Multi-subject training for a sustainable farming and food system

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Abstract: *Healthy, safe and sufficient food for the entire planet is the topic of the universal exhibition to be held in Milan in 2015. Food safety and food security are the main challenges to be tackled jointly in the fight against climatic change.*
Food policies require training citizens about new lifestyles and training public managers so that they adopt a new long term sustainable governance. Training represents an awareness development propulsion suitable to address sustainable food safety and sustainable food security problems through pedagogic planning meant for various professional and institutional categories as well as the community.
Examples of analysis regarding the farming and food issue open new multi-subject research scenarios regarding sustainability of the supply chain, from the farming to food distribution all the way to the end consumer.
Through food education, the system economic players and the consumer are trained, the first to implement and communicate whereas the latter to select the product environmental sustainability in an ware manner, this evaluation also including the environmental impact of the transport and distribution. Eating is per se a farming action. It is important to conserve farming land, especially in areas already subject to strong urbanisation.
The mentioned dimensions are complex, conventionally subject of the so-called hard science. However, pedagogy may also represent, with respect thereto, a valid base to near human sciences for a new multi-subject interpretation of the transverse environmental issues towards a sustainable governance.

Riassunto: *Un'alimentazione sana, sicura e sufficiente per tutto il Pianeta è il tema dell'esposizione universale che si terrà a Milano nel 2015. La food safety e la food security sono sfide da affrontare congiuntamente alla lotta contro il cambiamento climatico.*
Le politiche food richiamano l'educazione della cittadinanza a una nuovi stili di vita e la formazione degli amministratori pubblici affinché adottino una nuova governance sostenibile di lungo periodo. La formazione rappresenta un motore di sviluppo della consapevolezza idoneo ad affrontare i problemi della sustainable food safety e della sustainable food security attraverso progettazioni pedagogiche da rivolgere a diverse categorie professionali, istituzionali e alla comunità.
Saranno esposti esempi di analisi del tema agroalimentare, che aprono a nuove frontiere multidisciplinari di ricerca sulla sostenibilità della supply chain, dal campo alla distribuzione del cibo, fino al consumatore finale.

Attraverso l'educazione alimentare gli attori economici del sistema e il consumatore possono essere formati, i primi ad attuare e comunicare, i secondi a scegliere consapevolmente la sostenibilità ambientale del prodotto, includendo in tale valutazione anche il peso ambientale dei trasporti e della distribuzione. Lo stesso "mangiare è un atto agricolo". Fondamentale diventa preservare il suolo agricolo, soprattutto in zone già fortemente urbanizzate.
Le dimensioni citate sono complesse, tradizionalmente oggetto ad appannaggio delle cosiddette hard science, le scienze dure, che tuttavia possono trovare nella pedagogia un interlocutore per avvicinarsi alle scienze umanistiche, per una nuova chiave d'interpretazione multidisciplinare dei problemi ambientali trasversali verso una governance sostenibile.

Keywords: *education, food system, sustainability, mobility, soil.*

Body of the article

Nutrition, food and the territorial bond are currently major propelling factors behind research, hard sciences and human sciences jointly, with the aim of identifying analysis spaces and multi-subject application approaches to rise to huge global food challenge. In this context, Expo Milano 2015, the major exhibition event, under the theme *Feeding the planet. Energy for Life,* aims at creating a best practices education platform and innovative solutions aimed at meeting three inspirational principles: the right to a healthy, safe and sufficient nutrition for all; environmental, social and economic sustainability of the farming and food system; food taste and culture awareness. In all possible identified solutions, it is deemed wise to consider the multiple related effects: culture, nutritional and social as well as economic and environmental effects.

The multi-subject aspect of the farming and food issue including medicine, food sciences, economic engineering, urban planning and agricultural sciences, is based on the environmental pedagogy with the aim of stimulating the continuous contribution of the single epistemologies and ensure the coherence of research development with the heuristic sustainability debate so as to spread «new concepts of awareness, cooperation and government for the survival and prosperity of mankind»[1] (Pati et al., 2008, 198).

This attained by combing scientific, technological and economic progress with the value richness. Pedagogy may contribute to create relations between sciences, encourage professional gatherings, provide good training for people and organisations, in continuous collaboration with the com-

munities and the territory of operation. Pedagogic sciences play a major role in promoting cultural and scientific processes towards sustainability, in comprehensible expression and communication of the purposes[2] (Birbes, 2006, 59) as well as planning how to achieve them.

Below are examples of analysis regarding the farming and food issue, opening new multi-subject research scenarios regarding sustainability of the food chain, from the farming to food distribution all the way to the end consumer.

1. Creating sustainability awareness, from mobility to food

The research task entitled *Progettare l'integrazione dalla mobilità al food (i.e. planning integration from mobility to food)* involves creating nutrition awareness with reference to production and life styles, with the aim of outlining training guidelines regarding the farming and food system.

An analysed distinctive characteristic lies in training the people involved in the farming and food system as well as consumers as concerns awareness about the effects of transport in the evaluation of environmental sustainability of the food products, with specific reference to food and energy wastage and emission of greenhouse effect gases.

Food safety and food security are the main challenges to be tackled jointly in the fight against climatic change. The entire issue rotates around sustainability and sustainability awareness, with the aim of influencing people and communities, economies, lines of thoughts and behaviour towards the good of the earth, as the ideal management of natural resources and the quality enhancement of the human lifestyle, for a perfectible present and possible future. Sustainability represents the possibility to maintain and extend as well as validate and defend the harmonic relationship between human beings and the environment with urgency and commitment. Sustainable food safety and sustainable food security shall guarantee food that is respectively healthy from a nutritional point of view and sufficient for the entire world population in a planet conservation logic.

A keen analysis of the recent European policies on transporting food products reveals the need to fully integrate the aforementioned policies with the farming and food systems, with the aim of finding solutions capable of combining the advantages of both fields in the common environmental policies framework. Integration represents the key word identified

by the European Union outlining a cultural perspective even before a decision strategy, with the aim of addressing environmental issued, such as the food issue, in an ecological manner.

Regarding this, training has a considerable impact: a systemic approach to environmental matters capable of combining different sector plans and programmes with the aim of reducing wastage, increasing energy efficiency and reducing emissions, requires considering policies in an integrated manner, from mobility to food. Planning food policies, mobility policies and awareness policies as interconnected implies reflecting on training regarding green mobility management as well as farming and food system supply chain, by identifying scientific bases for decision makers, innovative solutions and strategies, bases for training competences in environmental-oriented human and professional resources.

Training represents an awareness development propulsion suitable to address sustainable food safety and sustainable food security problems through pedagogic planning meant for various professional and institutional categories as well as the community. The training intervention may increase awareness about the farming and food system as well with respect to consumers as concerns sustainability of the food products with reference to wastage, energy impact as well as emission impact of the transport systems indices, hence allowing raising concern amongst institutions, firms and civil society for an efficient coordination of a sustainable offer of food with an equally sustainable demand. Awareness, herein referring to transparent communication, sharing information and best practices with the aim of reducing wastage and environmental impact due to transportation in the farming and food supply chain thus leading to sustainable lifestyle as regards demand as well as logistics and transportation efficiency as regards the offer, may be deemed an operating mode for addressing food consumption ecological issues. For the sake of simplification, some of the current issues that may be subject of scientific and educative analysis are the supply chain distribution and consumption models, which move along a range termination in two pinnacles of thought, one addressing the right to movement and facilitating flows whereas the other addresses enhancement of forms of self-sustainable production/consumption forms as well as flow reduction policies.

Food wastage, energy consumption and the ensuing emission data, were selected as transverse indicators from among mobility and farming and food policies for comparison and integration purposes.

The analysis requires considering distribution models resolution proposals by differentiating distances, short and long supply chains as well as a closer focus on the environmental characteristics of the products by consumers who are accrediting direct forms of access of individuals with respect to decision policies: e.g. zero km products, food miles, fair miles, local food g.a.s., fair economic district, farmers' market and food collection.

The data at our disposal shows that in 2050 the world population shall have 9 billion people to be fed. According to the projections, agriculture will represent a third of the total emissions of the European Union, i.e. three times more than the current emissions[3] (COM, 2011, 112) with an increase in energy consumption. The levels of globalisation of food products markets attained due to the development of more efficient preservation techniques, the higher speed of transport means and the liberalisation agricultural policies, has facilitated the production specialisation of the various geographical areas. On the one hand, whereas this has generated positive effects such as the increase of choice opportunities for the consumers and greater competition, on the other hand it has also created problems including greater energy demand for transport and the increase of environmental impact. Mobility has revealed an increasing trend and transport demand, even in the farming and food system is bound to increase. A 2030 forecast reveals that the demand shall increase both as regards road and railway transport as well as private and public transport.

Farming and food products shall be considered in their full life cycle (LCA) with the aim of evaluating their actual environmental impact. As pointed out by FAO in the Food Wastage Footprint, every food supply chain stage (production, collection and storage, transformation, distribution and consumption) should be analysed and improved, even in the light of the fact that the more a food product is lost further ahead the food chain, the greater the environmental impact given that the environmental costs incurred sum up to the initial production costs.

The European Commission points out the need to concentrate on several types of necessarily parallel interventions at standards, technological, economic, infrastructural and education level. Through food education, the system economic players and the consumer are trained, the first to implement and communicate whereas the latter to select the product environmental sustainability in an ware manner, this evaluation also including the environmental impact of the distribution. "Technical interventions" shall help improve technologies, infrastructural networks, the laws in force and

financial investments. On the other hand, "cultural investments" support the spreading sustainable awareness, characterised by sober transport habits. The expression sober in this case applies to personal responsibility principles towards the surrounding environment and collectiveness.

2. A new governance to conserve food and territory

Food policies require training citizens about new lifestyles and training public managers so that they adopt a new long term sustainable governance. Persons must be recognised as the "change agents" and not just passive "receivers" or the "offered benefits"[4] (Conversi, 2005, 31). Correct food habits require enhancing the territory and land, respecting the environment and the community living there for their livelihood. The integrity of the territory represents the corner stone for defining the criteria and methods of our future development, so as to guarantee total food safety, which comprises food safety parameters (food health quality), food security (the amount of available food) and food identity (related food products or symbol of a territory). The three mentioned dimensions are complex, conventionally subject of the so-called hard science. However, pedagogy may also represent, with respect thereto, a valid base to near human sciences for a new multi-subject interpretation of the transverse environmental issues towards a sustainable governance. We have stepped into the era of new scarcity[5] (De Castro, 2011). The issue of development is strongly related to the duties that arise from the human-environment relationship today. It is important to conserve farming land, especially in areas already subject to strong urbanisation.

The debate, for example in the Padana plain lands, regarding the farming vocation of the territory, it requires brave policies in favour of utilising sustainable resources capable of protecting the environment we live in against degradation and progressive over exploitation. There arises the need for painstaking evaluation of costs deriving from the transformation of further farming land, as well as cautious and longsighted behaviours which are currently rarely applied. The soil is at the centre of the environmental equilibrium: it is essential to the quality of the plant biomass and thus the food chain, it is the main place of guarantee of biodiversity for the quality of the surface and deep waters and for the regulation of CO_2 in the atmosphere[6] (Settis, 2010, 9). Though an efficient, "land consumption"

is an improper expression because land is not subject to consumption but it changes the intended use, through transformation processes from farming or natural uses to urban uses. The change of use leads to an irreversible loss of mainly farming territory, which represents an irreplaceable production and environmental asset, like for example in the case of a region like Lombardy, which has some of the most fertile land and contributes 16% of the national farming and food products. The reduction of the surface of the territory intended for agriculture (TAS, Total Agricultural Surface) and the loss of land actually utilised in agriculture (UAS, Utilised Agricultural Surface) essentially depend on two factors: on the one hand, the increase of urbanisation and the abandonment of the most marginal rural areas on the other[7] (Ferroni, 2012). Preserving land to feed the planet, implies conserving the fertile land required for food, contributing to guarantee food security and food for all. Preventing urban sprawl, i.e. the phenomenon of widespread urbanisation, implies preserving open land and preventing the occurrence of continuity between one town and the other, protecting the countryside and the activities carried out there.

Eating is per se a farming action. Thus, putting a stop to the irreversible loss of farming land requires supporting the income of farming enterprises and even economically recognising the protection role played by the farmers in the territory. A gentle revolution is fuelled by change of the consumption of choices of individuals, but considering agriculture not only in terms of productivity but also a "land maintenance" instrument, protecting the farmers' income so that they remain in the territory. In addition, sustainability problems in the cities firstly arise from the fact that they are not independent from a food point of view and they are not capable of producing all the required energy. The expansion of urban settlements often occurs to the detriment of cultivated or cultivatable areas, thus facilitating food insecurity and deterioration of the land. The farming issue is much more serious than felt at the moment. This transformation of land from agricultural to urban forces us to give up a considerable amount of food produced at the "backyard" forever[8] (Pileri et al., 2011, 46) Food security has become a major requirement not only in developing countries but it now also occupies the centre stage in debates in regions like Lombardy both in terms of food safety (food quality and health safety), with evident effects on the Regional and National Healthcare Service expenditure and in terms of food security (self supply and "food sovereignty capacity). Regardless of a productivity more than twice the national data, for example,

Lombardy produces just 60% of its food demand, revealing a strong deficit for vegetables and surplus for animal products. This implies an increase of importance even as regards daily transport to provide food to the regional territory. These considerations outline the need for a new sustainable governance, based on a multi-subject and an inter-subject research with the help of pedagogy, with the aim of preserving land as a common asset and main source of food.

Conclusions

Healthy, safe and sufficient food for the entire planet is the topic of the universal exhibition to be held in Milan in 2015[9] (Malavasi, 2013). Over twenty million visitors are expected for the event, not a commercial trade fair but an event based on a programmatic awareness and political/cultural concept, intended to highlight tradition and creativity in the farming and food industry. All territories, all stakeholders, all public or private managers, all research centres are called upon to share thoughts on food and propose a new approach to glocal environmental and farming/food problems.

With the aim of contributing to exemplifying the aforesaid, let us consider the study of the case currently being implemented in the Brescia area as well as the measures taken by Sistema Brescia on Expo 2015, in collaboration with Alta Scuola per l'Ambiente of the Catholic University of Brescia. A research line, part of the joint project between the chamber of commerce and Università degli Studi di Brescia, Istituto Zooprofilatico, Consorzio D.A.Q. as well as the farming and food companies, aims at creating a joint group based on the territory capable of boosting the food security of the Brescia producers also with reference to transport sustainability, in the food safety framework.

In this framework, the Brescia Federazione Autotrasportatori Italiani, is an emblematic partner, involved in the project, relating both with the hard and human sciences. Founded in 1976 with the aim of "supporting the entrepreneurship culture, facilitating transformation in carriers and logistics operators" the trade union is actually strong and well organised. Among its duties, it long-sightedly identified "knowledge as the passport to any change". The presence of F.A.I., which currently counts more than 25000 companies with 250000 vehicles and 50 territorial trade unions in Italy, relates with research organisations which study sustainable food safety in

terms of logistics offer and demand for the sustainability of farming and food products, as relates to food quality, food wastage as well as environmental, energy and emission impact. Pedagogy cannot back down from facing the relevant farming and food stakeholders, serving as facilitators of the interaction between sciences and sectors traditionally far apart, by creating collaboration ties, also territorial, aimed at a full human and environmental development.

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Notes

[1] Malavasi, P. (2008), *Sostenibilità, governance. Progettualità educativa, governo di sé*, in Pati, L., Prenna, L. (a cura di), *Ripensare l'autorità. Riflessioni pedagogiche e proposte educative*, Milano, Guerini Studio, 198.

[2] Cfr. Birbes, C. (2006), *Riflessione pedagogica e sostenibilità*, Milano, I.S.U., 59.

[3] COM (2011), 112, 8.3.2011, *A Roadmap for moving to a competitive low edss-cxxcarbon economy in 2050.*

[4] Cfr. Conversi, P. (2005), *La capacità della società civile di promuovere uno sviluppo umano sostenibile*, Roma, Pontificia Università Lateranense, 31.

[5] De Castro, P. (2011), *Corsa alla terra*, Roma, Donzelli.

[6] Cfr. Settis, S. (2010), *Paesaggio, Costituzione e cemento. La battaglia per l'ambiente contro il degrado civile*, Torino, Einaudi, 9.

[7] Ferroni, F. (2012), *Territorio agricolo a perdere* in FAI e WWF (2012), *Terra Rubata. Viaggio nell'Italia che scompare. Le analisi e le proefbbfcvred poste di FAI e WWF sul consumo del suolo,* Roma.

[8] Cfr. Pileri, P., Giudici D., Tomasini L. (2011), *Suoli DOC. Effetti dell'uso del suolo in Franciacorta e Pianura Bresciana*, Rovato (BS), Fondazione COGEME, 46.

[9] Malavasi, P. (2013), *Expo Education Milano 2015. La città fertile*, Milano, Vita & Pensiero.

References

Aa.Vv. (2009), *Osservatorio Nazionale sui Consumi di Suolo. Primo rapporto 2009*, Rimini, Maggioli Editore.

Aa.Vv. (2011), *L'uso del suolo in Lombardia negli ultimi 50 anni*, Regione Lombardia.

Barilla Center For Food & Nutrition (2012), *Eating planet. Nutrirsi oggi: una sfida per l'uomo e per il pianeta*, Milano, Edizioni Ambiente.

Bianchi, D., Zanchini, E. (2011), *Ambiente Italia 2011*, Milano, Edizioni Ambiente.

Birbes, C. (2006), *Riflessione pedagogica e sostenibilità*, Milano, I.S.U.

Birbes, C. (2013), *Alimentare la vita tra cibo, persona e benessere*, Lecce Brescia, Pensa Multimedia.

COM (2011), 112, 8.3.2011- *A Roadmap for moving to a competitive low carbon economy in 2050.*

COM (2011), 144, 28.3.2011 – *Libro bianco. Tabella di marcia verso uno spazio unico europeo dei trasporti- Per una politica dei trasporti competitiva e sostenibile.*

COM (2011), 571, 20.09.2011 – *Tabella di marcia verso un'Europa efficiente nell'impiego delle risorse.*

Conversi, P. (2005), *La capacità della società civile di promuovere uno sviluppo umano sostenibile*, Roma, Pontificia Università Lateranense.

Cucca, R. (2009), *Partecipare alla mobilità sostenibile. Politiche, strumenti e attori*, Roma, Carocci.

De Castro, P. (2011), *Corsa alla terra*, Roma, Donzelli.

EEA (2006), U*rban Sprawl in Europe, the ignored challenge*, Office for Official Publications of the European Communities.

FAI, WWF (2012), *Terra Rubata*. *Viaggio nell'Italia che scompare. Le analisi e le proposte di FAI e WWF sul consumo del suolo,* Roma.

FAO (2013), *Food Wastage Footprint: Impacts on Natural Resources*.

ISMEA (2006), *La logistica come leva competitiva per l'agroalimentare italiano*.

Malavasi, P. (2013), *Expo Education Milano 2015. La città fertile*, Milano, Vita e Pensiero.

Pati, L., Prenna, L. (2008), *Ripensare l'autorità. Riflessioni pedagogiche e proposte educative*, Milano, Guerini Studio.

Pileri, P. (2011), *Spazi aperti. Un (altro) paesaggio per EXPO,* Milano, Electa.

Pontificio Consiglio della Giustizia e della Pace (2013), *Energia, Giustizia e Pace. Una riflessione sull'energia nel contesto attuale dello sviluppo e della tutela dell'ambiente*, Roma, Libreria Editrice Vaticana.

Segrè, A., Falasconi, L. (2011), *Il libro nero dello spreco in Italia: il cibo, Milano,* Edizioni Ambiente.

Settis, S. (2010), *Paesaggio, Costituzione e cemento. La battaglia per l'ambiente contro il degrado civile*, Torino, Einaudi.

Vischi, A. (2011), *Riflessione pedagogica e culture d'impresa. Tra progettualità formativa e responsabilità sociale*, Milano, Vita e Pensiero.