Chiara Briatico

COST Action Urban Agriculture Europe: Inventory of free/abandoned areas in Oslo and possibilities for future land use (urban agriculture) and local activities. Which opportunities and challenges can be defined?

Short Scientific Report on the Short Term Scientific Mission

Oslo, Norway 23/02 14/03/2015

COST Action Urban Agriculture Europe
Inventory of free/abandoned areas in Oslo and possibilities for future land use (urban agriculture) and local activities. Which opportunities and challenges can be defined?

Short Scientific Report on the Short Term Scientific Mission

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Author: Chiara Briatico

Supervisor: Sebastian Eiter

COST Action Urban Agriculture Europe is chaired by:

Prof. Dr.-Ing. Frank Lohrberg
Chair of Landscape Architecture
Faculty of Architecture
RWTH Aachen University

e-mail: science.cost@la.rwth-aachen.de

Professor Lionella Scazzosi
PaRID - Ricerca e documentazione internazionale per il paesaggio
Politecnico di Milano

e-mail: parid@polimi.it

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Introduction

In recent years, there has been a rapidly growing interest for greater local food production within cities. This is mainly due to fact that urban agriculture is a multi-faceted program that generates a variety of benefits including community involvement, educational opportunities, decreased fossil fuel consumption, urban greening, increased economic development, and easier access to healthy foods.

It is inevitable that a cityís ecological impact stretches far beyond its physical boundaries, and cities not including this practice use too many natural resources as a result of their food systems.. A system based on local food production instead, has the potential to combat the negative effects of todayís industrial food chain.

Despite to its positive impact, implementation of urban agriculture is a challenging process due to different kind of obstacles.

One of the more pressing challenges is the lack of space, which is allocated for competing interests such as residential, commercial, or industrial development.

But space in some cases can be an opportunity, while considering the unexploited or abandoned territory that is located in or close to the urban area.

In addition, urban agriculture needs certain parties as investors, growers, distributors, etc. to sustain it. To develop it is recommended as a first step the accurate mapping of existing and potential urban agriculture sites where to include criteria that involve physical and economic factors as all the parts involved into the process.

Acknowledgements

I would like to express its sincere gratitude to everyone who helped us during the STSM process. I would like to thank the COST Office for funding and the COST Action Urban Agriculture Europe for supporting the STSM research, and my supervisors Sebastian Eiter at the Norsk institutt for skog og landskap, Ellen Marie Forsberg at the Fylkesmannen i Oslo og Akershus and Line Tveiten at bymilj¯ etaten i Oslo for allowing me to conduct this study.

My supervisors have been very open and supportive, and this concern allowed me to gather such diverse data. I also appreciate the many employees of the Norwegian Institute for forestry and landscape who have aided me on obtaining the data I required and also provided valuable guidance.

I take this opportunity to thank all the parties involved.

Lastly, I would like to extend my thanks to the cities of Oslo and all those who have pioneered similar land inventory initiatives. Their examples were instrumental in the development of this project and its adaptation to the city.

Purpose of the STSM

This project intended to identify and present the potential for urban agriculture in the city of Oslo through the creation of a potentially useful land inventory. This was achieved by working with local stakeholders, analysing successful examples from Oslo and other cities, and utilizing GIS software. This inventory should be used to identify potential sites for food production and inform policy decisions regarding food, health, and city planning.

In agreement with the project supervisor I decided to use the urban agriculture classification defined by the Cost Action Urban Agriculture Europe working group1 as starting point in the order to set relevant criteria for each type and include them into the maps. For this reason the classification has been introduced to the stakeholders during meetings and presentations.

Our primary objectives were to:

- **Determine relevant criteria for the land inventory through discussion with local urban agriculture stakeholders.**
- **Analyse urban agricultural initiatives in other cities and the role of land inventories through comparative case studies.**
- **Develop a land inventory for the city of Oslo**
- **Establish an easily accessible and usable format for the finalized database.**

The ambition of this STSM was also to introduce to stakeholders and other parts the developed mapping tool as an innovative aid for supporting the decision making process in Urban Agriculture policies. With the potential model, we aim at contributing to the wider society dealing with urban agriculture, green spaces latent opportunities and food systems and to the methodological and theoretical approach of the European COST Action Urban Agriculture Europe.

Despite to the reduced amount of time, combining all relevant factors into potential maps based on the different UA typologies has been an achievable task for this short term mission. Therefore the purpose of this research was also to establish a methodology that can be used by the different parties including relevant information for different types of urban agriculture projects and or specific areas.

Description of the work carried out during the STSM

During this short term scientific mission I have been guest member of the ®Norsk institutt for skog og landskap® (Norwegian institute for forestry and landscape) in Ås, and the work as undergone with the supervision of Doc. Sebastian Eiter, a formal member of the action and in cooperation with the Oslo Municipality in the person of Ellen Marie Forsberg, senior advisor of ®Fylkesmannen i Oslo og Akershus® (the Agriculture department) and Line Tveiten from the ®Oslo bymiljøetaten® (Agency for city environment).

The study area was the entire Oslo Municipality, and all the 13 departments (®bydels®) have been taking into consideration, focusing mainly on the urban area. All data was handled using a specific boundary, as visible on the maps.

The preparatory works started already weeks prior to the STSM in the form of literature reviews and electronic communication. The typologies of urban agriculture set by the Cost UAE working group1 where especially examined, as they are available on the wiki section of the Cost UAE official internet site.

on the wiki section of the Cost UAE official internet site.

The on-site work started with an opening meeting with the supervisor, where the available information was presented, discussion and brain- storming on the objectives and methodology of the research on February 23. The cooperation was coordinated in the form of consultation meetings to discuss all the tasks and set the targets. In this occasion I also introduced the criteria for the research, and we made a selection according to priorities, achievable targets and available information.

I realized the main part of the work with the material, software and hardware provided from the Institute and from the Oslo Municipality. The main analysing tool has been Geographical Information System, and very diverse data where gathered, analysed and shown trough the aid of digital maps.

After the main results where set, they where presented in form of maps at the Oslo Agency for city environment and at the Institute as a seminary on 11th and 13th of March. The produced material is available in digital version at the Institute for forestry and landscape, and a paper version of the maps where dispensed during the meeting at the Agency for city environment.

Available input information

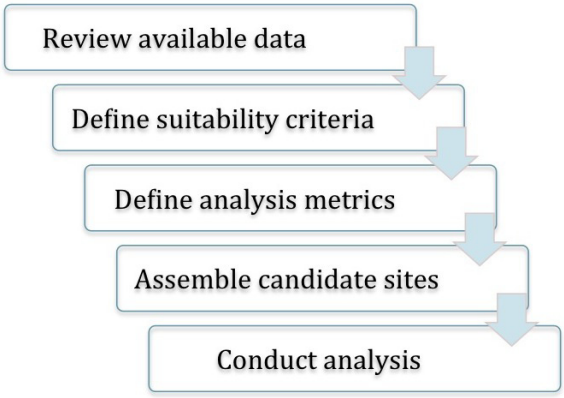
The data has mostly been gathered from the GIS database of the Institute, and other data set where provided from the agency for city environment.

The following scheme shows all the used geographical information:

SOURCE	NAME	DESCRIPTION	TYPE
Norsk Institutt for skog og landskap	32_0301bygning_flate	Buildings classified by typology	shapefile
	ar5_artype_oslo	Soil classification	
	arealdekke_flate	Land classification	
	agricultural_soil_quality	Agriculture soil quality (1-3 range)	
	Farms	Position of existing agriculture activities that applied for public funds	
	Regulering	Planning regulation	
	6605_2_10, 6606_3_10, 6606_4_10	Elevation value for the Oslo area 10 meter resolution	Raster (TIFF)
Oslo bymiljøetaten	Bydelsgrenser	Oslo Departments limit	Geo-database
	Markagrense	Oslo forest limit	
	Hovinbyen	Area for further planning	
	Bydelsanlegg	Leisure activities areas	
	Parkanlegg	Parks areas	
	Forurenset_grunn	Polluted soil	
	Potensielle_ forurensningskilder	Potential contamination focus	
	Aktsomhetskart_ forurenset_grunn	Potential polluted soil	
	Urbant_landbruk	Existing urban agriculture	
Geonrge online database	norgeibilder	Aerial photography	Web Mapping Service
	toporaster2	Topographic background	
	n5raster	Old "economic" map	

Methodology and criteria

The methodology for this research has been a step analysis whether different stages where adapted to the expectative of the stakeholders and the availability of the information.

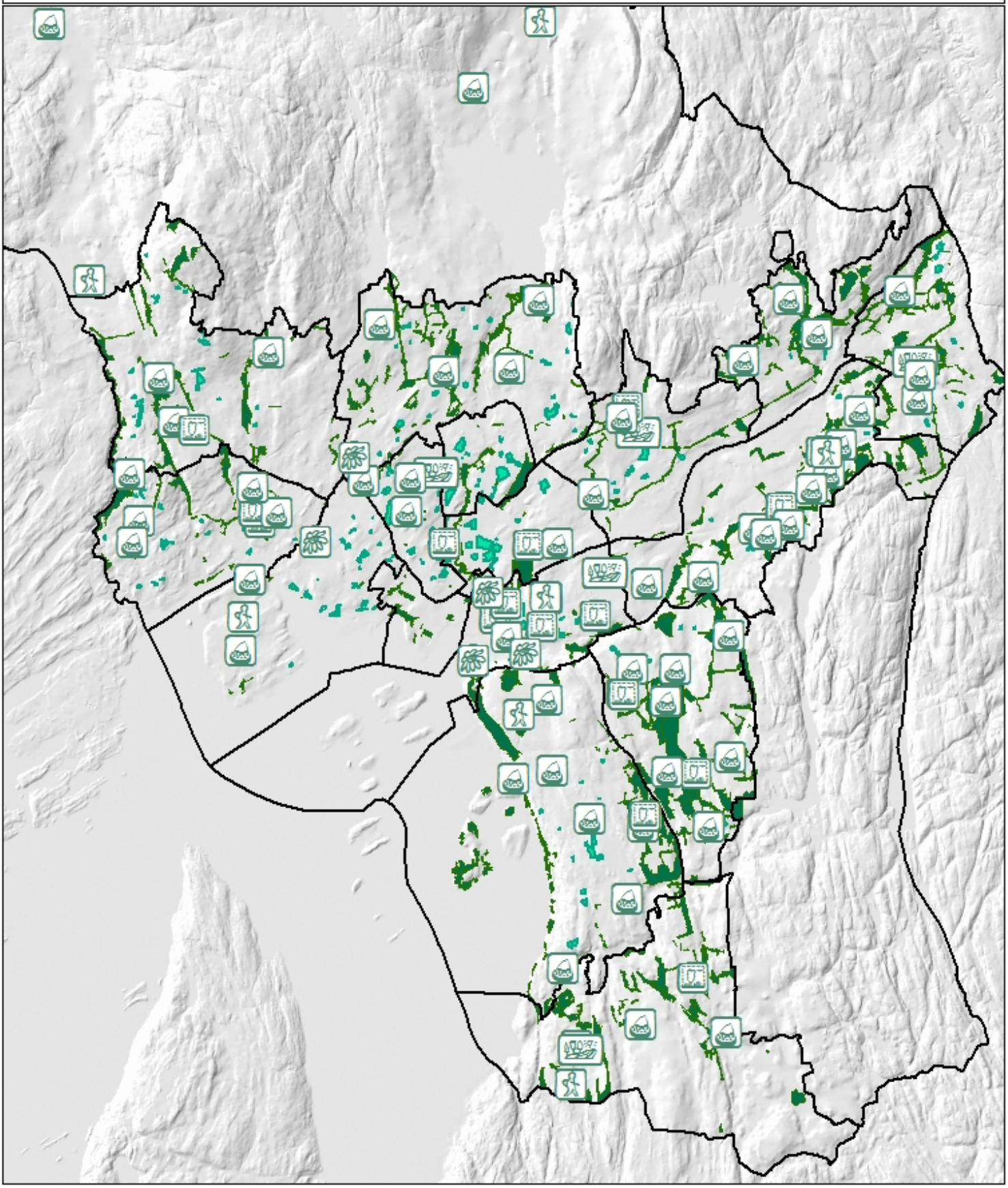


Existing urban agriculture projects have been a starting point while approaching available information, with the aim of finding similarities and inspiration for possible location of new projects. All the geographical information has been deeply investigated and many useful data and details where found.

Once that all the available data where examined and categorized, I resumed it in a presentation for the stakeholders, supported from the following map. The aim of the meeting was to establish relations between urban agriculture requirements and the available data, to set relevant criteria for the Oslo case and define priorities for the research. This approach led to the creation of scenarios based on urban agriculture types defined by the Action, available information and stakeholders expectative.

Once defined the scenarios between a wide variety the research effort focused on small to medium scale, dispersed or community based urban agriculture such as community gardens, and institutional supported projects as therapeutic and educational gardens. Also others more commercial oriented projects has been considered, and treated with a more general approach due to the limited time.

URBAN AGRICULTURE PROJECTS IN OSLO



Urbant landbruk

- Besøksgård
- Kombinert
- Nærmiljøanlegg
- Parsellhage
- Parsellhage (tidl. skolehage)
- Skolehage

- Bydelsgrenser
- Bydelsanlegg
- Parkanlegg

0 1 2 4 6 8 10 km

Coordinate System: ETRS 1989 UTM Zone 32N
Projection: Transverse Mercator
Datum: ETRS 1989
Units: Meter

Chiara Briatico 2015

As mentioned before, multiple criteria with strong connection to urban agriculture have been mapped. The general classification includes physical and social criteria as following:

- **Support of the institutions**
- **Soil quality requirements**
- **Soil extension requirements**
- **Proximity to related facilities**
- **Pollution**

I consider the **support of the institution** as the core of the strategy and one of the main points of strength for the Oslo case, and this supposition was also confirmed during the first meeting with the Oslo Municipality. For this reason I took advantage from the information contained in some of the provided layers to use public areas ruled by the municipality as a base for the investigation.

Physical criteria where included in the investigation, unless not only the soil already classified as agricultural was taken on count. This was because I consider that in some cases having top quality soil is not relevant for the projects, as it is possible to solve the problem with alternative growing solutions, and on the other hand it is possible to improve soil quality while needed. This consideration was also aimed to highlight the possible benefit of agriculture in an urban environment, as possibly recuperate the agricultural soil quality. Another crucial factor was the slope, whether I set a value > than 10 degree as an exclusive factor, but from my analysis it result that the maximum value found on the Oslo area was 8, and for this reason I did not exclude any part of the municipality for this reason.

To approach the **extension requirements** I reviewed literature and real cases, and I also analysed the existing Oslo urban agriculture initiatives. From my exploration it resulted that commonly 4.5/5x5 meters parcels for allotments are average size, as in general for gardens a minimum of 200 square meters is an acceptable size. While measuring existing urban agriculture initiatives from aerial pictures, as this information was not included directly on the layer, I found that existing projects are between 140 and 2500 square meters, and this extension was replicated in the final result.

For the some of the urban agriculture typologies that where on my main focus, **proximity to related activities** was a relevant criterion. Especially for educational and therapeutic gardens, the radius was set between 50 and 150 meters during different steps of the analysis. Even if therapeutic and educational farms were not separately discussed categories on this case, proximity was not considered as a constraint because the main propose of this activities does not necessarily require the physical presence of its related institution. Finally, for the urban gardens category, it has been included as general consideration, their location in the build-up area.

Pollution is a relevant factor as around 5% of the Oslo urban soil is contaminated, as it appears in the data provided from city environmental agency. As it is indicated from the same font, a wider area might be polluted, but this information has not been taken in count, considering that specific soil analysis are into normal routine wile setting new agriculture activities. Polluted soil contained in potential areas is marked with a specific symbology, as it could be used for activities and facilities related with urban agriculture as growing in boxes, storage etc.

After criteria where set, I established metrics for every scenario, and than performed analysis and geoprocessing with the aid of Geographical Information System software ArcGis, characterizing data depending on attributes and position, cutting and erasing features or portions, building models as digital elevation, extracting useful information and refining results depending on parameters. A more detailed description of the steps for each scenario will be included while presenting results.

Description of the main results obtained

The main results of the STSM are shown into a set of 5 maps that are attached to this document on the annex section. The information used to compose the maps is also available in a digital support at the Institute. In the CD it is included all the produced geographic information, in form of shapefiles and raster, the projects in ArcGis format .mxd and other additional reference documents including this report.

With the aid of map the inhabitants of Oslo have the opportunity of gaining insight of the activities related with urban agriculture, as well as the potential areas for further developments. The produced map set can be used as a consultancy tool for parties with an interest on urban agriculture initiatives; information is presented in a great detail including more embedded criteria.

While setting target user for the final product, I decide to stretch the category in the order of including a wide range of professionals and less educated subjects, because I think that accessibility to information is a key factor while discussing urban agriculture. For this reason while designing maps I tried to simplify the information to present it as clear and user friendly as possible, considering also that my first audience at the Oslo municipality were not supposed to have any geographic education.

Maps are available in vectorial (pdf) format, and can be printed in any format, as the suggested one is A0 or A1. To avoiding misunderstanding I did not add a scale value to the layout, unless the scale bar can be used for measuring purpose.

From the research I carried out during this mission it resulted that Oslo has a relevant proportion of uncovered/unsealed land in the form of parks, lawns, vacant land and roadside areas. In such areas soil is accessible and possibly usable.

In urban environments soil tend to be very contaminated or unsuitable for agriculture, unless some of the existing urban agriculture initiatives carry out their activity on contaminated soil. Soil based agriculture is mostly dependent on the availability of soil and its quality, nevertheless ground based food production can take a wide variety of forms. Soil quality and contamination is therefore a critical issue for all urban farms in Oslo as elsewhere.

The following list resume the main results found during the research activity.

ESTIMATED POTENTIAL FOR EACH OF THE URBAN AGRICULTURE TYPOLOGIES

o For educational gardens:

- 203 potentially useful areas, for a total surface of 4362850 square meters,

- 776 centres involved between primary schools and kindergartens.

o For therapeutic gardens:

- 62 potentially useful areas, for a total surface of 1021336 square meters,

- 22 of them related with a space already ruled by an institution,

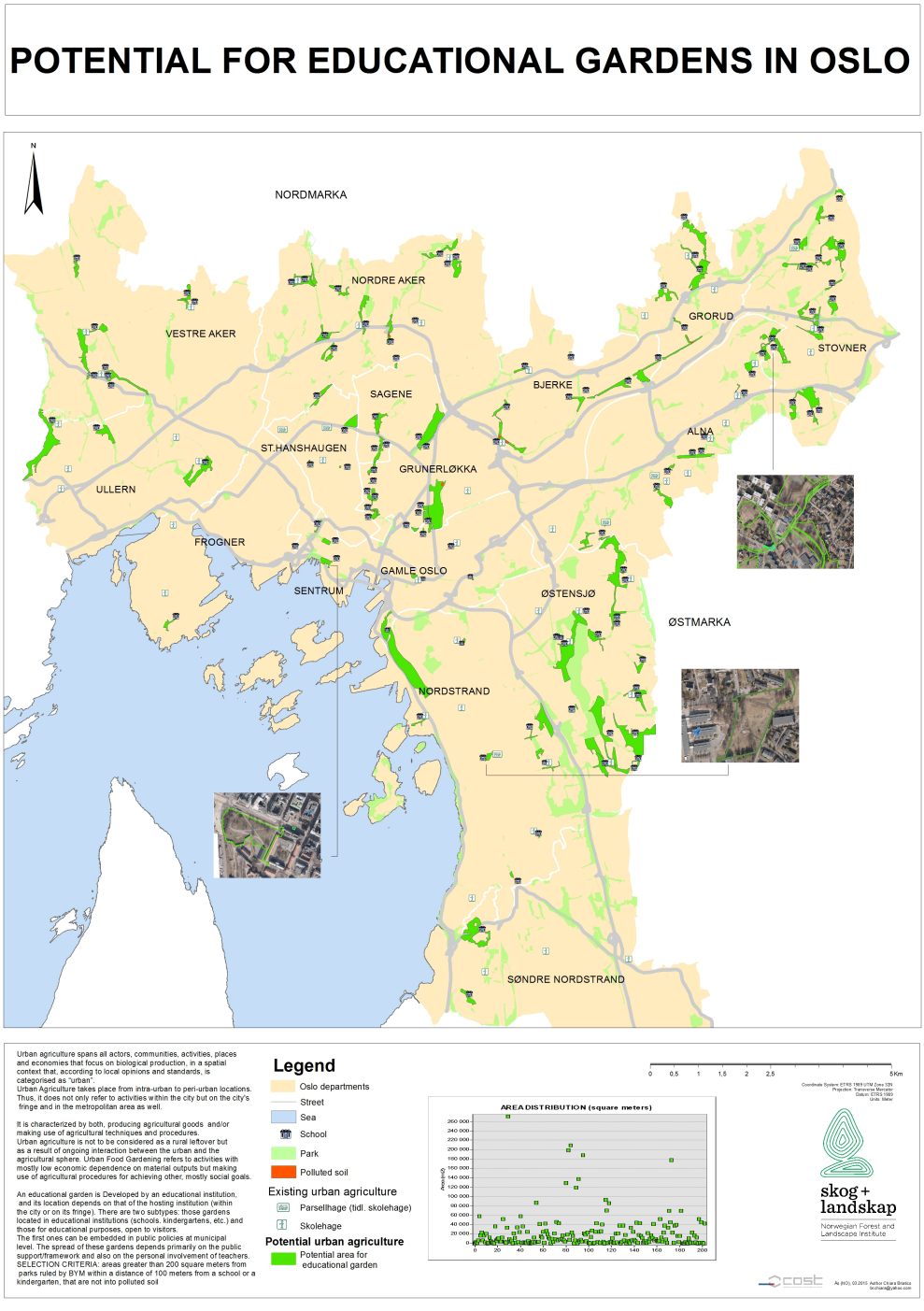
- 140 centres involved including nurseries, psychiatric and rehabilitation hou ses, elderly peoples institutions.

o For community gardens:

- 490 potentially useful areas, for a total surface of 2318710 square meters, that could be also suitable as allotment gardens

Presentation of the maps

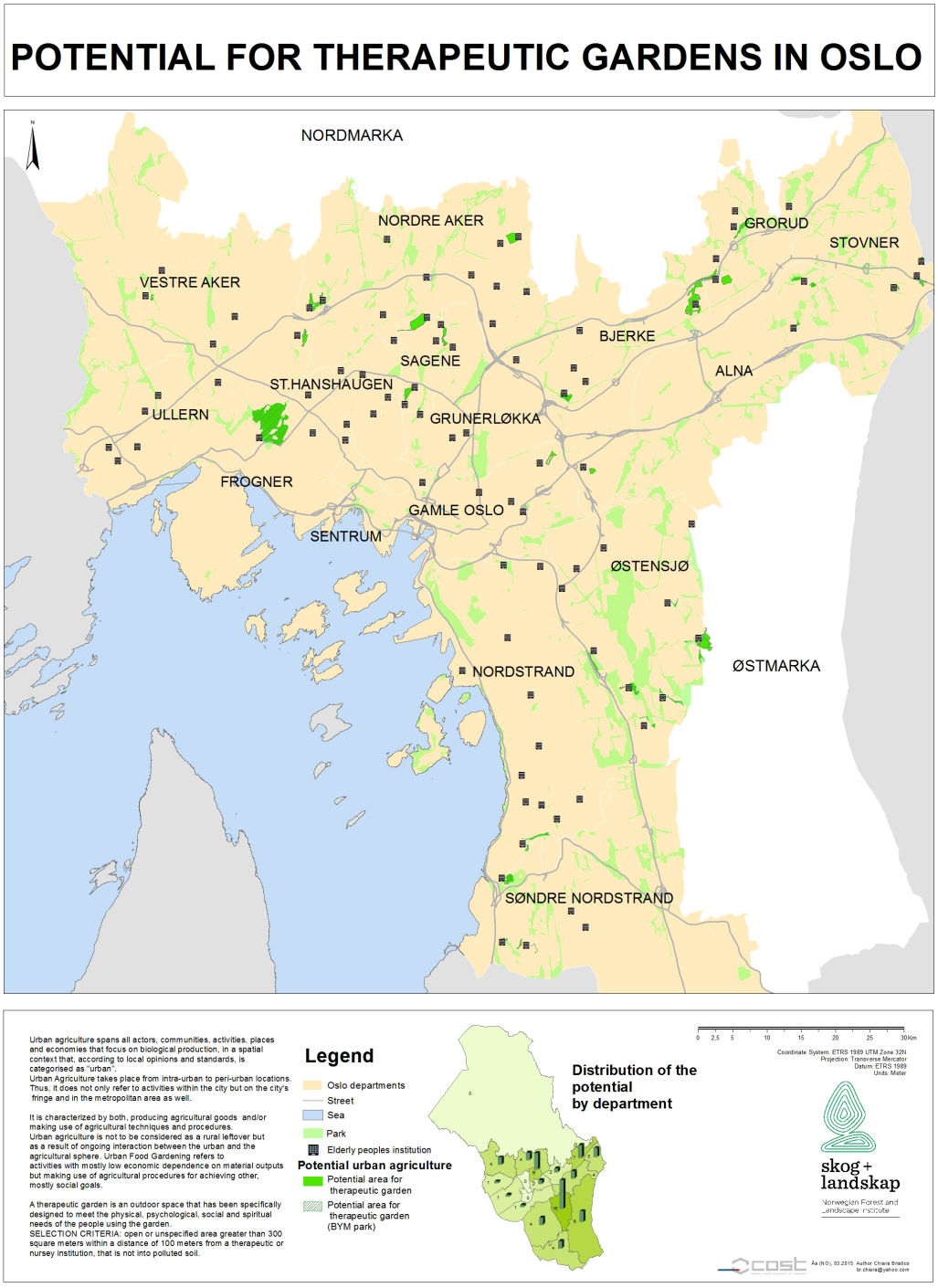
o Map1: POTENTIAL FOR EDUCATIONAL GARDENS IN OSLO



This map is representative of the analysis conducted using 776 relevant buildings of primary and secondary schools (class 1 to 10 for children of 6 to 15 years) to characterize those spaces classified as parks administrated by the municipality within a radius of 100 meters. The resulted areas smaller than 200 square meters have been excluded, and in the graphic it is possible to see the size distribution for the 203 relevant records. The polluted sections inside selected areas have been highlighted in red, but not excluded.

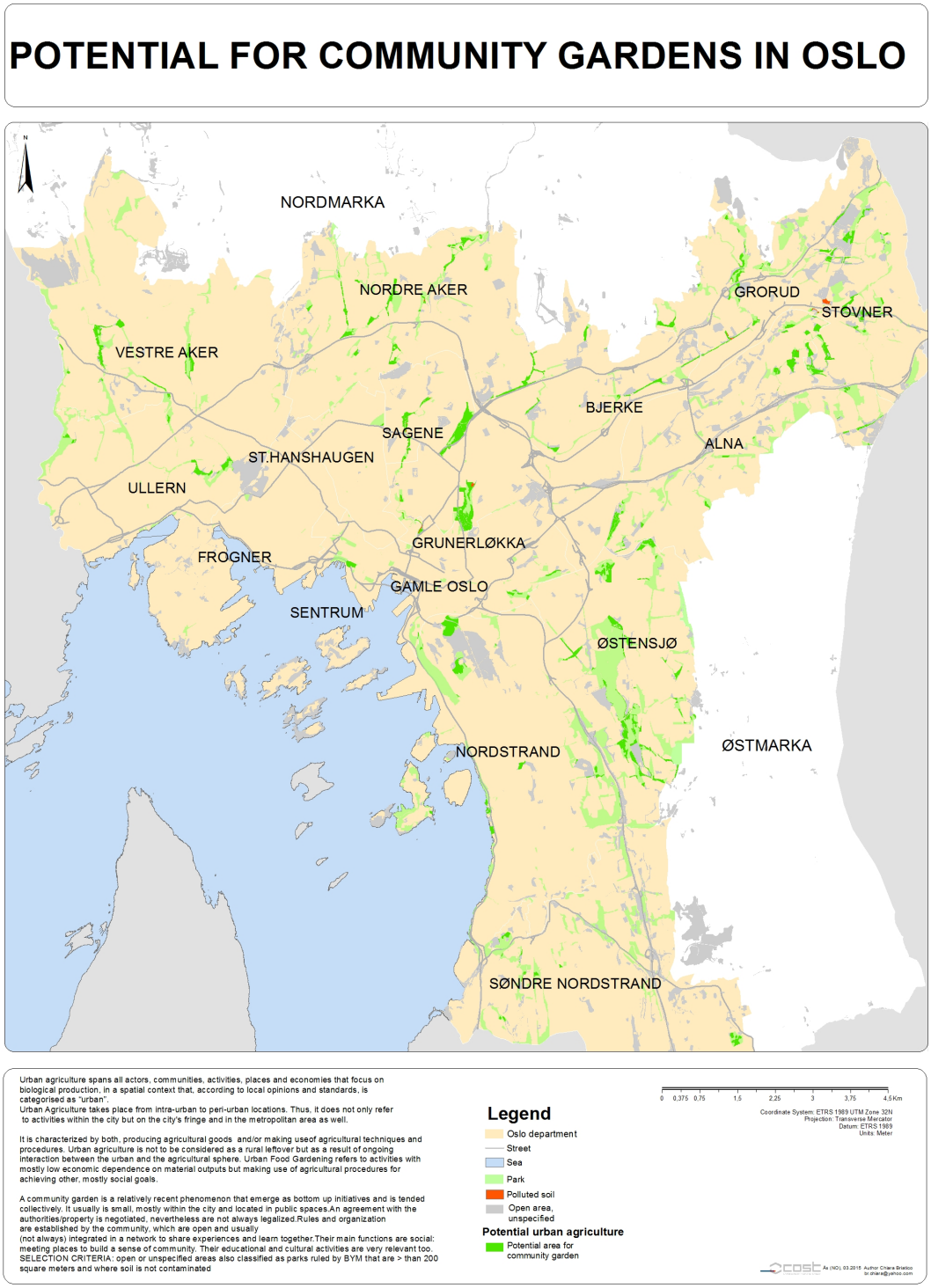
Some images have been added to the layout to display randomly how the selected sectors appear on aerial photography.

o **Map2: POTENTIAL FOR THERAPEUTIC GARDENS IN OSLO**



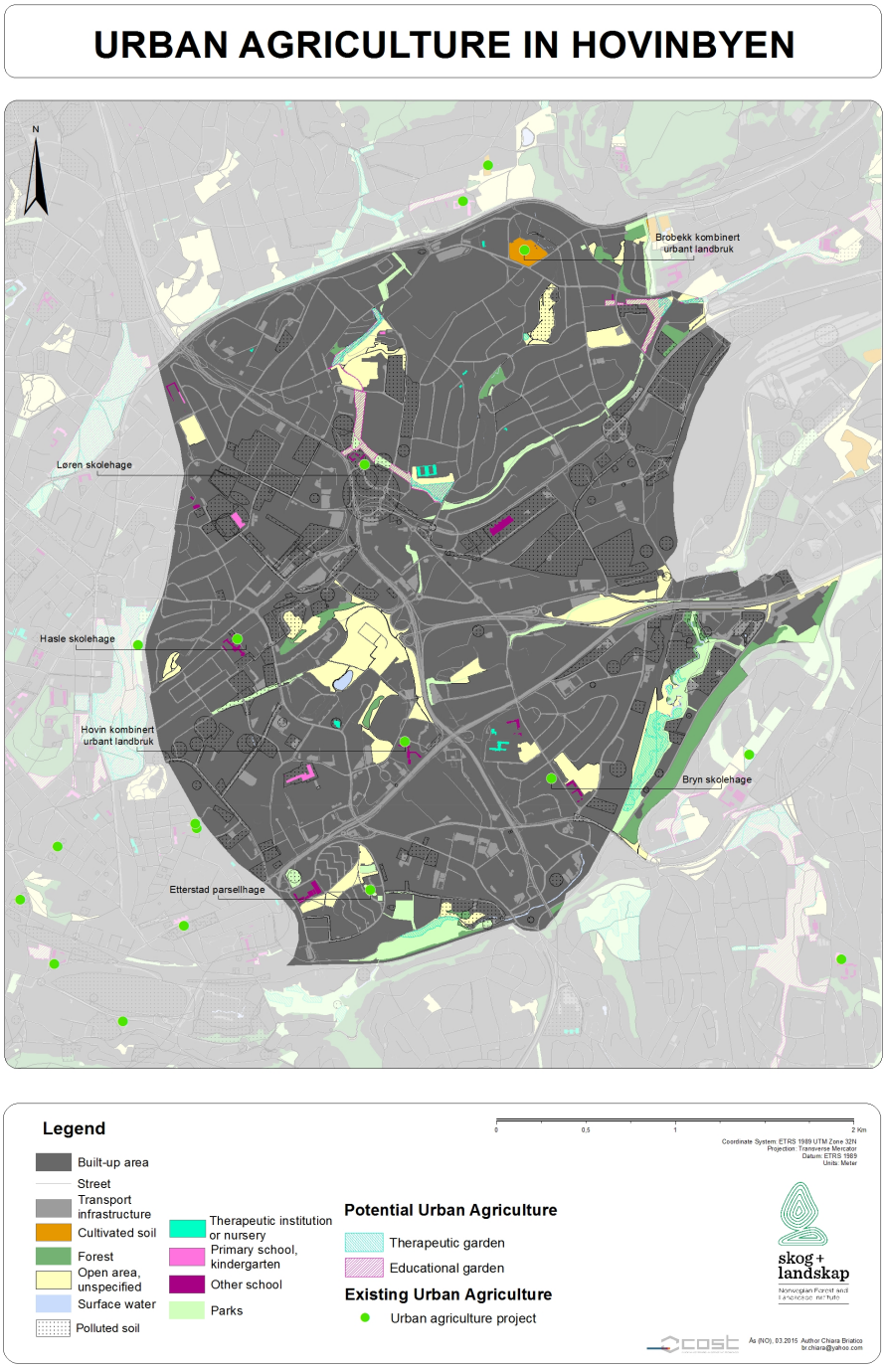
For this scenario have been taken 140 buildings related with institutions for mental retardation, disability, elderly peoples, nursing homes and treatment centres. This selection has been used to characterize from the soil classification layer (ar5_arty-pe_oslo) those areas that correspond to the denomination ë pen fastmarkí. This class correspond to a wide range of possibilities, often related with uncovered soil origi-nally classifies as agriculture. Those areas located into a radius of 100 meters, and greater than 200 square meters have been considered appropriate for therapeutic gardens implementation. The map shows also the potential concentration by depart-ment in a graph.

o Map3: POTENTIAL FOR COMMUNITY GARDENS IN OSLO



This map is created out of a scenario of small mostly within the city and located in public spaces areas, where emerging bottom up or citywide coordinated activities could be located. For this reason has been taken open or unspecified areas also classified as public parks ruled by municipality and not polluted. The minimum size for these areas has been set as 200 square meters. The resulting map reveals a consistent amount of uncovered surface, where urban agriculture could be introduced side to the existing leisure and other activities.

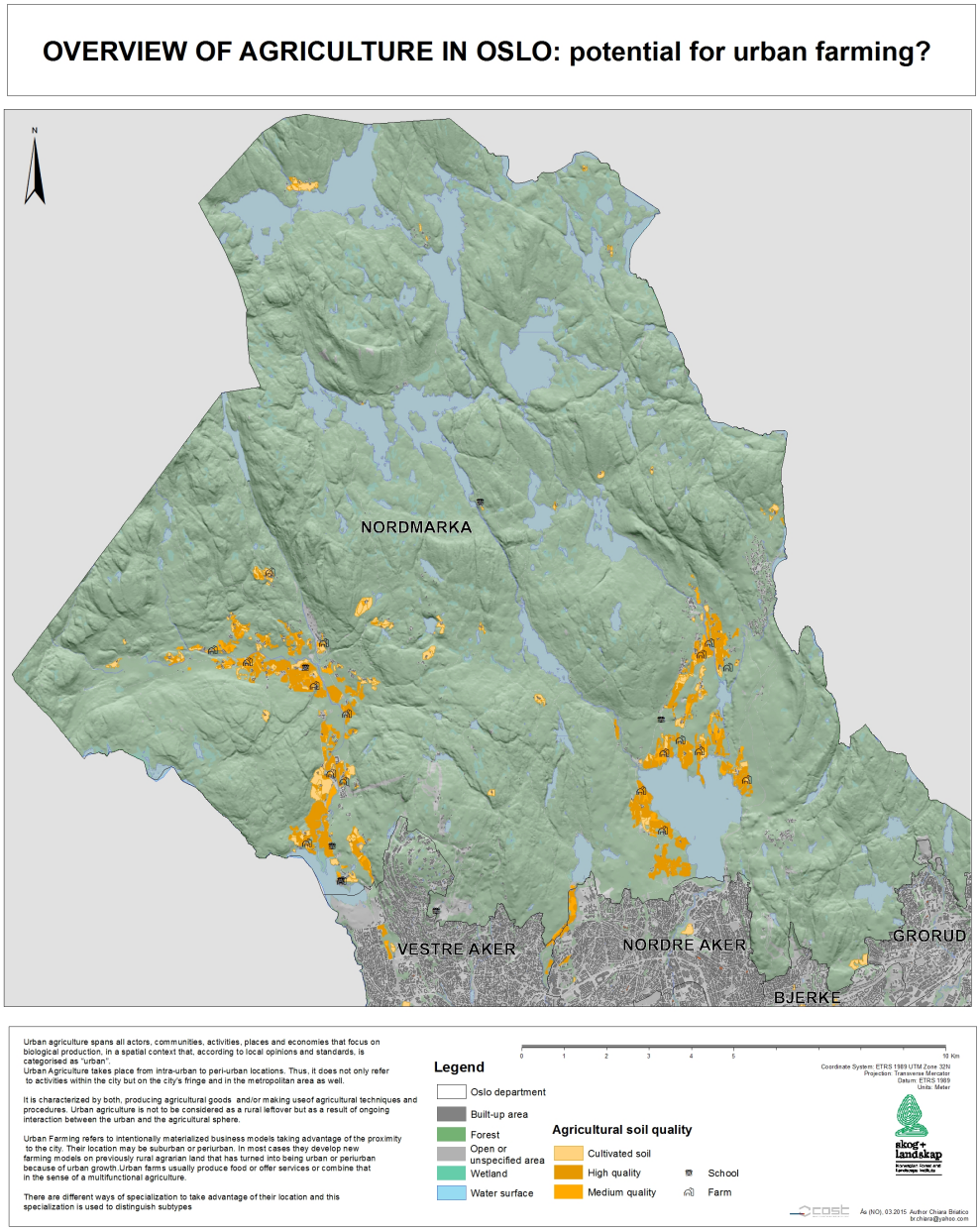
o Map4: URBAN AGRICULTURE IN HOVINBYEN



ëHovinbyení ıefers to a further developing area set next to Oslo city centre. This area is not a formal administration division, and it includes part of four departments (bydels). It is expected to raise 27,000 new homes and 2,5 million square meters of offices area. At first glance seems that built-up area is significant and green and free spaces are less extended compared to the rest of the city centre.

The map integrated possibilities for both educational, therapeutic and community gardens, and in some cases this potential areas are overlapping. Urban agriculture initiatives are also shown, and it could be possible to use existing institutions, which does not have any related urban agriculture project as a reference to establish priorities while planning. Finally, in Map 3, it shows the soil contamination where the black stripes correspond to certainly polluted areas.

o Map5: OVERVIEW OF AGRICULTURE IN OSLO: potential for urban farming?



Urban farming normally refers to more soil consuming activities where the economic investment can be consistent as it is described in the Cost Acton UAE official classification.

This map shows the result of the preliminary analysis for perspective urban agriculture activities in the Oslo northern ëMarkaí aŗea. The main starting point is the availability of agricultural soil, and existing farms not urban oriented are highlighted. Free and open areas, that are included on this map, should be taken into consideration as their proximity to cultivated land leads to suppose that the soil could be suitable for this propose. The map shows some relevant institutions as schools, unless I consider that distance is not a constraint while programming urban farming activities, as they does not requires necessarily continuous relationship with users.

Conclusions and proposals for further investigations

Urban agriculture is only one of the faces of the rising awareness of the impacts of food production chain on our environment and health, and has the potential of attracting a wide sector of our society. Local initiatives are flourishing in our cities independently from institutional support and this vitality should be encouraged at different levels.

Land inventories and potential mapping are often an initial step toward developing successful urban agricultural programs, and can be useful as multifaceted instruments that serve to both promote urban agricultural policy, and help locate vacant land in urban environments.

In Oslo as in the Scandinavian countries in general, social participation is emphasized during decision-making process and any support information for urban agriculture policies should be expanded and scattered to the entire society. This work can be considered as an attempt to delay an approach of how to manage geographical information while identify potential sites for food production, and inform policy decisions regarding food, health, and city planning.

ìAr eas regulated as public free spaces were included in the analyses. However, on the final stakeholder meeting it was expressed that Oslo municipality would basically prefer other areas for developing urban agriculture. It is most important for them to find locations where urban agriculture would not be developed at the expense of other/existing user groups.ì(Oslo municipality)

The created set of maps will result very useful for urban agriculture promotion and debate in the Oslo area, and the next step could be to provide the possibility to customize and improve results in the order to match expectations of different final users. This can be done transforming the static version of the maps into an interactive system that allows including other aspects and defining the radius of the research.

As final consideration I include here some suggestion emerged from the cooperation with actors during this Short Term Scientific Mission:

WIDE THE VARIETY OF CRITERIA FOR THE INVESTIGATION

Enhancing existing categories and including economical, social, etc. criteria.

INCLUDE ADDITIONAL APPROACHES

Highly recommended bottom-up strategies to involve local community and get close to the potentially interested population.

SUPPORT LOCAL INITIATIVE WITH USEFUL INFRASTRUCTURE

Suggested an accurate analysis of the existing infrastructure that has the potential to support urban agriculture activities taking advantage of the existing facilities (refrigeration, food processing, distribution...)

PROMOTE EXTENSION AND SHARING OF KNOWLEDGE RELATED WITH URBAN AGRICULTURE

To whom it may concern

skog+ landskap

NORWEGIAN FOREST AND LANDSCAPE INSTITUTE

Date:
16 May 2014

Yours ref:

Our ref:
see/wed

Confirmation of interest

Hereby we confirm that the Landscape Section at the Norwegian Forest and Landscape Institute is interested in hosting Ms Chiara Briatico during her planned Short-Term Scientific Mission «Inventory of free/abandoned areas in Oslo and possibilities for future land use (urban agriculture) and local activities. Which opportunities and challenges can be defined?», in cooperation with the Department of Agriculture at the County Governor of Oslo and Akershus, as part of COST Action «Urban Agriculture Europe» (TD1106).

Sincerely,

Dr Sebastian Eiter
Research Scientist
MC member of COST UAE

sign.

Dr Wenche Dramstad
Senior Research Scientist
Head of Section

Norwegian Forest and Landscape Institute
Pb 115, NO-1431 Ås
T +47 64 94 80 00
F +47 64 94 80 01
Org. No.: 970 167 641
Bank acc.: 7694 05 12081
IBAN: NO3276940512081

Norwegian Genetic Resource Centre – a part of Norwegian Forest and Landscape Institute

www.skogoglandskap.no

To whom it may concern

skog+
landskap

NORWEGIAN FOREST AND
LANDSCAPE INSTITUTE

Date:
22 April 2015

Yours ref:

Our ref:
see/wed

Confirmation

Hereby we confirm that Ms Chiara Briatico has successfully absolved her Short-Term Scientific Mission « Inventory of free/abandoned areas in Oslo and possibilities for future land use (urban agriculture) and local activities. Which opportunities and challenges can be defined?» as a guest researcher connected to the Landscape Monitoring Section at the Norwegian Forest and Landscape Institute from 23 February until 13 March 2015.

Sincerely,

Dr Sebastian Eiter
Research Scientist

Dr Wenche Dramstad
Senior Research Scientist
Head of Section

Norwegian Forest and
Landscape Institute
Pb 115, NO-1431 Ås
T +47 64 94 80 00
F +47 64 94 80 01
Org. No.: 970 167 641
Bank acc.: 7694 05 12081
IBAN: NO3276940512081

Norwegian Genetic
Resource Centre – a part
of Norwegian Forest and
Landscape Institute

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