

Supplementary materials

Table S1. Area of different urban green space typologies in Birjand city.

Typology of urban greenery	Area (ha)
Public parks (No. 87)	80.62
Street green space (boulevard, square, roadside)	92
Planted forest	61
Green belt	19.38
Total greenery under the supervision of Municipality	253
Private gardens	186.65
Per Capita Public Urban Parks (m ² /capita)	4.33
Per Capita Urban Green Spaces (m ² /capita)	13.75

Source: Official website of the Organization of Birjand's Urban Parks & Green Spaces (<http://birjandpark.ir/>).

Table S2. Number and area of urban parks by districts.

	Urban parks								Total Area (ha)
	Mini Parks (less than 0.5 ha)		Neighborhood Parks (0.5 – 2 ha)		District Parks (2-4 ha)		City Parks (4-8 ha)		
	N	Area (ha)	N	Area (ha)	N	Area (ha)	N	Area (ha)	
District 1	10	2.24	5	3.42	5	12.14	2	15.21	33
District 2	42	9.65	18	17.95	4	13.22	1	6.8	47.62
Total	52	11.89	23	21.37	9	25.36	3	22	80.62

Source: Official website of the Organization of Birjand's Urban Parks & Green Spaces (<http://birjandpark.ir/>).

Table S3. Greenery class, price of land and preference for residency for the Birjand neighborhoods where respondents live.

District	Neighborhoods	Classes of greenery per capita	Classes for price of urban lands	Classes for preferred for residency
2	1	8	5	5
1	2	8	6	6
1	3	7	6	6
1	4	7	6	6
1	5	8	6	6
1	6	8	6	6
1	7	7	5	4
1	8	7	5	4
1	9	7	5	4
1	10	8	5	4
1	11	7	5	4
1	12	7	5	4
1	13	7	5	4
1	14	6	4	5
1	15	6	4	5
1	16	7	4	5

1	17	8	4	5
1	18	8	4	5
1	19	7	4	5
1	20	8	4	5
1	21	2	4	5
1	22	4	4	5
1	23	8	no data	no data
1	24	8	no data	no data
1	25	5	7	6
2	26	1	7	6
2	27	7	3	3
2	28	4	3	2
2	29	7	2	2
2	30	8	2	2
2	31	7	3	3
2	32	7	2	3
2	33	7	2	2
2	34	7	no data	no data
2	35	7	3	3
2	36	7	3	3
2	37	7	1	1
2	38	7	3	3
2	39	7	3	3
2	40	7	3	3
2	41	7	1	1
2	42	7	1	1
2	43	7	1	1
2	44	7	1	1
2	45	8	1	1
2	46	6	1	1
2	47	6	1	1
2	48	6	1	1
2	49	6	1	1
2	50	7	1	1
2	51	7	1	1
2	52	3	1	1
2	53	5	1	1
2	54	6	1	1
2	55	6	1	1
2	56	5	1	1
2	57	6	1	1

Classes of greenery per capita, from 1 (61 to 70 m²) to 8 (1-10 m²); Price of urban lands from 1 (most expensive) to 7 (cheapest); Preferred for residency from 1 (most preferred) to 6 (least preferred).

Table S4. Descriptive statistics of the sample.

Age	Female		Male		Total	
	Count	Percentage	Count	Percentage	Count	Percentage
Less than 20	5	2%	7	5%	12	3%
Between 20 and 29	87	36%	22	14%	109	28%
Between 30 and 39	83	35%	46	30%	129	33%
Between 40 and 49	45	19%	49	32%	94	24%
Between 50 and 59	13	5%	24	15%	37	9%
Between 60 and 69	6	3%	4	3%	10	3%
More than 70	0	0%	3	2%	3	1%
Total	239	100%	155	100%	394	100%
Education						
Post-graduate degree	86	36%	87	56%	173	44%
University/college degree	128	54%	58	37%	186	47%
High school diploma	24	10%	5	3%	29	7%
Mandatory education	1	0%	5	3%	6	2%
Total	239	100%	155	100%	394	201%
Occupation						
Employee (public/private)	82	34%	97	63%	179	45%
Free-lance, private business	17	7%	22	14%	39	10%
Housewife	51	21%		0%	51	13%
Student	70	29%	14	9%	84	21%
Unemployed	6	3%	2	1%	8	2%
Retired	8	3%	12	8%	20	5%
Other	5	2%	8	5%	13	3%
Total	239	37%	155	23%	394	32%

Table S5. Users of private green space per size of space and house typology.

	Total		Flat in condominium		Single house	
	N	Percentage	N	Percentage	N	Percentage
More than 100 m ²	40	10%	10	5%	30	17%
Between 30 and 100 m ²	107	27%	23	10%	84	48%
Less than 30 m ²	62	16%	21	10%	41	23%
None	185	47%	164	75%	21	12%
Total	394	100%	218 (55%)	100%	176 (45%)	100%

Table S6. Type of public green space within 300 m from home without/with presence of private green space.

	Home without a private green space		Home with a private green space		Total	
	N	Percentage	N	Percentage	N	Percentage
None	27	10%	16	4%	42	8%
Playground	28	10%	43	11%	39	7%
An urban park	110	40%	140	37%	223	42%
A tree-lined street	33	12%	40	10%	73	14%
Neighborhood green space	32	12%	54	14%	58	11%
A public urban garden	12	4%	18	5%	22	4%
A square with trees	18	7%	28	7%	37	7%
Green area outside the town	0	0%	9	2%	5	1%

Other	15	5%	34	9%	32	6%
Totals	275	100%	382	100%	531	100%

Table S7. Characteristics of visitation of public green spaces before the pandemic by users of public green spaces (n=379).

	Public green spaces		Private green spaces		
	N	Percentage	N	Percentage	
1) Distance to reach the public green space					
More than 1 km	98	26%			
More than 500 m	53	14%			
Between 300 and 500 m	100	26%			
Less than 300 m	128	34%			
Total	379	100%			
2) Type of public green space	N	Percentage			
Playground	4	1%			
An urban park	209	55%			
A tree-lined street	28	7%			
Periurban green spaces	33	9%			
Mountains around city	75	20%			
Neighborhood green pocket	23	6%			
A public garden	7	2%			
Total	379	100%			
3) Frequency of visitation of a green space	N	Percentage	N	Percentage	P
Every day	33	8%	58	28%	***
More than once a week	97	25%	50	24%	ns
Several times a month	117	30%	45	22%	ns
Once a month	74	19%	18	9%	**
Less than once a month	58	15%	31	15%	ns
Never	15	4%	7	3%	ns
Total	394	100%	209	100%	ns
4) Motivation to visit a green space (max. 2 choices)	N	Percentage	N	Percentage	p
Gardening	3	0%	47	13%	***
Meeting people	34	5%	2	1%	***
Observing nature	110	17%	48	13%	ns
Passing through it	35	5%	44	12%	***
Physical exercise (e.g. running, sport)	31	5%	14	4%	ns
Reading	3	0%	12	3%	***
Relaxing	52	8%	67	19%	***
Staying outdoors	32	5%	75	21%	***
Taking the kids outdoor	185	28%	40	11%	***
Walking	175	27%	13	4%	***
Total	660	100%	362	100%	

The Chi Square goodness of fit test was used to compare the items between the two groups at $p < 0.05$. Significant differences are showed with * at $p < 0.05$; ** at $p < 0.01$; *** at $p < 0.001$; ns for non-significant differences.

Table S8. Difference in frequency (1), motivation (2) of visitation and benefits and services perception (3) regarding public green spaces by respondents without (No) and with (Yes) access to a private green space (pre and during the pandemic)

	Private Green Space = No			Private Green Space = Yes			Private green space
	N	Percentage	pre- vs. during	N	Percentage	pre- vs. during	No vs. Yes
1) Frequency of visitation of a public green space							
Before the pandemic							
Every day	21	11%	ns	12	6%	ns	*
More than once a week	48	26%	***	49	23%	***	ns
Several times a month	52	28%	***	65	31%	***	ns
Once a month	28	15%	***	46	22%	*	ns
Less than once a month	28	15%	ns	30	14%	ns	ns
Never	8	4%	***	7	3%	***	ns
Total	185	100%		209	100%		
During the pandemic							
Every day	8	5%		6	3%		ns
More than once a week	15	8%		10	5%		ns
Several times a month	17	10%		16	8%		ns
Once a month	12	33%		24	32%		ns
Less than once a month	58	7%		64	12%		ns
Never	67	38%		82	41%		ns
Total	137	100%		170	100%		
2) Reason to visit a public green space							
Before the pandemic							
Taking the kids outdoor	92	31%	*	93	26%	***	ns
Walking	77	26%	ns	98	27%	ns	ns
Meeting people	11	4%	**	23	6%	ns	ns
Relaxing	25	8%	*	27	8%	ns	ns
Observing nature	50	17%	ns	60	17%	ns	ns
Staying outdoors	17	6%	ns	15	4%	***	ns
Passing through while going somewhere else	13	4%	***	22	6%	ns	ns
Physical exercise (e.g. running, sport)	16	5%	ns	15	4%	ns	ns
Gardening	0	0%	ns	3	1%	ns	ns
Reading	0	0%	ns	3	1%	ns	ns
Total	301	100%		359	100%		
During the pandemic							
Taking the kids outdoor	36	20%		20	10%		***
Walking	49	28%		56	27%		ns
Meeting people	18	10%		20	10%		ns
Relaxing	6	3%		8	4%		ns
Observing nature	22	13%		39	19%		ns
Staying outdoors	14	8%		25	12%		ns
Passing through while going somewhere else	22	13%		21	10%		ns
Physical exercise (e.g. running; sport)	8	5%		15	7%		ns
Gardening	0	0%		2	1%		ns
Reading	1	1%		0	0%		ns
Total	176	100%		206	100%		

The Chi Square goodness of fit test was used to compare the items between the two groups (with vs. without private green space) and Wilcoxon test was used for the comparisons between pre- and during pandemic at $p < 0.05$. Significant differences are showed with * at $p < 0.05$; ** at $p < 0.01$; *** at $p < 0.001$; ns for non-significant differences.

Table S9. Frequency of visitation of public green spaces in relation to variables connected to the demographic and the presence of private green spaces.

n=379		b	Std.Err.	p-value
Pre-pandemic	Intercept	2.67	0.36	0.00
	Reason in public green space prior the pandemic - Passing through it	-0.85	0.22	0.00
	Student	-0.46	0.18	0.01
	Distance of public green space	0.12	0.05	0.02
	Reason in public green space prior the pandemic -Physical exercise	0.61	0.22	0.01
	Reason in public green space prior the pandemic - Walking	0.31	0.13	0.01
During the pandemic	Intercept	1.76	0.29	0.00
	Reason in public green space during the pandemic - Physical exercise	0.76	0.30	0.01
	Reason in public green space during the pandemic - Passing through it	-0.52	0.24	0.03
	Reason in public green space during the pandemic - Staying outdoors	-0.54	0.24	0.03
	Frequency of visitation of a private green space during the pandemic	0.1	0.05	0.04

Table S10. Motivation (up to two choices) for visiting a public and private green space during the pandemic.

	Public green space		Private green space		p
	Count	Percentage	Count	Percentage	
Gardening	2	1%	30	6%	***
Meeting people	38	10%	21	4%	***
Observing nature	61	16%	97	19%	ns
Passing through it	43	11%	37	7%	*
Physical exercise	23	6%	24	5%	ns
Reading	1	0%	7	1%	ns
Relaxing	14	4%	82	16%	***
Staying outdoors	39	10%	76	15%	*
Taking the kids outdoor	56	15%	97	19%	ns
Walking	105	27%	38	7%	***
Total	382	100%	510	100%	

The Chi Square goodness of fit test was used to test if the motivation was affected by the type of green space at $p < 0.05$. Significant differences are showed with * at $p < 0.05$; ** at $p < 0.01$; *** at $p < 0.001$; ns for non-significant differences.

Table S11. Aspects of private (left) and public (right) green space appreciated by respondents, in relationship to independent variables.

	Private green space (n=209)				Public green space (n=231)			
		b	Std. Err.	p-value		b	Std. Err.	p-value
Natural value	Intercept	3.278	0.263	0.000	Intercept	3.770	0.310	0.000
	House	0.207	0.090	0.022	Age	-0.096	0.039	0.015
	Price of urban lands	-0.308	0.142	0.031	Gender	-0.226	0.090	0.013
Biodiversity	Intercept	3.113	0.238	0.000	Intercept	3.685	0.322	0.000
	Age	-0.117	0.053	0.029	Gender	-0.315	0.109	0.004
	House	0.229	0.113	0.044	Greenery class	-0.069	0.026	0.007
	Price of urban lands	-0.417	0.170	0.014	House	0.221	0.107	0.040
Cleanness	Intercept	3.552	0.129	0.000	Intercept	4.086	0.160	0.000
	House	0.309	0.106	0.004	Gender	-0.369	0.087	0.000
					Age	-0.089	0.036	0.016
Quiet/freedom from noise	Intercept	2.158	0.293	0.000				
	Education	0.244	0.070	0.001				
	Housewife	0.365	0.142	0.011				
Privacy	Intercept	2.801	0.247	0.000	Intercept	3.892	0.340	0.000
	Having a private GS	0.230	0.083	0.006	Gender	-0.248	0.125	0.049
	Education	0.141	0.059	0.018	Education	-0.175	0.087	0.044
Socialization					Intercept	2.852	0.261	0.000
					Freq. of visitation of public GS	0.109	0.047	0.022
					pre-pandemic Greenery class	-0.066	0.029	0.024
Security from bad people	Intercept	2.944	0.332	0.000	Intercept	3.172	0.384	0.000
	Gender	-0.302	0.113	0.008	Gender	-0.434	0.116	0.000
	Other (profession)	-0.474	0.177	0.008	Education	0.224	0.080	0.006
	Free-lance	-0.353	0.178	0.048	Housewife	0.472	0.196	0.017
	Price of urban lands	-0.434	0.170	0.011				
	Preferred for residency	0.423	0.178	0.018				
Safety from contagion	Intercept	2.658	0.337	0.000	Intercept	3.747	0.141	0.000
	Gender	-0.514	0.108	0.000	Gender	-0.390	0.110	0.000
	Freq. of visitation of private GS during pandemic	0.081	0.034	0.020				

Multiple regression analysis between the dependent variables connected to appreciated benefits and services and independent variables, related to public green spaces and private green spaces as indicated in materials and methods. Only statistically significant results are reported.

Table S12. Missed things related to green spaces indicated by respondents (n=394).

	Count	Percentage
Nature	104	19%
Meeting people	97	18%
Family togetherness	54	10%
Children's play	44	8%
Walking	41	8%
Clean air	40	7%
Relaxation	25	5%
Quiet	26	5%
Enjoying the green space	25	5%
Physical exercise	21	4%
Breathing in open air	21	4%
Recreation	12	2%
No stress for the virus	11	2%
Everything	1	0%
Nothing	14	3%
Total	536	100%

Table S13. What was missed by respondents (n=394) in relation to demographic information and green space visitation before the pandemic.

		b	Std.Err.	p-value
Nature	Intercept	0.36	0.04	0.000
	Male	-0.13	0.05	0.009
Clean air	Intercept	0.10	0.02	0.000
	Student	0.13	0.04	0.001
Sociality	Intercept	0.12	0.15	0.432
	Distance of public green space	0.05	0.02	0.010
	Near tree lined-street	0.16	0.07	0.017
	Greenery class	0.03	0.01	0.036
	Near square with trees	0.23	0.11	0.033
	Male	0.12	0.06	0.031
	Age	-0.06	0.03	0.027
Physical exercise	Intercept	-0.02	0.09	0.778
	Age	0.06	0.02	0.001
	Other	0.13	0.06	0.031
	Student	0.10	0.05	0.045
Relax and quiet	House	-0.10	0.03	0.006
Recreation	Intercept	0.13	0.05	0.005
	Education	-0.03	0.01	0.050
Nothing	Intercept	0.28	0.06	0.000
	Frequency of visitation of public green space before the pandemic	-0.02	0.01	0.001
	Near square with trees	0.12	0.04	0.003
	Distance of public green space	-0.03	0.01	0.001
	Age	0.02	0.01	0.003

Education	-0.03	0.01	0.016
Near Park	-0.05	0.02	0.016

Multiple regression analysis between the dependent variables (what was missed) and independent variables. Only statistically significant results are reported.

Survey: Use of green spaces during the pandemic by COVID-19 in Birjand

The present questionnaire has been designed with the aim of studying the relationship between Birjand citizens and urban green space in the Corona period. Researchers aim to compare the use of urban green spaces (public and private green spaces) by Birjand citizens in the two periods before and after Corona. In this study, urban public green space means all green spaces that are managed by the municipality or other government agencies (natural resources, cultural heritage) like urban parks and gardens that all people can use. Private green spaces refer to privately owned gardens and yards at level of private houses and condominiums.

The questionnaire should take approximately 15 minutes to complete.

The questionnaire is entirely anonymous. Personal data are requested for statistical purposes only, and the reporting of results will be based solely on aggregated data.

Thank you in advance for your cooperation.

I have read the handling data management information:

- Yes

Section 1

Characteristics of the neighborhood and of the usage of green spaces

1 Name (or postcode) of your district/neighborhood?

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2 In which kind of house do you live?

- Flat in a condominium
 Single house
 Villa

3 Is there any PUBLIC green space in your neighborhood (within 300 m from home)? (If you select Other, please, specify)

- A tree-lined street
 An urban park
 A public urban garden
 A square with trees
 Neighborhood green space
 Playground
 River banks
 Green area outside the town (e.g. forest)
 Beach
 Lake
 Other
 None

Section 2A.

For the next questions, you can refer to such public green space or to another one; refer to your habits before the pandemic

4 How often (in general) did you use to visit a public urban green space before the pandemic?

- Every day
- More than once a week
- Several times a month
- Once a month
- Less than once a month
- Never (=> Q9)

5 How far did you use to travel to reach such public urban green space before the pandemic?

- Less than 300 m
- Between 300 and 500 m
- More than 500 m
- More than 1 km

6 What kind of green space is it? (If you select Other, please, specify)

- A tree-lined street
- An urban park
- A periurban forest
- A public garden
- A square with trees
- Neighborhood green pocket
- Playground
- River banks
- Beach
- Lake
- Other:

7 For which reason(s) did you usually visit the public urban green space before the pandemic? (max. 2 answers, the most important)

- Meeting people
- Physical exercise (e.g. running, sport)
- Walking
- Taking the kids outdoor
- Reading
- Observing nature
- Taking the dog out
- Relaxing
- Passing through while going somewhere else
- Staying outdoors
- Gardening
- Other:

8 What did you usually appreciated most in the public urban green space before the pandemic?

- Physical health benefits (weight, cardiovascular)
- Reduction of stress

- Reduction anxiety
- Reduction of depression
- Connection to nature
- Connection to spiritual side
- Appreciation of the environment
- Family togetherness
- Provision of clean air
- Sense of community

Section 2B

Use of private garden/courtyard/backyard in general, before the pandemic

- 9 Does your house/building include **an accessible private garden/courtyard/backyard**?
- Yes
 - No (=>Section 3)
- 10 How big is the private garden/courtyard/backyard?
- Less than 30 m²
 - Between 30 and 100 m²
 - More than 100 m²
- 11 Is it shared with other people?
- Yes, with the family
 - Yes, with the neighbors
 - No
- 12 How often do you spend time (meaningful for activities) in the private garden/courtyard/backyard?
- Everyday
 - More than once a week
 - Several times a month
 - Once a month
 - Less than once a month
 - Never
- 13 For which reason(s) do you usually spend time in the private garden/courtyard/backyard? (max. 2 answers, the most important)
- Meeting people
 - Physical exercise (e.g. running, sport)
 - Walking
 - Taking the kids outdoor
 - Reading
 - Observing nature
 - Taking the dog out
 - Relaxing
 - Passing through while going somewhere else
 - Staying outdoors
 - Gardening
 - Other:
- 14 What do you usually appreciate most in the private garden/courtyard/backyard?

- Physical health benefits (weight, cardiovascular)
- Reduction of stress
- Reduction anxiety
- Reduction in depression
- Connection to nature
- Connection to spiritual side
- Appreciation of the environment
- Family togetherness
- Provision of clean air
- Sense of community

Section 3A

Use and perception of public urban green space during the pandemic

15 How many times have you been in a **public urban green space** (to the extent allowed) **during the pandemic?**

- Everyday
- More than once a week
- Several times a month
- Once a month
- Less than once a month
- Never (=> Q20)**

16 For which reason(s) did you visit a **public urban green space during the pandemic?** (max. 2 answers, the most important)

- Meeting people
- Physical exercise (e.g. running, sport)
- Walking
- Taking the kids outdoor
- Reading
- Observing nature
- Taking the dog out
- Relaxing
- Passing through while going somewhere else
- Staying outdoors
- Gardening
- Other:

17 What do you usually appreciate most in a **public urban green space during the pandemic?**

- Physical health benefits (weight, cardiovascular)
- Reduction of stress
- Reduction anxiety
- Reduction in depression
- Connection to nature
- Connection to spiritual side
- Appreciation of the environment
- Family togetherness
- Provision of clean air
- Sense of community

18 What feeling change did you notice staying in the **public urban green space with respect to staying home during the pandemic?**

	Much less	Less	No change	More	Much more
Happy					
Pleased					
Excited (ecstatic)					
Physically energetic					
Anxious					
Nervous					
Tense					
Frightened					
Irritated					
Upset					
Depressed					
Blue					

Additional notes/explanations:

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19 Indicate, to which extent you appreciate the following items in such a **public urban green space during the pandemic**

	Not at all	Little	Appreciated	Very much
Quiet/freedom from noise				
Privacy				
Socialization				
Safety from contagion				
Security from bad people				
Cleanness				
Natural value				
Biodiversity (for plants and animals)				
Clean air				
Comfortable climate				
Vicinity				

Section 3B

Use and perception of private green spaces during the pandemic

20 How many times have you been in a **private garden/courtyard/backyard during the pandemic?**

- Everyday
- More than once a week
- Several times a month
- Once a month
- Less than once a month
- Never (=> Q25)

21 For which reason(s) did you visit the **private garden/courtyard/backyard during the pandemic?** (max. 2 answers, the most important)

- Meeting people
- Physical exercise (e.g. running, sport)
- Walking
- Taking the kids outdoor
- Reading
- Observing nature
- Taking the dog out
- Relaxing
- Passing through while going somewhere else
- Staying outdoors
- Gardening
- Other:

22 What did you enjoy most in the **private garden/courtyard/backyard during the pandemic?**

- Physical health benefits (weight, cardiovascular)
- Reduction of stress
- Reduction anxiety
- Reduction in depression
- Connection to nature
- Connection to spiritual side
- Appreciation of the environment
- Family togetherness
- Provision of clean air
- Sense of community

23 What feeling did you notice staying in the **private garden/courtyard/backyard with respect to staying home during the pandemic?**

	Much less	Less	No change	More	Much more
Happy					
Pleased					
Excited (ecstatic)					
Physically energetic					
Anxious					
Nervous					
Tense					
Frightened					
Irritated					
Upset					
Depressed					
Blue					

Additional notes/explanations:

.....

24 Indicate the extent to which you **appreciated** the following items in the **private garden/courtyard/backyard during the pandemic**

	Not at all	Little	Appreciated	Very much
Quiet/freedom from noise				
Privacy				

Socialization				
Safety from contagion				
Security from bad people				
Cleanness				
Natural value				
Biodiversity (for plants and animals)				
Clean air				
Comfortable climate				
Vicinity				

Notes ...

Section 4

Missing a green space

25. During the period of lockdown, how much did you miss going to a green space?

- Not at all
- A little
- Rather
- A lot

26. What did you miss most during the lockdown regarding the visitation of green spaces?

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Section 5

Personal details (anonymous)

The questionnaire is anonymous. We would just like to know about the composition of our sample.

27. Gender

- M
- F
- Other

28. Age

- Less than 20 years old
- Between 20 and 29
- Between 30 and 39
- Between 40 and 49
- Between 50 and 59
- Between 60 and 69
- Between 70 and 79
- Above 80

29. Education

- Mandatory education
- High school diploma
- University/college degree

- Post-graduate degree

30. Employment

- Employee (public / private)
- Free-lance, private business
- Retired
- Unemployed
- Student
- Housewife
- Other