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## Feeding the Cities Through Urban Agriculture The Community Esteem Value

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### Abstract

The growth of global urban population produces an increase in food demand. With the aim of facing this demand, mainly concentrated in large urban areas, urban agriculture should be fostered to integrate traditional agriculture production, no longer considered sustainable. After suggesting the implementation of integrated systems of urban agriculture, in order to measure their social appreciation expressed by the community, the paper proposes the Community Esteem Value, obtained with a deliberative appraisal procedure.

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### 1. Introduction

Recent studies predict that the world population (currently around 7 billion) will continue to grow and will exceed 9 billion by mid 21st century and developing countries (Asian countries in particular) will be the ones which will grow more; conversely, population in highly developed countries is expected to remain almost unchanged (UN, 2014).

To date, 54% of the world population lives in urban areas; in 2007, for the first time in history, the global urban population exceeded the rural population (Figure 1) and it is estimated that in 2050 one third of the global population (34%) will be rural and the remaining will be urban. Population distribution is quickly going to be concentrating around "mega cities", i.e. cities with more than 10 million inhabitants: so far more than 12% of the

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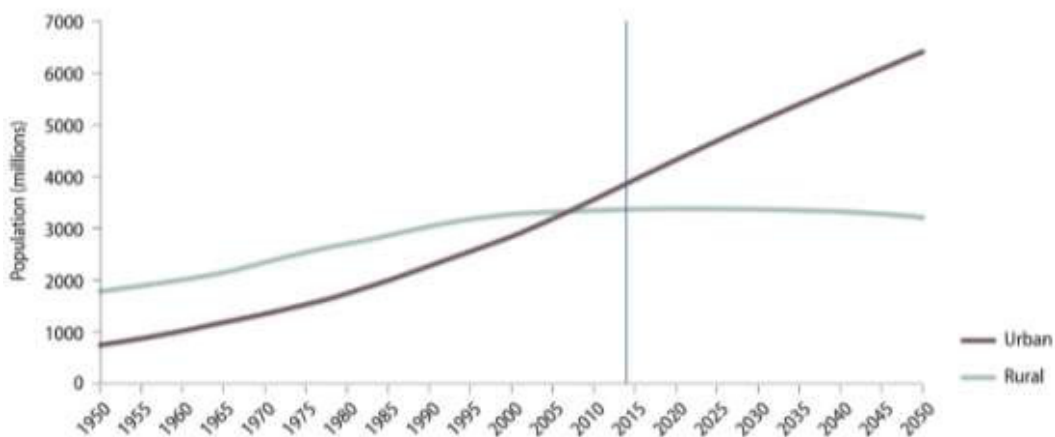
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urban population lives in 28 mega cities. Since 1990 the number of mega cities has tripled and it is expected to keep growing to more than 40 by 2030 (UN, 2014).

Most of these larger cities are expressing a strong demand for arable land needed for food supplies; a city like London, home to 12% of the UK population, currently needs an area equivalent to 40% of the whole agricultural production land of the UK to meet its food demand; this share of the surface is delocalized from the English context as it concerns production areas located in other geographical contexts.

As the larger urban areas, and the income of their residents grow, the demand for food grows accordingly, thus adding further pressure to the global food supply system. The world's agricultural production will have to respond to this demand with an increase in production from 70% to 100% of the current volume but, at the same time, it is expected that by 2050 the area of arable land will not be able to grow by more than 12% compared to today (IFAD, 2011).

Fig. 1. Urban and rural population of the world 1950 – 2050, source: United Nations 2014. Source UN (2014).



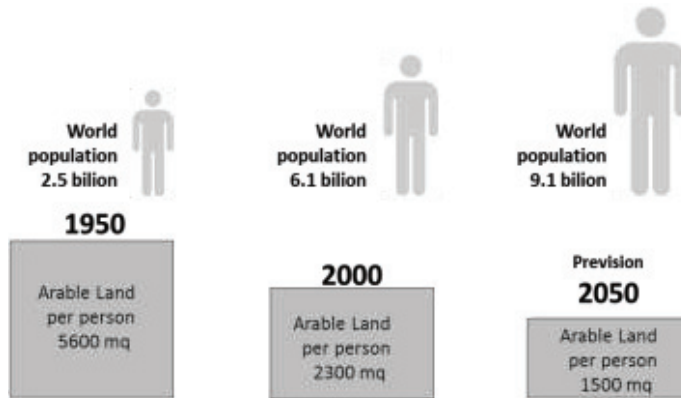
Without strong policies aimed at sustainability, it will be impossible to feed the entire world population while simultaneously guaranteeing the protection and preservation of natural resources for future generations. Agriculture, in fact, responded to the increased demand for food in different ways, which are no longer considered sustainable: increasing the use of fertilizers and pesticides, using new, selected crops, and employing energy-intensive or water-demanding technology (WHO, 1990; Tilman et al., 2001). The current agricultural production is among the causes of global warming, methane and nitrous oxide emissions, and land overuse (Vandermeer et al., 2002; Carpentier et al., 1998). There is an increasingly strong trade-off between environmental protection and maximization of agricultural production that is one of the causes of the disappearance of some natural ecosystems.

From the energy point of view the current agricultural system seems unsustainable as it depends mostly from fossil fuels and at the same time it generates greenhouse gases (Vandermeer et al., 2002). In addition to that the system's energy efficiency is also inadequate: the industrial food system is estimated to generate one calorie of food by consuming about 10-15 calories from non-renewable energy sources (Martinez-Alier, 2011). In addition to that, the retail sale and food distribution systems of today, heavily dependent on road and air transport have a very strong impact on the environment in terms of fossil fuel consumption and air pollution (SAFE Alliance, 1994).

Finally, some have suggested that since current methods of agricultural production together to cattle farming use about 50% of total land usable for agriculture (Tilman et al., 2001), all the land available as of today would not be enough to produce food to meet the proportional growth of the global population. In 1950 every person had 5,600 square meters of the planet's land available for food production; the early third millennium this figure dropped to 2,300 square meters and in 2050 the living space, according to UNFPA, estimates will be only 1,500 square meters per person (Figure 2). For these reasons, in addition to the necessary changes to agricultural production methods one

of the most important challenges related to the future sustainability of large cities is becoming able to produce a sufficient amount of food in urban areas, where the largest number of individuals live and where a low-impact agriculture, characterized by a short food supply chain and under citizens' control may be possible.

Fig. 2. Arable Land for Person 1950 – 2050, Source Perfetti (2010).



## 2. Definitions and Features of Urban Agriculture

Although urban agriculture (UA) may be viewed as a marginal and transient phenomenon, published data from different sources show that it is actually growing (Miccoli et al., 2014A; Miccoli et al., 2014B). In the earliest definitions, UA was intended as an economic activity related to the production of food products and non-food products in urban or peri-urban areas, Mogeout (1996). Subsequent definitions integrated in UA also processing and distribution of food, livestock breeding, aquaculture and horticulture (Bailkey and Nasr, 1999). Subsequently, FAO issued a definition that integrates the previous ones by stating that UA meets urban consumers demand and requires use of intensive production methods and reusing of natural resources and urban waste. This definition has subsequently evolved into regarding UA as a multifunctional system that connects traditional agricultural activities with the benefits of leisure activities, economic vitality, individual health, well-being of the community, landscape and environment protection issues (Butler and Moronek, 2002). Lastly, UA has encompassed safety and "food justice" issues (Alkon and Norgaard, 2009).

UA is a complex phenomenon that can make a substantial contribution to sustainable urban development. From an economic point of view, urban agricultural activities use efficient production strategies and specialization in precious crop plants, generating high economic value (Abel, 2012). As a result of that employment level improves and the attraction and start-up potential of micro businesses indirectly related to the agricultural cycle is consequently boosted. The improvement in general economic conditions produces an increase in consumption levels. Finally, market values of properties located in neighbourhoods renewed and improved by UA increases (Been and Voicu, 2008).

As regards the environmental dimension, the main effects produced by the UA can be summarised in reduction of greenhouse gas emissions, energy saving and subsequently a reduced impact on global warming. The introduction of "farm to table" food in the urban market reduces the consumption of products stored and distributed through highly energy-intensive infrastructure. In addition to that, localized food production in urban areas solves the problem of wasted food: as of today, a share of between 30 and 40% of food production is lost due to failures in the transport, storage and distribution chain (Stuart, 2009). Lastly, many urban areas are fully renewed and regenerated thanks to UA's reusing of empty, abandoned or underused areas.

As regards the social impact, UA provides the community, especially the poorest families, with access to fresh food, a fact which has positive effects on the health and quality of life. In those communities most seriously damaged by the economic crisis, UA can improve the psychological status of individuals by allowing them to

guarantee a secure supply of food to their household and helping them acquire skills in a new field of work; Furthermore, the UA promotes and strengthens the sense of belonging to the community: the new ways of living in neighbourhoods stimulate social exchange between groups with different ethnic, social-economic and generational backgrounds.

In summary, UA as well as integrating the food supply of larger towns with more environmentally friendly modes, can also "feed the city" through a combination of resources, networks and opportunities, while also contributing to the improvement of the welfare of the community.

### **3. Integrated Planning in Urban Agriculture**

In view of the fact that the population growth will require a sharp increase in food supply and that the current agricultural production model is, to date, no longer sustainable, UA represents a practice that facilitates the achievement of objectives related to urban sustainability and is also well suited to increase food production, with obvious environmental and social benefits. Therefore production and distribution of food which, until now, have remained marginal issues in city planning shall definitely gain higher priority on the agenda of urban development policy makers and planners.

Although UA significantly contributes to sustainable urban development it also has, in most cases, a sporadic, spontaneous and discontinuous nature. These facts have made it difficult to plan and organise it and, at the same time, do not allow maximisation of its benefits. In order to facilitate planning, implementation and management we propose the UA activities as an integrated system. Agricultural and urban areas should be interconnected, behaving as a whole according to general rules contributing to the common goal of sustainable development.

The formation and implementation of integrated systems of UA are directly related to the presence on the territory of "vacant land" and to the relationships that develop between the three main stakeholders involved: a) the owners of vacant land; b) the farmers, or those who are willing to start agricultural activities and devote themselves to them; and c) the rest of the community, i.e. the subjects of the community who are not involved in agricultural activities, neither as farmers nor as owners. The relationships between these people and the expectations they have about the use of vacant land are the basis of some issues that need to be addressed for the sake of the success of the UA integrated systems (Miccoli et al., 2014A).

One element that may hinder the birth of such systems, is the perception of UA by the rest of the community; if the community is not properly informed about the effects of UA, it may opt to devote vacant land to traditional urban green activities, rather than to agricultural uses. In absence of awareness on the benefits of UA and with a limited perception centred only on the benefits that may come to farmers and owners, UA would be deprived of the necessary consensus to provide land to be devoted to crops and farming and to creating a demand for an urban market. Integrated UA systems require, in fact, a high level of consensus from the community.

A large-scale and long term strategic planning focussing on major urban areas shall aim at the creative regeneration of its area of competence, integrating both naturalistic and agricultural components. The future programming of AU systems will have to find its strengths in visions that are capable of satisfying the public interest. In order to counter the development logic that encompasses large areas of agricultural land, it is necessary to develop unified plans aimed at implementing a system of areas devoted to UA. It is also necessary that any policy supporting these purposes, because of its relevance and impact, is shared and supported by the relevant community. However, in order to achieve a higher degree of significance and relevance, the involvement of the community and society should not be regulated and dictated by mere economic criteria and functions decided by the political class but rather defined basing on preferences directly stated by the members of the relevant community.

In order to facilitate the development of UA integrated programs it is necessary to provide a Deliberative Appraisal Procedure for such programs, capable of measuring their social importance via the direct expression of the involved community.

### **4. Deliberative Appraisal Procedures: the Community Esteem Value for Urban Agriculture Planning**

From a valuation perspective, the interesting economic aspect in deliberative appraisal is the Community Esteem Value which derives from the importance that the appraising subjects attribute to the good (Miccoli et al., 2014A).

In essence, in order to define and formulate the Community Esteem Value, it is necessary to take into account the social perception of the effects generated by a combination of three orders of causality: a) utility factors; b) intrinsic/existence factors; and c) factors of scarcity, due to naturally limited goods or goods of limited availability due to high costs (if producible) and market prices (if tradable). The use of monetary scale for measuring social appreciation is suggested by at least three reasons: 1) it makes possible not only to verify the existence of a preference but also to quantify it; 2) it is easier to communicate and convey appreciation for a social relevance project using a monetary scale; and 3) the monetary value of an asset represents a valid reference to set the amounts needed for a public investment, to evaluate the amount of bonds and to compare various alternate uses of the same funds.

The appraisal procedure proposed here allows the subjects of a community to directly estimate, through a direct, dialogue-based, well informed and inclusive approach, the appreciation of social programs focussed on implementation of UA integrated systems.

For several decades, many countries have initiated various programs to integrate the community in the key public decision hubs. Participatory democracy and deliberative democracy are the most important cultural events in the reform processes of more mature representative democracies. Given the recent increases in social tensions, conflicts and disagreements against many public or "government" decisions regarding land and community changes and transformations, community-inclusive processes are now considered a useful tool to manage and bring together all the interests at stake and make the most sustainable choices.

Among the many possible community-inclusive models those based on deliberative democracy are those who are, in recent times, gaining more approval and status. Deliberative democracy differs from the concept of democracy as an aggregation of preferences as it requires "deliberative decisions" to be available to all participants without resorting to vote. The most innovative aspect is the importance given to the transformation of preferences via a discursive/dialogue-based process aimed at defining public good, through which the preferences declared in the initial stage of the process are transformed in a way that takes into account the views of others, (Miller, 1991). The participants in the deliberation process convince each other via dialogue until they reach a shared decision. The aim of this process, the deliberation, is making individuals capable of making decisions while being fully aware of the general interest. Indeed, in the models of deliberative democracy each citizen engages in deliberation not just to define or defend his/her own interests but to discover a "good" that is not simply a function of individual utilities (Sagoff, 1998).

In order to measure the social appreciation of an integrated UA system we propose a Deliberative Appraisal procedure that combines the processes of deliberation with Stated Preference Methods (SPMs) approaches to economic evaluation of an asset based on individual behaviours related to hypothetical scenarios (Pearce and Özdemiroglu, 2002). Deliberative approaches can be combined also with multidimensional procedures, in order to reach shared decisions (Proctor and Drechsler, 2006).

In the proposed procedure, monetary valuation must be preceded by a deliberation, carried out by a random sample of citizens, the Valuation Group (VG), statistically representative of the of the relevant population, which is tasked with expressing its preference on the social importance attributed to the proposed system. These preferences shall be based on informed and conscious choices and the VG shall also clearly highlight its views, discuss them and if needed change them after the debate.

The members of the VG, through a series of meetings, shall then be provided with the information needed to discuss and express their social appreciation of this new system in which they will have to live; they shall also be given the opportunity to question witnesses and discuss among themselves the issues under the supervision of experienced moderators. The value expressed, therefore, is the result of a process of reflection and debate which has the purpose of forming a group which represents the community from a social point of view and is also capable of long-term, informed and impartial analyses. Compared to conventional monetary assessment approaches (e.g. Contingent Valuation, Discrete Choice Methods, Contingent Rating and Contingent Ranking), the Deliberative Appraisal allows a larger social legitimacy to the appraisal process' result and is less subject to cognitive distortions and, at the same time, it is also better connected to the formation of a collective identity, Wilson and Howarth (2006).

The Deliberative Appraisal is aimed at formulating a shared Willingness To Pay (WTP) by the VG. Participants evaluate the good as citizens belonging to a community which, through a deliberative path, identifies a series of

shared values and a common identity to be protected, thanks to the sense of interdependence and belonging that develops within the group.

During the information stage each component of the VG can compare his/her views with those of others and modify the initial opinion accordingly in the light of better knowledge and understanding of the positions and interests of the community. After the participants have received from the analysts the key information on the appraisal process, on the features of the integrated UA system and on the benefits that such a system entails, the VG identifies a shared list of experts and stakeholders to be consulted. During this consultation stage it is necessary that the views and intentions of the owners of the largest available lands, the farmers already operating in the area, the environment protection associations and all investors and any new stakeholder willing to engage in agricultural activities which are part of the system are shared and taken into account. During this stage, the stakeholders and experts shall be available to the VG to help them improve their knowledge, clarify doubts and bring into focus the positions and viewpoints of all involved parties. The appraisal stage shall begin only when the VG reaches a satisfactory information level; until then consultations may be repeated and new experts and new stakeholders may be added.

During the appraisal stage the parties shall try, via a deliberation session, to reach an agreement on a shared WTP that basically represents the social appreciation for the integrated UA project. The members of the VG shall not express their personal opinions but rather attribute a value to the system from a "common interest" perspective. The deliberative appraisal differs from conventional approaches because the WTP's ethical legitimacy comes from it being shared by all participants (Lo and Spash, 2013); agreement evolves through the rules of the dialogue, according to the belief that the speech has a motivational force that can resolve conflicts by shared social understanding (Warren, 1995). Through dialogue it is possible to reach a compromise between divergent positions in view of the best interests of society as a whole (Wilson and Howarth, 2002).

## 5. Conclusions

In the planning and implementation of integrated UA systems the community plays a key role in the recognition of the quality, benefits and other elements that together make it possible to appraise the social importance of the system. The expression of community appreciation, in addition to verifying the existence of the main prerequisites for the implementation of a system that integrates urban and rural environments, makes it possible to trigger processes of social and civic growth that, in the end, will be able to feed the cities.

The active involvement of citizens and a debate based on appropriate information allows the deliberative process to produce a responsible, democratic and shared decision. The Deliberative Appraisal enables individuals, who often do not have well-defined preferences regarding goods of social relevance, to build shared values devoid of the typical biases of conventional SPMs.

The validity of the deliberative appraisal procedures can be improved through a growing experimental activity. To date the most consolidated applications of deliberative appraisal procedures mainly concern with environmental issues (Urama and Hodge, 2006; Álvarez-Farizo et al., 2007; Gregory and Wellman, 2001; James and Blamey, 2005). Only in recent years it is possible to find applications related to urban contexts (Miccoli et al., 2015). Deliberative appraisal experimentalism, while renewing the modalities of participation to civic life also makes public choices more democratic, enhances the citizens' self-determination and expresses the extent of Community Esteem Value attributed to a series of social goods or projects.

Until the day when political and social representation of the interests and identities of citizens will have recovered its legitimacy, we should experiment with public decision-making, building decisions that respect the needs, preferences and desires expressed by the community.

## References

- Abel, J., 2012. Extension's Role with Farmers' Markets: Working with Farmers, Consumers, and Communities. Available at <http://www.joe.org/joe/2012february/iw3.php>. (Last visited January 2015).
- Alkon, A., Norgaard, K., 2009. Breaking the Food Chains: An Investigation of Food Justice Activism. *Sociol. Inq.* 79, 289–305.
- Álvarez-Farizo, Begoña H., Barberán, N. R., Lázaro, A., 2007. Choice modeling at the "market stall": Individual versus collective interest in

- environmental valuation. *Ecological Economics* Vol. 60, 4, 743-751.
- Bailkey, M., Nasr, J., 1999. From Brownfields to Greenfields: Producing Food in North American Cities; United Nations Development Programme: New York, USA.
- Been, V., Voicu, I., 2008. The Effect of Community Gardens on Neighboring Property Values. *Real Estate Econ.* 36, 241–283.
- Butler, L., Moronek, D.M. 2002. Urban and Agriculture Communities: Opportunities for Common Ground; Council for Agricultural Science and Technology: Ames, LA, USA.
- Carpenter, S. R., Caraco, N. F., Correll, D. L., Howarth, R. W., Sharpley, A. N., Smith, V. H., 1998. Nonpoint pollution of surface waters with phosphorus and nitrogen. *Ecol. Applic.* 8, 559–568.
- Gregory, R., Wellman, K., 2001. Bringing stakeholder values into environmental policy choices: a community-based estuary case study. *Ecological Economics*, 39, 37–52.
- James, R.F. and Blamey, R.K., 2005. Deliberation and Economic Valuation: National Park Management. In M. Getzner, S. Stagl and C. Spash (Eds.) *Alternatives for Environmental Valuation*. Routledge, London.
- IFAD's Rural Poverty Report 2011, available at <http://www.ifad.org/rpr2011> (last visited 10 February 2015).
- Lo, A.Y., Spash, C.L., 2013. Deliberative Monetary Valuation: In search of a democratic and value plural approach to environmental policy. *J. Econ. Surv.* Vol. 7, 4, 768-789.
- Martinez-Alier, J., 2011. The EROI of agriculture and its use by the Via Campesina. *The Journal of Peasant Studies* 38, 1, 145-160.
- Miccoli, S., Finucci, F., Murro, R., 2015. A Direct Deliberative Evaluation Method to Choose a Project for Via Giulia, Rome. *Pollack Periodica An International Journal For Engineering And Information Sciences* Vol. 10, 1, 143–153.
- Miccoli S., Finucci F., Murro R., 2014 (A). A Monetary Measure of Inclusive Goods: The Concept of Deliberative Appraisal in the Context of Urban Agriculture. *Sustainability*, 6, 9007-9026.
- Miccoli S., Finucci F., Murro R., 2014 (B). COLTURE URBANE- Stato, Caratteri e Apprezzamento Sociale. Un approccio introduttivo. *VALORI E VALUTAZIONI*, vol. 12.
- Miller, D., 1991. Deliberative democracy and social choice. *Polit. Stud.*, 40, 54–67.
- Mougeot, L.J.A., 1996. Introduction: an improving domestic and international environment for African urban agriculture. *Afr. Urban Q.*, 11, 137–152.
- Pearce, D.W., Özdemiroglu, E., 2002. *Economic Valuation with Stated Preference Techniques*; Department for Transport; Local Government and the Regions: Rotherham, UK.
- Perfetti, P., 2010. The New Millennium Risk Game Explodes: the Capture of Territories has just Started. *Energia, Ambiente e innovazione* 2.
- Proctor, W., Drechsler, M., 2006. Deliberative multi-criteria evaluation. *Environ. Plan* 24, 169-190.
- Wilson, M.A., Howarth, R.B., 2006. A Theoretical Approach to Deliberative Valuation: Aggregation by Mutual Consent. *Land Economics* Vol. 82, 1-16.
- SAFE Alliance, 1994. *The Food Miles Report: the dangers of long distance food transport*. SAFE Alliance, London, UK.
- Sagoff, M., 1998. Aggregation and deliberation in valuing environmental public goods: A look beyond contingent pricing. *Ecol. Econ.* 24, 213–230.
- Stuart, T., 2009. *Uncovering the Global Food Scandal*. Penguin, London.
- Tilman, D., Fargione, J., Wolff, B., D'Antonio, C., Dobson, A., Howarth, R., Schindler, D., Schlesinger, W.H., Simberloff, D., Swackhamer, D., 2001. Forecasting agriculturally driven global environmental change. *Science* 292, 281–284.
- United Nations department of Economic and Social Affairs, 2014. *World Urbanization prospects – The 2014 Revision*, United Nation, 2014 Available at <http://esa.un.org/unpd/wup> (last visited January 2015).
- Urama, K.C., Hodge, I., 2006. Participatory environmental education and willingness to pay for river basin management: Empirical evidence from Nigeria. *Land Economics* 82.
- Vandermeer, J., et al., 2009. Effects of industrial agriculture on global warming and the potential of small-scale agro ecological techniques to reverse those effects. Available at: <http://www.viacampesina.net/downloads> (last visited January 2015).
- Warren, M.E., 1995. The self in discursive democracy, In “*The Cambridge Companion to Habermas*”. White, S.K., Ed.; Cambridge University Press: Cambridge, UK.
- Wilson, M.A., Howarth, R.B., 2002. Discourse-based valuation of ecosystem services: Establishing fair outcomes through group deliberation. *Ecol. Econ.* 41, 431–443.
- World Health Organization (WHO), 1990. *Public Health Impacts of Pesticides Used in Agriculture* (WHO in collaboration with the United Nations Environment Programme, Geneva). Available at <http://whqlibdoc.who.int/publications/1990/9241561394.pdf> (last visited 10 February 2015).