**Supplementary Material S3:** Overview of drivers and constraints, as well as actors influencing UPA implementation.

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| --- | --- | --- | --- |
| **Drivers of implementation** | | |  |
| **Categories** | **Drivers** | **References (see S2)** | **Frequency** |
| **Social drivers of UPA implementation** | community building and participation | 2.5; 2.17; 6.6; 6.8; 6.10; 7.1; 7.2; 7.7; 7.8; 7.11; 7.12; 7.14; 7.17; 7.21; 7.23; 7.25; 8.2; 8.5; 8.17; 9.1; 9.2; 9.3; 9.6; 9.7; 9.8; 9.10; 9.12; 9.15; 9.19; 9.20; 10.2; 10.4; 10.5; 10.9; 10.10; 10.12 | 36 |
| access to food in qualitative terms | 2.7; 2.9; 2.17; 3.4; 3.17; 4.2; 4.3; 5.12; 6.6; 6.10; 7.1; 7.2; 7.5; 7.7; 7.9; 7.21; 8.5; 9.3; 9.5; 9.6; 9.7; 9.9; 9.16; 9.19; 9.20; 9.21; 10.7; 10.8; 10.12 | 29 |
| potential to mitigate public health and environmental problems | 2.2; 2.7; 2.15; 5.1; 5.12; 6.1; 6.3; 6.10; 7.7; 7.8; 7.11; 7.14; 7.21; 7.23; 8.11; 9.1; 9.3; 9.4; 9.5; 9.9; 9.10; 9.11; 9.12; 9.17; 9.19; 10.12 | 26 |
| network collaboration | 2.5; 3.4; 3.19; 7.14; 7.21; 7.25; 8.1; 8.17; 8.19; 9.1; 9.3; 9.11; 9.12; 9.13; 10.8; 10.12 | 16 |
| improve UPA skills | 1.2; 2.6; 2.17; 3.8; 3.19; 4.2; 8.4; 8.5; 8.11; 9.1; 9.9; 9.10; 9.13; 9.15; 10.1 | 15 |
| educational support | 1.2; 3.9; 6.6; 7.7; 7.11; 7.21; 9.1; 9.3; 10.4; 10.9; 10.10; 10.12 | 12 |
| access to food in quantitative terms | 1.6; 2.7; 7.22; 8.2; 8.4; 9.1; 9.2; 9.6; 9.12; 9.17; 10.8 | 11 |
| Relaxation | 2.7; 3.17; 8.1; 8.5; 8.17; 9.3; 9.6; 9.9; 9.17; 10.4 | 10 |
| political UPA | 2.19; 6.1; 6.8; 7.6; 9.5; 9.17; 10.1; 10.7 | 8 |
| practical experiences with UPA | 2.5; 2.6; 3.5; 7.17; 9.17; 9.21; 10.3 | 7 |
| social relationships with producers | 2.9; 6.3; 7.7; 9.2; 9.14; 9.16; 9.19 | 7 |
| encourage children and youth to participate in UPA | 2.17; 7.11; 8.4; 8.11; 9.12; 10.7; 10.9 | 7 |
| popularity in media | 3.19; 7.2; 7.10; 10.3; 10.11; 10.12 | 6 |
| social events | 2.5; 2.20; 6.3; 6.12; 9.9; 9.15 | 6 |
| resource exchange | 2.3; 6.12; 10.1; 10.5; 10.6 | 5 |
| good practice examples | 8.4; 9.1; 9.8; 9.9; 10.12 | 5 |
| family history of UPA activities | 2.17; 3.19; 7.25; 8.4; 9.9 | 5 |
| compensation to lacking private green space | 3.17; 8.2; 8.4; 8.5; 9.8 | 5 |
| physical exercise | 7.25; 8.5; 8.6; 9.5; 9.6 | 5 |
| improve the district's image | 8.17; 9.6; 10.12 | 3 |
| multifunctional goals of UPA | 10.2; 10.4 | 2 |
| **Institutional drivers of UPA implementation** | policy regulations supporting UPA | 1.2; 2.2; 2.3; 2.8; 3.1; 3.7; 3.24; 4.3; 6.1; 6.2; 6.3; 6.4; 6.8; 6.10; 7.1; 7.2; 7.3; 7.5; 7.7; 7.10; 7.12; 7.14; 7.17; 7.22; 8.6; 8.19; 9.1; 9.12; 9.17; 9.20; 10.10; 10.11; 10.12 | 33 |
| bottom-up policy making | 2.6; 2.9; 6.10; 7.2; 7.3; 7.5; 7.8; 7.10; 7.12; 7.14; 7.21; 9.1; 9.3; 9.8; 9.10; 9.15; 9.20; 10.8 | 18 |
| public provision of resources for UPA (funding, material, land) | 2.4; 2.6; 7.6; 7.7; 7.8; 7.10; 7.17; 7.21; 8.17; 9.8; 9.10; 9.12; 9.13; 10.10 | 14 |
| security of tenure | 2.17; 7.3; 7.7; 7.9; 7.17; 10.2 | 6 |
| connections to city representatives | 4.3; 7.5; 7.7; 7.21; 9.12 | 5 |
| mayor's support | 2.8; 7.5 | 2 |
| good communication among city departments | 7.3; 10.5 | 2 |
| top-down policy-making | 7.17 | 1 |
| **Economic drivers of UPA implementation** | resources available for UPA | 1.6; 2.3; 2.4; 2.17; 5.1; 5.5; 6.10; 6.12; 7.2; 7.6; 7.7; 7.15; 7.17; 8.1; 9.1; 9.2; 9.6; 9.8; 9.10; 9.12; 9.20; 10.3; 10.5; 10.8; 10.10; 10.12 | 26 |
| money savings | 2.11; 3.4; 3.7; 3.14; 5.1; 5.7; 6.6; 6.12; 7.6; 7.9; 7.11; 7.23; 7.25; 8.1; 9.16; 9.20; 10.2; 10.5 | 18 |
| sustainable business model | 9.1; 10.2; 10.5; 10.7; 10.8; 10.10; 10.12 | 7 |
| good image/city branding | 6.2; 9.16; 10.2; 10.3; 10.6 | 5 |
| partnerships with enterprises | 6.2; 6.10; 7.6; 7.8 | 4 |
| financial crisis | 6.10; 9.17; 10.1 | 3 |
| time savings | 2.4; 6.6; 7.23 | 3 |
| diverse product supply | 10.2; 10.10 | 2 |
| proximity to supply market | 2.3 | 1 |
| **Ecological drivers of UPA implementation** | nature protection | 3.1; 3.2; 3.3; 3.6; 3.12; 4.2; 5.8; 7.7; 7.8; 7.22; 8.11; 9.1; 9.3; 9.4; 9.6; 9.9; 9.10; 9.11; 9.16; 9.21; 10.5 | 21 |
| favorable location characteristics for UPA | 5.7; 5.16; 6.11; 7.7; 10.2; 10.8 | 6 |
| counteracting environmental pollution | 4.2; 6.6; 7.7; 7.8; 7.11; 9.1 | 6 |
| **Spatial drivers of UPA implementation** | securing space for UPA | 1.6; 2.4; 2.8; 2.16; 5.9; 9.1; 9.3; 9.20 | 8 |
| easily accessible | 2.14; 3.2; 9.6; 9.8; 10.4; 10.8; 10.12 | 7 |
| use of empty or abandoned spaces | 4.2; 5.4; 6.3; 9.3; 9.20 | 5 |
| areas of low air and soil pollution | 4.1; 7.13 | 2 |
| leasing private yard space for UPA | 5.8 | 1 |
| low demand for new residential areas | 7.19 | 1 |
| **Technical drivers of UPA implementation** | efficient management methods | 2.1; 5.4; 5.7; 5.9; 10.8 | 5 |
| technical stakeholder support | 3.10; 7.7; 10.9 | 3 |
| technical skills | 5.5 | 1 |
| regular maintenance of UPA areas | 6.5 | 1 |
| **Constraints of implementation** | | | |
| **Categories** | **Constraints** | **References (see S2)** |  |
| **Social constraints of UPA implementation** | lack of community support | 1.2; 2.8; 3.4; 3.18; 4.3; 5.4; 5.8; 5.11; 6.3; 6.5; 6.9; 6.10; 7.2; 7.5; 7.6; 7.12; 7.17; 7.23; 7.25; 8.17; 9.2; 9.6; 10.5; 10.8; 10.10; 10.11; 10.12 | 27 |
| lack of information/skills on UPA | 2.2; 2.5; 2.17; 3.9; 3.10; 3.19; 4.2; 5.11; 7.13; 8.1; 9.3; 9.16; 10.2; 10.5; 10.6; 10.8; 10.12 | 17 |
| lack of time | 2.17; 6.6; 6.10; 7.6; 7.8; 8.1; 9.3; 9.10 | 8 |
| concerns on health-related impacts | 6.6; 7.12; 7.21; 8.17; 8.19; 9.2; 10.12 | 7 |
| social injustice | 7.7; 7.10; 7.12; 10.5; 10.9 | 5 |
| residents' lack of coordinated planning process | 7.10; 7.14; 10.8 | 3 |
| conflicts and tensions among actors | 9.3; 10.4; 10.5 | 3 |
| constraining food consumption patterns | 2.14; 7.14 | 2 |
| **Institutional constraints of UPA implementation** | lack of governmental support | 2.4; 2.15; 6.2; 6.3; 7.2; 7.3; 7.7; 7.10; 7.12; 7.14; 7.17; 7.23; 7.24; 9.4; 9.12; 9.13; 9.20; 10.2; 10.12 | 19 |
| too strict legal requirements | 2.16; 2.22; 3.1; 4.3; 5.6; 5.8; 6.2; 7.1; 7.6; 7.14; 8.17; 9.20; 10.6; 10.8; 10.11 | 15 |
| planning insecurity | 6.1; 6.7; 7.3; 7.7; 7.14; 7.17; 7.23; 9.8; 9.13; 9.20; 10.2; 10.8; 10.9; 10.12 | 14 |
| lack of legal requirements supporting UPA | 5.11; 6.3; 7.3; 7.10; 7.12; 7.24; 7.25; 9.1; 9.8; 10.1; 10.2 | 11 |
| bureaucratic burdens | 7.10; 7.22; 7.25; 9.8; 9.11; 9.13; 9.17; 9.20; 10.5; 10.12 | 10 |
| exclusive access to gardens/farms | 2.18; 5.1; 5.4; 6.2; 6.3; 6.11 | 6 |
| lack of governmental resources (e.g., staff, money) | 5.11; 7.2; 7.5; 7.7; 7.9; 10.2 | 6 |
| competing priorities | 7.5; 7.7; 7.23; 10.3; 10.8 | 5 |
| inconsistencies between policy aims and implementation | 2.4; 7.5; 7.14; 7.22 | 4 |
| lack of quantifiable goals | 1.2; 2.11; 7.2; 7.3 | 4 |
| unclear ownerships | 2.8; 6.11; 9.16 | 3 |
| dependence on globalized food policy | 7.9; 7.14 | 2 |
| unclear responsibilities in the city government | 7.3 | 1 |
| **Economic constraints of UPA implementation** | costs related to UPA | 1.2; 2.2; 4.3; 5.4; 5.5; 5.8; 5.9; 6.2; 6.3; 6.7; 7.2; 7.6; 7.11; 7.14; 9.16; 10.8; 10.10; 10.12 | 18 |
| limited resources (e.g., manpower, finances, time) | 2.9; 2.17; 3.10; 6.8; 6.10; 7.2; 7.7; 7.12; 7.17; 7.22; 9.2; 9.3; 9.6; 10.1; 10.2; 10.6; 10.8; 10.9 | 18 |
| competition for land (increases land prizes) | 7.9; 7.14; 7.22; 8.19; 10.2; 10.3 | 6 |
| low yield and thus, low profit | 2.8; 5.6; 6.7; 9.20; 10.5 | 5 |
| competition with other forms of UPA | 4.3; 7.23; 10.2; 10.5; 10.11 | 5 |
| focus on economic growth and urbanization | 7.12; 7.14; 7.25 | 3 |
| export of locally grown food | 3.18; 7.14 | 2 |
| increasing resource consumption | 5.5 | 1 |
| lack of UPA business model | 10.10 | 1 |
| **Ecological constraints of UPA implementation** | soil contamination affecting UPA | 1.5; 2.8; 5.4; 6.1; 6.9; 7.2; 7.3; 7.23; 10.2; 10.8; 10.9 | 11 |
| air pollution affecting UPA | 2.1; 2.8; 5.4; 7.2; 7.20; 7.23; 10.9 | 7 |
| pests | 2.17; 3.10; 9.4; 10.8 | 5 |
| unreliable access to water | 2.8; 3.10; 9.10; 10.8 | 4 |
| lacking soil fertility and nitrogen supply | 3.1; 7.13; 7.15 | 3 |
| lacking information on UPA's environmental performance | 2.2; 10.12 | 2 |
| overabundance of animal manure | 5.11 | 1 |
| flood risk | 7.23 | 1 |
| **Spatial constraints of UPA implementation** | limited space for UPA | 2.2; 2.9; 2.15; 5.8; 5.10; 6.7; 7.12; 9.1; 9.4; 9.6 | 10 |
| lacking physical accessibility of land for users | 2.16; 3.13; 6.10; 9.16 | 4 |
| **Technical constraints of UPA implementation** | infrastructural constraints | 2.10; 5.4; 5.5; 5.8; 5.10; 10.5; 10.8 | 8 |
| lack of management/technical solutions | 1.4; 2.2; 3.10; 5.11; 10.11; 10.12 | 6 |
| lack of technological knowledge | 3.9; 5.16; 10.10 | 3 |
| **Actors for UPA implementation** | | | |
| **Categories** | **Actors** | **References (see S2)** |  |
| **Macro scale** | regional government | 2.4; 2.7; 2.9; 6.11; 6.12; 7.4; 7.7; 7.14; 7.21; 9.3; 9.5; 9.6; 9.15; 9.20; 10.2; 10.5 | 16 |
| national government | 7.2; 9.9; 9.20; 10.3 | 4 |
| European Union | 3.13; 7.14 | 2 |
| national informal networks | 9.8; 9.17 | 2 |
| integration into global policies | 10.12 | 1 |
| **Meso scale** | local government | 1.6; 2.1; 2.3; 2.4; 2.5; 2.6; 2.7; 2.8; 2.18; 2.19; 2.20; 2.22; 3.1; 3.5; 3.7; 3.10; 3.13; 3.16; 3.22; 4.1; 4.2; 4.3; 5.5; 5.8; 5.9; 6.1; 6.2; 6.3; 6.4; 6.5; 6.8; 6.11; 6.12; 7.1; 7.2; 7.3; 7.5; 7.6; 7.7; 7.8; 7.9; 7.10; 7.11; 7.12; 7.13; 7.14; 7.17; 7.21; 7.22; 7.23; 7.25; 8.11; 8.17; 8.19; 9.1; 9.3; 9.5; 9.6; 9.8; 9.11; 9.12; 9.13; 9.15; 9.20; 10.1; 10.2; 10.5; 10.6; 10.8; 10.9; 10.10; 10.11; 10.12 | 73 |
| **Micro scale** | NGOs | 1.6; 2.3; 2.4; 2.5; 3.1; 4.2; 5.8; 6.2; 6.3; 6.5; 6.8; 6.10; 6.11; 6.12; 7.1; 7.2; 7.3; 7.6; 7.7; 7.8; 7.10; 7.11; 7.12; 7.21; 7.25; 8.17; 8.19; 9.1; 9.3; 9.4; 9.6; 9.7; 9.11; 9.13; 9.15; 9.16; 9.17; 9.20; 10.9; 10.11; 10.12 | 42 |
| residents | 2.1; 2.15; 3.7; 3.19; 5.4; 5.5; 5.8; 5.9; 6.2; 6.3; 6.5; 6.6; 6.7; 6.8; 6.10; 6.11; 7.9; 7.10; 7.11; 7.17; 7.22; 9.2; 9.3; 9.6; 9.8; 9.9; 9.10; 9.12; 9.13; 9.16; 9.17; 9.20; 10.1; 10.7; 10.9 | 35 |
| (urban) farmers (incl. Community Supported Agriculture) | 1.6; 2.2; 2.9; 2.11; 2.20; 3.18; 3.25; 4.2; 4.3; 5.8; 5.11; 6.3; 6.7; 6.10; 6.13; 7.2; 7.6; 7.7; 7.9; 7.12; 7.14; 7.23; 9.2; 9.3; 9.12; 9.14; 9.19; 10.1; 10.7; 10.10 | 30 |
| gardeners | 1.3; 2.5; 2.6; 2.17; 3.1; 3.17; 3.22; 3.24; 3.25; 4.1; 6.1; 6.3; 6.5; 6.6; 6.9; 6.10; 6.11; 7.7; 7.8; 7.13; 7.22; 7.25; 8.1; 8.19; 9.4; 9.7; 9.16; 9.20 | 28 |
| vulnerable population groups (incl. children and youth, pensioners, immigrants, people of low income, ex-criminals) | 1.6; 3.4; 3.8; 6.2; 6.3; 6.10; 6.12; 8.19; 9.3; 9.7; 9.9; 9.15; 9.16; 9.17; 9.20; 9.21; 10.7 | 17 |
| (local/ social) companies | 1.6; 2.9; 2.22; 4.3; 5.8; 6.4; 6.10; 6.11; 6.12; 7.6; 7.17; 8.19; 9.1; 9.11; 9.15; 10.11; 10.12 | 17 |
| researchers | 2.5; 2.11; 3.10; 6.3; 6.4; 7.2; 7.8; 7.17; 9.1; 9.3; 9.10; 9.16; 10.10; 10.11; 10.12 | 15 |
| volunteers | 2.3; 6.3; 6.8; 6.10; 7.1; 7.12; 8.1; 9.7; 9.14; 9.16; 9.20; 10.10 | 12 |
| architects and planners | 2.3; 5.8; 5.12; 6.4; 7.2; 7.8; 7.11; 7.12; 7.17; 10.11; 10.12 | 11 |
| activists | 6.1; 6.3; 7.3; 7.8; 9.4; 9.20; 10.1; 10.11; 10.12 | 9 |
| consumers | 2.9; 4.3; 7.14; 9.15; 9.16 | 5 |
| donors | 7.7; 9.11; 9.15 | 3 |
| investors | 6.2; 7.7; 7.11 | 3 |
| food policy councils | 2.5; 7.21; 9.8 | 3 |
| artists | 7.8; 10.12 | 2 |
| clinics | 8.1; 9.20 | 2 |
| real-estate agencies | 8.17; 10.12 | 2 |
| (local) media | 9.15; 9.16 | 2 |