

Appendix 2 - Model based Tools

Table 1 Short description of the tools

Tool's name	Description of the tool
Farming Concrete: Toolkit: Data registrator (incl. yield)	The data collection tool of 437 community gardens in different formats with their totals calculated. The Toolkit includes a total of 18 methods organized into five categories: food production data, environmental data, social data, health data and economic data. There is no direct indicator estimation but only a good dataset to estimate them. https://farmingconcrete.org/
Parcel tool (a web application)	Evaluation of the agricultural land needed for local food self-sufficiency for a given territory, as well as of the agricultural jobs created and the ecological impacts associated with possible changes in agricultural production methods and/or diets (e.g. greenhouse gas emissions, pollution of water resources, effects on biodiversity, etc.).The tool offers the estimation of the effects of certain changes in our diet, e.g. proximity between production agriculture and food consumption, modes of production, composition of our diets and food, etc. http://www.parcel-app.org/
UnaLab - NBS Simulation Visualization Tool	to visualize and discuss the potential direct and indirect environmental, social and economic impacts of user-defined nature-based solutions (NBS) for urban global change adaptation. http://unalab.eng.it/NbsSvt/
farmAR app	farmAR app brings information about soil and crops health directly to the smartphone. A user can design a farm by drawing a polygon on the map. Additionally, the vegetation health map is provided. http://farmar.create4d.com/
Geofood	Estimation of geothermal heat potential for agricultural production. This tool is not public and used for designing aquaponic systems using a circular approach (water and nutrient recycling and energy recovery) https://geofoodproject.eu/
Urban GreenUP NBS Selection tool	The tool recommends NBS for a city, based on challenges and the capabilities of an organisation. It can be used to support the identification of the best NBS to tackle environmental problems and to become more resilient to climate change. https://www.urbangreenup.eu/resources/nbs-selection-tool/nbs-selection-tool.kl

Table 2 Data items managed by the tools (output data, input and external datasets)

Tool's name	farmAR app	UNaLab - NBS Simulation Visualization Tool	Urban GreenUP NBS Selection tool	GeoFood - Showcases and innovative concepts	Parcel tool (A web application)	Farming Concrete - Toolkit: Data registrator (incl. yield)
	<i>Ex-post</i>	<i>Ex-ante</i>	<i>Ex-ante</i>	<i>Ex-ante</i>	<i>Ex-ante</i>	<i>Ex-post</i>
Yield						kg harvested/nb of plants by date
Irrigation need					0	
Cultivated area					ha (area necessary) for organic or conventional agriculture	m2
Vegetation health	vegetation health distribution index (color maps)					
Soil moisture	volume of water per total volume of soil (10cm soil depth)					
jobs created					Full Equivalent jobs based on employments coef. by ha by type of crops	
Water use and water pollution variation					% /ha	
Biodiversity variation					% of species /ha	
Impact on air and climate					CO2 emissions/ha (positive or negative)	
Soil impact variation of soil footprint					%/pers. fed	
Soil impact variation of soil fertility					%/ha	

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<i>urban heat</i>		°C Temp difference with baseline scenario + map				
<i>air quality</i>		1				
<i>flooding</i>		1				
<i>gentrification</i>		1				
<i>NBS properness score</i>			Score calculated along 8 success factors ¹			
number of plants produced						m2 by crops or number of plants by m2
Geothermal energy requirement				kWh/m3 by type of aquaculture		
Social inclusion - Community participation						nb of hours spent by volunteers by period of time Nb of hours spent by task (composting, watering, ...) by period of time
Social inclusion - Training activities						nb of events organised by year, number of participants by event
Organisational benefits						
Landfill waste produced						m3 and kg by type of waste (grass, dried leaves, ...) by date
Compost produced and used						kg and litres by period (measured with a bucket)

¹ Stable executive and political support ; Suitable internal processes/standards/regulations/policy ; Staff have time and motivation ; Advanced community engagement skills ; Alignment of internal departments ; Culture of innovation and risk tolerance ; Supportive departments in other level of government ; Access to suitable technical skills

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Rainwater harvested						rain water collector area (m2) by date (period) plus rainfall data (insitu or external) m3 by period
Health impact: change in visitors feeling/mood						% of visitor's mood value (10 - from Happy to frustrated) over a period visitors survey in/out the garden
market sales						Revenues generated by products sales over a period
Food donated						kg by type of product over a period
External datasets	up-to date Satellite (Copernicus) data observations	Models: urban heat and air quality (WRF-CHEM) Flooding & water quality (InfoWorks, Mike Urban/flood) Biodiv (InVEST, iTREE) spraw, gentrification, real estate (SULD)	Catalogue of NBS. Calculation method integrated in an Excel file		average consumption by 61 typical products in kg/pers./year water footprint of crops	None
Input data	Login with an email and create a farm (outlining in a map), then satellite observations (GEO tags) will be visualised; for creating own GEO tags, picture and notes (lat-long, altitude automatic)	Choice of NBS, local datasets (landuse, emissions, air&water quality, biodiversity, demography, socio-economic and climate.	Urban challenges to address; NBS already considered; organization capacity information		1. The concerned territory (commune, department...) 2. Population (number, composition, ...) 3. Percentage of the relocated food (local production) 4. Population diet 5. Percentage of organic matter that conditions the yield used for the calculations	Data collected by local communities into Concrete farming online DB