting, testing) investments and interlink (inputs, credit, and service supply against milk-delivery) contracts with the stallholders, while the dairy marketing is managed by branding and long-term contracts – standards and bio-labels (Bachev, 2011a).

Fifth, the increasing consumers' willingness to pay for the food-safety attributes such as chemical and hormone bans, safety and inspection labels, original and special products etc. (Trench et al.). The latter justify and make economically possible the paying-back of the costs for special governance. For instance, the recent trend is a growing consumer appetite for non-GMO goods which is met by leading producers like Cargill are responding (Wall Street Journal). The evolution of the concept "from consumer rights to consumer duties" and diverse practices of sustainable consumption are well presented by Pirscher (Pirscher).

Six, the growing consumers' (representation, organizations) and the media involvement, and the national and transnational (information, technical, managerial, training, certification etc.) cooperation of partners and stakeholders improving agent's choice, inducing public and private actions, enhancing risk-management communication, efficiency, and speed.

The modern development is also associated with a number of (new) challenges for the risk governance in the agri-food chain:

i/ the emergence of new threats, risks and uncertainty associated with the evolution of natural environment (e.g. climate change, water stress, newly emerging plant, animal and human hazards etc.) as well as the new human induced economic, financial, food, food safety, water, environmental etc. crises at large (transnational, global) scales. For instance, in the EU the household waste associated with the food (packaging, animal and vegetal wastes) is quite significant as merely its animal and vegetal components amount to 23.8 million tones and comprises almost 11% of the all household waste, or 48 kg per capita [Eurostat, 2011b].

ii/ the increasing new threats, risks and uncertainty connected with the inputs, technologies, and products differentiation and innovation – e.g. Fukushima nuclear accident severely affected the agri-food sector in Japan and beyond (Behdani); there are uncertainties and safety concerns associated with the growing application of nanotechnologies and GMCs etc. (Eurostat, 2011a).

iii/ the increasing specialization and concentration of activity and organizations which separates the risk-creation (incident, ignorance, opportunistic behaviour) and the risk-taking (unilateral-dependencies, quasi-monopolies,

spill-overs, externalities etc.). That makes the risk-assessment, pricing, communication, disputing, and liability through the (pure) market and private modes very difficult and costly. For instance, cheating, misleading, and pirating are common in the food-chain relations – high information asymmetry, detection, disputing, and punishment costs (Bachev, 2010a). It is indicating that for the risk information consumers in the EU trust more to health professionals, family and friends, consumers associations, and scientists rather than food producers, supermarkets and shops (Figure 7). A recent survey in UK also found that just one in three Britons trust the government to make sure food is safe to eat and consumers have low levels of trust in supermarkets and food manufacturers, while 70% trusted food inspectors to make sure food was safe and 60% said they trusted farmers (Daily Mail).

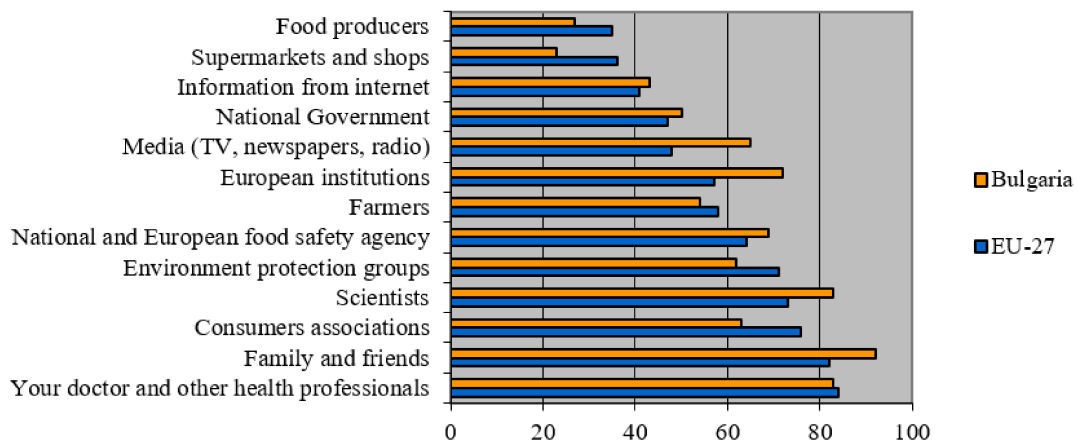


Figure 7: In case a serious food-safety risk is found I would trust for risk information to (% of respondents), *Eurobarometer*.

iv/ widespread mass production, distribution, and consumption increases the vulnerability of the agri-food chain expanding the scope and the severity of natural, incidental, opportunistic, criminal or terrorist risks. For instance, in the EU there has been a progressive number of the official notifications based on the market and non-member countries controls, food-poisoning, consumer complaints, company own-checks, border screening and rejections approaching 8000 in 2009 (Eurostat, 2011a).

v/ the increasing adaptation and compliance costs (capital, training, certification, documentation etc.) for the rapidly evolving market and institutional environment which delay or prevent the reformation of smaller farms and food-chain enterprises (Trench et al.; Bachev, 2010a). For instance, in Bulgaria the dairy and meat processors adaptation to the EU standards have continued 10 years while two-thirds of them ceased to exist before the country accession to the EU in 2007 (Bachev, 2011a).

vi/ the public and private food quality and safety standards and the efficiency of their enforcement differ considerably between the industries,

countries, and regions (Humphrey and Memedovic). This is a result of the unequal norms (e.g. GAPs, formal and informal rules) and the implementing and enforcing capability, and/or the deliberate policies or the private strategies (e.g. multinationals sell the same products with unlike quality in different countries). The double/multiple standards are responsible for the inequality of exchange, and the dissimilar threats and risks exposure of individual agri-food systems.

vii/ wide spreading public failures in the food-chain (risk) management – the bad, inefficient, delayed, under or over interventions; gaps, overlaps, infighting and contradictions of different agencies and rules; high bureaucratic costs; unsustainable and underfunding etc. For instance, the Bulgarian Food Agency and its Risk Assessment Centre were established with a 5-year delay after joining the EU (in 2011); the EU *Acquis Communautaire* are still not completely implemented in the country (capability deficiency, mismanagement, corruption); trust to the EU rather than the national institutions prevails (Bachev, 2010a). There are also numerous instances of the international assistance or governance failures when institutions are “imported” rather than adapted or designed for the specific local conditions (Bachev, 2010a).

viii/ the production, marketing, and consumption traditions, the high food or governance costs, the will and capacity deficiency, all they are responsible for the persistence of a large risky informal/grey agri-food sector around the globe without an effective control, and substandard, fake, and illegitimate products and activities. For instance, merely one-third of the Bulgarian dairy farms comply with the EU milk-standards, only 0.1% possess safe manure-pile sites, a half of produced milk is home-consumed, exchanged or directly sold (Bachev, 2011a).

ix/ the multiplying new treats and risks associated with the adversary (e.g. by a competitor) and the terrorist attacks, and the emerging governing and exchange forms (e.g. street-sells; internet, phone and mail-orders; shopping-trips etc.). All they require specific non-traditional risk-management methods and modes such as guards; policing; intelligence; multi-organizational and transnational cooperation etc.

x/ there would be further failure in securing effective food supply (food access) to all if a fundamental shift in the traditional model of governance has taken place. The later will require a new social contract and a novel public order as well as new theories and practices of distribution of wealth. In this sense a new emerging and discussed concepts of universal income, unconditional basic income, citizen's income, basic income guarantee, universal basic income or universal demogrant (BIEN) would likely give answers about prospects of dealing with persisting issues and future development.

D. Conclusion

The analysis of the modes, efficiency and challenges of risk management in agri-food chain let us withdraw a number of academic, business and policies recommendations:

First, the governance (along with the technical, information etc.) issues are to take a central part in the risk management analysis and design. The type of threats and risks, and the specific (natural, technological, behavioural, dimensional, institutional etc.) factors, and comparative benefits and costs (including third-party, transaction, time) are to be taken into account in assessing the efficiencies, complementarities and the prospects of alternative (market, private, public and hybrid) modes.

Second, the system of the risk management is to adapt/improved taking advantage of the number of the new opportunities and overcoming/defending against the evolving new challenges summarized in the paper.

Third, more hybrid (public-private, public-collective) modes should be employed given the coordination, incentives, control, and costs advantages. The (pure) public management of the most agri-food-chain risks is difficult or impossible (agent's opportunism, informal sector, externalities). Often the introduction and enforcement of new rights (on food security, risk-management responsibility etc.), and supporting the private and collective initiatives (informing, training, assisting, funding) is much more efficient.

Forth, a greater (public) support must be given to multidisciplinary and interdisciplinary research on (factors, modes, impacts of) the risk governance in the agri-food chain in order to assist effectively the national and international policies, the design of modes for public interventions, and the individual, collective and business actions for the risk management.

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PART III: CASE STUDIES

THE RIGHT TO FOOD: GLOBAL INSTRUMENTS, NATIONAL OBLIGATIONS AND LOCAL REALITIES – FEW FOOTNOTES FROM BANGLADESH*

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A. Introduction

Bangladesh is on the way to become a Middle-Income Country (MIC), but marginalized people and other vulnerable groups in the country continue to struggle for their basic human rights. Increased economic growth alone does not ensure development. It has manifold dimensions and diverse issues are interrelated. On the one hand, the legal and political obligations of the national government related to human rights are connected with global instruments. On the other hand, the accountability of the national government of Bangladesh is measured by global instruments and platforms of Civil Societies (CSOs). In practice, a complex connectivity is proceeded outside and inside of the national government. The national policies and development documents of Bangladesh acknowledge economic growth and development, but inequalities and discrimination are still burning issues. The paper describes a significant number of global instruments of the right to food in relation to Bangladesh context, makes references on national policies and discusses the status and needs of the discriminated and deprived people. In the end, the document refers to some prospects of work. The paper mainly depends on secondary information, but it also corresponds to field experiences and observations of the author. Manifold activism is happening in this field, which is not incorporated here. It can be supplemented in order to develop recommendations to enhance the right to food for all.

B. Food security, the right to food and food sovereignty

The government of Bangladesh follows the concept of food security which is the dominant concept to establish food rights. The concept of food security was shaped over the last 50 years. It was reformulated at the 1996 World Food Summit and defined as a state “when all people at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences to lead a healthy and active life”. The concept of food security has four basic pillars: availability, access, stability and utilization. The concept addresses needs and plans to implement by policies and programs.

* (a) The paper has also been shared at the “Bangladesh Conference” 04 June, 2016, Wetzlar, Germany. The conference was organized by the NETZ Bangladesh.

(b) Some parts (background and national instruments for food rights (edited & revisited) of this article have been incorporated from the Farmers Brief for Public Resources, under the ActionAid Bangladesh publication, October, 2015 which is also been written by Farhat Jahan.

In contrast, the right to food is a legal concept where the responsibility of the state has to be ensured by law. It makes a connection between right-holders and duty-bearers. In fact, the right to food is an effective way to make the food governance system accountable on global, regional and national levels.

To ensure food for all, the term “food sovereignty” was coined by the international movement La Via Campesina at the World Food Summit in 1996. The concept of food sovereignty is

“the right of peoples to healthy and culturally appropriate food produced through sustainable methods and their right to define their own food and agricultural systems. It develops a model of small scale sustainable production benefiting communities and their environment”.¹

The concept of food sovereignty prioritizes local control of the market, while food security is based on the liberalized market system.

Food security is a more technical concept, the right to food is a legal one, and food sovereignty is mainly a political concept². To understand the complexity of food rights the underlying factors of development discourses need to be considered.

C. The Bangladesh context

The right to food is a cross-cutting development issue. At present, about 62 percent of the population is involved in the agriculture sector as labour force and it contributes to about 20 percent of the Gross Domestic Product (GDP) of Bangladesh. In the last decade, Bangladesh has an impressive track record on economic growth (nearly 6 percent of GDP per year), more than 15 million people have moved out of poverty since 1992, life expectancy has increased, literacy and per capita food intake ratio as well. During the last 43 years, the people of the country have increased rice production from 10 metric tons (MT) to over 34.43 MT, but still 31.5 percent of the population is considered to live under food insecurity.³ The World Food Program (WFP) affirmed that 60 million people are food insecure.⁴ Bangladesh is ranked 142th out of 188 countries in the 2015 Human Development Index (HDI).⁵ The country was ranked 57th in the 2014 Global Hunger Index (GHI) and it has slipped rank to 73th out of 104 countries in the GHI 2015.⁶ The World Bank states that around 47 million people are still

¹ La via campesina, Defending food Sovereignty, 09 February 2011, available from: <<https://web.archive.org/web/20160509234320/http://viacampesina.org/en/index.php/organisation-mainmenu-44>> (visited on 20 March 2018).

² Food Security vs. Food Sovereignty, available from: <https://globalfoodpolitics.wordpress.com/2012/11/30/food-security-vs-food-sovereignty/> (visited on 20 March 2018).

³ About BRRI: A short introduction, Bangladesh Rice Research Institute (BRRI), 2014, 1 (8).

⁴ World Food Program, Overview Bangladesh, available from: <<https://www.wfp.org/countries/bangladesh/overview>> (visited on 20 March 2018).

⁵ Bangladesh static in Human Development Index. The Daily Star, 20 December, 2015, available from: <<http://www.thedailystar.net/country/bangladesh-static-human-development-index-190033>> (visited on 20 March 2018).

⁶ Global Hunger Index 2015: BD slips down 16 notches. The Daily Star, 13 October 2015, available from: <<http://www.thedailystar.net/backpage/bd-slips-down-16-notches-156358>> (visited on 20

below the poverty line.⁷ The country has made impressive achievements, but at the same time faces considerable challenges such as population growth (over 2 million per year), effects of climate change (sea intrusion, natural disasters, increasing salinity), deteriorating access to natural resources of marginalized people, vulnerability to price shocks (since 2008), persistent poverty (leading to poor access to food) and highest malnutrition rate of the world.⁸ Moreover, erosion of arable large scale land (0.6 percent every year), unplanned infrastructural developments and urbanization⁹, disturbed democratic practices and political turmoil, insufficient food storage systems, inadequate agriculture services for small farmers, corporate assault on agriculture, and lack of sustainable agriculture practices are challenges to the food security in Bangladesh.

However, in July 2015 the World Bank ranked Bangladesh as a lower-middle income country. The status of a middle-income country will be achieved if the average per capita income will be at least \$ 1,045 for three consecutive years¹⁰. Nevertheless, beyond the Gross National Income social insecurity, and discrimination in different levels are remain high. Gender inequalities exclude women from their rights, inadequate livelihood opportunities push rural poor in migration to urban areas and short-fall of minimum wages of workers lead to disparities.

D. International instruments on the right to food

The right to food as a human right was formally recognized for the first time in 1948 by the Universal Declaration of Human Rights (UDHR). Article 25 (1) acknowledges the right to food. Later on, the International Covenant on Civil and Political Rights (ICCPR) and the International Covenant on Economic, Social and Cultural rights (ICESCR) also acknowledged the right to food as a second category of human rights.¹¹ The “Right to Food Handbook (Legislation)” by the Food and Agriculture Organization of the United Nations (FAO) identifies the obligations of the signatory states and categories three features of international instruments. These are “main binding instruments”, “non-main binding instruments” and “normative content”. The “main binding” instruments impose legal obligations in order to enforce the right to food on the national level. The instruments are: the International Covenant on Economic Social and Cultural Rights (1966), the Convention on the Elimination of All Forms of Discrimination against Women (1979), The Convention on the Rights to the

March 2018).

⁷ World Food Program, Overview Bangladesh, available from: <http://www.worldbank.org/en/country/bangladesh/overview> (visited on 20 March 2018).

⁸ Ministry of Food and Disaster Management, Bangladesh Country Investment Plan (CIP): A road map towards investment in agriculture, food security and nutrition, Government of the People’s Republic of Bangladesh, Ministry of Food Planning and Monitoring Unit (FPMU), 2011, 7.

⁹ Food Security in Bangladesh: Achievement and challenges, The Daily Star, March 20, 2013, available from: <https://web.archive.org/web/20151003005022/http://archive.thedailystar.net/beta2/news/achievement-and-challenges/> (visited on 20 March 2018).

¹⁰ Bangladesh goes one step forward, 2 July 2015, The Daily Sun, available from: <http://www.thedailystar.net/frontpage/bangladesh-goes-one-step-forward-106231> (visited on 23 March 2018).

¹¹ Right to Food Handbook (Legislation), Food and Agriculture organization of the United Nations, 2014, 2.

Child (1989), The Convention Relating to the Status of Refugees (1951), the Convention on the Rights of Persons with Disabilities (2006), and a number of regional human rights instruments. Bangladesh has ratified the “main binding” instruments except the Convention Relating to the Status of Refugees. “Non-binding” international instruments are linked with moral obligation of the signatory states. Those are: the Universal Declaration on the Eradication of Hunger and Malnutrition (1974), the Rome Declaration on World Food Security (1996), and the voluntary guidelines to support the progressive realization of the right to adequate food in the context of national food security (2004) (*RtF: Legislation*, note 21, pp: 3-4). Bangladesh has endorsed all these “non-binding” instruments.

The “normative content” of the human right to food is addressed twice in the ICESCR. The ICESCR article 11 acknowledges the right to food. The article 11 (2) states that “the States Parties to the present Covenant, recognizing the fundamental right of everyone to be free from hunger¹².” In 1999 the Committee on Economic, Social and Cultural Rights (CESCR) has replicated the importance of the right to food in the General Comment 12, when it stated that “the right to adequate food is realized when every man, woman, and child, alone or in community with others, has the physical and economic access at all times to adequate food or means for its procurement¹³.” The establishment of the right to food is related to political, social and economic conditions. Primarily states are obligated to comply with human rights by respecting, protecting and fulfilling them. The measures of progressive realization of human rights through international cooperation and assistance can be many types: legislative, administrative, economic, financial, educational and social. The fulfillment of the right to food is abided with its constitutional recognition by states and national governments. Explicit constitutional recognition of the right to food is a legal benchmark, where the country is deliberately obligated to protect and fulfill the right to food. It is a basis to pursue a law framework for the right to food. But the constitutions of many countries follow the right to food as a guiding principle rather than an explicit one. As a guiding principle the right to food is considered as an objective to be attained. However, the exercise of the right to food is governed by legal interpretations of constitutions and the human rights set out therein (*RtF: Legislation*, note 21, pp: 5-13). The constitution of Bangladesh follows the right to food as a fundamental principle, where the right to food is identified as a basic necessity rather than a basic right (*The constitution of Bangladesh*, note 3, part-II, Article-15).

The acknowledgement of the right to food by national governments is interrelated with global governance systems. The FAO was established in 1945. It is the first international institution dealing with hunger. In the late nineties various intergovernmental processes were taken to address food security (e.g. series of world food summits in 1974, 1996, 2002, 2008). The first Millennium Development Goal (MGD 1) in 2000 was targeted “cutting by half the proportion of people who suffer from hunger by 2015”. To realize the progressive advancement of food rights, the Voluntary Guidelines to Sup-

¹² International Covenant on Economic, Social and Cultural Rights (ICESCR), <<http://www.ohchr.org/EN/ProfessionalInterest/Pages/CESCR.aspx>> (visited on 21 March 2018).

¹³ About Right to Food, <<http://www.fao.org/righttofood/about-right-to-food/en/>> (visited on 21 March 2018).

port the Regressive Realization of the Right to Adequate Food in the Context of National Food Security (Right to Food Guidelines or RtFG) were adopted by the FAO in 2004. Accordingly, the right to food guidelines the national governments are based on these laws, policies and programs. Yet governments, civil society groups and non-governmental organizations promoted the right to food at local and national levels. To reinforce a strategic focus on the right to food, an international multi-stakeholder platform, the Committee on World Food Security (CFS), played an active role in 2012. It adopted the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forest in the Context of National Food Security (VGGT). The VGGT intended to improve the governance of tenure of resources under existing obligations of states. According to the VGGT, national food security would be ensured by responsible practices of land, fisheries and forests. In 2013 the CFS also adopted the Global Strategic Framework for Food Security and Nutrition and synchronized it with implementation of the Right to Food Guidelines (*RtFG*, note 22, pp.1-4).

Despite that, about 795 million people are undernourished globally (*The State of Food Insecurity*, note 23, p. 4). The UN conference on sustainable development (Rio+20) boosted the Zero Hunger Challenge in 2012. The Rio+20 conference did not elaborate specific goals but stated that the Sustainable Development Goals (SDGs) should be the integrated development agenda beyond 2015. The focus areas of the SDGs were identified by the Open Working Group (OWG), established in 2013 by decision of the UN General Assembly¹⁴. Human rights, the principles of participation, accountability, non-discrimination, empowerment and the rule of law were the basic part of the post-2015 development agenda. While the MDGs were targeted to get “half way” of ending hunger and poverty by 2015, the SDGs planned to finish the job and to achieve “zero” statistics on hunger and poverty by 2030. The second goal of the SDGs among the 17 is dedicated to “end hunger, achieve food security and improve nutrition and promote sustainable agriculture”¹⁵. The statement addresses explicitly the driving factor of agriculture and has added links between food demands and supply chains. Thus, to get the “zero” statistical status requires real empowerment of the poorest people of the earth.

The Government of Bangladesh has integrated the MGD objectives in the Poverty Reduction Strategy Paper (PRSP) or Five-Year Plan, and the country has also committed itself to attain the SDGs. The MDG Progress Report 2015 stated that Bangladesh has made remarkable progress to attain the objectives in the areas of poverty alleviation and ensuring food security, in primary school enrolment and lowering the infant and under-five mortality rate as well as the maternal mortality rate, in improving immunization coverage and reducing communicable diseases (*MDGs Report, Bangladesh*, note 9, p. “forward” section). The Bangladesh MDG Progress Report 2015 states that the people below poverty line have been reduced from 58.8 percent in 2000 to 43.3 percent in 2010 (*MDGs Report, Bangladesh*, note 9, p.19). The State Food Insecurity in the World Report 2015 also states that in recent year (2014) the number of un-nourished

¹⁴ Open Working Group on Sustainable Development Goals, available from: <<https://sustainabledevelopment.un.org/owg.html>> (visited on 21 March 2018).

¹⁵ Goal 2: End Hunger, available from: <<http://www.un.org/sustainabledevelopment/hunger/>> (visited on 21 March 2018).

people in Bangladesh 26.3 percent (*The State of Food Insecurity*, note 23, p.46). However, the existence of poverty pockets, the prevalence of unemployment and the uneven growth are some of the numerous remaining challenges in Bangladesh. According to the World Food Program (WFP), 41 percent of children under the age of five are chronically undernourished, 26 percent stunted and 12 percent have low weight-for-height. A third of the children from six months to age of five years are anemic, 40 percent of school-aged children are iron deficient, only 25 percent of children have access to an adequate diet. Among women, 24 percent are underweight and 13 percent are short in stature; subsequently their children will also be stunted. Despite of the growth in wages over the past five years, food price spikes place balanced diets beyond the reach of millions. Sacrifices of food consumption are highly gender biased, women and girls make the sacrifice¹⁶. Against this background, it remains challenging to attain the SDGs, while national instruments are mainly committed to achieve the status of a middle-income country. But the growing inequalities need to be addressed through the sustainable development approach.

E. National instruments for food rights

The constitution of Bangladesh states in Article 15 (a) that “it shall be a fundamental responsibility of the state to secure its citizen the basic necessities of food”. According to the constitution, food rights shall be applied as fundamental principles rather than fundamental rights, despite the recognition that food rights are a surviving issue for many people in the country.

I. Development document

The national government as per all global legacies is firmly committed to achieve food security for all. Other national instruments also echo the same commitment. In practice, vast gaps exist between policies and practices. In this section, the paper describes policy commitments of the national government and the practices people’s access to the necessary resources to exercise their food rights. The current National Food Policy (NFP) was adopted in 2006 and followed the definition of “food security” of the World Food Summit of 1996. The NFP aims to provide immediate access to food to most vulnerable groups, promote agricultural development and income growth. The National Agriculture Policy (2013) also aims to increase production and efficiency of the related institutions. The National Agriculture Extension Policy (draft: 2012) also encourages various partners and agencies to increase productivity of agriculture. Beyond these policies, the food security issue is related with other national instruments which are also committed to ensure people’s access and rights in natural resources. Some global involvements also encourage the national government to prepare national development instruments to follow the commitment to food security and the development of the Bangladesh Country Investment Plan (CIP) is a part of that global legacy.

¹⁶ 10 Facts about Hunger in Bangladesh, available from: <<http://www.wfp.org/stories/10-facts-about-hunger-bangladesh>> (visited on 21 March 2018).

In 2010, the country has adopted its first-ever long-term plan, the Perspective Plan of Bangladesh to make the Vision 2021. The main goal of the Vision 2021 is to increase economic growth, to eradicate poverty and to upgrade Bangladesh to a middle-income country by 2021, the Golden Jubilee Year of national independence, and to raise the per capita income to US\$ 2,000.¹⁷ But if the distribution of the national income is not equal, will the MIC status help to eradicate poverty? In the country, inequality has been stagnant from 2006 and it has been going down from 2010 onwards according to statistical data. The wealthiest 20 percent of Bangladeshis control 42.8 percent of the wealth. The poorest 20 percent of the population control only 3.9 percent of the wealth.¹⁸ The Vision 2021 is associated with two five-year plans (Sixth and Seventh five-year plan). On the other hand, the present Seventh Five Year Plan (2016-2020) is targeting more than 8 percent GDP growth in the first two years of the Seventh Five Year Plan. To become a MIC, the country development instruments cannot be simplified by economic growth; those require sustainable development plans in many aspects. These should include redistribution, equality, and a responsible governance system.

The background of the draft National Social Protection Strategy (2014) (NSPS) were the identified poverty challenges: First, one third of the population is living below poverty line. Second, additional 18.8 of the population are living below the Upper Poverty Line (UPL) and most vulnerable groups are reaching out the social protection programs. Third, the Social Protection Strategy needs to be refined by the poverty profile of geographic and sectoral variation (*NSPS (draft)*, note 16, p. x). The Government's commitment is reflected in the budgetary allocation for Social Protection Programs (SPP) which was in 1.3 percent of the GDP in 1998 and 2.5 in FY 2011 (*NSPS (draft)*, note 16, p. xi). But the allocation is nominal against the percentage of poverty. However, the changing poverty context of Bangladesh and the complexity of the current social protection system (SPS) inspired the government to review the SPS and adopt the NSPS. To ensure social protection to vulnerable groups, the current draft NSPS tries to coordinate the "food transfer programs": Various programs can be listed under four groups that provide food as benefit transfer (i.e. Vulnerable Group Development, VGD), food as consumption for work (i.e. Food for Work), food as disaster relief (i.e. Vulnerable Group Feeding, VGF) and stabilizing food prices (i.e. Open Market Sales). It has been announced that the implementation process will continue in a systematic manner and the reform will be completed by July 2018 (*NSPS (draft)*, note 16, pp. 73-74). The existing schemes in the current SPP should be revisited through broader sharing of the NSPS. The incorporation of an accountable monitoring system can be welcomed to make governance system of the social protection system effective.

¹⁷ Perspective Plan of Bangladesh 2010-2021: Making Vision 2021 a Reality (Vision 2021), General Economics Division Planning Commission, 2012, 1 (2, 19).

¹⁸ Encyclopedia of the Nation. Bangladesh - Poverty and wealth, available from: <<http://www.nationencyclopedia.com/economics/Asia-and-the-Pacific/Bangladesh-POVERTY-AND-WEALTH.html>> (visited on 21 March 2018).

II. Budget

Is the national budget of the country able to include equality, redistribution and a responsible governance system? In the last couple of years, the GDP growth is ceased to about 6 percent per annum. In the fiscal year (FY) 2011-12 the targeted GDP growth rate was 7.0 percent, in 2012-13 and 2013-14 FY the expected GDP was 7.2 percent. But the targets were missed in every fiscal year, the achievement in 2013-14 was 6.2 percent. The 2014-15 FY targeted a GDP growth rate of 7.3 percent (*A Rapid Assessment of National Budget 2014-15*, note 8, pp.5-6), which was reviewed and targeted then to 6.8 percent, although donor organizations and economists predicted that political turmoil and other constraints had influenced the GDP growth and that it would be about 6.5 percent¹⁹. The current fiscal year 2015-16 has targeted a GDP growth of 7 percent again but according to World Bank's forecasts the achievement will be 6.7 percent²⁰. Mention that, to minimize the GDP shortfalls most of the subsidies sectors are revisited. In last decade the country has made significant progress in terms of rice production, but agriculture subsidy has declined in the fiscal year 2014-15 in comparison to last couples of fiscal years.

III. Land

The issue of food security is interlinked with many other national development instruments. The National Land Use Policy (2001) has highlighted effective land use to ensure food security. But every year arable lands are decreasing and used for different purpose. The policy also committed to conserve forest (*National Land Use Policy*, Article-2 (Cha) and article-17 (section 17.12), note 15, pp. 5&12); but in 2013 the government approved the Rampal Power Plant to improve the energy sector of the country. The location of the power plant is only 14 kilo-meter away of the Sunderbans' mangrove forest, it itself violate the basic precondition which says a project should be 25 kilometers away from ecological sensitive areas endorsed by the Department of Environment. The Sundarbans' forest is internationally marked as wetland deserving protection, and the Rampal project goes against the Ramsar Convention, which was signed by the national government in 1992.

The Phulbari Coal Mining Project is another case of land acquisition by the State. It is one of the biggest mine projects in Bangladesh history. It is projected that the project will acquire about 135 square kilometers, and its affect will carry nearly 656 square kilometers. It will physically and economically displace around 220,000 people, mainly farmers and indigenous households²¹. In fact, it will destroy a significant agricultural region of the country, but the initiative of the government goes against the

¹⁹ The GDP growth will not be more than 6.5. percent (in Bengali). Daily Samakal, 8 April, 2015, available from: <<http://www.samakal.net/2015/04/08/129825>> (visited on 21 March 2018).

²⁰ World Bank global report forecasts, available from: <<http://bdnews24.com/economy/2016/01/07/world-bank-global-report-forecasts-6.7-percent-gdp-growth-for-bangladesh-in-2015-16>> (visited on 21 March 2018).

²¹ BankTrack 2012, Dodgy Deal: Phulbari coal mine Bangladesh, available from: <https://file.ejatl.org/docs/open-cast-coal-mine-phulbari-bangladesh/banktrack_phulbari_coal_mine.pdf> (visited on 21 March 2018).

notion of National Land Use Policy (*National Land Use Policy*, Article-2 (Ka) and Article-5 (5.5), note 15, pp. 4&7). If it will be implemented thousands of farmers will turn into wage laborers and will be threatened by food security too. Due to the planned open-pit acid mine drainage system the project will be linked to hundreds of small rivers; those will travel long beyond the mining footprint and deplete the water level. The United Nations Educational, Scientific and Cultural Organization (UNESCO) projected that the impact will carry up to Sundarbans' mangrove forest. The people resistance of Phulbari areas has postponed the project implementation initiatives. The people protest against the Rampal project is going on. Large-scale transactions and investments on natural recourses as the Rampal and the Phulbari projects deny legitimate tenure rights of the people living in these areas including human rights, livelihood and right to food.

Nevertheless, the extreme level of land scarcity has been consistent in the country and it is gradually growing because of unplanned infrastructure development, urbanization and population growth. In the country per capita land ratio is 27 decimal and arable land ratio is 17 decimal (*National Land Use Policy*, article-1.1. note 15, p.3); (1 decimal is equal to 1/100 acre, equivalent to 40.46 square meter). The trend is declining over the years, according to the Agriculture Census Report 2001 up to 68.8 percent of rural households are landless, which was up to 56.5 in 1983-84. But in the country, only 11.5 percent of agricultural *khas* (state owned land) land are distributed among landless people and the rest are occupied by the political elites and powerful riches (*Raihan, Fatehin, and Haque*, note 20, pp. 25-27). Bangladesh has 3.3 million acres of *khas* land and 6-7 million landless households²². To review land policies and the distribution of *khas* land are major challenges as in practice large-scale land mainly owned by national and local political elites and in some cases by bureaucrats. To implement a land reform and to redistribute *khas* land needs political support while to work on the issues would be a 'political suicide' for any regime. On the other hand, in case of *char* lands (emerging lands due to erosion and accretion of rivers) it is often difficult to determine the ownership which is related to accelerated vulnerabilities of marginalized people. By the end of the twentieth century, an estimated 10.5 million Hindu households were affected by the Enemy Property Act²³ (EPA. 1965. 1969) and Vested Property Act (VPA. 1974, 2001); religious minorities were unable to exchange their property and a 'legitimate displacement' occurred through the laws (*Feldman and Geisler*, note 4, pp. 8-10). In the country, women have also limited legal rights on land. Inheritance law, social practice and patriarchy deny women's right to own land. This is one of the major obstacles to establish women's access to resources in the country. Rather than, every year in the country over 80 thousand hectares of agricultural land turn into non-agricultural land²³. All these factors are serious concerns regarding agriculture production and food security.

²² The benefits of khas land distribution among the extreme poor, see: <<https://web.archive.org/web/20160915062035/http://www.shiree.org/khasland-can-arrest-extreme-pov-erty/#.Wr12Y5ciGUk>> (visited on 21 March 2018).

²³ Food Production to double, The Daily Star, September 08, 2013, available from: <<http://www.thedailystar.net/news/food-production-to-double>> (last accessed on 20 April, 2016).

IV. Water

Once Bangladesh was considered as a riverine country; but nowadays rivers-cannels and water bodies are possessed and polluted by manifold reasons and actors. The National Water Policy (1999) does not protect to own private water-bodies. Based on the National Water Policy in 2001 the country adopted the National Water Act-2013. According to the Act, all types of water within the territory (surface water, ground water, sea water, rain water and atmospheric water) belongs to the government on behalf of the people (*National Water Act-2013*, Article-3 (1), note 17, p.4). The Act provided unlimited power to the Executive Committee while ‘water resources belong to the people’; however, no individual or no organization can file a lawsuit against other individuals, organizations or government without a prior written complaint from the Director General of Water Resources Planning Organization (*National Water Act-2013*, Chapter-III, note 17, pp.8-12). The unlimited power of the Executive Committee may lead to lawlessness of the country people; those who have ultimate power of the water resources.

To uphold interests of actual fisherfolks, the government adopted the Jalmahal Management Policy 2009 (Jalmahal refers to water-bodies). But does it protect fisherfolks rights? The government statistics states that about 28,000 public water-bodies exist in the country²⁴. The Jalmahal Management Policy has a vital role to lease out these water-bodies to marginalized fisherfolk communities. As per the Jalmahal Management Policy, only genuine fisherfolk societies are eligible to obtain a lease of the public water-bodies and they should be registered by the local Social Welfare Department or Cooperatives Department (*Jalmahal Management Policy*, Article-5, note 7, p.3). In practice, to receive the registration from Cooperative Department remains a big challenge for marginalized fisherfolks communities. Because to formulate a group or society is difficult for extreme poor fisherfolk communities; in this process they should get certified their ‘genuine’ identity as fisherfolk group or society by the Upazila²⁵ fisheries officer on behalf of Upazila Jalmahal Management Committee and then they would go to the Cooperative Department for registration. Thus, to obtain a registration as ‘genuine’ fisherfolk society itself is a big challenge and in practice the ‘genuine’ fisherfolk societies failed to do it. As *khas* land ‘fisherfolk societies are also captured by the powerful section of the society or local and national political elites. The reality exists in practice since long but the Jalmahal Management Policy (2009) failed to address the complex issue. Thus, the implementation of the policy has failed to ensure fisher fisherfolks accesses and rights to water.

V. Forest

The forest policy (1994) and the Forestry Master Plan (1993) affirmed that the Forest Department (FD) is responsible to afforest and protect existing forests based on

²⁴ Does it benefit fishers? The Daily Star, July 28, 2011, available from: <http://archive.thedailystar.net/newDesign/news-details.php?nid=196018> (visited on 21 March 2018).

²⁵ Upazila refers to some sub-units of a district, and the Upazilas are working for administrative purposes within a determined geographical area in Bangladesh.

the participation of forest dependent people; the acknowledgement of the people's participation has to ensure their access to natural resources. But in collaboration of different donor funded projects the FD is implementing afforestation in the Madhupur Sal Forest Area, including planting mainly alien and exotic species trees of commercial value. The land tenancy disputes between the FD and the local indigenous inhabitants are yet unresolved whereas indigenous inhabitants are accused as "illegal" loggers by the FD officials.

VI. Indigenous peoples

The country is comprised of diverse people out of which about 3 million are indigenous peoples (about 1.2 percent of total population) belonging to 45 different ethnic groups. Land matters to all people; whereas land related disputes are the main instrument to make indigenous peoples marginalized. Moreover, land issues of indigenous peoples are not uniform across the country and individual property ownership of the mainstream culture clashes indigenous communal ownership practices. In the Chittagong Hill Tracts (CHT), about 13 indigenous groups are collectively called 'jumma people'. They are traditionally habituated with *jum* cultivation (slash-and-burn). But the state imposed restriction on *jum* cultivation and banned it officially. In the 1960s the Kaptai Dam and hydro-electric plant was built in the CHT. The project caused for massive displacement, which accrued 40 percent cultivable land of the CHT and around 85,000 people were displaced. To some extent the displaced people were not compensated and rehabilitated. In the late 1970s, the state provided settlement program for Bengali settler heightened land problems in the CHT. According to the law, customs and practices of the CHT people, the CHT Peace Accord of 1997 and the CHT Land Commission were not able to solve the land problems yet. On the other hand, land issues of plain land indigenous peoples have different dimension. The 'Chhito Nagpur Tenancy Act 1908' prohibited land transfer from 'tribal to non-tribal people' and according to the 'State Acquisition and Tenancy Act 1950' District Commissioner's permission is required to transfer land (*Raihan, Fatehin, and Haque*, note 29, pp. 48-52). But in practice, both acts are violated and indigenous peoples of plain land are dispossessed from land either by misusing law or by force. The plain land indigenous peoples have lack of consciousness of rights, and legal information. The development programs of the government make them more marginalized. According to the International Covenant on Economic, Social and Cultural Rights (ICESCR: Article 2.1)²⁶ the state is obligated 'to respect, protect and fulfill all human rights to the maximum of available resources.' But in practice indigenous peoples including other vulnerable groups are deprived from minimum access to natural resources.

F. Prospects of work

It has become clear that policies are committed to ensure rights while practices are

²⁶ International Covenant on Economic, Social and Cultural Rights, <<http://www.ohchr.org/EN/ProfessionalInterest/Pages/ICESCR.aspx>> (visited on 21 March 2018).

to be challenged to exercise the rights. The demand for effective practices is echoed in the voice of grassroots farmers' leader Sajeda Begam (35):

“If marginalized people get the opportunity to enjoy all rights which they are entitled to that would be enough to advance food security. In practice, there are big gaps to implement programs and policies. In this concern the government should be regulated by development of use, management and control over resources”.²⁷

Thus, the recently drafted Food Security Act (2016) *should include all tenure rights of poor, vulnerable and marginalized sections of the country.*

To ensure food security, accountable governance structures should be addressed in the next seventh Five Year Plan (2016-21). *To enhance the right to food, institutional stakeholders of food security can work for effective governance at global, regional and national level. Accountability of the governance system needs to be achieved beyond food and agriculture sectors. It should include food as a multi-dimensional issue and secure the access of marginalized and vulnerable groups to natural and public resources.* The initiatives of the NSPS should be shared and verified by different non-government actors of the country, including grassroots representatives.

To reach MIC status, the importance of economic growth is emphasized over and again in the national development agenda. Yet issues of redistribution of resources are overlooked. Moreover, the country does not protect the right to food through a specific law or the constitution. While a significant number of development instruments exist, they are only indirectly acknowledged as various aspect of the right to food. Thus, a comprehensive institutional review can help to uphold activism on the right to food issue.

It should be also mentioned that the right to food concept mainly draws attentions to state obligations and responsibilities. However, non-state actors such as transnational corporations (TNCs) and international financial institutes (IFIs) significantly influence human rights consequences. The TNCs and IFIs have menacing control on food production, processing and marketing around the globe. Thus, to realize the right to food status, the existing critical analysis of corporatization of agriculture and food needs to be discussed and taken into consideration.

A series of meetings and discussions on the right to food issue have taken place at global level. The G8 and G20, UN agencies, and global civil society actors participate in the Committee on World Food Security (CFS). Beyond that, substantial global funding sources have been spent (e.g. World Bank, European Union) for food security. These procedures and events need to be critically analyzed to take on the right to food and food security issue beyond the economic engagement.

G. Closing word

The discussion above has asserted a consistency between global and national instruments. It has also made a clear statement that the national instruments are committed to advance food security while local realities penetrate the unaccountable governance

²⁷ Jahan, Farmers Brief for public resources, ActionAid Bangladesh, 2015, 13.

system. The discussion also highlighted that significant development instruments exist but marginalized people and other vulnerable groups are out of reach of the development journey. A clear focus is required to review the implementation strategy and the accountability of the present governance system. Moreover, it is necessary to understand the growing global concern “to ensure peoples’ rights” as a particular configuration between global and local. In conclusion, it could be said that the gaps between national instruments and implementation strategies need to be addressed in an institutional way. Bangladesh has achieved remarkable economic growth, but the terms of social development indicators, redistribution of resources and the overcoming of growing inequalities need to be addressed in a holistic manner, which will ensure the right to food for all.

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FOOD SECURITY OF UKRAINE AND THE CHALLENGES OF GLOBALIZATION

Andrii Mykhailov

The last decade of the 20th century and the beginning of the 21st century have been characterized by rapid shifts in the system of international relations, fast progressive trends of international integration, with new management principles. The world economy is transformed into a single organism – this is all happening under the influence of globalization, in terms of resources, their sources, forms and dimensions of economic evolution. In general, the rapid integration processes can be characterized as positive, contributing to the development of new regional markets, and to achieve effective interaction between suppliers and consumers and stabilize the national socio-economic development of individual countries.

In order to analyse the influence of integration and globalization processes on the development of certain sectors of the economy, one should understand the nature of their occurrence, as well as what exactly globalization is. A synthesis of the views of many researchers, leading international Economics experts gives reason to the conclusion that, first of all, the growth of international trade and investment, diversification of world financial markets, the expansion of global labour markets, the increasing role of TNCs (transnational corporations) in world processes, sharpened global competition, the emergence of systems of global and international strategic management (*Filipenko 2002, Fomishin 2002, Sabluk 2008*). Based on the evidence, the essential meaning of the notion of globalization is interpreted differently.

According to many scholars, globalization is a product of the postmodern era, the transition from industrial to post-industrial stage of economic development, forming the basis of the neosphere-space civilization¹. *S. V. Fomishin* notes that the globalization of economic development is an objective process of submission of directions of economic development of individual countries laws and directions of development of the global market economy². We fully share this understanding of globalization processes, which is to a certain extent confirmed by the results of their influence on the development of agrarian sector of economy of Ukraine. This influence manifests itself in various aspects. First of all, there is a growth of volumes of foreign economic activity, that is, export activities, enhanced divergence international trade in agricultural and food products, agricultural production of the country is subject to the requirements of the world market and specialize on the cultivation of export-oriented crops (sunflower, wheat, corn, soybeans, barley).

¹ *Filipenko A.*, Ukraine and the world economy: interaction at the turn of the millennium, in: A. Filipenko, V. Budkin, A. Galchinsky (eds.), Lybid, Kiev 2002, 470 (in Ukrainian: Україна і світове господарство: взаємодія на межі тисячоліть / А.С. Філіпенко, В.С. Будкін, А.С. Гальчинський. – К.: Либідь, 2002. – 470 с).

² *Fomishin S.*, International economic relations at the turn of the millennium. [textbook], Oldi-plus, Kherson 2002, 560. (in Ukrainian: Фомишин С.В. Международные экономические отношения на рубеже тысячелетий: учебное пособие - Херсон, Олди-плюс. 2002, 560 с).

At the same time, the integration and globalization processes give rise to certain positive opportunities and factors, as well as negative consequences and results. Unlike internationalization, which, through the intensification of international trade, has always secured significant dividends for the most powerful countries, globalization means inevitable subordination of national economies to global centers on the terms of the latter³.

Thus, globalization becomes a permanent factor in domestic and international economic life – and this should be considered in the formation of foreign economic policy of each country, identifying priority areas of international economic cooperation.

This fully applies to the impact of globalization processes on the development of foreign trade activities of the agrarian sector of Ukraine, which in the last decade is characterized as a powerful player in world markets for agricultural products and foodstuffs. However, realizing the above characteristic features of the globalization process, the choice of destinations of international economic cooperation and the possible connections to different kinds of integration structures, requires careful weighing of potential risks and benefits.

Market research in world markets for agricultural products and foodstuffs testifies to the fact that Ukraine, especially after gaining membership in the WTO, rapidly became one of the major players in world trade in agricultural products. However, the definition of prospects of development of foreign economic activity in the agricultural sector of the country in the context of the implementation of various vectors of its international integration requires, in our opinion, the implementation of comparative analysis of main socio-economic indicators of Ukraine and certain major international integration groupings: the European Union and the Customs Union (table. 1).

The data in table 1 reflect conditions of development of foreign economic activity in the agricultural sector and show that Ukraine, processing 32.5 million hectares of arable land (which constitutes one fifth of the arable land of the countries of the Customs Union), is exporting per ha four times more agricultural products than countries of the Customs Union, which confirms its significant export potential. However, bearing in mind the level of creation of GDP per capita, Ukraine is much smaller in comparison to European countries and the countries of the Customs Union. It should be noted that the development of the agricultural sector of the European Union, in particular, the level of provision of population with food as well as the transformation of the European Union with permanent stable importer to a net exporter took place due to the accession of new members, as well as through the formation and implementation of Common agricultural policy (CAP).

³ *Sabluk P.* Globalization and food, [Monograph], in: P. Sabluk, O. Bilorus, V. Vlasov (eds.), NSC IAE, Kiev 2008, 632 (in Ukrainian: Саблук П.Т. та ін.. Глобалізація і продовольство: Монографія /П.Т.Саблук, О.Г.Білорус, В.І.Власов. – К.: ННЦ ІАЕ, 2008. – 632 с).

Table 1: Comparison of individual socio-economic indicators of Ukraine, the customs Union and the EU.

Indicators	Custom union	EU	Ukraine
Population, million	168,6	502,1	45,2
GDP per capita, thous. USA	10,9	33,0	6,5
The area of farmland, million ha	433,3	186,5	41,3
The area of arable land, million ha	151,0	107,4	32,5
Production:			
Grain, million tons	92,5	292,8	56,3
Yield, centner /ha	21,0	51,5	37,5
Oil crops, million tons	4,9	14,1	4,5
Yield, centner /ha	4,2	8,3	6,7
Milk, million tons	43,3	149,7	10,8
Milk yield, kg	3146	6461	4175
Exports of agricultural products, in billion us dollars.	14,7	521,0	12,7
including 1 ha of arable land, USD	97,4	4851,0	390,8

Source: State statistics service of Ukraine.⁴

It should be noted that the domestic agricultural sector annually increases its presence in the global agri-food markets. In addition, the agricultural sector is one of the key sectors in the country, which ensures the supply of foreign currency. In particular, in 2015, the agricultural sector accounted for one third of foreign exchange earnings of the country, making it a powerful locomotive of development for other sectors of the national economy⁵.

To characterize the dynamics of development of foreign economic activities of the agricultural sector, it should be noted that, in comparison, the share of agri-food products in the structure of national exports increased from 19 percent (9.8 billion USD) in 2010 to 30 percent (16.7 billion USD) in 2014. As of the end of December 2013, Ukraine exported products of the agro-industrial complex (AIC) of nearly 15 billion USD, which accounted for over 25 percent of the total exports of Ukraine.

In addition to the consistently positive foreign trade balance of the country from trade agri-food products over the past decade, Ukraine is rapidly climbing to the top of the major players exporting to the world market for certain types of goods. Thus, the volume of soft wheat export of Ukraine in 2014 became sixth place among the leading exporters of the world (11 million tons), while the volume of sunflower oil (4.3 million tons) is ranked first. In 2014, Ukraine was ranked 3rd on world markets in the export

⁴ *State Statistics Service of Ukraine*, available at: www.ukrstat.gov.ua. (last accessed on 17 September 2017) (in Ukrainian: Державна служба статистики України. – [Електронний ресурс]. – Режим доступу: <http://www.ukrstat.gov.ua>. (на 17 вересня 2017р).

⁵ *Danylyshyn B.* About the future of Ukrainian agriculture, available at: https://lb.ua/blog/bogdan_danylysyn/283545_budushchem_selskogo_hozyaystva.html (visited on 21 March 2018) (in Russian: Данилишин Б. О будущем сельского хозяйства Украины. (на 19 августа 2016р).

of corn (18 million tons), 4th in the export of barley (2.7 million tons), 7th for export of soybean (2 million tons) and 8th for export of poultry meat (170 thousand tons) ⁶. The agricultural sector even during the global financial and economic crisis provides a positive foreign trade balance in international trade in agricultural products. The volumes of export of Ukrainian farmers have long been ahead of such traditional export industries like machinery and chemicals. In particular, the domestic agricultural complex for several years shows a steady growth of deliveries of its products abroad. Increasing supply on the international market, the agricultural sector of Ukraine in the sphere of international economic cooperation predetermines the decline in world food prices and solves the growing problem of global food security.

However, analysing the commodity structure of export of the agrarian sector of Ukraine, one should point out its raw material orientation: predominant are the products of an insignificant value. The product range offered on international markets is very constricted, and mostly consists of grain products. So I can talk about the specific dictates of the global market trends and specialization of agricultural production of Ukraine, which is expressed in the structure of agricultural lands occupied by major agricultural crops (table. 2).

Data in table 2 confirm the influence of globalization processes in the world economy on the development of agrarian sector of Ukraine through the subordination of agriculture to the needs of the global market. It appears that in the structure of sown areas of the country there has been a significant transformation by reducing forage crops 4 to 5 times, with a simultaneous increase of nearly 3 times the proportion of industrial crops, namely sunflower, the proportion of crops which reaches nearly 19 percent annually, which exceeds the scientifically grounded norm (10-12 percent) by almost half. Analyzing the presented data, it can be noted that for most producers the characteristic is a violation of scientific rules of management, with the cultivation of monocultures prevailing. One should also point to a significant expansion in the structure of cultivated areas of energy crops (sunflower, corn, soybean, sugar beet, etc.) that requires producers to resort to growing them as monocultures, not following the sequence and alternation of major crops and predecessors. This causes the population of the pests of the fields and associated weeds, which reduces yields, the use of additional means of protection of plants leads to soil pollution.

⁶ *Business Views*, 10 agrarian results of 2016, available at: <<http://businessviews.com.ua/ru/economy/id/selskoe-hozjajstvo-2016-itogi-1419/>> (visited on 21 March 2018) (in Russian: Бизнес взгляды, 10 аграрных итогов 2016 года Украины. (на 19 октября 2017р).

Table 2: Dynamics of structure of cultivated lands under main agricultural crops in Ukraine.

Indicators	1990	1995	2000	2005	2010	2014	2014 to 1990 +,-
Total land, million ha	60,35	60,35	60,35	60,35	60,35	60,35	0
Sowing area agro crops, thousand ha	32,41	28,11	27,17	26,95	27,67	27,80	-4,61
including grains and legumes	14,58	14,22	13,65	15,09	15,72	15,45	0,87
technical culture	3,75	4,0	4,19	7,30	7,44	7,85	4,1
of which: sugar beet	1,61	0,95	0,86	0,50	0,53	0,46	-1,15
Sunflower	1,64	2,87	2,94	4,57	4,74	5,19	3,55
forage crops	12,00	8,33	7,06	2,60	2,48	2,48	-9,52
The level of development, %	69,6	69,5	69,3	68,9	68,9	68,8	-0,8
The level of tilled soil, %	79,5	78,1	77,9	78,1	78,2	78,3	-1,2
The structure of sown areas, %							
a) grains and legumes	45,0	48,5	50,2	56,0	56,8	55,6	10,6
b) technical culture	11,6	13,2	15,4	27,1	26,9	28,3	16,7
of which: sugar beet	5,0	3,2	3,2	1,9	1,9	1,6	-3,4
sunflower	5,0	7,3	10,8	17,0	17,1	18,7	13,7
c) forage crops	37,0	30,1	26,0	9,6	9,0	8,9	-28,1

Source: State statistics service of Ukraine.⁷

We can say that over the past decades, the main agricultural producers defiantly neglect the observance of the requirements of rational land use and crop rotation, which, of course, adversely affects the environmental condition of the land and leads to the depletion of the soil by the reduction of qualitative characteristics (in particular, the content of humus) of agricultural land.

A definite confirmation of the influence of the world economy and globalization processes on the development of the agrarian sector of Ukraine can provide data on the ratio of the main branches of agriculture in the structure of gross output (table 3).

⁷ *State Statistics Service of Ukraine*, available at: <www.ukrstat.gov.ua> (visited on 21 March 2018) (in Ukrainian: Державна служба статистики України. – [Електронний ресурс]. – Режим доступу: <http://www.ukrstat.gov.ua>. (на 17 вересня 2017р).

Table 3: The share of crop production and livestock in the production of gross output of agriculture (in percent).

Years	All categories of producers			Agricultural enterprises			Households		
	Gross products	including		Gross products	including		Gross products	Including	
		crop	live-stock		Crop	live-stock		crop	Live-stock
2010	100,0	64,3	35,7	100,0	71,4	28,6	100,0	57,6	42,4
2011	100,0	69,9	30,1	100,0	76,5	23,5	100,0	62,8	37,2
2012	100,0	67,3	32,7	100,0	73,1	26,9	100,0	61,4	38,6
2013	100,0	69,9	30,1	100,0	75,8	24,2	100,0	63,0	37,0
2014	100,0	70,7	29,3	100,0	75,9	24,1	100,0	64,2	35,8
2015	100,0	70,3	29,7	100,0	75,4	24,6	100,0	64,1	35,9

Source: State statistics service of Ukraine⁸.

The data of table 3 show that the share of crop production in the structure of gross agricultural production produced in all categories of farms amounts to 70.3 percent. However, if we analyze the crop production in the agricultural enterprises and households, we can note that they rapidly abandon livestock production and produce what one can sell more, what costs less and requires no long-term investment that dictates the global market – crop production. Even households of the population in the rural areas – which are characterized by ageing and the outflow of labour – refuse the livestock industry, and over the past six years have reduced the proportion of livestock products by almost seven percentage points.

The growth of world prices for agricultural products, as well as the increase of the physical volume of crop production, provided for a higher efficiency of use of agricultural land and allowed for a certain way to stabilize the financial situation in the region (table 4).

⁸ *State Statistics Service of Ukraine*, available at: <www.ukrstat.gov.ua> (visited on 21 March 2018) (in Ukrainian: Державна служба статистики України. – [Електронний ресурс]. – Режим доступу: <http://www.ukrstat.gov.ua>. (на 17 вересня 2017р)).

Table 4: The gross output of agriculture in the calculation per 100 ha of agricultural land (constant prices 2010), thousands UAH.

Years	All categories of producers			Including					
	Gross products	Including		Gross products	including		Gross products	including	
		crop	Live-stock		Crop	live-stock		crop	live-stock
2010	525,5	337,9	187,6	440,5	314,7	125,8	641,9	369,8	272,1
2011	632,8	442,4	190,4	574,0	439,0	135,0	711,8	447,0	264,8
2012	608,4	409,7	198,7	541,7	396,0	145,7	697,3	428,0	269,3
2013	691,4	483,6	207,8	653,9	495,5	158,4	741,9	467,4	274,5
2014	708,3	500,6	207,7	688,0	522,1	165,9	735,2	472,2	263,0
2015	674,0	474,0	200,0	648,6	489,3	159,3	707,9	453,5	254,4

Source: State statistics service of Ukraine.⁹

The data of table 4 illustrate the increase of efficiency of use of agricultural land, which is expressed by the value of gross output of agriculture per 100 ha of agricultural land in constant prices of 2010. The growth of crop production, as more liquid and such that don't requires long-term investment, has a significant impact on these indicators. Scientists say that limited access to Bank loans and lack of quality of the Elevator industry for grain storage, the demand for which is estimated at about 21 million t, makes the vast majority of agricultural producers directly sell from 80 to 100 percent of the new crop. This ensures the access to working capital and occurs mostly internal, by self-financing from profits and savings¹⁰.

Describing regional aspects of the development of agriculture and assessing the proportion and place of regions in the total volume of gross output of agriculture in 2015, we will note that the Sumy region in terms of volume of production of agriculture is at the 13th place, producing 4.1 percent of the total production in the country. In terms of production of crop products it is at the 12th place and in terms of production of livestock products on the 18th place among 24 regions of Ukraine. Among the top five leading manufacturers of agricultural products in Ukraine are Vinnitsa, Poltava, Dnipropetrovsk, Kharkiv and Cherkasy region. Among the outsiders in terms of production of agricultural products in 2015 respectively: Zakarpatska, Luhansk, Chernivtsi, Ivano-Frankivsk and Volyn oblasts.

Other distinctive features of the influence of integration and globalization processes

⁹ *State Statistics Service of Ukraine*, <www.ukrstat.gov.ua> (visited on 21 March 2018) (in Ukrainian: Державна служба статистики України. – [Електронний ресурс]. – Режим доступу: <http://www.ukrstat.gov.ua>. (на 17 вересня 2017р).

¹⁰ *Ermolaev A.* Agrarian sector of Ukraine: trends, subjects, prospects for reform / A. Ermolayev, I. Klymenko, V. Yemets, S. Taran // *New Ukraine: Institute for Strategic Studies*. - Kyiv, 2015. - 28 p. (in Ukrainian: *Єрмолаєв А.* Аграрний сектор України: тенденції, суб'єкти, перспективи реформування / А.Єрмолаєв, І.Клименко, В.Ємець, С.Таран // *Нова Україна: Інститут стратегічних досліджень*. – Київ, 2015. – 28 с).

in the world economy on the agricultural sector of Ukraine are the merger and acquisition of business entities and the participation of TNCs, accompanied by the formation of large-scale agricultural structures (agricultural holdings) and an increasingly dominant role in agriculture.

It should be noted that, in 2013, agricultural holdings made up 21.3 percent of agricultural products in Ukraine, 46 percent of households, and 32.7 percent of other farmers¹¹. In the ranking of the TOP 100 agricultural enterprises in terms of space (land), which are in their operational management, the top ten includes companies that control 150-670 thousand hectares of agricultural land. In the management of the 10 largest agricultural holdings of Ukraine is about 7.5 percent of the agricultural land of Ukraine. The last places in this ranking are occupied by companies which control about 10 thousand hectares of land each, but they should also be considered quite powerful by agricultural producers.

It should be noted that the processes of mergers and acquisitions and as a consequence the formation of vertically and horizontally integrated entities (in particular, in the agrarian sector of the economy of Ukraine), are a symptom and result of international division of labour. Total global demand through a well-developed market infrastructure determines the directions of development of economic activities, which is why agricultural holdings concentrate significant financial resources under their control, have access to export markets and an even more powerful access to technologies and political influence at local and national levels. In addition, quite often shareholders of such companies include a large international company, which gives them additional advantages in lobbying at the international level.

However, globalization processes also determine, though still rare, occurrence of domestic producers in foreign enterprises, occupying a stable and reliable position in world food markets. Also among the largest agricultural holdings in the world there are Ukrainian companies. According to the analysis of public data held by the member of the Board of Directors of GC "Grain UA" Andrew Druzyaka, the top 10 largest companies in the world includes two and a half of Ukrainian companies (table 5). "Why? Because UkrLandFarming and Kernel - are purely Ukrainian, and one investment, NCH Capital, which owns a land Bank in Ukraine and in Russia", – he explained¹².

¹¹ *Portal Express*. Billions of Dollars from Ukrainian Village: Amazing Figures and Lowly "Heroes", available from: <<http://expres.ua/main/2015/06/15/139585-milyardy-dolariv-ukrayinskogo-seladyvovyzhni-cyfrymalovidomi-geroyi>> (visited on 21 March 2018) (in Ukrainian: Портал Експрес «Мільярди доларів з українського села: дивовижні цифри і маловидні «герої»).

¹² *Druzyaka A.* The top 10 largest agroholdings of the world include 2.5 Ukrainian companies, available from: <<https://latifundist.com/novosti/22161-v-top-10-krupnejshih-agroholdingov-mira-vho-dyat-25-ukrainskih-kompanij-ekspert>> (visited on 21 March 2018) (in Ukrainian: Друзяка А. В топ 10 крупнейших агрохолдингов мира входят 2,5 украинских компаний).

Table 5: Top 10 landowners in the world at 01.01.2014.

№	Company name	Area of land Bank
1	Beidahuang Group	5400 thousand hectares
2	Ivolga – holding	1500thousand hectares
3	KazExportAstik	1000 thousand hectares
4	El Tejar	1 000 thousand hectares
5	Cresud	1000 thousand hectares
6	NCH Capital	800 thousand hectares
7	Agrocenter Astana	700 thousand hectares
8	UkrLandFarming	670 thousand hectares
9	Razhulaj Group	500thousand hectares
10	Kernel Group	420 thousand hectares

Source: according to data.¹³

He also notes that the world's largest company, as presented in table5, focused on the production of crop products and mainly engaged in the cultivation, processing, transport and export of grains and oilseeds. As for Ukrainian companies, which are in the top 10, they are not only production sites, but also a powerful trading houses, influencing the price policy of the traders in the black sea region and can destabilize the market in the direction "minus" and "plus" side, and most likely will continue to increase their land assets.

Globalization challenges in the agricultural sector of Ukraine are also evident in the concentration of land resources in agricultural producers. Among the largest agricultural holdings in Ukraine (in terms of land Bank in the operational management) must be identified: "UkrLandFarming", "NCH", "Kernel Group", "Myronivsky Hliboproduct", "Ukrainian agrarian investments", "Astarta-Kyiv", "Mriya agro holding", "HarvEast", "Agroton".

In turn, the ranking of agricultural holdings by revenue, which they received in the first half of 2014, is somewhat similar to the ranking by the size of their land Bank, which could be explained by the significant differences in the types of activities that agricultural holdings carry out, as well as differences in their business models, styles of management and operational management. Moreover, as noted by other experts, bigger is not that effective, rather the contrary¹⁴. Forbes deliberately has not published a rating of the largest agricultural holdings by size of land Bank in all these years. The traditional approach (the area of land in the process) when preparing agrirating is non-correct because of the illegal rank of the company, which focuses on an asset that doesn't belong to them (through the official absence of the market of agricultural land), and is rented

¹³ *Druzvaka A.* The top 10 largest agrohholdings of the world include 2.5 Ukrainian companies, available at: <<https://latifundist.com/novosti/22161-v-top-10-krupnejshih-agroholdingov-mira-vhodjat-25-ukrainskih-kompanij-ekspert>> (visited on 21 March 2018) (in Ukrainian: Друзяка А. В топ 10 крупнейших агрохолдингов мира входят 2,5 украинских компаний).

¹⁴ *Forbes.* Rating of the 20 most effective agro-companies in Ukraine. Who earns the most on Ukrainian chernozem?, available from: <<http://forbes.net.ua/magazine/forbes/1399408-rejting-20-samyh-effektivnyh-agrokompanij-ukrainy>> (visited on 21 March 2018) (in Russian: Рейтинг 20 более эффективных агро-компаний в Украине).

long term period.

Forbes experts apply a methodology based on EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortization) to calculate the analytical indicator equal to the volume of profit before deduction of interest expenses, taxes and depreciation. This is a common indicator of the effectiveness per one hectare in the agricultural business. Yields, costs per hectare and the predominance in the structure of crops most profitable crops are the key factors that affect crop EBITDA of the company. A number of holdings that are leaders among large landowners took the last places in the ranking, and therefore didn't get to it.

For example, the company "Kernel" Andrei Verevskiy on the results of the marketing year received 85 USD per 1 hectare. This result is explained by unfavourable weather conditions, which lowered expected yield and price volatility. To remedy the situation in April 2013, the company "Kernel" acquired "Druzhba-Nova", which is one of the most effective in the agricultural sector. Through the application of evidence-based approaches in the cultivation of the soil, innovative technologies and increase of intangible assets in the ownership structure, this company received 800-900 USD EBITDA per one ha. It was assumed that, spreading her experience on all their fields, "Kernel" will significantly increase the efficiency of crop production. However, agriculture is not the priority activities of the company "Kernel" and accounts for an insignificant share in the structure of its business.

A leader in grain yield among Ukrainian companies is "Svarog West Group", which handles 80 thousand hectares of land, and can be considered not only the most productive agricultural holdings, but also the most effective: the profitability of crop production is 1.5 times higher than in most other large companies ¹⁵.

Another distinctive feature of the integration of the agricultural sector of Ukraine into the world economy and feeling the influence of globalization processes is the degree of its involvement in world markets for agricultural products and foodstuffs at the expense of exports of agricultural products from Ukraine.

Among the TOP 10 largest exporters of grain in the first half of the 2013/2014 marketing year were leading the company "NIBULON" also in the top ten included "Kernel" fourth position, "Cargill" – the fifth and the other (Tab. 6).

¹⁵ *Ibid.*

Table 6: TOP 10 Ukrainian grain exporters, the first half of 2013/2014.

№	Company	Share in total exports
1.	NIBULON	13,1%
2.	State food-grain Corporation	9,6%
3.	Louis Dreyfus Ukraine	9,3%
4.	Kernel	7,3%
5.	Cargill	4,8%
6.	Bunge	4,4%
7.	AC.Toepfer Int. Ukraine	4,0%
8.	Serna	3,2%
9.	Rayz	2,3%
10.	Agrotrade Export	2,4%

Source: according to data ¹⁶.

Studies show that the main exporters of agricultural products are agricultural holdings, as well as intermediary trading companies (traders) which are often foreign-based companies. Very important for the formation of significant export shipments of grain products is the presence of highly developed Elevator industry, carrying out appropriate training of grain to international requirements in terms of quality.

Today, the largest owners of grain elevators in Ukraine are: "Kernel", "Glencore", "NIBULON", "MHP", "UkrLandFarming". Despite the fact that in recent years, agricultural market participants are actively investing in the development of logistics in Ukraine, there is a shortage of elevators that often forces small producers to sell grain at low prices or to pay unreasonably high rates for storage. Therefore, given the above indicators, we can distinguish four main agricultural holdings that are in the TOP 5, both the amount of cultivated land (with the exception of "NIBULON"), and volume of the proceeds, namely: "UkrLandFarming" (A. Bakhmatyuk), "Kernel" (A. Ver-evskiy), "MHP" (Y. Kosiuk) and "NIBULON" (A. Vadatursky). Moreover, these companies are leaders in certain market segments of agriculture, in which they specialized.

Describing in general the process of rapid formation of major agricultural holdings, there are certain stages of their development:

- deterioration in the financial condition of a large number of small farms in connection with the beginning of the global financial crisis of 2007-08 resulted in a chaotic concentration of capital and their enterprises;
- the next phase of consolidation of capital, land resources and the simultaneous abandonment of unprofitable production (mainly, the destruction of the livestock industry, specialized only in crop production);

¹⁶ *Druzyaka A.* The top 10 largest agrohholdings of the world include 2.5 Ukrainian companies, available from: <<https://latifundist.com/novosti/22161-v-top-10-krupnejshih-agroholdingov-mira-vho-dyat-25-ukrainskih-kompanij--ekspert>> (visited on 21 March 2018) (in Ukrainian: Друзяка А. В топ 10 крупнейших агрохолдингов мира входят 2,5 украинских компаний).

- today, large agricultural holdings refrain from drastic reorganization of assets, especially in terms of postponement of land reform.

Ermolaev A. and other experts cite the main factors that contributed to the emergence of large agricultural holdings in Ukraine, for example, the four most successful (UkrLandFarming, Kernel Group, "MHP", "NIBULON")¹⁷. According to them, the defining factors are:

- political relations at the initial stage of the formation of the holding;
- the underlying asset, which became the basis for the formation of the holding;
- consolidation of the assets and lands of agricultural holdings in a relatively short period of time;
- the use of advanced technologies;
- availability of own capacities for the conservation and export of products;
- access to markets; and
- access to the capital markets of agricultural holdings, where he was preceded by active work on upgrading them to international standards of work.

The consequence of these and other factors is that from year to year there has been a steady tendency to increase the share of agricultural products in the export structure of the country (unfortunately, with small amount of value added). The product of agriculture and food industry forms a significant part of Ukrainian exports.

During 2014 agricultural products and food were exported to 16.7 billion US dollars (0.3 billion US dollars less than in 2013), that is 30,9 percent of the value of exports (versus 27.1 percent in 2013). The share of EU countries accounted for 26.8 percent of the value of exports of agricultural products and food industry in Ukraine, or 4.8 billion USD (respectively 26.4 percent and 4.5 billion USD in 2013).

During 2014 imports of products of agriculture and food industry amounted to 6.1 billion US dollars (2 billion US dollars less than in the previous year). In the cost structure of import, the share of these products amounted to 11.2 percent (in 2013 – 10,5 percent).

Very important for the development of foreign economic activity of the agricultural sector of the country is the implementation of European integration aspirations of Ukraine and the full implementation of the comprehensive Agreement on free trade Area (FTA) between Ukraine and the EU, which started to act January 1st, 2016. The FTA is the economic and political part of the Association agreement between Ukraine and the EU. The framework of this Agreement provides for the introduction of a new format for the implementation of export-import operations focused on trade liberalization and the promotion of agricultural exports. The main aim of the Agreement is the

¹⁷ *Ermolaev A.* Agrarian sector of Ukraine: trends, subjects, prospects for reform / A. Ermolayev, I. Klymenko, V. Yemets, S. Taran // *New Ukraine: Institute for Strategic Studies.* - Kyiv, 2015. – 12-14 p. (in Ukrainian: *Єрмолаєв А.* Аграрний сектор України: тенденції, суб'єкти, перспективи реформування / А.Єрмолаєв, І.Клименко, В.Ємець, С.Таран // *Нова Україна: Інститут стратегічних досліджень.* – Київ, 2015. – 12-14 с).

intensification of the Ukrainian agri-food exports by increasing the competitive advantages of the product, which was characterized by a high level of processing and significant added value. The European Union has introduced duty free tariff quotas for 36 kinds of products. For some products (beef, pork, lamb, poultry, eggs, milk, cream, yogurts, cereals, bran, honey, sugar, starch, mushrooms, garlic, malt, grape and apple juices, butter, cigarettes, ethanol and the like) additional volumes were installed. It should be noted that Ukraine also introduced tariff rate quotas for three types of goods and provided additional volumes for two (pork, poultry meat and semi-finished products of poultry, sugar). For domestic producers a little strange and absolutely new is the order of implementation of export-import operations with the European Union. However, the use of tariff quotas there are two algorithms:

- a) “first come, first get”. For certain product lines, quotas are provided as application and appearance of the goods at the border;
- b) through a system of import licenses (for a limited list of goods the importer from the EU must obtain a license in the relevant bodies of the EU)¹⁸.

It should be noted that Ukraine has lost a quite succinct, clear and well-known food market in Russia that made the country's agricultural sector to develop new markets, offering high-quality domestic agricultural products and food. 2015 was the year of finding alternatives to the exports of the agricultural sector. As noted by A. Pavlenko, the development of exports of agricultural products is the key to success of Ukraine as a whole¹⁹.

First of all, the export generates the development of the industry and new jobs, which is extremely important to ensure stability in the state. Secondly, establishing good, strong and mutually beneficial relations with other countries only benefit us. According to the results of the analysis of dynamics of foreign trade in agricultural products, one can notice that for 7 months of 2015, Ukraine has received a positive balance of foreign trade in the agricultural sector – 5.6 billion USD. In particular, exports of agricultural products totalled 7.7 billion USD, or 35.7 percent of the total Ukraine's exports and imports 2.2 billion USD, or 10.5 percent of the total imports of the country. Undoubtedly, it should be recognized that in terms of value compared to the same period in 2014 there was a reduction in agricultural exports by 16.8 percent and imports by 45.5 percent. This is due to the change of the world prices for principal export products. Overall, the fall in world prices for grains occurred by 24 percent. According to FAO (the Food and Agriculture Organization of the United Nations), the index of food prices, particularly for grain in 2015, were the lowest in the last five years. Accordingly, selling on the export of wheat in January-July 2014, for 3,3 million tons it received 815

¹⁸ Rutitskaya V. What are export quotas in the ES and how can they be used by producers of agricultural products?, available at: <<https://latifundist.com/blog/read/931-что-такое-квоты-на-экспорт-в-ес-и-как-ими-воспользуются-производителям-сельхозпродукции>> (visited on 21 March 2018) (in Russian: Рутницкая В. Что такое квоты на экспорт в ЭС и как ими воспользоваться производителям сельхозпродукции?).

¹⁹ Pavlenko O. Ukraine is on the external agrarian markets. How to compensate for the loss of the Russian market?, available at: <<http://www.eurointegration.com.ua/experts/2015/09/23/7038635/>> (visited on 21 March 2018) (in Ukrainian: Павленко О. Україна на зовнішніх аграрних ринках. Як компенсувати втрату ринку РФ?).

million USD. In the same period in 2015, the number of exports increased by 12 percent to 3.7 million tons, revenues amounted to just 696 million USD.

The loss of the Russian market has led to a decline in exports of animal products and confectionery products, i.e. products with high added value, which affected revenue from exports. Another factor that caused a decline in exports is the fact that the Ukrainians began to prefer the consumption of mainly Ukrainian goods. Indeed, a significant volume of its exports prove the high quality and safety that is in demand on the world market. The growth of domestic demand for certain products causes the increase in their prices, and consequently, producers are much more profitable to sell their own products on the domestic market than to export. Growing domestic demand causes a decline in exports.

Witness to the positive development of foreign economic activity of the agrarian sector of Ukraine is that a positive balance is kept and even increased by almost 5 percent. The most important factors are that a positive balance of agricultural products remains with regard to the volume of export of grain crops (39.9 percent), of oil (23.7 percent) and oilseeds (7.5 percent). For the first time in recent years, sugar deserves special attention: compared to 2014, the export of sugar has increased almost 100 times in 2015 (!) – from 361.000 USD to 37.7 million USD, The export of fat pigs and poultry also significantly increased – from 27.000 USD to 3.8 million USD. Recovery applies to products such as soybeans (by 72.2 percent) and pork (more than 5 times). However, decreased exports of sunflower oil (22.1 percent), maize (7.5 percent), cheeses, mainly because of the embargo in Russia (88.3 percent; 97 million USD), bakery and confectionery products (49.7 percent; 69.9 million USD), fruit juices (47.5 percent) and barley (13.2 percent).

Describing the import of products and foodstuffs of Ukraine, it is possible to identify some positive trends: a reduction of imports, which gives grounds to speak about the implementation of the policy of import substitution. So, from January to July 2015, the import decreased by 45.5 percent to 2.16 billion USD. However, this is also a significant decrease in solvency of Ukrainian consumers. The largest share in the structure of import of main kinds of agricultural products are: fruits, nuts and peel (11.9 percent), tobacco and its products (10.6 percent), fish, crustaceans and molluscs (6.6 percent), cereals (6.4 percent), coffee, tea, spices (5.1 percent), chocolate, cocoa (4.5 percent), oil (3.2 percent), meat and meat products (2.4 percent).

The globalization of the world economy which "shifts" Ukraine into the global space makes us constantly look for and develop new markets for international trade in agricultural products. Geographical structure of foreign trade in products of agricultural sector of Ukraine by results of 2015 looks thus:

- Asian countries – 46.6 percent (3.6 billion USD);
- EU countries – 25.3 percent (1.96 billion USD);
- African countries – 14 percent (1.08 billion USD);
- CIS countries – 11.1 percent (0.86 billion USD);
- US – 0.3 percent (0.027 billion USD);
- Other countries – 2.7 percent (0.2 billion USD).

It can be argued that the results of export-import activities, even under unfavourable world prices, Ukrainian farmers are gradually expanding markets, thus offsetting the

loss of the Russian market.

We fully share the caution of scientists that in the conditions of strengthening of integration processes and globalization challenges, special attention requires the issue of standardization of quality of agricultural products²⁰. If domestic producers will be to focus on the long term global leadership and hold steady positions on the world food markets, as well as the use of the benefits of the European Union regarding the entry into the European market, then all efforts should be directed at confirmation of the quality of the production process and the quality of agricultural products. Ignoring this requirement may leave Ukrainian farmers out over time.

Thus, investments are an important factor in the implementation of innovative technologies, development of agricultural production and the formation of the high competitiveness of its products²¹. The development of world economic relations will promote the integration processes in the agricultural sector, which is accompanied by mergers and acquisitions of agricultural companies, the subordination of industrial activity to short-term needs arising from a conjuncture of the world market. Therefore, we consider it appropriate at the stage of conclusion of investment agreements, using the levers of government regulation, guided by the needs of regions, communities to ensure balanced development of the productive forces of the region, rural economy, rural areas, promoting rural employment and environmental protection.

²⁰ *Shubravska O.* Agro-food development of Ukraine in the context of providing food security: collective monograph, in O.V. Shubravska, L.V.Moldovan, B.Y.Paskhaver (eds.), NAS of Ukraine, DU "Institute of Economics and Forecast. National Academy of Sciences of Ukraine", Kiev 2014, 456 p. (in Ukrainian: Агропродовольчий розвиток України в контексті забезпечення продовольчої безпеки: кол.моногр./ [О.В.Шубравська, Л.В.Молдован, Б.Й.Пасхавер та ін.]. За ред. д-ра екон.наук О.В.Шубравської, НАН України, ДУ «Ін-т екон.та прогноз. НАН України». – К.: 2014. – 456.).

²¹ *Mykhailov A.* Features of investment processes in the agrarian sector of Ukraine, Economic, social and environmental problems of the development of the agro-food sector: materials of the International Science - practice Conference, 19 February 2016/Kharkiv. national agrarian University named after V.V. Dokuchaev, Kharkiv 2016, 348 p., P.173-177 (in Ukrainian: Михайлов А.М. Особливості інвестиційних процесів в аграрному секторі України / А.М. Михайлов // Економічні, соціальні та екологічні проблеми розвитку агропродовольчої сфери : матеріали Міжнародної наук.-практ. конф., 19 лютого 2016 р. / Харк. нац. аграр. ун-т ім. В.В. Докучаєва. – Харків: ХНАУ, 2016. – 348 с., С.173-177.

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ECONOMIC-GEOGRAPHICAL ASPECTS OF THE CONSUMPTION OF AGRICULTURAL PRODUCTS PRODUCED BY HOUSEHOLDS OF THE REPUBLIC OF THE BURYATIA

Olga Yekimovskaya

A. Introduction: Formulation of the problem

During the last 25 years after the reduction of soviet collective agricultural enterprises, we observe a growth of small-scale production in households in the Republic Buryatia, Russia. Such households are characterized by problems of delivering products to the consumer. This problem is common to all regions of Russia, especially for those with a lot of independent farms not included in the large agricultural holdings with their own sales networks.

B. The marketability of agricultural products

The volumes of production of major agricultural products (potatoes, vegetables, milk, meat of cattle) is significantly higher than the recommended consumption rates in the farms of the Republic of Buryatia. This indicates the presence of excess agricultural products (Table 1).

The sales of own output provide an important addition to pensions and unemployment compensations. Not only did the farm household expand for survival purposes through the self-subsistence natural economy, but it switched over markedly to small-scale commodity production. Available surpluses are exchanged for other types of products sold in nearby large settlements, among the villagers, including those engaged in buying agricultural products. The marketability of certain types of products manufactured in house-holds thus reaches 50 percent in the Republic of Buryatia (Table 2).

The greatest amplitude of oscillation of the marketability has been observed for eggs and vegetables. The gradient between the indices are, respectively, 10 and 10.1 times. Steady growth and marketability of small amplitude fluctuations can be registered for milk and potatoes. This is connected with the constant high demand for fresh dairy products in Ulan-Ude – the capital of the Republic Buryatia – and with the ability to deliver raw milk, albeit at a very low price, in agricultural enterprises. Potato growing marketability is due to the fact that big enterprises do not grow potatoes, but instead prefer to buy it from the population.

Sales are carried out in the form of retail sales of milk and dairy produce, vegetables and potatoes at the (also unorganized) urban marketplaces, and in the form of wholesales of meat and skins of neat cattle and sheep to “stranger merchants”, who supply raw materials to China.

Hence the farm households, having historical experience of survival under hard socio-historical conditions and with no subsidies and assistance from the State, demonstrate a good adaptation to the ongoing reforms and stability under the agrarian economy as well as increasing marketability and output. However, the expansion of small-

commodity production also suffers from a large number of shortcomings: a naturalization of households, the return to natural forms of exchange, a decrease in the technical level of production, non-observance of the requirements of agricultural engineering, and an exacerbation of ecological problems.

C. Characteristics of households and places of the sale of agricultural products

The sellers of small-scale agricultural products are the families of different generations, as a rule, the husband, wife and adult children. An uneven family structure respectively the presence of several generations in a household has a positive effect on the competitiveness of the household. Household members are able to replace each other as the seller or the driver, thereby ensuring the regularity of trading. There is a diverse range of products in households with two or more generations. Households, which consist of only one older generation, are dependent on various subjective and objective factors (primarily the state of health) and cannot ensure the regularity of sales. Of the 47 outlets, 43 are located in the central areas of Ulan-Ude, in places convenient for entrance to the complex of residential houses, near major highways, large chain stores and public facilities (clinics, hospitals). The main, regular customers are the residents of nearby houses. They have telephone contacts with sellers and know in advance about the change in the sales chart. With the seller, the owner of the vehicle can deliver the large batch of product directly to the home of the buyer. This trading is only done in cash.

D. Assortment and price of agricultural products

The basic range comprises milk and dairy products (cream, cheese) which are being offered throughout the year. Additional assortment changes depend on the season (Table 3).

Most of the surveyed merchants sell their products only from their own households. A small number of sellers sells milk, which they produced on their own and purchased from other villagers. In fact, we are talking about the intermediary trade.

Some households received orders from regular customers on certain types of products (chicken, quail, duck eggs, mushroom and vegetable preserves) and delivered them at a specified time. Over the entire study period, the average price for the main products varied depending on the inflation rate and the season of the year.

E. Factors affecting the price of dairy products

We have tried to articulate the factors that, from our point of view, could affect the price of dairy products. These factors are:

the distance from the place of production to the point of sale and the cost of gasoline;

- the economic and geographical position of the outlet;
- the livestock value of livestock productivity and technical equipment;
- the specialization of household;
- the age structure of the household and labor resources;
- competition and
- the season of the year.

Studies show that the price of the products does not affect the distance from the place of production to the selling point. The correlation coefficient between the distances from the production site to the place of sale is negative.

A certain relationship exists between the realizable price and the availability of a car. Models of different vehicles differ from small trucks to the Soviet "Lada". Car owners use different brands of gasoline, but the price of milk and dairy products may be higher for the owners of inexpensive cars with cheap gasoline. For example, at the 5 points where the sale is carried out by women who came by "free" cars from suburban villages, the price of milk and dairy products was higher on average by 5 rubles than the prices of those women using their own cars.

The same fact could be observed if the household comprises only one old generation. The favorable location of the outlet affects the prices of goods and increases their costs. Of the surveyed retail outlets, the highest price of milk was mostly in "walk-through" places near transport interchanges, Republican hospitals and large chain stores. Realizable price competition limits the low solvency of the major buyers-retirees, the residents of neighboring houses. The prices of products depend on seasonal changes. In summer and autumn, when the milk yield is at its highest point, its shelf life is reduced dramatically due to the high temperature. Therefore, the selling price drops by 10-13 percent (Table 4).

F. Additional distribution channels for the products

One additional option for the distribution of products are food stores located in major shopping malls and in farmers' markets. The milk is then brought by manufacturers in metal jars and is pre-checked in veterinary laboratory.

Another option are small food shops in walking distance without veterinary laboratories. In this case, the manufacturer packages the milk in plastic bottles.

The selling price of milk is higher in such shops and markets than in retail outlets. Polls of households owners, who give the milk to the shops and markets, show that this way of selling products is often chosen by medium and large manufacturers that are not bringing wage earners. The number of dairy cattle varies from 7 to 25 cows in such households. Only their own family members are involved in the domestic production and working time is valued expensively by the owner of the household.

G. Conclusions

1. Households with historical experience of survival in difficult socio-historical conditions, in the absence of subsidies and assistance from the state show a high adaptation to the reforms, contribute to the stability in the agricultural economy and enhance marketability and production.

2. For private households, having surplus production, an acute problem is selling. It is very important to stimulate credit and tax benefits for the development of marketing services (wholesale and retail markets, meat markets etc.). The manufacturer should be confident that he will be able at the right time to hand over or sell quality products at a convenient location and at reasonable prices.

3. A large part of grown products is sold to private buyers instead of processors. Profit settles in broker-dealers. That turnover does not allow the control of cash flows and thus greatly reduces the tax base.

4. The family structure is an important factor in ensuring the competitiveness and efficiency of the household product sales, especially families of several generations. Households consisting of only one older generation are characterized by selling products for higher prices and also offer a meager assortment of products.

5. The main reasons for the constant demand for products of such households are the freshness and high-quality taste. A flexible approach and the maximum willingness of sellers to go "forward" to their customers (e.g. sale to regular customers in debt, packaging products in small packaging, delivery of products to the entrance) also contributes to improve the competitiveness and efficiency of small households.

Table 1: The production and the agricultural output.

Types of agricultural produce	Volume of output per 1 rural Resident*	Recommended consumption rates**	Volume of output/ Recommended consumption rates
Potatos, metric kg	339,1	115,0	3,0
Vegetables, metric kg	82,1	97,0	0,9
Milk, metric kg	502,0	187,1	2,7
Eggs, pcs	52,5	200,0	0,3
Meat, metric kg	56,0	39,8	1,4

*According to the Federal Service of State Statistics of Buryatia Republic

**According to the Research Institute Occupational Medicine and Human Ecology SB RAMS

Table 2: Share of sold products (in Percent of the total volume of output)*

Year	Potatoes	Vegetables	Cattle and poultry meat	Milk	Eggs
1998	5,2	2,9	13,0	8,4	1,7
2000	4,9	2,0	14,4	7,3	3,5
2001	14,0	3,8	18,0	8,6	4,6
2002	12,8	3,3	31,3	9,1	3,3
2003	9,4	3,2	32,6	11,4	2,9
2005	10,1	5,0	37,1	10,6	2,9
2007	10,1	4,5	42,8	10,3	2,7
2009	12,7	5,7	50,5	14,5	8,1
2010	12,3	1,9	38,5	12,3	5,9
2011	10,6	1,4	25,6	11,3	7,4
2012	12,8	0,5	11,3	19,3	0,9
2013	15,6	1,5	10,4	19,2	0,8
2014	12,9	3,2	16,8	20,2	1,4

*According to the Federal Service of State Statistics of Buryatia Republic

Table 3: Types of agricultural produce for sale.

Months	The main product, brought within the year	Additional products, brought depending on the season, crop yields, climate and location of households	
		Vegetables, berries and mushrooms products	Livestock products
June – October	Milk, cream, cottage cheese	Cucumbers, tomatoes, eggplants, peppers, cabbage, onions, garlic, potatoes, green crops (dill, parsley, celery)	Cheese, eggs
November – the middle of December, after butchering		Potatoes, carrots, home canned vegetables, berry jam, pickled cabbage, pine nuts	Blood sausage, cattle meat
January – March			
April - May		Cucumbers, radish, potatoes, carrots, home canned vegetables, berry jam	-

Table 4: The average price for the basic products.

Years	Price, rubles		
	Milk, metric liter	Cream, metric kilogram	Cottage cheese, kilogram
January – April 2011	35	250	130
May - October 2011	30	240	120
November 2011 – April 2012	40	250	140
May – October 2012	35	240	130
November 2012 – April 2013	45	250	140
May – October 2013	40	250	140
November 2013 – April 2014	45	300	160

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