Fondazione Giangiacomo Feltrinelli, Laboratorio Expo

Patto della Scienza: Food security: what’s behind and what’s next
a cura di C. Sorlini, B. Dendena, S. Grassi

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Executive summary

The scientific community has an intellectual duty to question itself on issues of radical importance and the responsibility to identify what is the problem, opening up space for an exchange of ideas and knowledge on the important theme “Feeding the planet”. Several issues are at stake. Firstly, the need to increase the availability of quality food for a growing population, confronting the dynamics of access and distribution of food resources have at a global level and developing production systems that are at the same time both efficient and fair. Secondly, the issue of environmental sustainability: it is crucial to identify solutions that will ensure energy for all, by also questioning the impact that our food preferences have on the environment. Sustainability is concerned with lifestyles, with the territories, with traditions and the multifaceted and ever changing nature of food cultures.

In this socio-economic context, the goal is to identify areas of intervention in which it is urgent to address the challenge of social sustainability: protection of collective goods, redistribution of wealth, new mechanisms of participation; and to support, in a dimension that opposes the dynamics of strongly unequal contemporary growth through social innovation and new forms of urban governance.

From these pressing issues, the researchers involved in the project LabExpo, have identified twelve main questions that need to be addressed in order to move toward a more sustainable planet. These questions are very diverse, ranging from food security to governance practices, and address the many facets of sustainability in contemporary societies.

The main questions are the following:

Food security

The latest estimates by the United Nations report that 805 million people are chronically undernourished, thus highlighting food insecurity as a widely spread phenomenon caused by complex issues strictly intertwined with another compromising availability, access, utilization and/or stability of food resources. In order to tackle such issues, single actions taken by stakeholders operating
independently are not sufficient, nor effective. Instead, coordination is central to create an environment conducive to the implementation of tailored measures ensuring food security. In this regard, social participation, inclusion of vulnerable groups, and the adoption of an integrated approach taking count of technical, political and social aspects, are paramount. Particularly, agriculture is a game changer in addressing food insecurity and hunger worldwide. Public and private partners at all levels should thus act in concert in order to implement ad hoc initiatives both at policy and field level to raise agricultural productivity, promote farm and non-farm activities, strengthen value chains and access to market, reduce vulnerability to environmental crisis and close the gender gap.

Safe and nutritious food for all

Even when access to food resources is ensured, food security is at risk if those resources are neither nutritious nor safe. Undeniably, all over the world a large portion of the population is dealing with healthy issues related to malnutrition and foodborne diseases. As food safety is strictly dependent on how food is processed, stored and consumed, clearly emerges the necessity of raising awareness, simplifying rules, improving skills and infrastructures, adapting food safety monitoring and management systems in order to guarantee healthy nutritional status worldwide.

Healthy nutritional status is furthermore guarantee by balanced energy and nutrients intake resulting from good care and feeding practices, food preparation, and diversity of the diet. This, combined with the physical activities, determines the nutritional status of individuals. Due to the complex framework, a systemic approach, as nutrition sensitive agriculture and food system programs, are a sustainable- environmentally and socially - and gender-sensitive answer to re-establish a human healthy nutritional status in synergy with the environment worldwide.

The way to future food production

Since the 1960s world population has grown from three billion to more than seven billion. Such a growth came along with a significant increase in food
demand requiring the intensification of production processes that gradually led to the depletion and deterioration of finite natural resources. Fertile soils, water, biodiversity and energy have long been mismanaged, which compromised the sustainability of modern production systems and threatened global food security. The need to rethink, design and implement more environmentally sustainable and socially just production systems is thus getting urgent. In this framework, the agroecologic approach appears promising, as it is based on more biodiverse and resilient production systems less dependent on external inputs. Similarly, a more efficient use of water resources, the implementation of innovative and smart solutions for valuing alternative energy sources and reducing agricultural inputs, the definition of strategies to reduce food waste and the inclusion of consumers in designing sustainable production and consumption patterns are increasingly relevant.

Aesthetics of Food and Cultures of the Senses

Likes and dislikes of food are social constructions shaped through the cultural elaboration of the sensorial experience. Taste is a form of social action through which societies discriminate between friends, enemies and guests, building ethnic, class and gender differences. Their transmission from one generation to the other leads to the awareness of who we are and the memory of what we have been: by mean of them, identities and belongings are defined. The issue of taste is a political one: the homologation and privation processes linked to tasting experience, act as deculturation and dependence patterns. Furthermore, the impoverishment of tastes is not only due to a simplification of flavors, but also to the loss of symbolic dimension, to the inability of creating meaningful relationships, whether “around the table” as much as by the retailers and the producers as well.

Food and Belonging: bodies, territories and agri-cultures

Patterns of food production and consumption are approached by anthropology as tools of identity construction at the collective as well as at the individual level. Following large-scale industrialization of agriculture and agro-business, food cultures have radically changed in southern and northern countries: a disjuncture has imposed more and more between the farmers or those who
produce food, the consumers and their territories, as well as between cultures and ‘agri/cultures’. In this scenario, emergent and innovative patterns of production, distribution and consumption, are redefining the symbolic and collective dimension of food (Gruppi di Acquisto Soldidale and Des in Italy, Amap in France, seeds banks, rural networks of food security). At the same time a growing number of individuals have become aware of the over determined nature of their alimentary choices and have voiced critical concerns towards the assimilation of aliments void of identitary character, and have embraced a new-found interest in the idea of food as a means to assert identity.

Food Heritage

It is in the category of Intangible Cultural Heritage whose definition is increasingly contested and not adopted by all UNESCO state members that food practices officially enter into the dynamics of heritage institutionalization. Central to the issue of food heritage are the anthropological critics to the notions of tradition and authenticity as well as the attention given to the process of transmission in the definition of a cultural heritage. Indeed, the challenge posed by the cultural heritage is that of moving from the original etymology of the legal term, which is conceived as private heritage often selectively transmitted from the family through father, towards a notion of cultural heritage which is shared, recognised, consciously and democratically participated in by everybody.

Collective goods

Common resources have an important redistributive function, being a vehicle for direct and equitable access to important means across all socio-economic strata. They also work as a sort of ‘social glue’, which can contribute to a group’s sense of belonging, cohesiveness and cultural resilience. Collective goods are common-pool resources that are de facto used by specific groups in time and space, namely by collectivities at different levels: local, national, regional, global. Collective goods can comprise a variegated list of tangible and intangible items, around which potential conflicts may arise because the protection of access of one collectivity may stand in contrast – and reduce – the access of another one. Protecting collective goods is crucial for the scope of
feeding the planet, yet the challenges to face are many and complex, including large-scale abuses, unclear or unfair definitions of property rights as well as the lack of shared consciousness.

**Social sustainability**

Inequality is expected to play a major role in the post-2015 development agenda. Situations that create and perpetuate social disadvantage play a major role for access to food and for malnutrition, too. In line with the Human Development Paradigm, social sustainability can be interpreted as the set of circumstances in which large asymmetries of human freedoms and opportunities within and across generations are being avoided. Currently, asymmetries in the world can be traced back to different factors, such as increasing wealth concentrations, inequality of opportunities, or lack of agency and participation. In tackling food insecurity – and in a broader sense social disadvantage – a main challenge is to actively promote shared responsibility: top-down interventions and bottom-up movements involving different actors and complementary actions are both necessary in order to feed the planet. Responsible consumption and production localize global problems; and changes in institutions, policies and practices can globalize local concerns.

**Access to energy**

Access to modern energy services, intended as access to electricity and to clean cooking facilities, is a fundamental condition for sustainable development, given its key role in the provision of clean water, sanitation, healthcare, reliable and efficient lighting, heating, food security, mechanical power, transport and telecommunication services. A large share of the global population still lacks access to electricity (1.3 billion) and relies on traditional methods and fuels to cook and heat (2.3 billion), with serious danger for health. Reaching the target of universal access to modern energy, while ensuring environmental sustainability and economic development is a great challenge that involves everybody, at all levels: international organizations, governments, firms, civil society and individuals.

**Socio-economic development**
Socio-economic development has become an issue because continuous economic growth has come to a halt and there are serious threats of decline and stagnation in many western cities. In general, cities face major difficulties in creating economic opportunities in a framework of high competition, shrinking markets and reduced resources. The contributions collected from experts all over the world point to new forms of production in the postindustrial city, in particular a collaborative mode of production based on the sharing of knowledge and skills, which has begun to emerge in several industries. In envisioning the possibilities of economic development, it is important to take into account the debate about the role of these new forms in the future of urban economies. What is certain is that they are emerging thanks to resources and conditions which are peculiar to cities.

**Governance**

The urban governance processes are progressively losing democratic dimensions and egalitarian substance because of the asymmetric influence of powerful élites, particularly economic ones. The weakening of representative democracy is causing the disaffection of the ordinary citizen from politics institutions. Politics has become a private affair whereby decisions are made through exchanges of favours between the elected and the lobbies. Alongside these tendencies, number of events, processes and phenomena have emerged that, despite not being prevalent, allow for some countertendencies to be registered, showing seeds of change at different levels in the system of urban governance. Some of these phenomena are connected with new technologies and with the role these can have in facilitating inclusive governance. Other phenomena are manifested in politics itself, participatory budgets for instance; others concern the role of non-profit organizations or civic society enterprises that promote activities and services that are not provided by the state; others still are connected to urban social movements.

**Social cohesion**

The issue of social cohesion concerns the need for the city to overcome disruptive features of our “liquid modernity”, such as fragmentation and individualization, and, more importantly, increasing inequalities, social
polarization, marginalization and exclusion. In the face of these disintegrative processes, we discuss emerging practices of social innovation that aim to respond to unmet social needs through the re-organization of socio-spatial relations, the activation and empowerment of individuals and communities, highlighting their potential to resist and counter these exclusionary and socially corrosive trends.
Agriculture, Environmental Sustainability and Food-Nutrition

The EXPO event, focused on the theme "Feeding the planet, energy for life", on the one hand puts agriculture, livestock and fisheries under the spotlight by acknowledging their strategic relevance; on the other, it highlights unsolved issues in regard to right to food, malnutrition and environmental impacts of food production. As such, therefore, the Universal Exposition to be held in Milan represents a great opportunity to gather experts, intellectuals, scientists, administrators and policy makers to debate and contribute with innovative ideas dealing with global issues. In this framework, the present document was elaborated. Indeed, in the three following sections, suggestions and contributions received by a pool of international and national experts have been collected and summarized. They have been asked to answer to main questions on issues related to the future of our planet and in particular how to face hunger and poverty, and how to guarantee to all people, at all times, the access to sufficient, safe, affordable and nutritious food for a healthy diet while preserving natural resources for future generations.

The present scenario is characterized by 805 million people suffering from hunger, 2 billion from hidden hunger, more than 500 million from obesity and about two billion from overweight. At the same time as much as 30% food produced is lost or wasted, while the available natural resources (water, fertile soils, biodiversity, energy) are scarce and partially compromised. For the future, the scenario seems to change because food production is not growing at the same ratio as in the past and currently food demand is increasing faster than the food offer; world’s population, in fact, keeps growing and requires more animal protein. The arable surfaces are threatened by desertification, urbanization and non-food cultivation, i.e. production of biomass for energy. Modern agricultural systems rely on a small number of species, selected on the basis of productivity. As it is presently structured, agriculture significantly contributes to climate change by greenhouse gases emissions. Moreover, as much as 70% fresh water consumed is due to the agriculture. Therefore, there is the need of rethinking the way we produce. There are different opinions about future agriculture: 1) Sustainable intensification agriculture model is the first
proposal. The critical aspect is: how is it possible to reduce water consumption, gases emissions, soils exploitation and biodiversity loss? 2) Agro-ecology model is the second proposal, based on the conservation of natural resources. The critical point of this model is: can it produce enough food for all the populations in the world?

Proposals have been collected for food losses and wastage reduction, as well as for new dietary styles in order to reduce obesity and overweight and non-communicable diseases associated to nutrition imbalances; similarly, new proposals to support developing countries have been reported with the aim of improving their human capital and to ensure the access to appropriate technologies towards the effective achievement of food security based on availability, access, utilization and stability. Scientific research can give a significant contribution to these issues. Different opinions have been collected on the GMOs. Traditional and advanced technologies can help to face the problems and can help to find a solution. Coordination among the different levels of management (national, regional and local) is required and in any case it is necessary to guarantee a large participation of people in order to share decisions behind plans and programs. We are aware also that the scientific research and innovation transfer to production activities are important, but policies at all levels will be decisive in order to create a conducive environment for the implementation of ad hoc measures addressing food insecurity negative externalities deriving from agriculture. In any case we are confident that disseminating by several scientific events good ideas and proposals suggested by international experts and researchers during and after the universal exposition will positively contribute to raise awareness on these issues and put pressure on international and national policy-makers.

**Food security: what's behind and what's next**

The latest figures provided by the agencies of the United Nations report that 805 million people are chronically undernourished and that the vast majority of them (791 million) live in developing countries (FAO, IFAD & WFP 2014). These people are in a condition of food insecurity, as they do not have sufficient nor nutritious food for an active and healthy life (FAO 2009; 1996). Behind these
remarkable numeral figures, there are large differences across developing regions, pointing to very different situations characterized by specific issues. Eastern and South-Eastern Asia, for example, have already achieved the first Millennium Development Goal, MDG1 (UN 2014), as well as Latin America and the Caribbean. Similarly, the Caucasus and Central Asia are on track to reach MDG1\(^1\) by 2015 (UN 2014). By contrast, sub-Saharan Africa and Southern and Western Asia have reported insufficient progress, with the former becoming home to more than a quarter of the world’s undernourished population (UN 2014). When focusing on ensuring food security, four dimensions - namely availability, access, stability and utilization (FAO 2009; 1996) - have to be considered in order to provide a comprehensive picture.

**Availability** is the first pillar necessary - but not sufficient - to guarantee food security. Most often, food availability has been associated with the concept of producing enough food, but it does not actually refer only to food quantity: instead, it also touches upon food quality and diversity. Nowadays the lack of availability persists, even if global food production has kept well ahead the global demand for food over the past half-century. This is because there are several interconnected pressures affecting food availability that go beyond an increasing number of people to be fed (FAO, IFAD & WFP 2014). The balance between food availability and food demand, in fact, is highly affected by environmental factors linked with global trends, such as those related to climate change, biodiversity loss, water resources depletion and deterioration, land use change and increasing release of pollutants in the environment (Porter et al. 2014; Wheeler & von Braun 2013; Sunderland 2011; Wheeler & Kay 2011; Nelleman et al. 2009). Among these, climate change is increasingly being acknowledged to cause a drop in food availability due to changes in temperatures, rainfall amounts and patterns, and increase in weather extremes that will significantly affect food production (Porter et al. 2014).

Notwithstanding the complexity of food availability concept and the difficulty to ensure it to a growing population, **food access** has even more composite underlying factors, thus being equally tough to ensure. As economies grow and

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\(^1\) It is here referred to target 1c of the MDG1, *i.e.* Halve, between 1990 and 2015, the proportion of people who suffer from hunger. [http://www.un.org/millenniumgoals/poverty.shtml](http://www.un.org/millenniumgoals/poverty.shtml)
diversify from food production and agriculture, access to food becomes increasingly important for achieving food security, thus calling for appropriate measures to be implemented. Increasing agricultural productivity surely improves access to food, both at the global and local scale, especially in light of the fact that domestic agriculture is still the main provider of food and the principal source of income and employment in rural areas (FAO, IFAD & WFP 2014). However, increasing productivity may not sufficiently address access related problems. The access to food, in fact, has also a complex connotation relative to social, economic and political aspects that has long been underestimated in food security related interventions. Distribution, in this sense, has a pivotal role in determining food access imbalances (Altieri 2014; Altieri & Nicholls 2012). From one side, the interruption of connections due to climate related issues like floods, or to security concerns, would prevent people from accessing food distribution hubs as markets or food aid points. In addition, distribution also has a social facet that has significant consequences in the access to food within the household (FAO 2014). In many contexts, in fact, grass-rooted intra-household social dynamics determine distribution patterns where male adults have the priority over women and children (FAO 2013b). This is clearly revealed in famine mortality statistics reporting that woman, children and the elderly, are the ones suffering the most and the first to die (FAO 2011). From the socioeconomic perspective, access strictly depends on economic resources of individuals, but also on social dynamics, both at country, regional and local level. In this regard, there is evidence that high food prices and the global financial crisis have reduced access to nutritious food and worsened nutritional status and health by reducing the quantity and quality of food consumed. The rise of food prices and increasing unemployment rates have, in fact, resulted in a reduced purchasing power, in turn leading to cutting down the amount of food consumed or shifting to cheaper foods high in fat and sugar. Both trends are strongly correlated with the spread of malnutrition worldwide (WB 2012; HLPE 2011).

Another important factor potentially affecting food availability and access is food wastage along the entire food chain, from production to consumption, as it is responsible for about one-third of global food production for human
consumption not to reach the potential consumer (FAO 2014). Food availability and access have no significance if they are not associated with the third dimension of food security, i.e. **stability**, meaning the continuity over time of accessing nutritious food resources. Stability is here considered to strongly depend on the economic and political situation, meant as the status of the overall economy, people’s ability to generate income and governments’ capacity to support the poor. When ensured, these conditions favour food distribution and access, whereas, by contrast, disorders, market failures, economic crises, both at the regional and global level, significantly hamper these processes (Barrett 2013). In this regard, there is evidence that the economic instability characterizing food and agricultural markets since the mid-2000s have determined large supply deficits, price swings and increased food security uncertainty (Gillson & Fouad 2015; FAO et al. 2011). Stability has also another component that is increasingly acknowledged as in important concern for the future: this is related to the ability of the environment to support food production. In light of the depletion and deterioration of environmental resources caused by the implementation of unsustainable production systems over the last decades, the production of food needs to be restructured in order to continue over time (Nelleman et al. 2009).

Availability, access and stability should be then considered in combination with **utilization** in order to effectively ensure food security: indeed, compromised utilization of food resources due to poor hygiene conditions and/or improper preparation practices can generate nutrition failures. Similarly, unbalanced diets can give rise to overweight and associated non-communicable diseases coexisting with micronutrient deficiencies. When focusing on utilization, the first issue to be considered is access to clean water and sanitation facilities. These factors affect the ability of safely utilizing food, as well as the health condition of individuals and, as a consequence, their nutritional status. Similarly, food quality and diversity do contribute to the determination of such a status. This is particularly true in low-income countries, but it generally applies to all high-risk vulnerable groups. In this regard, most progress has been made in regions that already have relatively high levels of overall food security, such as Eastern Asia and Latin America. By contrast, notable challenges remain in Southern Asia.
and Northern Africa, where problematic hygiene conditions and significant imbalances in dietary quality bring to high stunting prevalence among children. What is new with respect of the last century is that inadequate utilization of food resources is now giving rise to the coexistence of under- and overnutrition issues in countries undergoing rapid transformation, resulting in the so-called double burden of malnutrition (FAO, IFAD & WFP 2014).

How to ensure the four dimensions of food security – availability, access, utilization, stability - while preventing non-sustainable food production and consumption modes? Which room has the reduction of food wastage in improving food availability and access? To what extent can national and international agricultural policies act to improve food security?

As emerging from the abovereported considerations, food insecurity and malnutrition are deeply rooted phenomena caused by a complex set of factors strictly intertwined with another resulting in both immediate and underlying causes. The acknowledgment of such a complexity has made clear that, in order to tackle these worldwide problems, single actions taken by stakeholders operating independently are not sufficient in the short- or in the long-term. By contrast, it is the combination of a variety of actions taken by a similarly wide variety of actors to be indeed acknowledged to make the difference, as it emerges from the progress made towards the achievement of the MDG1. However, the challenge that actions taken at different levels (local, regional, and global) by different stakeholders (private sector, governments and civil society) within different sectors may overlap, contrast or even compete with one another, does exist. Therefore, there is a strong need all the efforts be channelled and coordinated to make the best out of the implemented actions. Therefore, an important consideration emerges: it is not only what is done, but also in which context the action takes place. In light of this, the significance of an environment conducive to the implementation of tailored measures is indeed acknowledged as the key challenge for tackling hunger in the future (FAO, IFAD & WFP 2014; OECD 2013; FAO et al. 2011).
In this regard, the accomplishment of the conditions to ensure the effectiveness of measures addressing food insecurity and malnutrition entails structural changes of the actions taken at global and local level. These changes should first be based on a strengthened coordination. Coordination, first of all, should apply to the link existing between immediate hunger relief actions and long-term initiative supporting sustainable growth. The enhancement of such a link is not new, in that it constitutes the backbone of the well-established twin track approach by the United Nations. However, coordination should also be meant at a higher level meaning that it should also characterize actions by governments with respect to the design and implementation of mechanisms harmonizing food security and nutrition related policies in order to prevent fragmentation and inefficiency. In addition, also the coordination and partnership amongst different stakeholders operating in the field of food security and nutrition should be ensured (CFS 2014; FAO, IFAD & WFP 2014).

Social participation is, in this sense, particularly relevant as it would ensure the involvement of a wide range of actors, including those that are more vulnerable and often marginalized. Inclusion is, thus, a key factor for the successful design and implementation of food security and nutrition programs and policies, especially in light of the increasing call for more equitable and just systems (CFS 2014; FAO, IFAD & WFP 2014; HLPE 2012). The widening of actors participating in the definition and development of food security initiatives also highlights the need for the clear designation of roles and responsibilities in order to effectively act in concert: hence, the definition of ad hoc legal frameworks would help to ensure that every entity involved, from governments to civil society associations, take up their own role (CFS, 2014; FAO, IFAD and WFP, 2014). However, evidence show that, in many cases, especially in politically fragile areas, key institutions may be delegitimized and processes dependent on them significantly compromised due to political and social unrest. This highlights the close link existing between the achievement of food security with the surrounding conditions and calls, once again, for the adoption of an integrated approach taking count of political and social aspects, to be addressed in combination with technical ones (Barrett 2013).
With specific regard to interventions focusing on technical aspects underlying food insecurity, a similar comprehensive perspective is widely acknowledged to be the key for effectively contributing to eradicating hunger. In this sense, in fact, a coherent approach is needed to promote and ensure complementarities among agriculture, environment, health, education and economic sectors in the implementation of food security programs and projects. All of these sectors, in fact, differently contribute to address the immediate and/or underlying causes of food insecurity (FAO, IFAD & WFP 2014). Notwithstanding the need of adopting such an integrated approach, a special mention is here due to agriculture, given its relevance as a *game changer* while addressing food insecurity and hunger worldwide. Approximately 2.5 billion people, in fact, live directly from agricultural production systems, and growth in agriculture, more than in any other sector, is positively related with poverty reduction to which food insecurity is strictly associated (IFAD & UNEP 2013). Therefore, intervening in support of agriculture and rural development will be central to reduce the share of food insecure world's population. In this regard, the *raise of agricultural productivity*, to be complemented with mechanisms ensuring a *fair distribution of food resources*, would have to take place by implementing more environmentally and socially sustainable systems. The focus, by taking on the main issues hampering agricultural development worldwide, would now be on improving *land governance* to ensure *land tenure security*, especially in light of the pressure deriving from large scale land acquisition schemes mostly due to food and biofuel production (FAO, IFAD & WFP 2014). Also, increasing emphasis would be placed on *social and environmental safeguards* by putting in place appropriate social protection mechanisms, particularly for those small producers vulnerable to socio-political disorders and natural disasters (CFS 2014; HLPE 2012). Another important element calling for structural change would be the *attraction of investments in the agricultural sector* by encouraging inclusive business models that integrate small-scale farmers into high value food chain. *Strengthening value chains*, based on technical advancement and social inclusion, in combination with better connections with market, would significantly help farmers to raise their income, and reduce overall agricultural price volatility. This would be achieved through several actions taken at different levels including: improving physical infrastructure and
ICT; strengthening producer organizations, business services, and value chain coordination; increasing access to finance; and facilitating intra-regional, South-South and global exchange. Along with agriculture related activities, the development of non-farm activities would also be important, as rural non-farm income may provide a significant contribution to food security (FAO, IFAD & WFP 2014; GHI 2013). Moreover, in a context of consolidated urbanization, the strengthening of rural-urban linkages would be a priority, as well as actions aimed at improving rural livelihood by launching services supporting productive activities and small businesses, especially when focused on vulnerable groups, as youth and women. With the latter still being widely subject to inequalities in access to markets, resources, credits and income, the gender gap still requires mainstreaming in all agricultural project and programs (FAO 2011). In light of the increased frequency and magnitude of extreme weather events, the reduction of vulnerability to environmental disasters and the adoption of appropriate measures to enhance risk management are to become more and more crucial, calling for actions to reduce the risk of outbreaks, as well as of losses of products and assets. The same applies to socio-political disorders, often giving rise to humanitarian emergencies (Lipper et al. 2014; Porter et al. 2014).

Not least, given the extent of food wastage worldwide - recent estimates report that the share of food supply lost every year through food loss and waste could be enough for feeding 3 billion people (Stuart 2009) -, its reduction is crucial for achieving food security, with ad hoc measures to address food loss and waste. In regard to the former, as the lack of infrastructures and poor harvesting/growing techniques are among the major elements in generating food losses in developing countries, the transfer of existing technologies and the dissemination of good practices, along with market-led investments, would likely have positive impacts. On the other hand, in developed countries, where food waste is the main issue, promotion of a shift in the consumer behaviour, changes in legislation and business models towards more sustainable food production and consumption patterns would be highly recommended (Parfitt et al. 2010).
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